

Log wood boiler



Dual fuel boiler



(Log wood + pellets)

Wood chip boiler



110L



Dual fuel boiler with intermediate pellet store

## Biomass boiler thermi<sup>nator</sup> touch

Installation manual for qualified personnel

Read carefully before operating.

DR-6083-EN / v29-202002

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## 1 About this manual

The language of the original manual is German. Versions of this manual in all other languages are translations of the original.

### Storing the manual

- Keep the manual for the entire service life of the product and ready to hand at all times.
- The manual must be passed on to the new owner when the product is dismantled/reused.
- If the manual is lost or destroyed, request a copy from the manufacturer.

### Classification of warnings

The warnings used in this manual are shown with symbols and signal words. The signal word indicates the level and nature of the danger and how to avert it.



**DANGER** - Failure to comply with this instruction poses a danger to people.



**ATTENTION** - Failure to comply with this instruction could result in damage to property.



Indicates information for correct handling of the product.

**Limitation of liability**

SOLARFOCUS GmbH is not liable for personal injury and property damage due to:

- Failure to observe the instructions in this manual.
- Use of the product for any purpose other than for its intended use.
- Deployment of non-qualified personnel.
- Use of non-approved spare parts.
- Technical modifications to the product by the user.

**Copyright protection**

- This manual is protected by copyright. Reprinting, translation and reproduction of this manual – in its entirety or in part – is only permissible with the prior written approval of the manufacturer.

**Warranty**

See terms and conditions of business and delivery of SOLARFOCUS GmbH.

**Manufacturer**

SOLARFOCUS GmbH.  
Werkstrasse 1, A-4451 St.Ulrich  
Commercial register no. 281755x  
Tel.: +43 7252 50 002-0, Fax: +43 7252 50 002-10  
[office@solarfocus.eu](mailto:office@solarfocus.eu), [www.solarfocus.com](http://www.solarfocus.com)

**Service-Hotline**

- Email: [service@solarfocus.at](mailto:service@solarfocus.at)
- Austria, and international: +43 7252 50002-4920

- Germany: +49 6251 13665-14

- Switzerland: +41 41 9840889

**2 For your safety**

- Note the weight of the individual parts during transport. Only tested lifting equipment (crane, conveyor belt, ropes, belts, etc.) is permitted for use!
- The thermi<sup>nator</sup> may only be installed by qualified personnel.
- It is vital that you note and adhere to the procedures described in this installation manual.
- In order to prevent later problems and to ensure correct functioning of the thermi<sup>nator</sup>, all work must be performed with due diligence.
- Work on the electrical and electronic equipment must be performed by appropriately licensed and qualified personnel and in compliance with the safety regulations.
- To ensure the correct functioning of the thermi<sup>nator</sup>, you must carefully read through the operation manual included in the scope of delivery prior to commissioning. The operation manual must be drawn to the attention of all persons responsible for commissioning, operating, inspecting, servicing and repairing the boiler.
- Modifications to the design or functions of the thermi<sup>nator</sup>-II may only be performed after prior consultation with our Service Department and with the prior written approval of SOLARFOCUS.

## 3 Product information

### 3.1 Technical specifications

#### Log wood boiler

Log wood boiler <b>thermi<sup>n</sup>ator II</b>		<b>18</b>	<b>27</b>	<b>36</b>	<b>49</b>	<b>60</b>
Output	[kW]	18	27	36	49	60
Energy efficiency class		A+	A+	A+	A+	A+

#### Dimensions

Total depth	[cm]	120	120	130	151	151
Depth without fan (D)	[cm]	104	104	115	136	136
Width without ignition device (W)	[cm]	62	62	67	83	83
Height incl. adjustable feet <sup>[1]</sup>	[cm]	155	155	166	167	167
Minimum room height <sup>[2]</sup>	[cm]	168	168	186	186	186

#### Weight

Weight	[kg]	534	534	652	777	777
--------	------	-----	-----	-----	-----	-----

#### Water side

Water content	[l]	90	90	126	188	188
Maximum operating pressure	[bar]	3	3	3	3	3
Boiler flow/boiler return connection	["]	External thread 5/4	External thread 5/4	External thread 5/4	External thread 6/4	External thread 6/4
Drain connection	["]	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2
Connection for thermal overload protection	["]	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2
Immersion sleeve for the temperature sensor of the thermal overload protection	["]	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2
Flow rate / differential pressure at $\Delta T$ 10°K	[kg/h] [hPa]	1550 4.9	2310 8.8	3090 15.7	4199 26.3	5140 35.6
Flow rate / differential pressure at $\Delta T$ 20°K	[kg/h] [hPa]	770 1.8	1160 2.1	1540 4.0	2097 6.9	2570 9.4

#### Fuel

Fuel	Log wood/beech					
Filling chamber opening WxH	[cm]	34x24	34x24	39x24	54x24	54x24
Filling chamber capacity for log wood	[l]	145	145	186	290	290
Maximum log wood length	[cm]	56	56	56	66	66

#### Flue gas side

Flue gas pipe diameter	[cm]	13	13	15	20	20
Height to centre of flue gas pipe <sup>[1]</sup>	[cm]	78	78	88	90	90
Minimum draught requirement <sup>[3]</sup>	[Pa]	5	5	5	5	5
Maximum flue gas temperature <sup>[4]</sup>	[°C]	140	140	140	140	140

#### Emissions according to test report: **Log wood mode**

Flue gas value <sup>[5]</sup> from test report: Test institute / test report no.	TÜV Austria / 10- UW-Wels-EX- 029-3	TÜV Austria / 13- U-500/SD	TÜV Austria / 12- UW-Wels-EX- 127-1	TÜV Austria / 12- UW-Wels-EX-127	BLT / 042-06	
CO full load	[mg/m <sup>3</sup> ]	158	118.5	79	99.7	191
NO <sub>x</sub> full load	[mg/m <sup>3</sup> ]	114	119.5	125	131.3	133
Org. C full load	[mg/m <sup>3</sup> ]	4.4	3.2	2	2	4
Dust content full load	[mg/m <sup>3</sup> ]	8	11	14	14.9	14
Flue gas mass flow full load	[g/s]	10	14.1	20.2	26.3	31.5

[1] Adjustable feet at maximum depth of thread

[2] The minimum room height is required for maintenance work

[3] A draught stabiliser must be fitted if the specified draught of 15 Pa is exceeded (attention: In the case of a boiler with room-sealed operation, use a room-sealed draught stabiliser)

[4] The maximum flue gas temperature can be adjusted electronically

[5] Flue gas values in mg/m<sup>3</sup> are based on 13% O<sub>2</sub> of the volume flow

**Wood chip boiler**

Wood chip boiler <b>thermi<sup>nator</sup> II</b>		<b>30</b>	<b>40</b>	<b>49</b>	<b>60</b>
Output	[kW]	30	40	49	59
Energy efficiency class		A+	A+	A+	A+
<b>Dimensions</b>					
Total depth	[cm]	126	136	158	158
Depth without fan (D)	[cm]	116	130	150	150
Width without ignition device (W)	[cm]	62	67	83	83
Height incl. adjustable feet <sup>[1]</sup>	[cm]	155	166	167	167
Minimum room height <sup>[2]</sup>	[cm]	168	168	186	186
<b>Weight</b>					
Weight	[kg]	495	601	914	914
<b>Water side</b>					
Water content	[l]	90	126	188	188
Maximum operating pressure	[bar]	3	3	3	3
Boiler flow/boiler return connection	["]	External thread 5/4	External thread 5/4	External thread 6/4	External thread 6/4
Drain connection	["]	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2
Connection for thermal overload protection	["]	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2
Immersion sleeve for the temperature sensor of the thermal overload protection	["]	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2
Flow rate / differential pressure at $\Delta T$ 10°K	[kg/h] [hPa]	2580 1.4	3433 21.2	5060 9.8	5140 35.6
Flow rate / differential pressure at $\Delta T$ 20°K	[kg/h] [hPa]	1290 3.8	1716 5.6	2530 2.5	2570 9.4
<b>Fuel</b>					
Fuel		Wood chips G 30 / W 30 acc. to ONORM M 7133; log wood			
Filling chamber opening WxH	[cm]	34x24	39x24	54x24	54x24
Filling chamber capacity for log wood	[l]	145	186	290	290
Maximum log wood length	[cm]	56	56	66	66
<b>Flue gas side</b>					
Flue gas pipe diameter	[cm]	13	15	20	20
Height to centre of flue gas pipe <sup>[1]</sup>	[cm]	78	88	90	90
Minimum draught requirement <sup>[3]</sup>	[Pa]	5	5	5	5
Maximum flue gas temperature <sup>[4]</sup> full load	[°C]	140	140	140	140
Maximum flue gas temperature <sup>[4]</sup> partial load	[°C]	100	100	100	100
<b>Emissions according to test report: Wood chip mode</b>					
Flue gas value <sup>[5]</sup> from test report: Test institute / test report no.		TÜV Austria /13- UW-Wels-EX-266	BLT / 058_13	BLT / 0308_13	BLT / 059_13
CO full load	[mg/m <sup>3</sup> ]	15	43	64	85
CO partial load	[mg/m <sup>3</sup> ]	108	204	121.5	39
NO <sub>x</sub> full load	[mg/m <sup>3</sup> ]	85	114	112.5	111
NO <sub>x</sub> partial load	[mg/m <sup>3</sup> ]	75	87	102.5	118
Org. C full load	[mg/m <sup>3</sup> ]	2.3	1	1	111
Org. C partial load	[mg/m <sup>3</sup> ]	4.0	4	2.5	118
Dust content full load	[mg/m <sup>3</sup> ]	20	18	-	-
Dust content partial load	[mg/m <sup>3</sup> ]	20	18	-	-
Flue gas mass flow full load	[g/s]	-	22.9	26.6	30.3
Flue gas mass flow partial load	[g/s]	-	7.5	8.7	9.9

[1] Adjustable feet at maximum depth of thread

[2] The minimum room height is required for maintenance work

[3] A draught stabiliser must be fitted if the specified draught of 15 Pa is exceeded (attention: In the case of a boiler with room-sealed operation, use a room-sealed draught stabiliser)

[4] The maximum flue gas temperature can be adjusted electronically

[5] Flue gas values in mg/m<sup>3</sup> are based on 13% O<sub>2</sub> of the volume flow

**Dual fuel boiler**

Dual fuel boiler <b>thermi<sup>nator</sup> II</b>		<b>22</b>	<b>30</b>	<b>40</b>	<b>49</b>	<b>60</b>
Pellets output	[kW]	22	30	40	49	60
Log wood output	[kW]	18	27	36	49	60
Energy efficiency class		A+	A+	A+	A+	A+

**Dimensions**

Total depth	[cm]	120	120	130	151	151
Depth without fan (D)	[cm]	104	104	115	136	136
Width without ignition device (W)	[cm]	62	62	67	83	83
Height incl. adjustable feet <sup>[1]</sup>	[cm]	155	155	166	167	167
Minimum room height <sup>[2]</sup>	[cm]	168	168	186	186	186

**Weight**

Weight	[kg]	534	534	652	777	777
--------	------	-----	-----	-----	-----	-----

**Water side**

Water content	[l]	90	90	126	188	188
Maximum operating pressure	[bar]	3	3	3	3	3
Boiler flow/boiler return connection	["]	External thread 5/4	External thread 5/4	External thread 5/4	External thread 6/4	External thread 6/4
Drain connection	["]	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2
Connection for thermal overload protection	["]	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2	External thread 1/2
Immersion sleeve for the temperature sensor of the thermal overload protection	["]	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2	Internal thread 1/2
Flow rate / differential pressure at $\Delta T$ 10°K	[kg/h] [hPa]	1710 5.8	2474 11.5	3430 18.6	5140 35.6	5140 35.6
Flow rate / differential pressure at $\Delta T$ 20°K	[kg/h] [hPa]	860 1.5	1237 3.0	1710 4.9	2570 9.4	2570 9.4

**Fuel**

Fuel	Wood pellets acc. to EN14961-2, ENplus-A1					
	Log wood					
Filling chamber opening WxH	[cm]	34x24	34x24	39x24	54x24	54x24
Filling chamber capacity for log wood	[l]	145	145	186	290	290
Maximum log wood length	[cm]	56	56	56	66	66

**Flue gas side**

Flue gas pipe diameter	[cm]	13	13	15	20	20
Height to centre of flue gas pipe <sup>[1]</sup>	[cm]	78	78	88	90	90
Minimum draught requirement <sup>[3]</sup>	[Pa]	5	5	5	5	5
Maximum flue gas temperature <sup>[4]</sup> full load	[°C]	140	140	140	140	140
Maximum flue gas temperature <sup>[4]</sup> partial load	[°C]	100	100	100	100	100

**Emissions according to test report: Pellet mode**

Flue gas value <sup>[5]</sup> from test report: Test institute / test report no.	TÜV Austria/10- UW-Wels- EX- 029-2	TÜV Austria/12- UW-Wels- EX- 127	TÜV Austria/10- UW-Wels- EX- 260-1	BLT /1262-06	BLT /045-06	
CO full load	[mg/m <sup>3</sup> ]	31	22.56	12	25.25	17
CO partial load	[mg/m <sup>3</sup> ]	193	165.44	131	207.1	184
NO <sub>x</sub> full load	[mg/m <sup>3</sup> ]	110	104.67	98	105.95	101
NO <sub>x</sub> partial load	[mg/m <sup>3</sup> ]	103	95.44	86	-	107
Org. C full load	[mg/m <sup>3</sup> ]	1	1	1	1.0	1
Org. C partial load	[mg/m <sup>3</sup> ]	4	2.8	1.3	1.55	1
Dust content full load	[mg/m <sup>3</sup> ]	18	18.89	20	17.55	17
Dust content partial load	[mg/m <sup>3</sup> ]	18	18	18	-	12

Dual fuel boiler <b>thermi<sup>n</sup>ator II</b>		<b>22</b>	<b>30</b>	<b>40</b>	<b>49</b>	<b>60</b>
Flue gas mass flow full load	[g/s]	11.5	15.4	22.2	24.1	28.9
Flue gas mass flow partial load	[g/s]	3.8	4.7	5.8	7.7	10
<b>Emissions according to test report: Log wood mode</b>						
Flue gas value <sup>[5]</sup> from test report: Test institute / test report no.		TÜV Austria/10- UW- Wels-EX- 029-2	TÜV Austria /12-UW- Wels- EX-127	Austria /10- UW- Wels- EX-260-1	BLT /1262-06	BLT /045-06
CO full load	[mg/m <sup>3</sup> ]	158	118.5	79	99.7	191
NO <sub>x</sub> full load	[mg/m <sup>3</sup> ]	114	119.5	125	131.3	133
Org. C full load	[mg/m <sup>3</sup> ]	4.4	3.2	2	2	4
Dust content full load	[mg/m <sup>3</sup> ]	8	11	14	14.9	14
Flue gas mass flow full load	[g/s]	10	14.1	20.2	26.3	31.5

[1] Adjustable feet at maximum depth of thread

[2] The minimum room height is required for maintenance work

[3] A draught stabiliser must be fitted if the specified draught of 15 Pa is exceeded (attention: In the case of a boiler with room-sealed operation, use a room-sealed draught stabiliser)

[4] The maximum flue gas temperature can be adjusted electronically

[5] Flue gas values in mg/m<sup>3</sup> are based on 13% O<sub>2</sub> of the volume flow

### 3.2 Scope of delivery

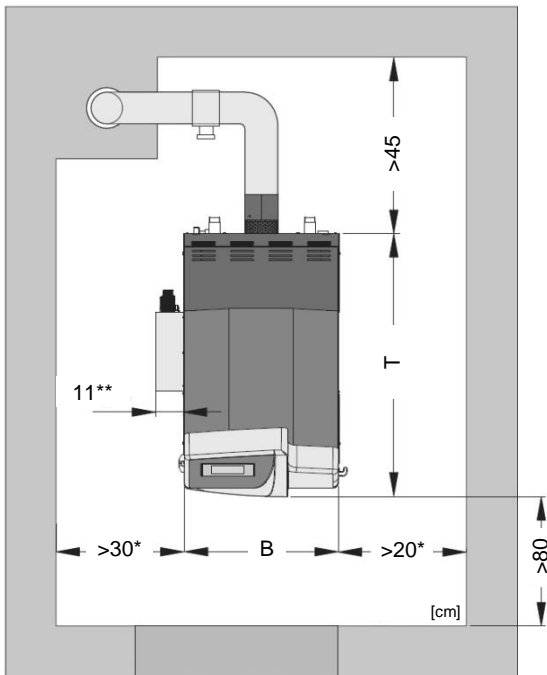
	Designation	Wood chip boiler [Qty.]	Dual fuel boiler [Qty.]	Log wood boiler [Qty.]
1	Boiler <b>thermi<sup>n</sup>ator II touch</b> preassembled, including electronic control	1	1	1
2	Stainless steel combustion grate for wood chips	1	-	-
3	Stainless steel combustion grate for pellets	-	2	-
4	Stainless steel combustion grate for log wood	-	1	1
5	Fuel chute for the boiler filling chamber (in the case of wood chip boiler and dual fuel boiler)	1	1	-
6	Adjustable foot	4	4	4
7	Tank temperature sensor PT1000	3	3	3
8	Immersion sleeve, length 140 mm	3	3	3
9	Outside temperature sensor with housing	1	1	1
10	Flow temperature sensor PT1000 contact sensor with Aluprisma	1	1	1
11	Stainless steel blind flange plate 23x26cm and ceramic fibre mat white enclosed	1	1	-
12	Ash pan	1	1	1
13	Ash scraper 69329	1	1	1
14	Bent poker 69348	1	1	1
15	Glove	1	1	1
16	Operation manual	1	1	1
17	Installation manual	1	1	1



Some parts are packed in the boiler filling chamber when the boiler is delivered.

### 3.3 Installation dimensions

#### 3.3.1 Log wood boiler



\* Access to the rear side of the boiler must be provided (>45 cm on the left or right)

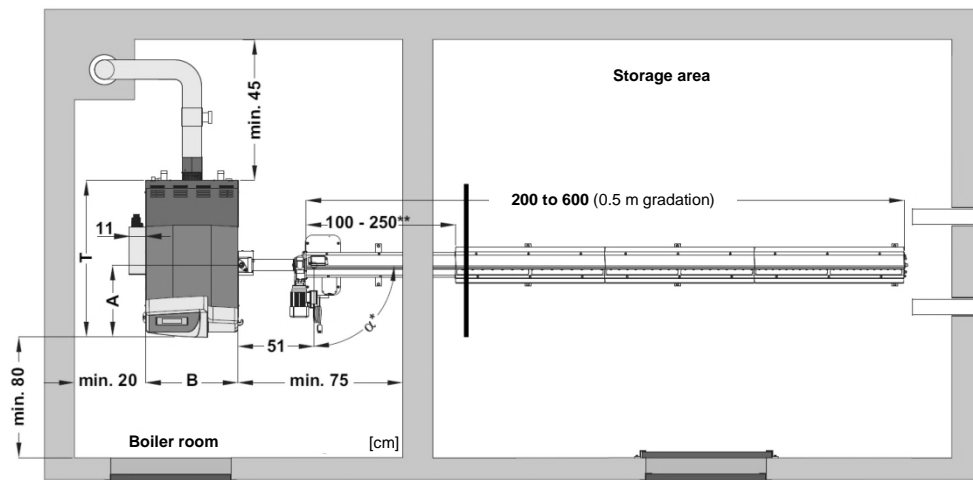
\*\* Automatic ignition (optional item, also right-mountable)

For dimensions B and T see technical data table

#### 3.3.2 Dual fuel boiler

##### Auger extraction for direct extraction

**i** Graphical overview of available dual fuel boiler storage and conveyor systems → 36



Boiler	cm	A
thermi <sup>nator</sup> II 22	45	45
thermi <sup>nator</sup> II 30	45	45
thermi <sup>nator</sup> II 40	47	47
thermi <sup>nator</sup> II 49	54	54
thermi <sup>nator</sup> II 60	54	54

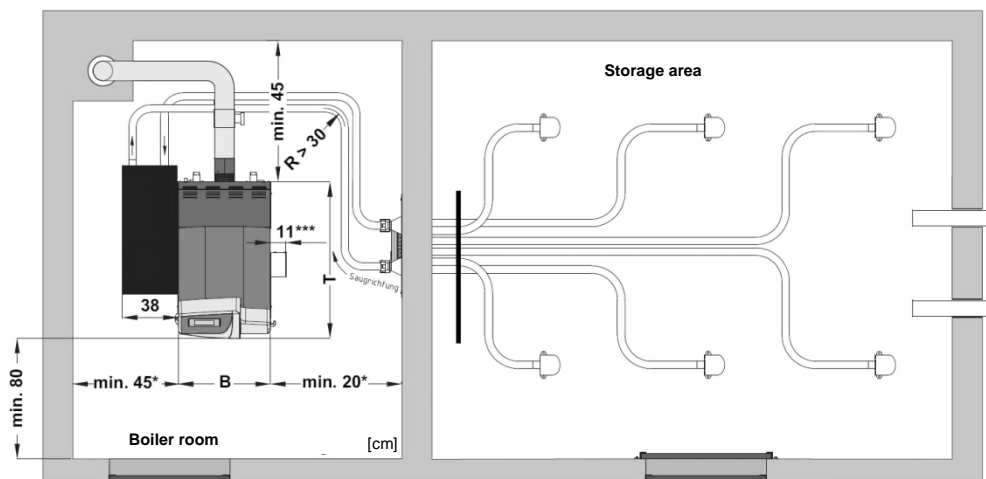
\*Installation angle  $\alpha$  from 0° to 180°

\*\* Covered length

For dimensions B and T see technical data table



### Intermediate store 110 litre with suction system (suction heads or suction auger)

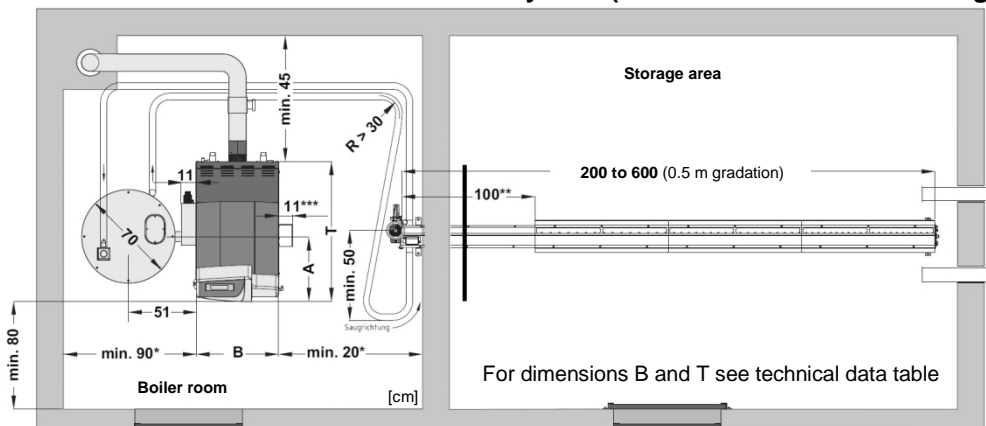


\* Access to the back of the boiler must be provided (approx. 45 cm on the left or right)

\*\*\* Optional item: automatic switchover from log wood to pellets

For dimensions B and T see technical data table

### Intermediate store 250 litre with suction system (suction heads or suction auger)



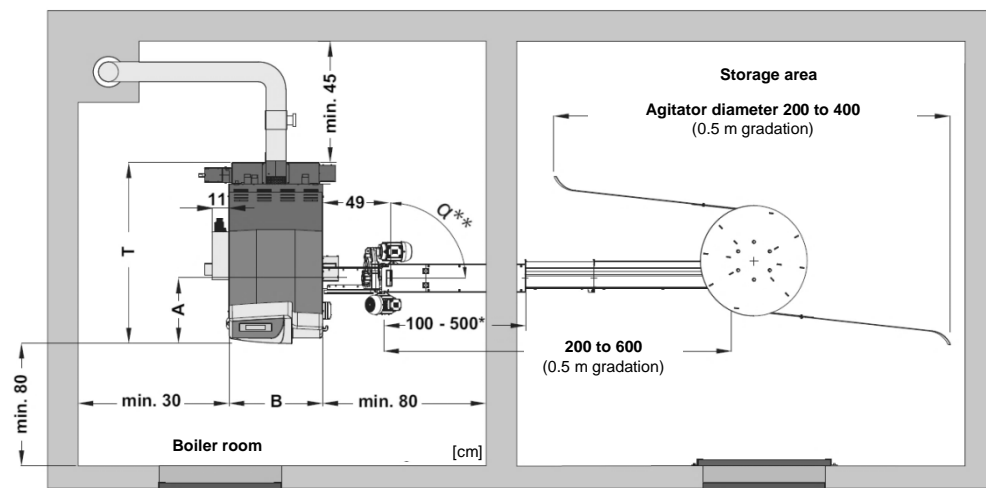
Boiler	cm	A
thermi <sup>n</sup> ator II 22	45	45
thermi <sup>n</sup> ator II 30	45	45
thermi <sup>n</sup> ator II 40	47	47
thermi <sup>n</sup> ator II 49	54	54
thermi <sup>n</sup> ator II 60	54	54

\* Access to the back of the boiler must be provided (approx. 45 cm on the left or right)

\*\* Covered length

\*\*\* Optional item: automatic switchover from log wood to pellets

### 3.3.3 Wood chip boiler - direct extraction



Boiler	cm	A
thermi <sup>n</sup> ator II 30	47	47
thermi <sup>n</sup> ator II 40	47	47
thermi <sup>n</sup> ator II 49	59	59
thermi <sup>n</sup> ator II 60	52	52

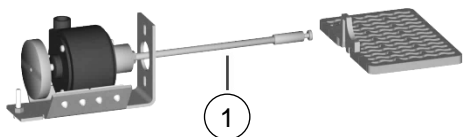
\* Covered length

\*\* Installation angle  $\alpha$  from 0° to 180°

For dimensions B and T see technical data table

### 3.3.4 Shaker motor for stainless steel combustion grate

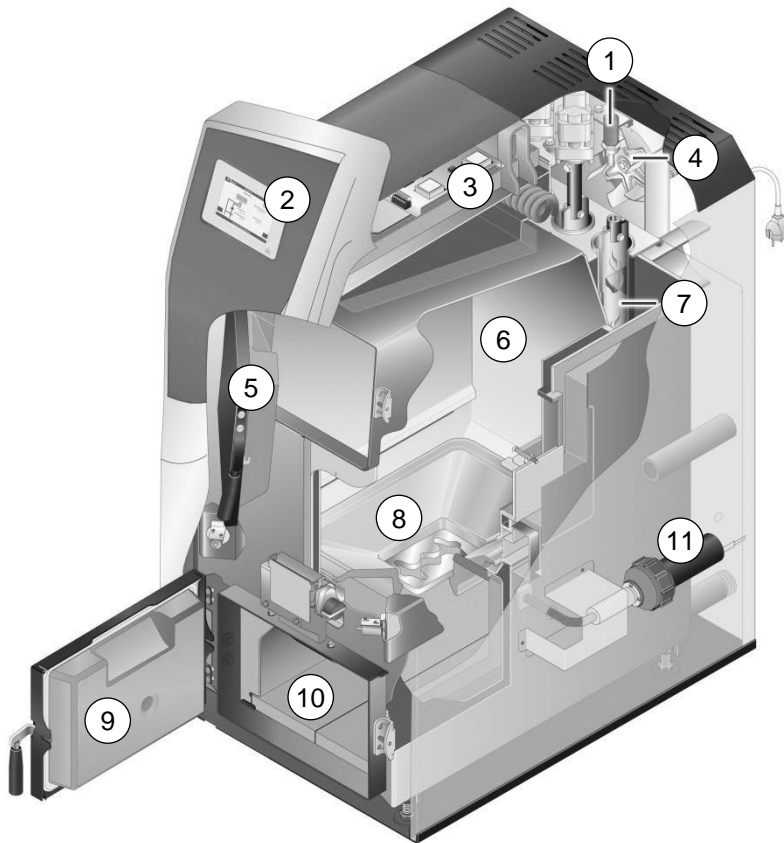
(Series with wood chip boiler, optionally with dual fuel boiler: Item Autom. switching of log wood to pellets)



Observe the following minimum side clearances for the boiler (for subsequent installation or possible replacement of the actuating rods 1):

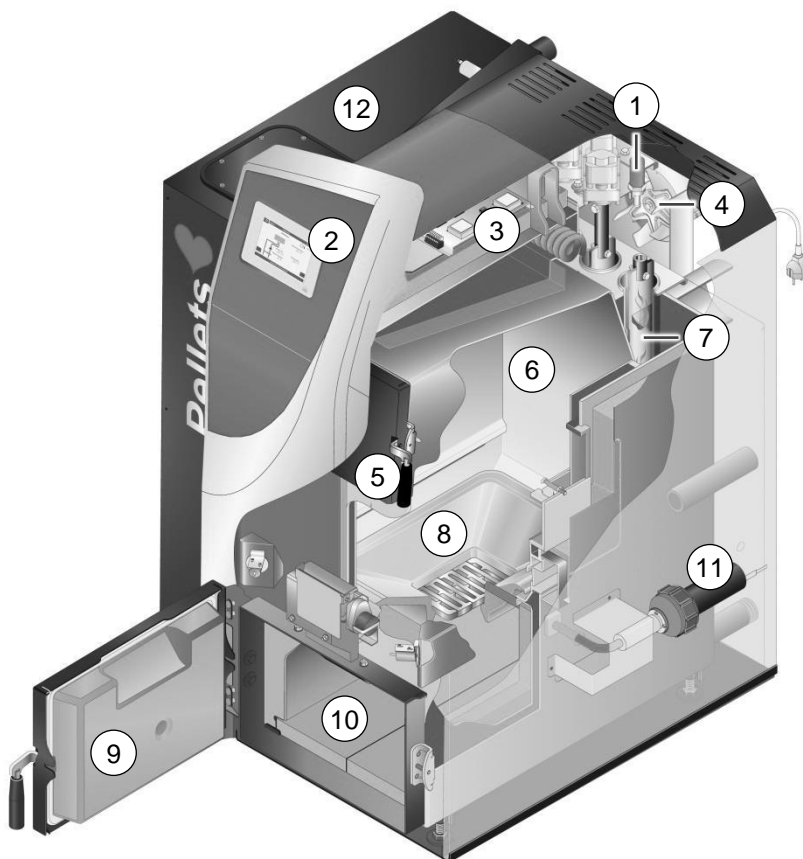
- thermi<sup>n</sup>ator II 18-30: **23 cm**
- thermi<sup>n</sup>ator II 36-40: **27 cm**
- thermi<sup>n</sup>ator II 49-60: **33 cm**

### 3.4 Cross-section



#### Log wood boiler

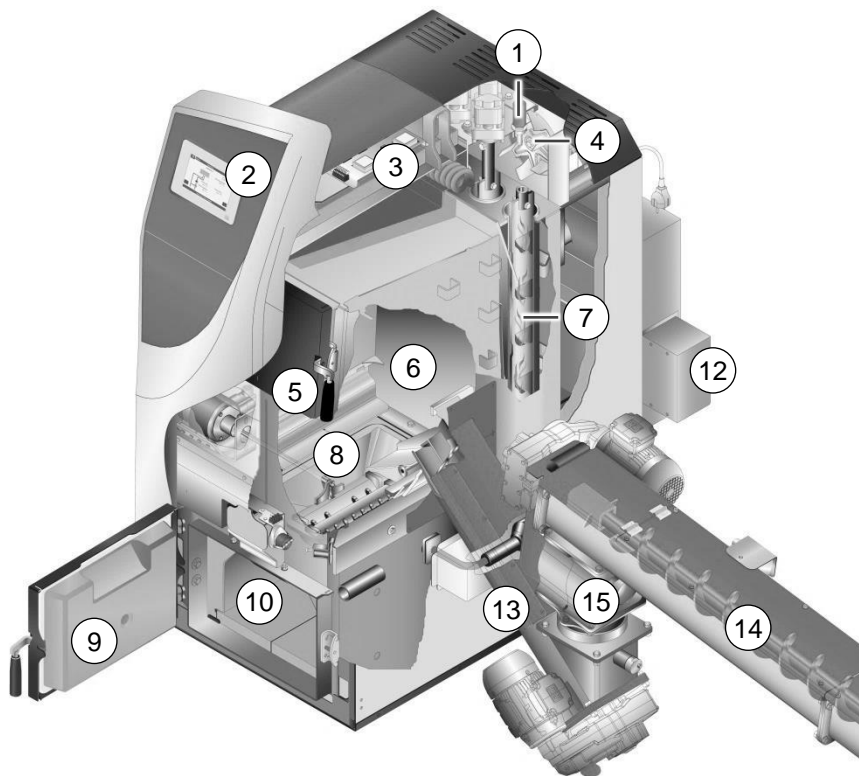
1	Lambda sensor
2	Boiler control operating unit
3	Electrical power element
4	ID fan
5	Filling chamber door
6	Filling chamber
7	Heat exchanger with interior turbulators
8	Stainless steel hopper with stainless steel combustion grate
9	Combustion chamber door
10	Combustion chamber
11	Ignition device



#### Dual fuel boiler

1	Lambda sensor
2	Boiler control operating unit
3	Electrical power element
4	ID fan
5	Filling chamber door
6	Filling chamber
7	Heat exchanger with interior turbulators
8	Stainless steel hopper with stainless steel combustion grate
9	Combustion chamber door
10	Combustion chamber
11	Ignition device
12	Intermediate pellet store, 110 litres <sup>[1]</sup>

<sup>[1]</sup> Dual fuel boiler also available with 250L container, auger direct extraction, etc.).



### Wood chip boiler

1	Lambda sensor
2	Boiler control operating unit
3	Electrical power element
4	ID fan
5	Filling chamber door
6	Filling chamber
7	Heat exchanger with interior turbulators
8	Stainless steel hopper with stainless steel combustion grate
9	Combustion chamber door
10	Combustion chamber
11	Ignition device
12	Flue ash container
13	Feeder unit
14	Direct extraction auger
15	Rotary valve

### 3.5 Dimensioning the boiler

The boiler must be dimensioned in terms of output in the right proportion to the underlying heat distribution system. For a correct design, see the calculations according to standard EN 12828.

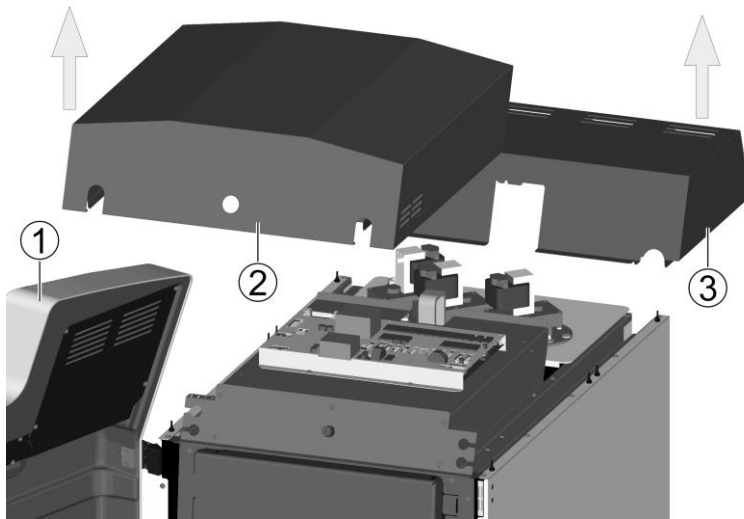
## 4 Prior to installation

### 4.1 Transport, setup

**i** For boiler weight see *Technical Data*, → 4

**i** Removal of boiler parts (stainless steel hopper, fire brick parts, etc.) during transport/setup is not recommended.

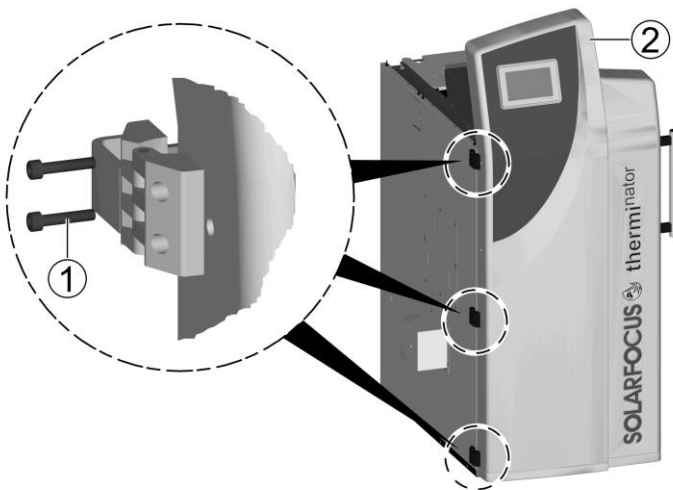
#### 4.1.1 Remove boiler covers



4-1\_002

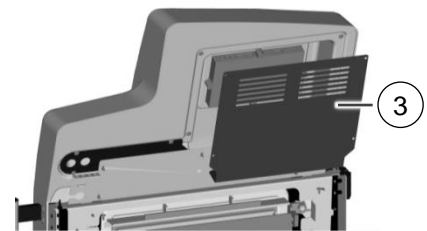
- ▶ Open cladding door 1.
- ▶ Lift front cover 2 upwards (no tools required).
- ▶ Release the 4 self-tapping screws and remove the rear cover 3.

#### 4.1.2 Disassemble the cladding door



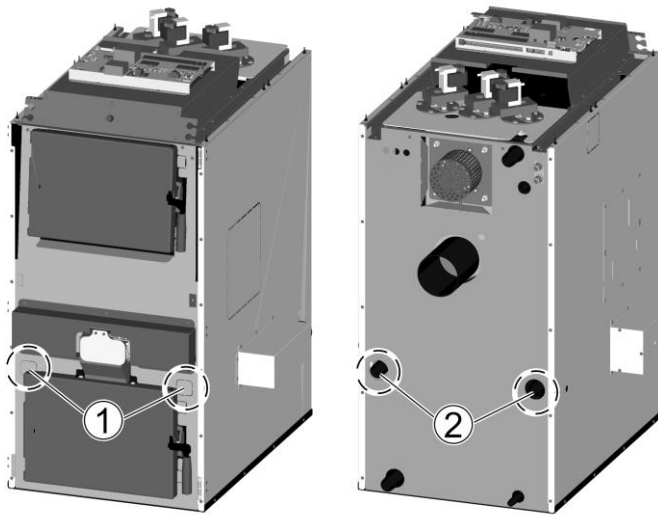
4-2\_008

- ▶ Remove cover 3 and disconnect the cables on the underside of the display.



- ▶ For each hinge loosen 2 x screws 1 and remove cladding door 2.

### 4.1.3 Transport aids

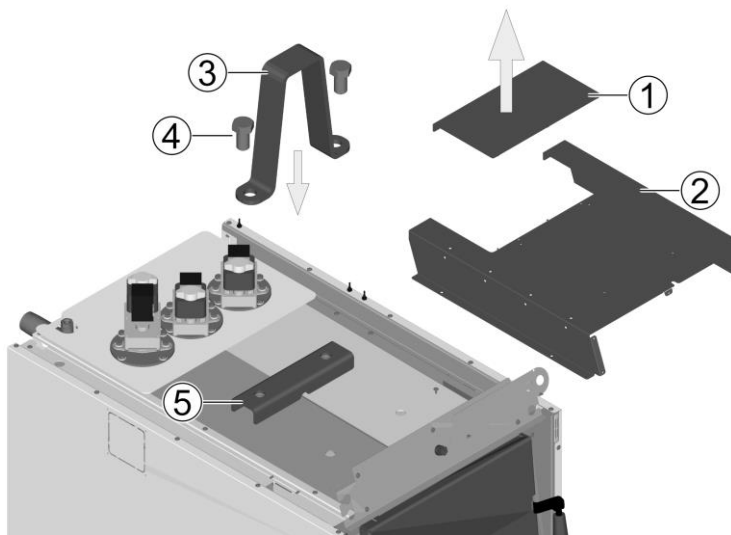


#### Lifting aid (for lifting/moving)

- 1 inch pipe usable.
- Receptacle opening on the front of the boiler **1** and back **2**.

**i** On the front of the boiler, remove the perforated parts **1** from the boiler cladding.

4-3\_011



#### Transport hook (art. no. 98534, not included)

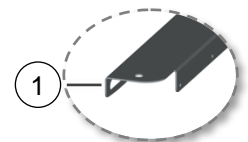
For lifting the boiler (by means of a hoist)

- ▶ Remove perforated area **1** from cover **2**.
- ▶ Mount hook **3** on the console **5** with the 2 x M20x35 hex bolts **4**.

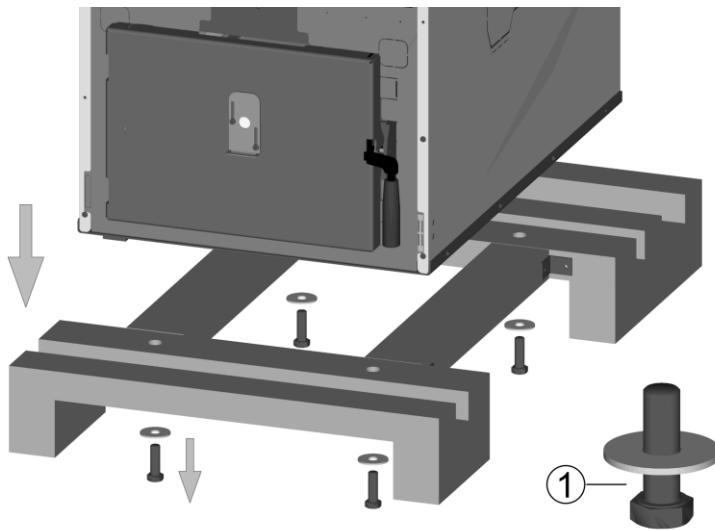
4-4\_012

#### thermi<sup>nator</sup> II 49/60: Hooking tab **1** on the metal skids (bottom of the boiler)

For securing the boiler in complicated insertion situations (e.g. sliding over stairs, etc.)



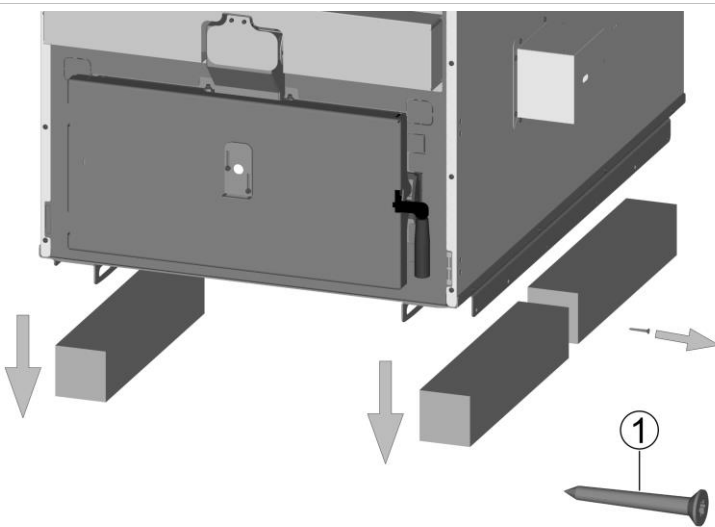
#### 4.1.4 Dismantle pallet/wooden poles



##### thermi<sup>nator</sup> II – 18 to 40

- Loosen 4 hex bolts M16x50 (SW 24) 1 on the underside of the pallet.

4-5\_007



##### thermi<sup>nator</sup> II – 49/60

- On each side of the boiler, remove 6 x screw TX 5x40 1.

4-6\_006

## 4.2 Information about the boiler room

### Structural specifications

- The boiler may only be installed in a dry, frost-free room; the permissible room temperature is 5 to 30°C.
- The boiler may only be used on a non-combustible surface with sufficient load-bearing capacity.
- Observe spacing to flammable materials (regional regulations).
- Note the installation dimensions to ensure sufficient space is provided (e.g. for service and maintenance work) → 8.
- For normative specifications see Austrian standard ÖNORM H 5170

### 4.3 Chimney, flue gas pipe

- The chimney must be resistant to humidity.
- For trouble-free operation of the boiler, it is essential that the chimney is configured correctly.
- This is done by your local chimney sweep.
- The boiler tube to the chimney must be mounted vertically.
- The pipe length must not exceed 1/3 of the effective chimney height, subtracting 0.5 m in height for each 45° bend and 1 m for each 90° bend.
- The flue pipe connection must be of leak-tight design (weld the pipes or use heat-resistant silicone), as must the point at which it enters the chimney.
- A cleaning aperture must be provided in each pipe bend.
- The distance between the smoke pipe and the ID fan motor must be at least 15 cm (to allow cooling).
- The chimney must be commissioned and appropriate for the boiler output.
- The chimney draught must be at least 0.05 and at most 0.10 mbar (5 – 10 Pa).
- A draught stabiliser must be installed to ensure an even chimney draught.
- The draught stabiliser should be installed as close as possible to the boiler.
- We also recommend the installation of a pressure relief flap in the flue pipe. This flap is also available in combination with a draught stabiliser. Contact your local authorities to find out whether such a flap is mandatory in your region.
- It is also advisable to insulate the flue pipe between the boiler and the chimney and in the cold area (e.g. attic).

The flue system must be approved by the building authorities, insensitive to moisture (design type 1 DIN 4705 Part 2) and have a thermal resistance of at least 0.65 mK/W (Group I as per DIN 18160 T1).

- Make a hole in the flue gas pipe for emission measurement → 34

## 5 Installation

### 5.1 Overview: Boiler types and accessories



Log wood boiler



Dual fuel boiler



Wood chip boiler

	Log wood boiler	Dual fuel boiler	Wood chip boiler
Hot air fan → 17	optional	optional	Series
Shaker motor for stainless steel combustion grate → 18	-	optional	Series
Intermediate pellet store with suction system 110 litres (art. no. 6218) → 22	-	optional	-
Intermediate pellet store 250 litres (manual filling art. no. 6214 or suction system art. no. 6217) → 20	-	optional	-

### 5.2 Installation sequence

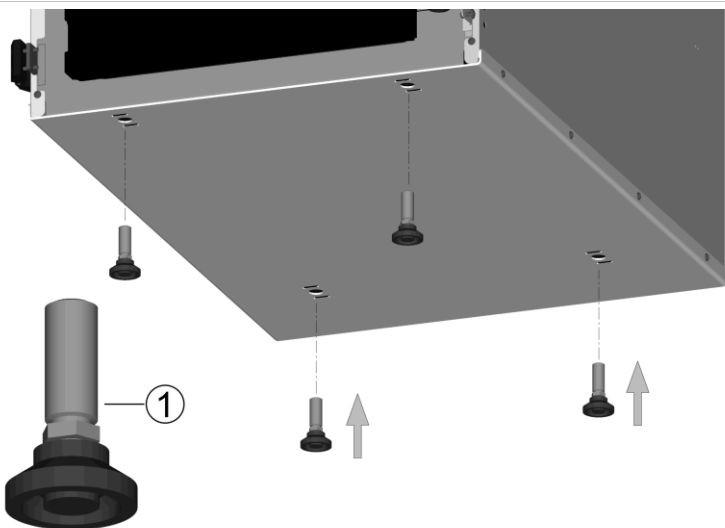


**DANGER** - There is a risk of fatal electric shocks when working on electrical components of the product.

- Work may only be performed by qualified electricians.
- Applicable standards and regulations must be observed.



### 5.3 Adjustable feet



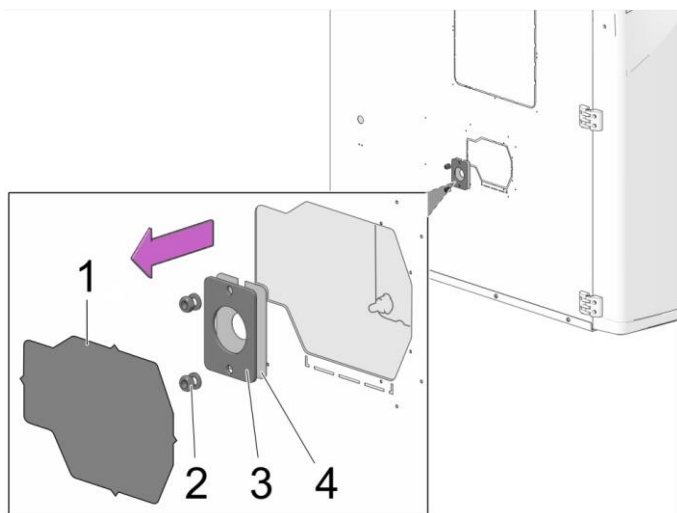
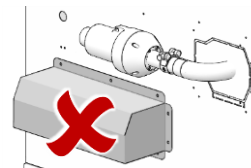
5-1\_005

- Screw 4 x levelling feet (SW16) **1** into the bottom plate of the boiler.
- Align the boiler horizontally.

### 5.4 Mounting the hot air fan

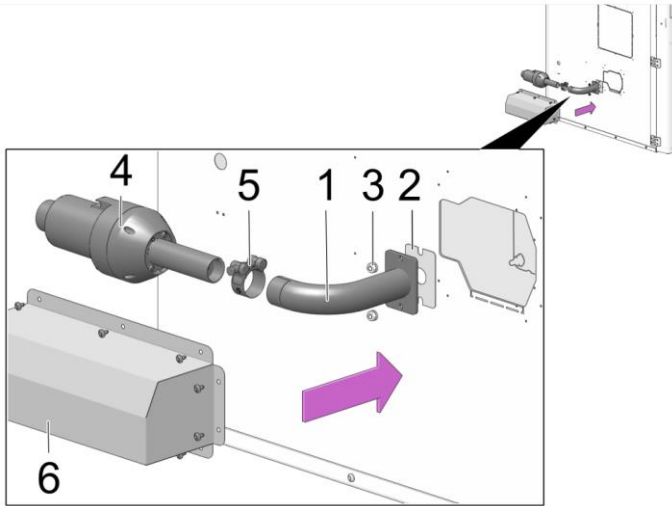
- i** The hot air fan can be mounted on the left or right side of the boiler (pre-wired on the left side).
    - Dual fuel boiler: With simultaneous use of
      - Item *Intermediate pellet store 110 litre* (to be mounted on the left) and
      - Item *Automatic switchover from log wood to pellets* (=shaker motor)
- it is recommended to mount the hot air fan on the left.

- i** If, when mounting the *intermediate pellet store 110 litre*, the hot air fan is mounted on the left side of the boiler, then do not mount the fan cover (housing).



5-1\_001-001BL-iAL

- ▶ Separate the perforated section **1** from the side cladding, e.g. using wire cutters.
- ▶ Release the two M6 (WAF10) nuts **2** and remove the blanking flange plate **3** and seal **4**.



- ▶ Fit ignition pipe bend **1** and flange seal **2** to the boiler with 2 x hex nuts M6 **3** and washers.
- ▶ Insert hot air fan **4** into the ignition pipe bend and secure with clamp **5**.
- ▶ Mount cover **6** with self-tapping screws M4x10 (TX20).
- ▶ Attach the cable connector of the fan to the matching connector on the side wall of the boiler.

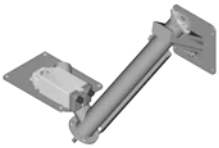
(The hot air blower is connected to the boiler power element at X4).

5-2\_002-002BL-iAL

### 5.5 Mount the shaker motor

- For the *thermi II dual fuel boiler* the following applies: For the installation of the shaker motor, see the instructions enclosed with the item *Automatic switchover log wood to pellets DR-0026*.
- For the *thermi II Wood chip boiler* the following applies: For the installation of the shaker motor, see the manual DR-0025 enclosed with the *wood chip direct extraction*.

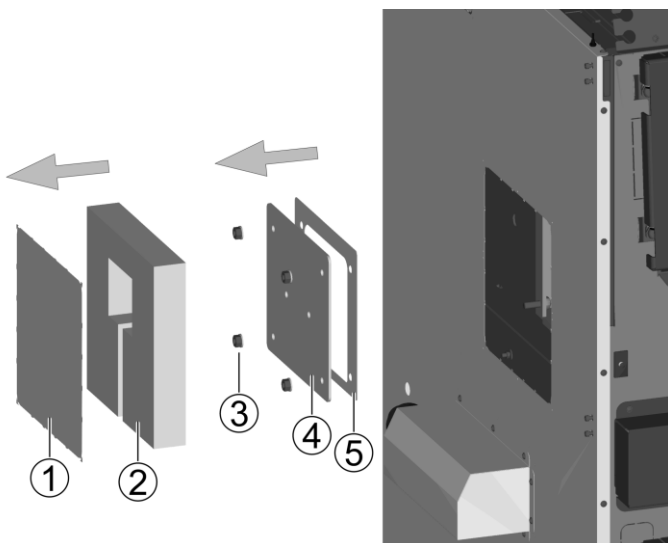
### 5.6 Pellet feeder



**i** The following steps are valid for the **pellet feeder unit art. no. 68220** (used with the conveyor system *auger extraction for direct extraction and intermediate pellet store 250 litres*).

For mounting the **pellet feeder unit art. no. 68225** (used with *intermediate pellet store with suction system 110 litres*) see ➔ 22

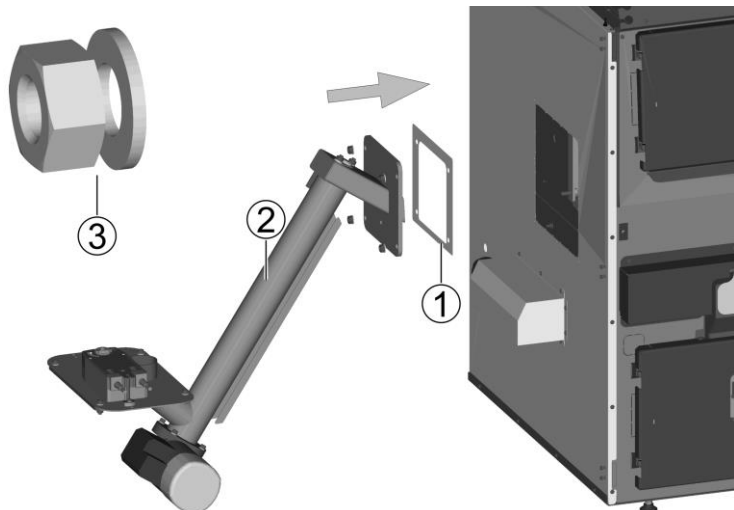
**i** The pellet feeder unit can be mounted on the left or right side of the boiler.



#### Open side cladding

- ▶ Separate the pre-punched part **1** from boiler cladding (using wire cutters).
- ▶ Remove insulation **2**.
- ▶ Loosen the 4 x M10 hex nuts (SW17) and washer **3**.
- ▶ Remove flange plate **4** and seal **5**.

5-2\_019

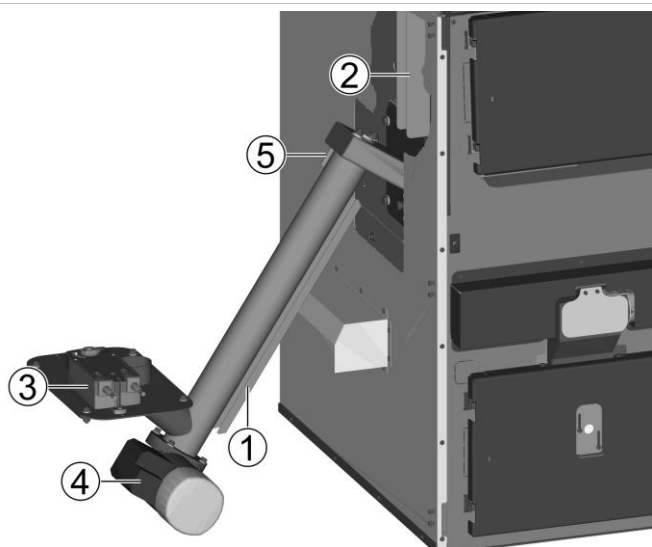


**Install the feeder unit**

- ▶ Enclose the flange seal 1.
- ▶ Mount feeder unit 2 with 4 x hex nuts M10 (SW17) and washers 3 to the boiler.

**i** Use new flange gasket (included in scope of delivery).

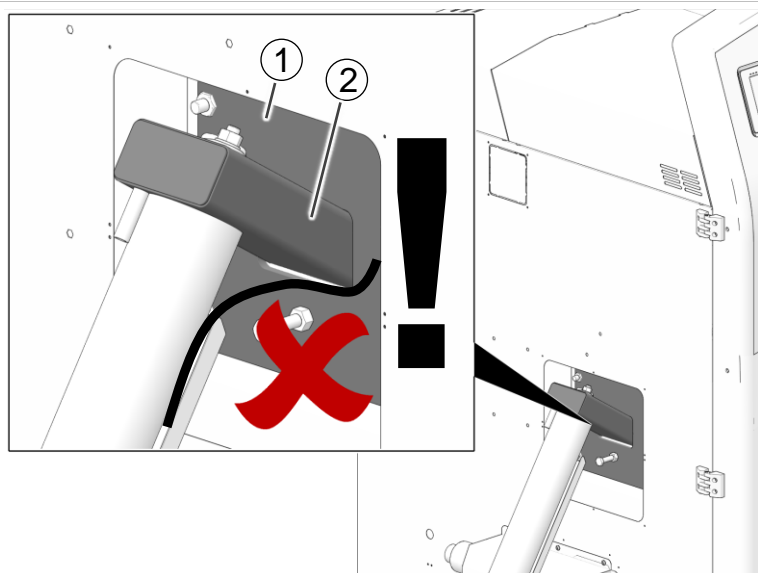
5-3\_018



**Connect electrical components**

- ▶ Lay the cables in duct 1 and lay duct 2 (behind the boiler cladding) to the boiler power element.
- ▶ Connect burn-back slide 3 to adapter cable X25 (plug 3, plug 14).
- ▶ Connect feed auger motor 4 to X23.
- ▶ Place feeder temperature sensor in pipe 5/clamp with screw and connect to X33.

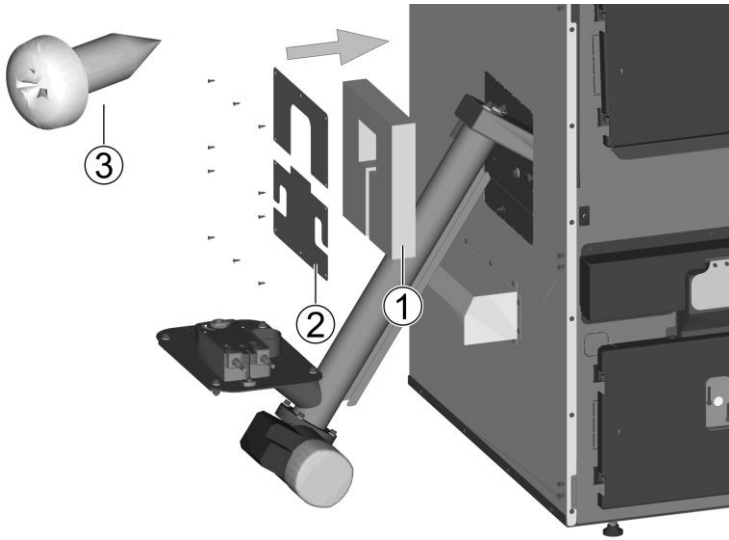
5-4\_020



**Attention!** The cables must not touch the flange plate 1 and the feeder head 2. High temperatures possible, danger of cable burn.



5-5\_001AF



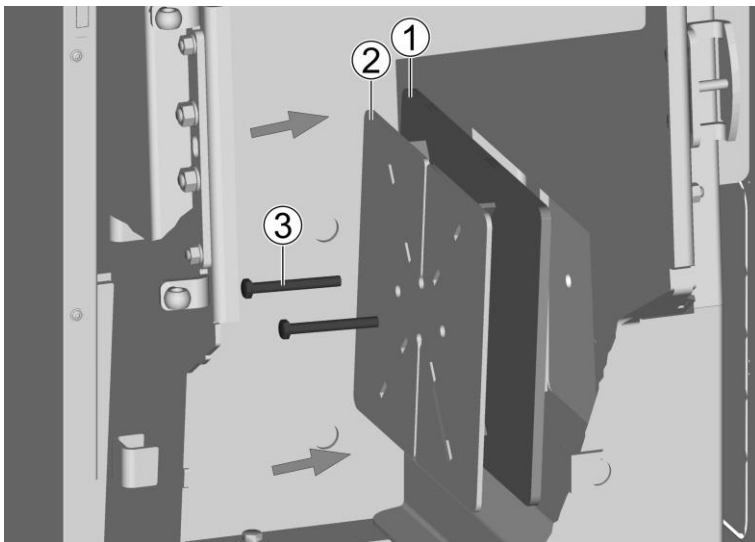
**Mount flange cover**

- ▶ Insert insulation **1** in the opening.
- ▶ Mount two-part flange cover **2** with 10 x self-tapping screws M4x10 (TX20) **3**.

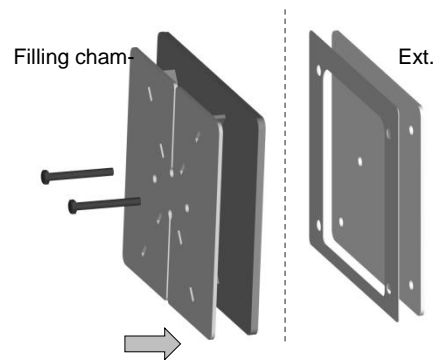
5-6\_017

**5.7 Seal flange in the boiler filling chamber**

**i** Only required for the boiler types dual fuel boiler and wood chip boiler. For log wood boilers, factory sealed on both sides.



- ▶ In boiler filling chamber: Seal the unused boiler flange (left or right) with white ceramic fibre mat **1** and stainless steel flange plate **2**.
- ▶ Fasten with 2x hex bolts M8x70 (SW13) **3**.



5-7\_004

**5.8 Intermediate pellet store, 250 litres**

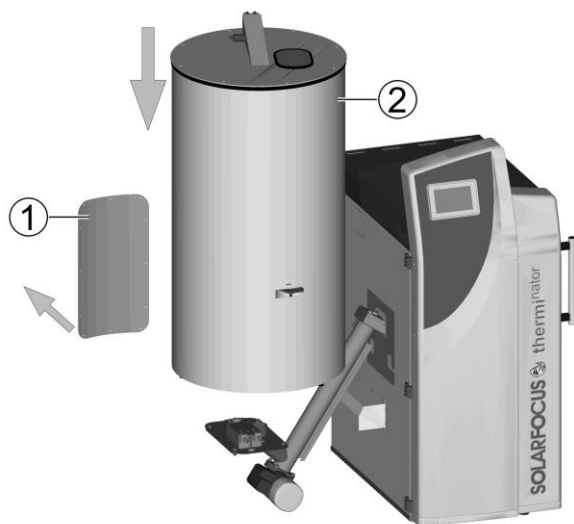
**Scope of delivery**

Intermediate pellet store 250 L, manual filling, art. no. 6214

Quantity	Designation
1	Intermediate pellet store Ø700xH1300 mm
1	Split pole geared motor for container auger
1	Connection cable for container auger, length 2.5 m
	Cable ties; sticker

Additional items with: Intermediate pellet store 250 L, with suction system, art. no. 6217

1	Suction turbine incl. seal
1	Connection cable for suction turbine, length 3.2 m
4	Hose clamp Ø56-59 mm
1	Filling level sensor (capacitive)

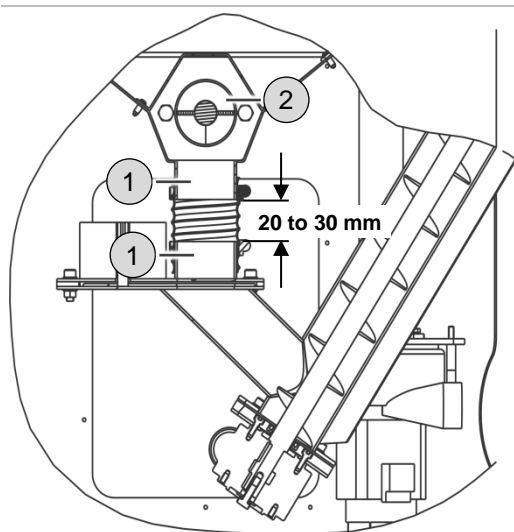


5-8\_015

**Place intermediate store**

- ▶ Release the 12 self-tapping screws and remove the revision cover 1.
- ▶ Place intermediate store 2 from above over the mounted pellet feeder unit.

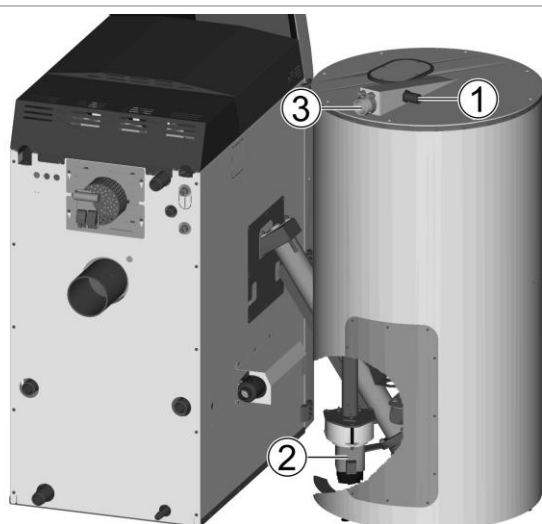
**i** 2 people required.



5-9\_010

**Adjust container, connect**

- ▶ Align intermediate store
  - The two connection pipes 1 must be aligned one above the other.
  - Distance between the pipes 20 to 30 mm (adjust with adjusting feed of the intermediate store).
- ▶ Connect the two connecting pipes with hose and hose clamps.
- ▶ Connect the horizontally positioned container auger 2 on the boiler power element to X22 .



5-10\_013

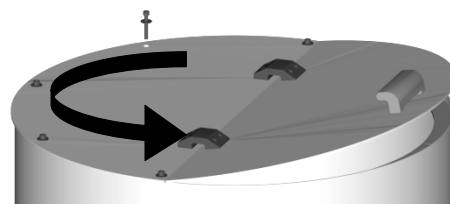
**For 250 litre intermediate store with suction system additionally:**

- ▶ Connect the container filling level sensor 1 on the power element to X49.
- ▶ Connect the suction turbine 2 on the power element to X3.

**Pellet hose**

- ▶ Connect the suction hose (pellet conveyor) to the container at the top 3 and the return air hose to the suction turbine 2.

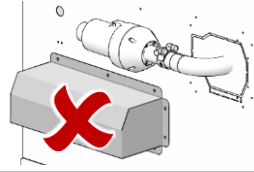
**i** Intermediate store for manual filling: By loosening the 5 x Allen screws, the cover can be turned gradually; for optimal alignment of the filling opening (>accessibility).



## 5.9 Intermediate pellet store, 110 litres

**i** The following illustrations show the installation of the **intermediate pellet store with suction system** (art. no. 6218). The assembly of the **intermediate pellet store for manual filling** (art. no. 6219) is basically done the same way, but the connection of the pellet hoses and the connection of some electrical components (suction turbine, filling level sensor) does not apply.

**i** If, when mounting the *intermediate pellet store 110 litre*, the hot air fan is mounted on the left side of the boiler, then do not mount the fan cover (housing).

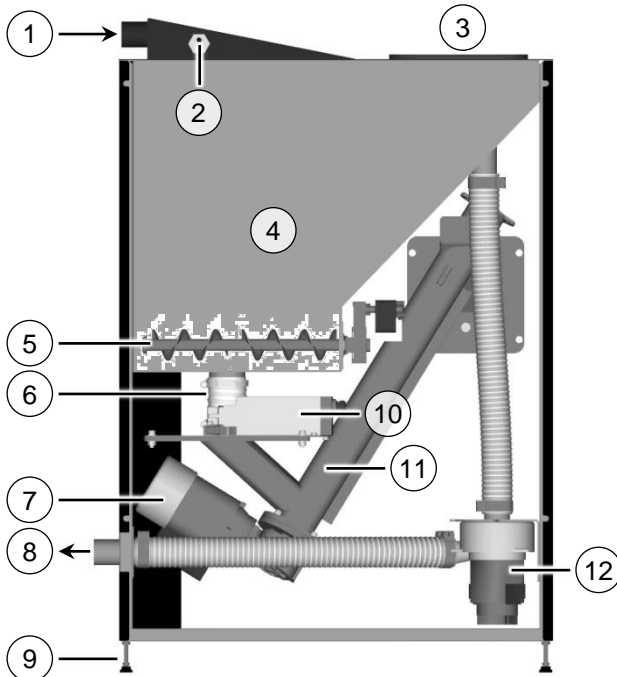


### 5.9.1 Application range (with suction system)

- As an intermediate store for the pellet suction system on the biomass boiler **thermi<sup>nator</sup> II** and **thermi<sup>nator</sup> II touch**.
- Pre-assembled with high-performance suction turbine, suction pipe, hose clamps and filling level sensor.
- Supplied ready to connect to the boiler electrical power element.
- Can only be installed on the left side of the boiler.
- Art. no. 6218

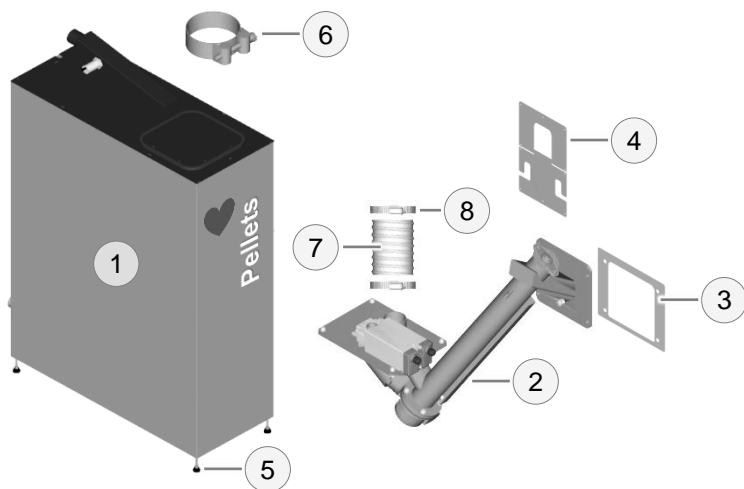
**i** Can be optimally used for a boiler output up to 30 kW.

### 5.9.2 Functional components



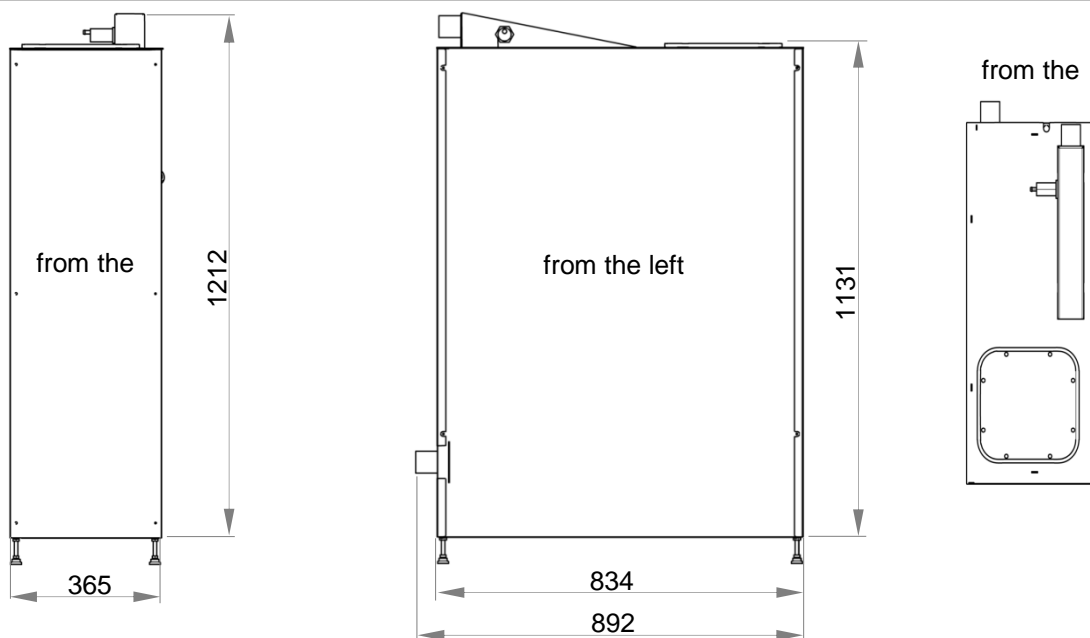
- |    |                                     |
|----|-------------------------------------|
| 1  | Suction hose connection (pellets)   |
| 2  | Container filling level sensor      |
| 3  | Inspection opening                  |
| 4  | Container (volume 110 litres)       |
| 5  | Container screw                     |
| 6  | Connection hose                     |
| 7  | Feed auger motor                    |
| 8  | B = Return air hose connection      |
| 9  | Adjustable foot                     |
| 10 | Plate slide back-burning protection |
| 11 | Feed auger                          |
| 12 | Suction turbine                     |

### 5.9.3 Scope of delivery

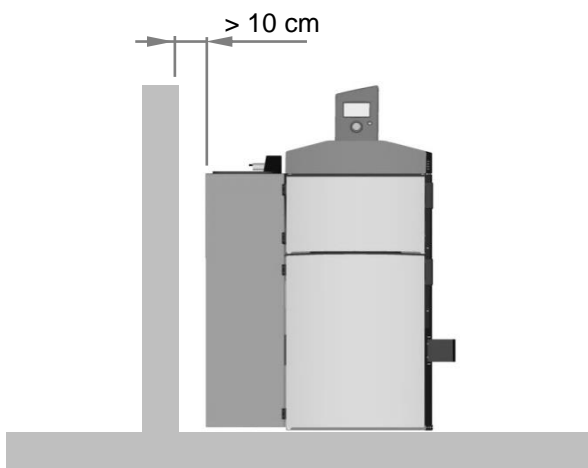


Item	Qty.	Designation
1	1	Housing
2	1	Feeder unit preinstalled
3	1	Flange seal
4	1	Flange cover, 2-part
5	4	Adjustable foot - SW 12
6	4	Articulated bolt hose clamp (heavy duty), DIN 3017 - SW10
7	1	Connection hose Ø 70 mm
8	1	Hose clamp for Ø 70 mm - SW 7
17		Self-tapping screw M4x10 TX20

### 5.9.4 Dimensions – housing



### 5.9.5 Installation dimensions



▶ Allow a gap of at least 10 cm between the intermediate pellet store and the side wall.

**i** If the unit is set up with the minimum clearance from the wall, the container must be accessible from the front and back.

### 5.9.6 Installation sequence

Tools required: Bit TX15 / TX20 ♦ Side cutter ♦ Wrench SW 7/12/17 ♦ Snap-off blade knife



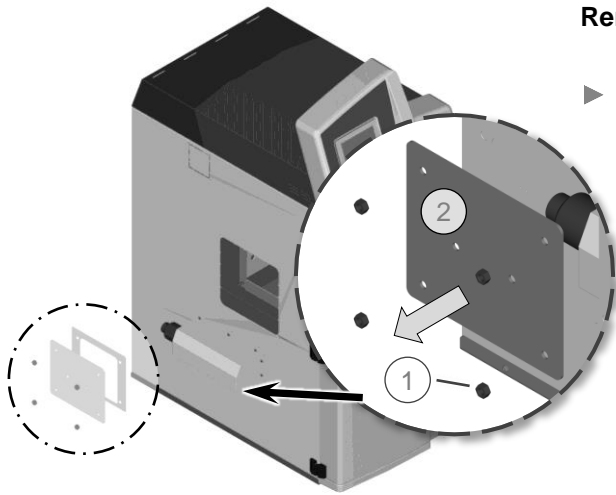
#### Open side cladding

- ☑ Boiler thermi<sup>n</sup>ator II touch must be fully set up and aligned.

**i** The intermediate pellet store can only be installed on the left side of the boiler. Mount the shaker motor (optional item *Automatic switchover of log wood to pellets*) on the right side of the boiler for better accessibility!

- ▶ Separate the pre-punched part from side cladding (using wire cutters).
- ▶ Cut out the insulation behind the side cladding.

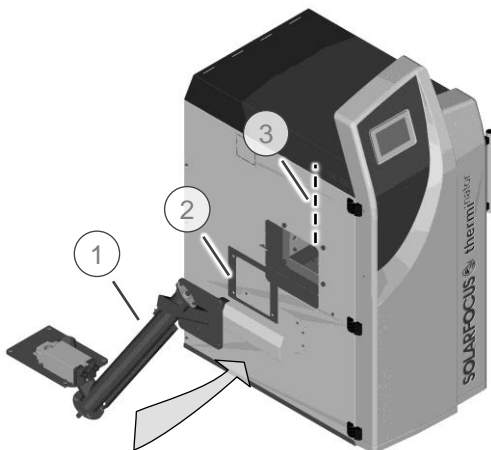
5-3\_001



#### Removing the flange plate

- ▶ Release 4 hex nuts M10 (SW17) 1 and remove the flange plate 2.

5-4\_002



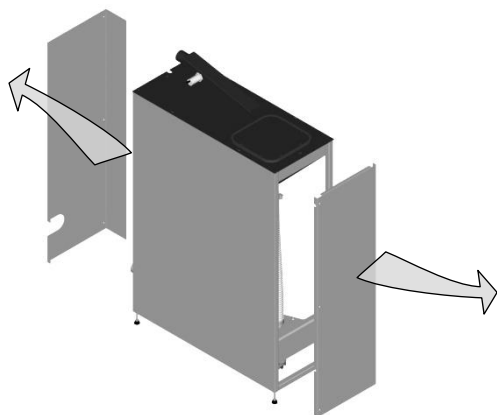
#### Install the feeder unit

**i** If the vessel has an existing shaker motor (Item *Automatic switchover unit from logs to pellets*): BEFORE installing the feeder unit, permanently remove the cover (housing) of the shaker motor. Ideally, however, the shaker motor is located on the right side of the boiler.

- ▶ Insert feeder unit 1 incl. flange seal 2 onto the threaded bolts and fasten with 4 x hex nuts.
- ▶ Route the following cables in the cable duct 3 on the inside of the boiler cladding:
  - Plate slide back-burning protection
  - Temperature sensor for the feed auger
  - Feed auger motor

5-5\_004

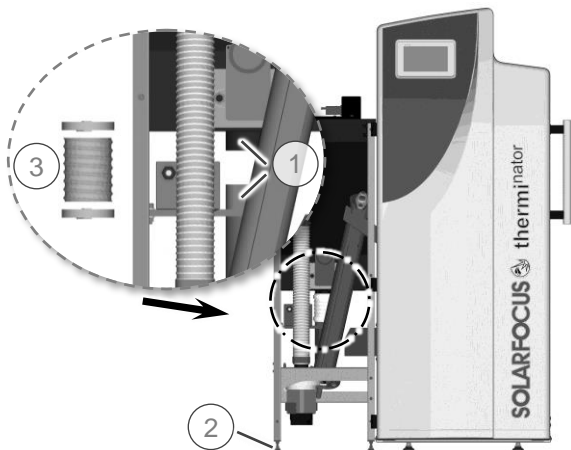




### Remove front and rear side of housing

- ▶ Release the screws (TX15) on the front and back of the housing and remove the housing sections, .
- ▶ Position the housing on the left side next to the boiler.

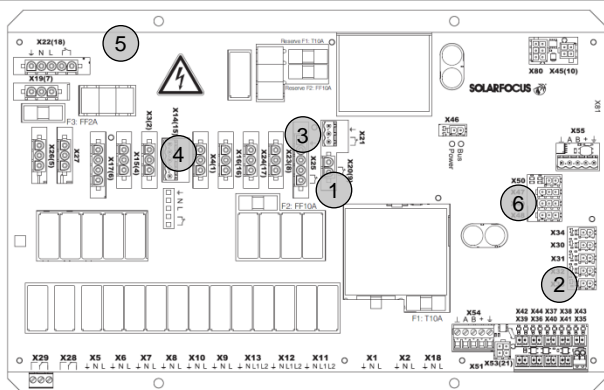
5-6\_003



### Adjust housing, fit connecting hose

- ▶ Position the housing so that the two connection nozzles **1** are aligned (adjust the height with the adjustable feet **2**, SW 12).
- ▶ Fit the connection hose **3** over the connection nozzles and attach with the two hose clamps (SW7).

5-7\_005



### Connect the cable to the power element

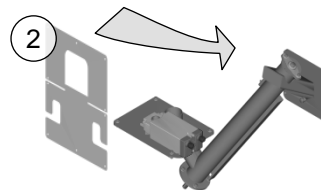
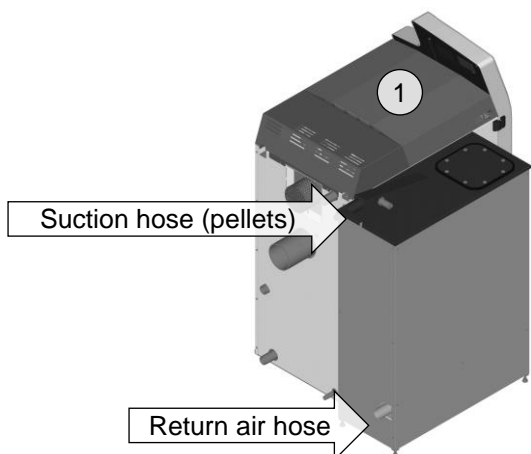
- ▶ Remove the front cover (red) from the boiler.
- ▶ Route the following cables across the back of the boiler and into the cable duct to the power element
  - Suction turbine
  - Container auger motor
  - Filling level sensor on the container
- ▶ Connect all routed cables to the boiler power element

- |   |  |
|---|--|
| 1 | Plate slide back-burning protection: X25 |
| 2 | Feed auger temperature sensor: X33       |
| 3 | Feed auger motor: X23 (8)                |
| 4 | Suction turbine: X3 (2)                  |
| 5 | Container auger motor: X22 (18)          |
| 6 | Filling level sensor: X49                |

5-8\_Boiler power element

### Install cover, connect hoses

- ▶ Mount the front cover **1**.
- ▶ Mount flange cover **2** (2-piece) with 9 x self-tapping screws M4x10, TX20 on the boiler cover.



- ▶ Fit front and back housing sections.
- ▶ Connect hoses (fix with hose clamp SW10) → 35

5-9\_006

### 5.9.7 Service

The intermediate pellet store and its components are maintenance-free.

### 5.9.8 Settings in the SOLARFOCUS boiler control unit

Attention! When commissioning the intermediate pellet store 110L, adjust the parameters in the screen below as specified. Failure to observe this will lead to malfunction.

► Make the following selection.

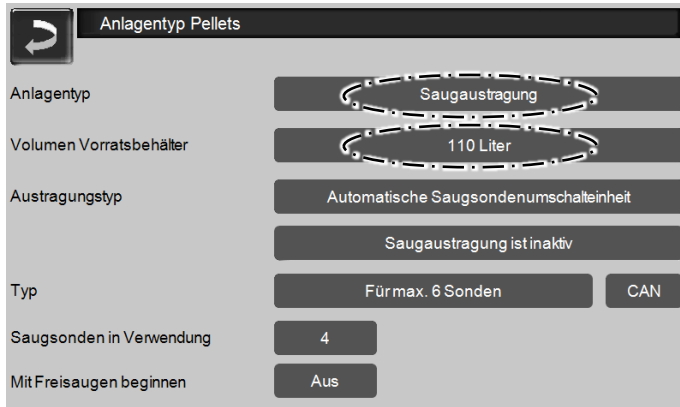
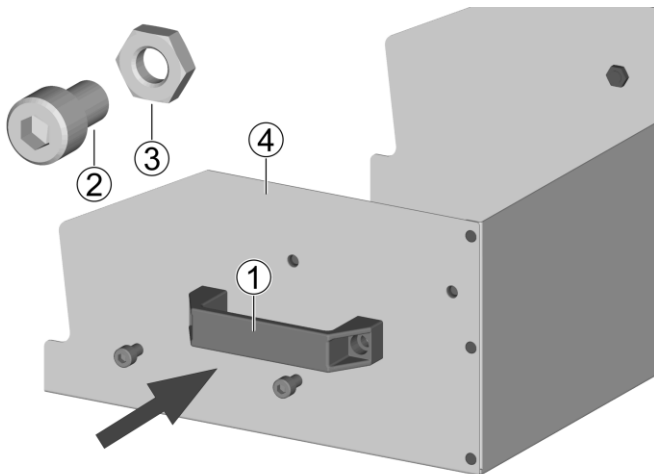


Fig. 5-10\_01-114-02

### 5.10 Ash pan

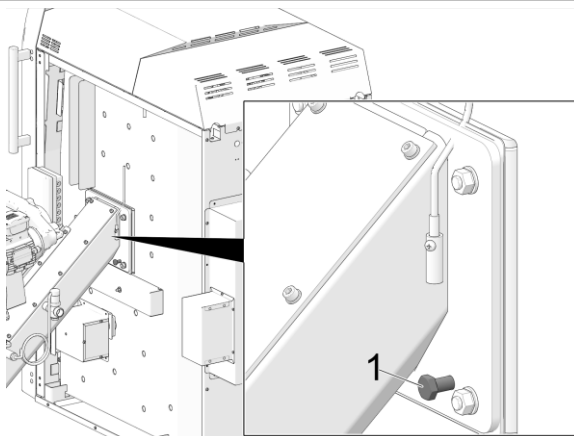


► Mount 2 x handles **1** with cylinder head screw **2** and nut **3** on the ash pan **4**.

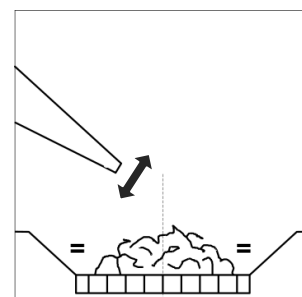
**i** Use ash pan only during boiler cleaning, never place permanently in the combustion chamber.

5-11\_001

### 5.11 Fuel chute



► Adjust the inclination of the fuel chute mounted in the filling chamber (with hex bolts **1**) so that the fuel is conveyed onto the middle of the stainless steel combustion grate.



5-12\_001AJ

## 6 Hydraulic connection

### 6.1 General information

#### Provide sufficient shut-off options

Position shut-off valves for each section (in buffer tank, etc.) in order to minimise the quantity of water that needs to be replaced in the event of repairs or system extensions

#### Expansion tank (ADG)

Dimension the expansion tank with a capacity of 12% of the total hydraulic system volume.

Secure the expansion tank against shut-off. To do this, either use the shut-off options on the way to the expansion tank as cap valves, or unscrew the hand lever (handwheel) and attach it to the expansion tank with the wire in a clearly visible position.

#### Hydraulic switch

A hydraulic switch separates the flows in boiler and heating circuits. If the heating system is operated without a buffer tank, a hydraulic switch must be installed between flow and return.

#### Buffer tank: Use, dimensioning

The use of a buffer tank is to be recommended in any case, as the boiler can then always operate in the optimum load range. This prevents frequent and unnecessary boiler start-ups and significantly reduces the higher fuel consumption during start phases.

A further advantage is that there is always a certain volume available for heating, allowing a quick supply of heat.

A buffer tank also prolongs the service life of the boiler and reduces emissions.

For pellet boilers, a buffer tank volume of 30 litres per kW heating output is recommended.

### 6.2 Fill-up water requirements

#### General recommendations for installation

- Fit an upstream filter (<25 µm) to prevent particles getting into the heating water.
- Position shut-off valves for each section (in buffer tank, etc.) in order to minimise heating water loss in the event of repairs or system extensions.

#### Corrosion

Corrosion is usually triggered by the available oxygen in the water. This value can be brought into a safe range with proper planning, design, installation and maintenance of the heating system.

Important in this regard: **Pressure maintenance at regular intervals** (operating pressure, pressure in the expansion tank)

#### Formation of scaling

Scaling refers to heating water deposits on the heat exchanger of the boiler. The cause of scaling is the presence of limestone in the water. If the value (total hardness °dH) is too high, the fill-up water must be treated.

Parameters that play a role in the formation of scaling:

- *System volume* (the bigger it is, the less total hardness is permissible, e.g. buffer tank fitted, boiler cascade, etc.).
- *Boiler output* (the bigger it is, the less total hardness is permissible).

**To determine the total allowable hardness for the system, the *specific water content* must be determined:**

$$\frac{\text{System volume (litres)}}{\text{Boiler output (kW)}} = \text{Spec. water content of the system (l/kW)}$$

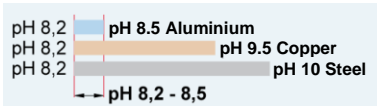
$$\text{Example: } \frac{1166}{25 \text{ kW}} = 46.64 \text{ l/kW}$$

Overall output of heat supply	German hardness
Specific water content of the system <20 l / kW	
≤ 50 kW	≤ 16.8 °dH
> 50 kW to ≤ 200 kW	≤ 11.2 °dH
> 200 kW to ≤ 600 kW	≤ 5.6 °dH
> 600 kW	≤ 2.8 °dH
Specific water content of the system ≥ 20 l/kW, but < 50 l/kW	
≤ 50 kW	≤ 11.2 °dH
> 50 kW to ≤ 200 kW	≤ 5.6 °dH
> 200 kW to ≤ 600 kW	≤ 2.8 °dH
> 600 kW	≤ 0.6 °dH
Specific water content of the system ≥ 50 l/kW	
≤ 50 kW	≤ 5.6 °dH
> 50 kW to ≤ 200 kW	≤ 2.8 °dH
> 200 kW	≤ 0.6 °dH

In the event of exceeding the above values, the fill-up water is to be treated. Recommended action: Softening (e.g., ion-exchange resin, the same procedure as for drinking water softening).

**Check the pH of the fill-up water**

- In the normal case (mixed installation) no measures are required to influence the pH (control: value should be in the range of 8.2 to 10).
- Exception: If aluminium materials are used in the heating system, a pH from 8.2 to 8.5 must be met (pH > 8.5 increased corrosion tendency).



- If the value is significantly less than <8.2 after filling, then check again after 8-12 weeks
- If there is no increase in value, then add 10 g/m³ trisodium phosphate (Na3PO4) or 5 g/m³ sodium hydroxide (NaOH).

Allow 2-4 weeks of operation before further corrections.

**Electrical conductivity**

Recommendation: Low salt driving (filling with demineralised water), see VDI 2035 sheet 2.

	Low salt	Salty
Electrical conductivity at 25°C	< 100 μS/cm	100 – 1500 μS/cm

**i** Compliance with the above mentioned standards/regulations must be ensured by the heating engineer.

**i** Manufacturer's requirements for high-efficiency heat pumps: > The heater water must meet the specifications of standard VDI 2035.

**6.3 Boiler connections**

**thermi<sup>n</sup>ator II 18 up to 30**

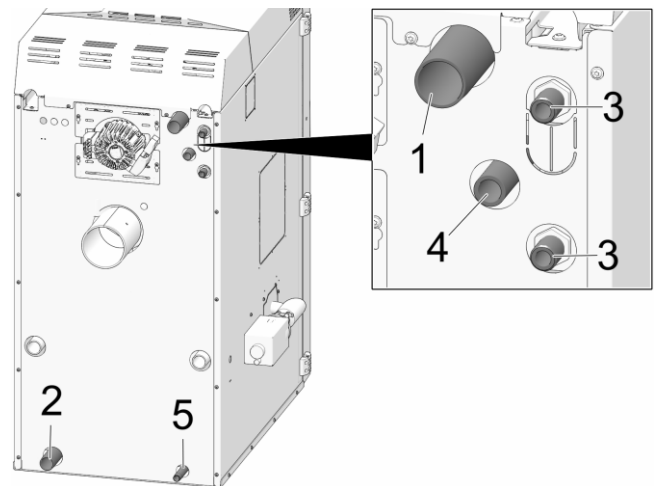


Fig. 6-1\_001cCP

- 1 Boiler flow
- 2 Boiler return
- 3 Connections for the thermal overload protection (1/2" external thread)
- 4 Immersion sleeve for the sensor of the thermal overload protection
- 5 Boiler drain point (1/2" OT)

**thermi<sup>n</sup>ator II 36 up to 60**

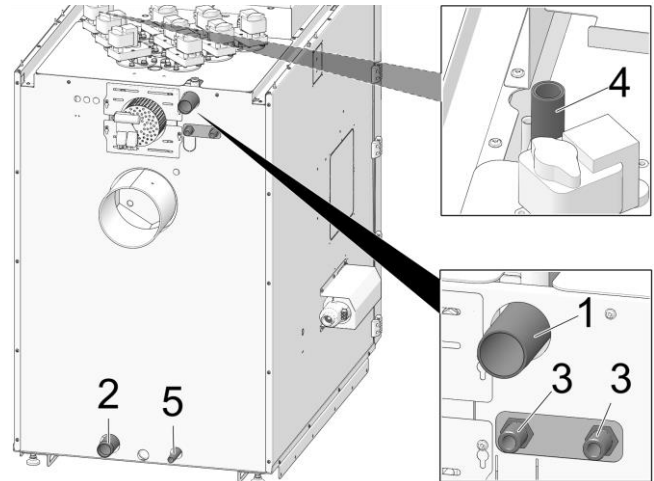


Fig. 6-2\_002cBY

- 1 Boiler flow
- 2 Boiler return
- 3 Connections for the thermal overload protection (1/2" external thread)
- 4 Immersion sleeve for the sensor of the thermal overload protection (below the boiler cover)
- 5 Boiler drain point (1/2" OT)

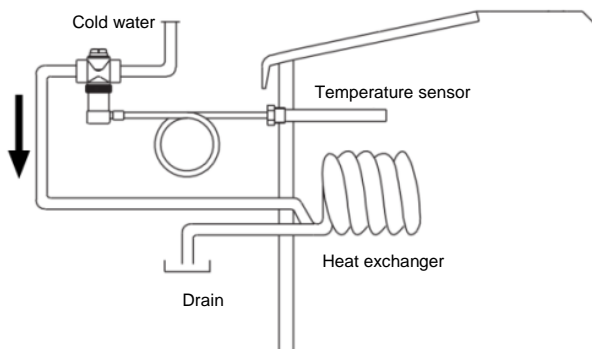
## 6.4 Boiler safety group (BSG)



Install the BSG in the boiler supply line, at the highest point of the line, as close as possible to the boiler. Installation position: vertical, see illustration.

**! ATTENTION-** Do not install any barriers in the pipework that could render the boiler safety group ineffective.

## 6.5 Thermal overload protection



The thermal overload protection is a safety device in the boiler. It prevents an uncontrolled increase in temperature and pressure inside the boiler.

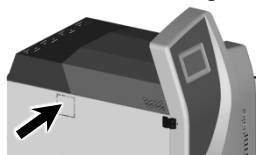
When the boiler temperature is  $>95^{\circ}\text{C}$ , it opens a valve and feeds cold water into the boiler water circuit to reduce the boiler temperature.

**Fit the thermal overload protection valve before (as seen from the direction of flow) the heat exchanger (i.e. no water pressure building up in the heat exchanger).**

### ! ATTENTION

- Only standard-tested thermal overload protection may be installed.
- The water supply line must be designed so that it cannot be shut off and has a continuous minimum pressure of 2 bar.
- The drain line must be routed freely into a drain funnel.
- A backflow inhibitor and, as a pressure limiting device, a safety valve or an expansion tank with a minimum capacity of 4 litres must be installed at the inlet connection.

On the left side of the boiler: Perforation in the cladding for easy access when replacing the thermal overload protection heat exchanger.



## 6.6 Return booster module (RFB)



- Function of the return flow boosting: The return temperature in the boiler is kept  $> 55^{\circ}\text{C}$  (this prevents condensation of the flue gases in the heat exchanger and resulting corrosion).
- The electrical connection of the return lift module is made on the back of the boiler (plug-in connection when using a SOLARFOCUS return booster module).

**i** Installation of a return booster module is a condition for warranty.

**i** During installation, make sure that there is a clearance  $>20\text{ cm}$  between the boiler and the return booster module (to allow for subsequent replacement of pump components, if necessary).

### Return flow booster module with servomotor

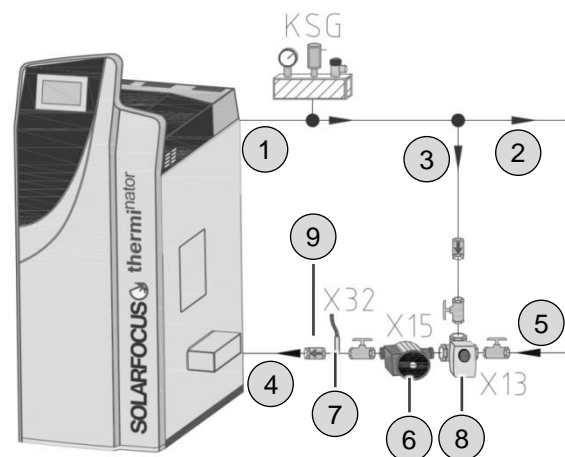


Fig. 6-3

1	Boiler flow
2	Heating circuit or buffer tank flow
3	Bypass line
4	Boiler return
5	Return, heating circuit or buffer tank
6	Pump X15
7	Temperature sensor X32
8	Servomotor X13
9	Non-return valve (not included in the scope of delivery)

**Thermostatic Return Booster Module**

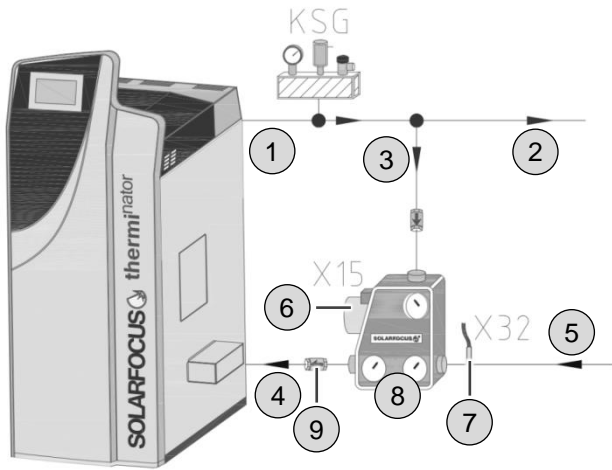


Fig. 6-4

1	Boiler flow
2	Heating circuit or buffer tank flow
3	Bypass line
4	Boiler return
5	Return, heating circuit or buffer tank
6	Pump X15
7	Temperature sensor X32
8	Thermostatic Return Booster Module
9	Non-return valve (not included in the scope of delivery)

**7 Electrical connection**

**⚠ DANGER** - There is a risk of fatal electric shocks when working on electrical components of the product (230 V AC).

- Work may only be performed by qualified electricians.
- Applicable standards and regulations must be observed.

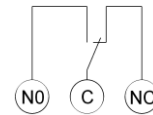
**7.1 Power supply for the heating system**



A separate power circuit is to be provided in the boiler room for the heating system.

Mains connection: 230 V AC / 50 Hz C13 A; Specification for the mains connection cable (e.g. in case of replacement): cable SIHF-J 3x1.5 mm<sup>2</sup>.

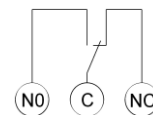
**7.2 External boiler request (X28)**



Potential-free relay output for switching an external boiler, for example, an external boiler is controlled by the SOLARFOCUS boiler control.

**!** **ATTENTION** –The connection is potential-free and has a maximum load of 5A.

**7.3 Fault (X29)**



Potential-free relay output, for example, to switch a warning device (optical/acoustic). Triggered in the event of a malfunction on the boiler.

**!** **ATTENTION** –The connection is potential-free and has a maximum load of 5A.

**7.4 Parameter Function X51**

Input; parameter can be found in the *Service menu* | *System parameter* | Button *General Settings*; three options to choose from:

- *External request*: The SOLARFOCUS boiler can be started by an external control.
- *External boiler*: Possible application - The exhaust thermostat of a third-party boiler prevents the SOLARFOCUS boiler from starting.
- *External message*: Function - If contact X51 is closed continuously for 10 seconds, a window

opens with a display of the stored text. In addition, the fault contact X29 is switched.

**! ATTENTION** - The connection must be potential-free.

### 7.5 Parameter reserve relay (X6)

230 V AC output; parameter can be found in the *Service menu* | Button *External boiler/reserve relay*; three options to choose from:

- *Boiler operation*: When the burner is active, the output is switched, e.g. for a supply air flap in the boiler room.
- *3-way motor valve*: for switching a 3-way motor valve (if the third-party boiler does not load the buffer tank); example: Depending on which boiler is active (SOLARFOCUS boiler or third-party boiler), the 3-way motor valve is switched between the buffer charging circuit and the external boiler; see Item 68408 - *External boiler + 3-way valve control* ).
- *Supply to DFSH*: The automatic diverter for suction heads (DFSH) is only supplied with power when pellet suction is required.

### 7.6 Emergency OFF switch (X21)



An *emergency OFF switch* must be fitted outside the boiler room. Observe regional building regulations.

Connect the cable to the power element **X21**.

### 7.7 Safety chain (X21)

Connect all safety-related devices (EMERGENCY OFF switch, if necessary pressure sensor, etc.) in series.

## 7.8 Cable management

For all thermi<sup>nator</sup> II boiler types.

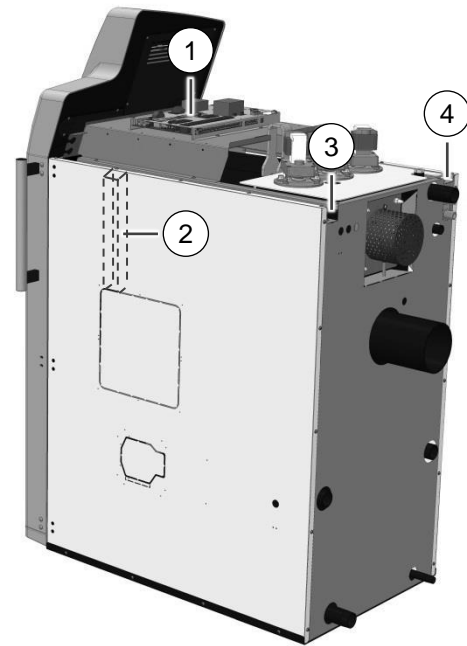


Fig. 7-1\_010

- |   |   |
|---|---|
| 1 | Electrical power element  |
| 2 | Cable duct (behind the boiler cladding); available on both boiler sides |
| 3 | Cable duct for live wires (pumps, mixers, mains connection, etc.)       |
| 4 | Cable duct for sensor cables  |

## 7.9 Electrical fusing

Slot on the power element	Use	Rating
F1	Mains fuse	T 10 A
F2	TRIAC fuse	FF 10 A
F3	Rectifier fuse	FF 2A

## 7.10 Internet connection

To connect the boiler control with the Internet, connect the Ethernet port IF3 (type RJ45) on the bottom of the display with a network router via cable.

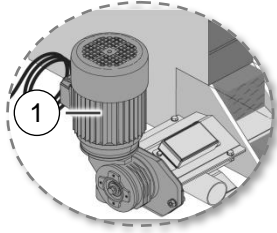
The connection is required in order to use the following functions:

- mySOLARFOCUS app
- Weatherman function
- IP-VNC (Remote access to the boiler control)
- Sending e-mails



### 7.11 Connecting pellet conveyor systems

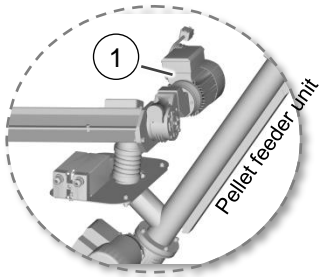
► Suction system with suction auger



- Lay a cable (5x1.5 mm<sup>2</sup>, to be provided on site) from motor 1 to the boiler power element.

Direct extraction motor	Connection X14 on the power element
PE	PE
N	N
L3	L
L2	TC
L1	TC

- Auger extraction (with room direction extraction auger, or from pellet box)

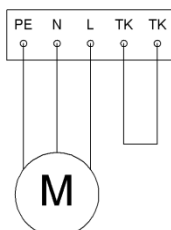


- Lay a cable (5x1.5 mm<sup>2</sup>, to be provided on site) from motor 1 to the boiler power element.

Direct extraction motor	Connection X22 on the power element
PE	PE
N	N
L3	L
L2	TC
L1	TC

► External system (e.g. mole)

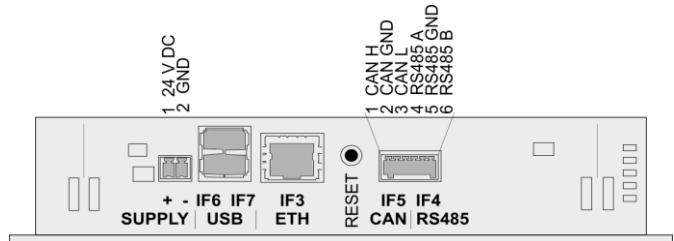
- Connect motor (5-pin plug) to boiler power element unit X14 .
- Bridge the two TC terminals on the boiler power element.



Graphical overview of the storage and conveying systems for the dual fuel boiler → 36

### 7.12 Touch display

The touch display is wired at the factory. The information here serves for possible replacement of the boiler control.



Wire	Display connection	Connection to the power element
black	SUPPLY – 1 24 V DC	X54 +
light argy	SUPPLY – 2 GND	X54 ⊥
brown	IF4 – Pin 4 - RS485 A	X53 A
blue	IF4 – Pin 6 - RS485 B	X53 B



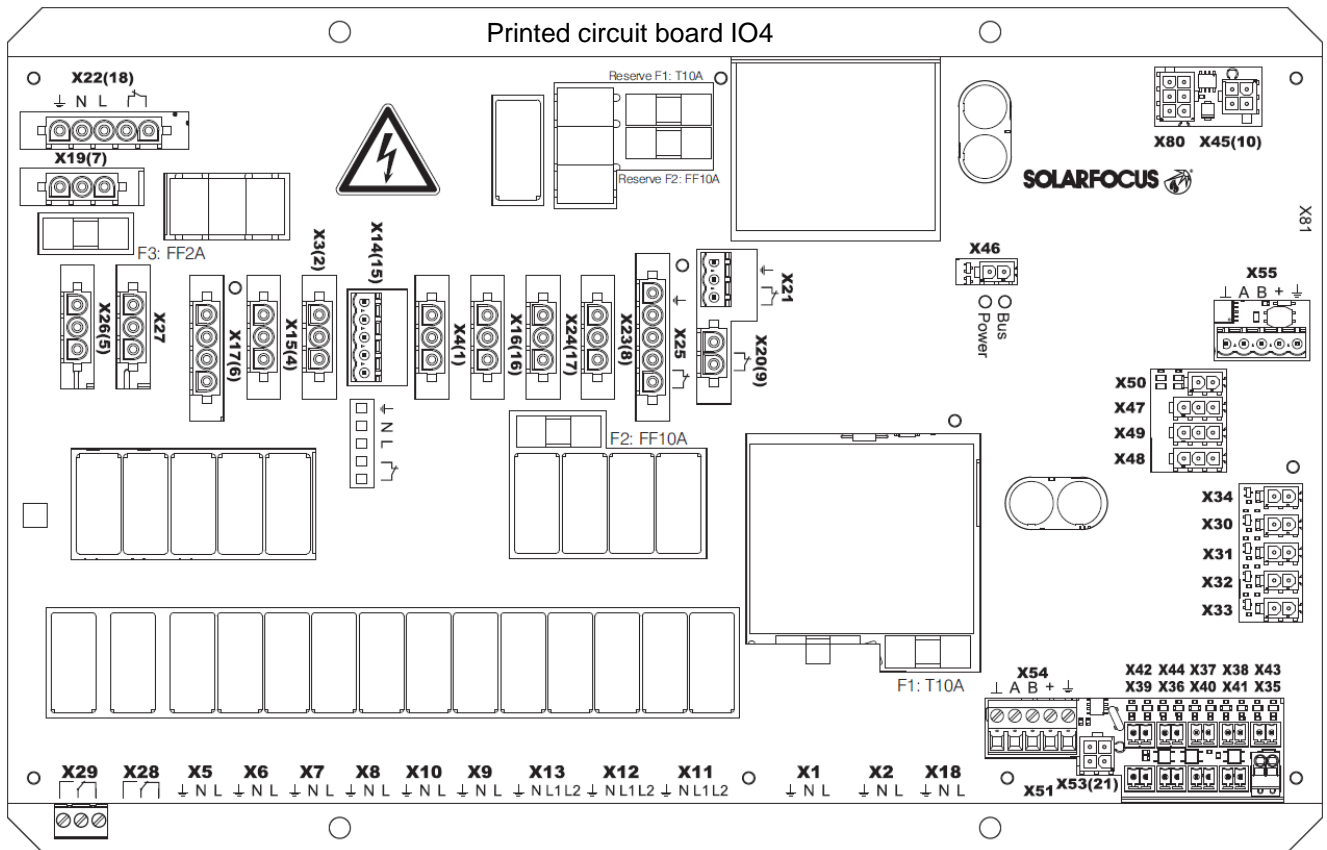
### 7.13 Sensor resistance table

Sensor type	PT 100	PT 1000	KTY 81-110
Tolerance	± 0.7%	± 1%	± 3%
Temperature [°C]	Resistance [Ohms]	Resistance [Ohms]	Resistance [Ohms]
-20	92.16	922	684
-10	96.09	961	747
0	100	1000	815
10	103.9	1039	886
20	107.79	1078	961
25	109.74	1097	1000
30	111.69	1117	1040
40	115.54	1155	1122
50	119.4	1194	1209
60	123.24	1232	1299
70	127.07	1271	1392
80	130.8	1309	1490
100	138.5	1385	1696
120	146.06	1461	1915
140	153.58	1536	2124
150	157.31	1573	2211
160	161.04	-	-
170	164.76	-	-
180	168.46	-	-
190	172.16	-	-



### 7.14 Boiler power element – Connections

Terminal CAN-OUT (next to the power element)



No.	Function	No.	Function	No.	Function
	Fuel feed		Boiler		
X3	Suction turbine (for system type <i>Pellets</i> )	X4	Automatic ignition	X34	Flue gas temperature sensor
X14	- Motor with pellet suction system with suction auger - External systems for pellet transport	X16	In the case of the system type <i>Wood chips</i> : Fly ash discharge. In the case of the system type <i>Pellets</i> : Shaker motor.	X45	Lambda sensor
X22	<input checked="" type="checkbox"/> Motor for direct extraction (with system type pellet direct extraction or pellet downpipe) <input checked="" type="checkbox"/> Motor of the container screw (for intermediate pellet store 110 and 250). <input checked="" type="checkbox"/> Shaker motor (for wood chip boilers)	X17	Secondary air damper	X46	24 V DC
	Bus	X19	ID fan	X47	Speed measurement ID fan
X54	RS-485 bus (the display draws power from this output)	X20	Overtemperature reset (OTR)	X48	front door control switch
X53	RS-485 bus: Communication with the display (connection <i>IF4</i> )	X21	Safety chain 230 V AC (optional); e.g. for emergency off switch	X49	Container filling level sensor (for intermediate pellet store 110 and 250 litres)
CAN-OUT	CAN bus: Terminal CAN-OUT (next to the power element): for connection to electronic modules.	X23	System type <i>Pellets</i> : Feed motor.  System type <i>wood chip downpipe</i> or <i>wood chip intermediate auger</i> : Feed motor.	X51	Optional: External request; external boiler; home connection box
	Heating circuit	X24	Heat exchanger cleaning motor		Buffer tank
X9	Heating circuit pump – HC1	X25	Burn-back slider (with pellet feeder)	X7	additional buffer cylinder charging pump (optional)
X10	Heating circuit pump – HC2	X26	Primary air solenoid	X13	Return mixer
X11	Heating circuit mixing valve - HC1	X28	External boiler request (optional)	X15	Return booster pump
X12	Heating circuit mixing valve - HC2	X29	Fault (optional)	X35	Buffer sensor 3 (optional)
X37	Flow temperature sensor - HC2	X30	External boiler sensor	X36	Buffer sensor bottom
X38	Flow temperature sensor - HC1	X31	Boiler temperature sensor	X44	Buffer sensor top
X40	Room sensor - HC2 (optional)	X32	Return temperature sensor		Other
X41	Room sensor - HC1 (optional)	X33	Plug-in temperature sensor for <i>pellet</i> system type (for <i>wood chip material</i> , connect the feeder temperature sensor to the electronic module).	X6	Spare: 230 V AC output; for special functions, see parameter <i>reserve relay</i> → 31
X42	Outside temperature sensor				Power supply
				X1	230 V AC input
				X2	230 V AC output
				X18	230 V AC output
					Domestic hot water tank
				X8	DHW tank pump
				X39	DHW tank sensor
					Recirculation control
				X5	Recirculation pump
				X43	Circulation sensor (optional)

## 8 Initial commissioning

**i** Initial commissioning of the boiler may only be performed by qualified personnel (SOLARFOCUS service technician or SOLARFOCUS specialist service partner) (= condition for guarantee, warranty).

- The boiler is hydraulically connected.
  - The heating system is filled with water and has been vented.
  - The boiler is electrically connected.
- Connect the boiler to the mains power supply.
- Carry out the commissioning routine in the boiler control.

**i** After having completed initial commissioning, the completed commissioning form should be returned to SOLARFOCUS. If this does not happen, then for guarantee and warranty claims of any kind the date of shipment from the manufacturer to the dealer (according to the delivery note and invoice) will be used.

### Output setting

- During commissioning, set the nominal output **1** of the boiler, the system type **2**, and the boiler operating modes bought **3**.

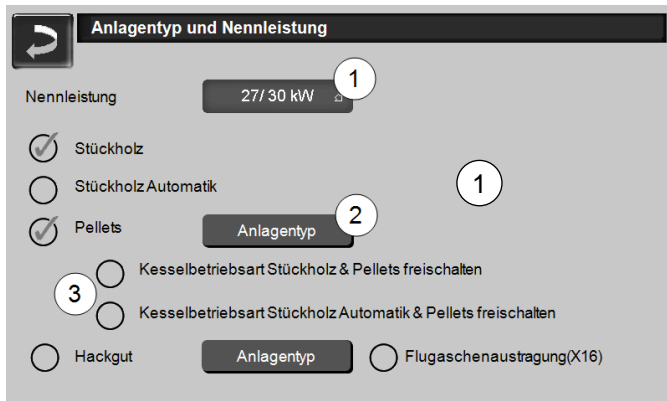


Fig. 8-1

The output is controlled (ID fan control) based on parameters set at the factory. No further setting work is required for this.

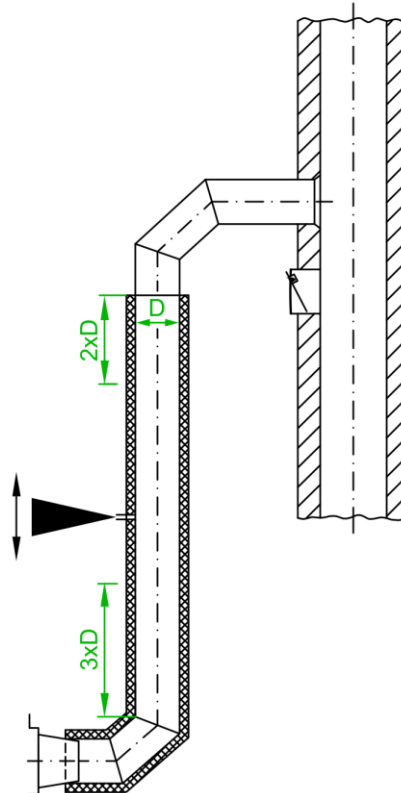
## 9 Annex

### 9.1 Flue gas pipe: Hole for emission measurement

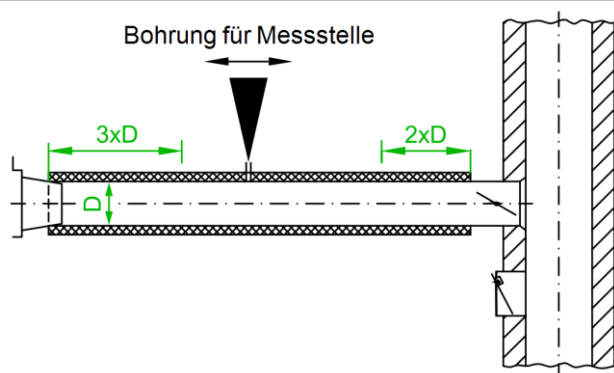
- Make the hole for the emission measurement according to the following images (recommendation according to standard).
- If these specifications cannot be implemented, then make the measuring point after a calming section, i.e. after the longest straight section of the pipe. The tube orientation (horizontal, vertical, oblique) plays no role in this case.
- In any case, place the measuring point before any existing draught stabiliser.

You can find the function for carrying out the emission measurement in the boiler operation manual, keyword: *Chimney sweep function*.

#### Flue gas pipe vertical



## Flue gas pipe horizontal



## 9.2 Install pellet hose



- Do not kink the hose (observe bending radius of > 30 cm).
- The hose is not UV-resistant (routing outdoors is not permissible).
- Temperature resistance of the hose < 60°C.
- Route hose as straight as possible. To avoid sagging, use the SOLARFOCUS item *support shell made of zinc-plated sheet steel*.
- The hose must be attached to the floor at several points to prevent it from 'floating' upwards (in the case of floor-mounting, e.g. suction head).
- Observe maximum hose length and delivery height.

	Max. hose length	Max. conveying height
Suction head to diverter for suction heads	10 m	1.0 m
Diverter for suction heads to boiler	20 m	2.5 m
Total delivery path	30 m	3.5 m

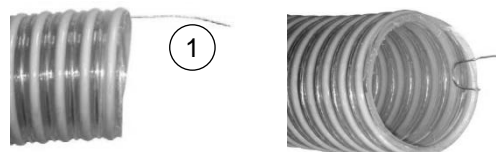
### Notes on installing hose

- Always push the end of the hose onto the pipe connection as far as the stop. The hose will slide on to the connection pipe better if you apply a little water to the pipe.

- Tighten hose clamps firmly. (Detachment of the hose and the intake of false air must be reliably prevented).

### Note on electrical earthing

- ▶ Cut the required length of hard PVC spiral from the hose (with a cutter).
- ▶ Adjust the cable stripping pliers to the thickness of the metal strand **1** and strip them (as with electrical cables, the strand lies loosely in the hard PVC spiral, i.e. it can be easily separated from it).
- ▶ Bend the strand onto the inside of the hose, connect hose.



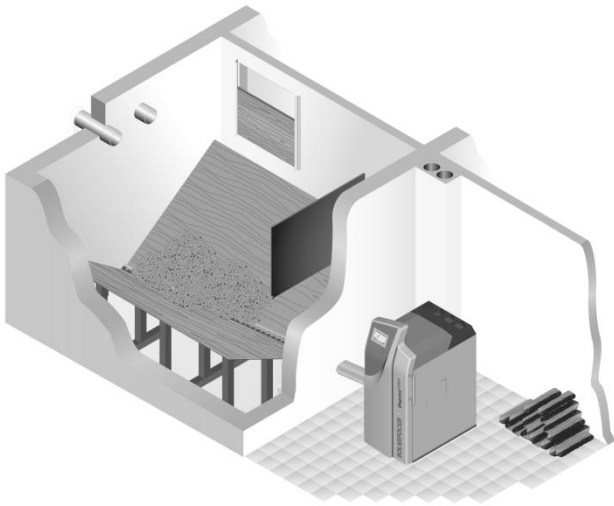
**!** **ATTENTION-** The strand and the hose connection pipe/connection nozzles must always be in conductive electrical contact (scrape off any existing coating).

**i** Only the suction hose has to be earthed at both ends (no earthing required for return-air hose).

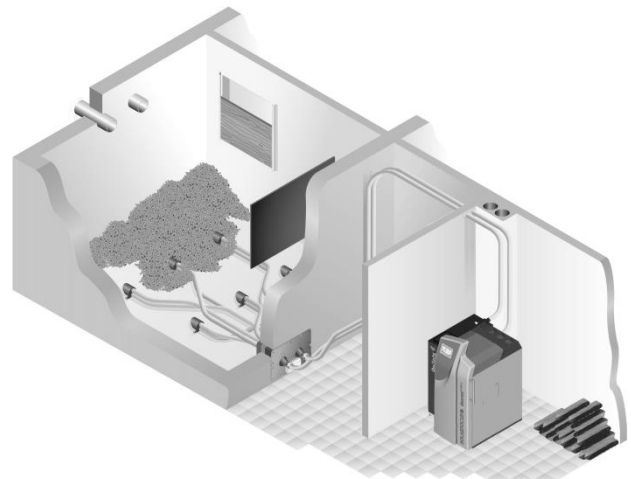
## 9.3 Air supply into the boiler room

- Continuous and adequate ventilation of the boiler room must be provided. This ensures an adequate supply of the air necessary for combustion.
- The structural design must comply with the locally applicable regulations at the installation location. The minimum effective area of the supply air openings is 200 cm<sup>2</sup> up to 30 kW, 300 cm<sup>2</sup> up to 40 kW and 400 cm<sup>2</sup> up to 60 kW. This opening must be non-closable.
- Optimum operation without a lack of oxygen can only be ensured if these requirements are met.

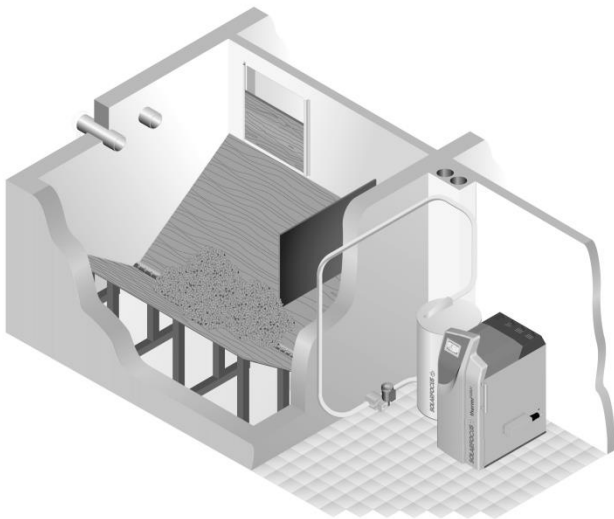
## 9.4 Storage and conveying systems (for thermi<sup>nator</sup> II dual fuel boiler)



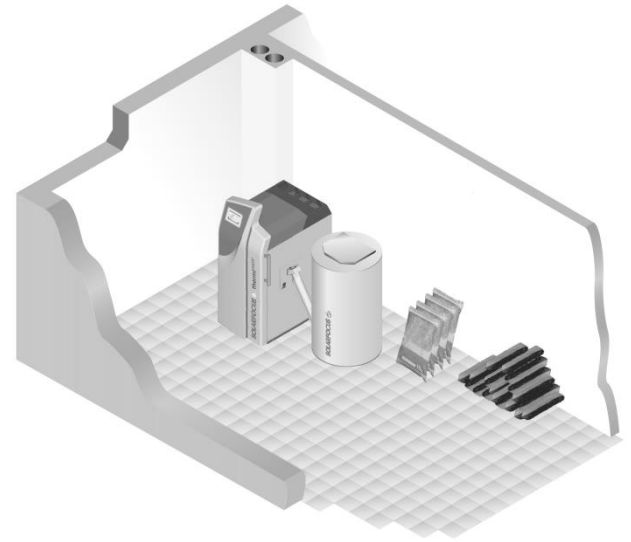
Auger extraction for direct extraction



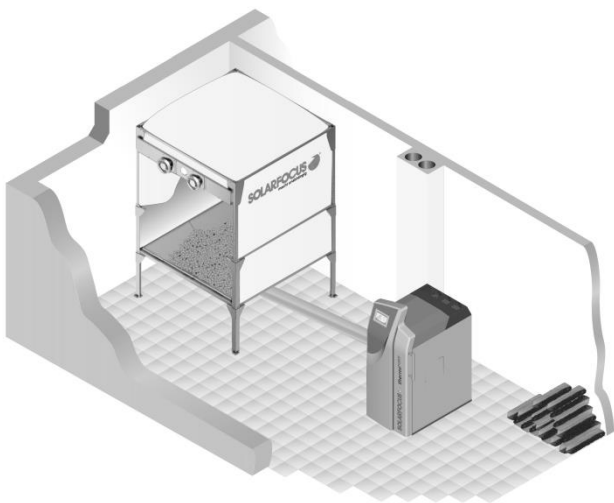
Suction system with suction heads



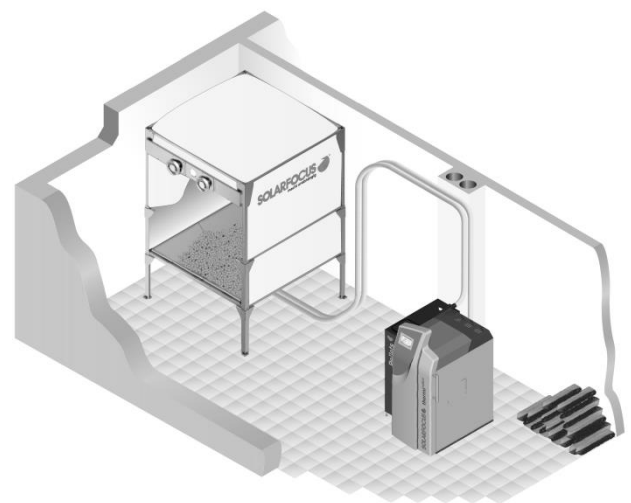
Suction system with suction auger



Manual filling of the intermediate store



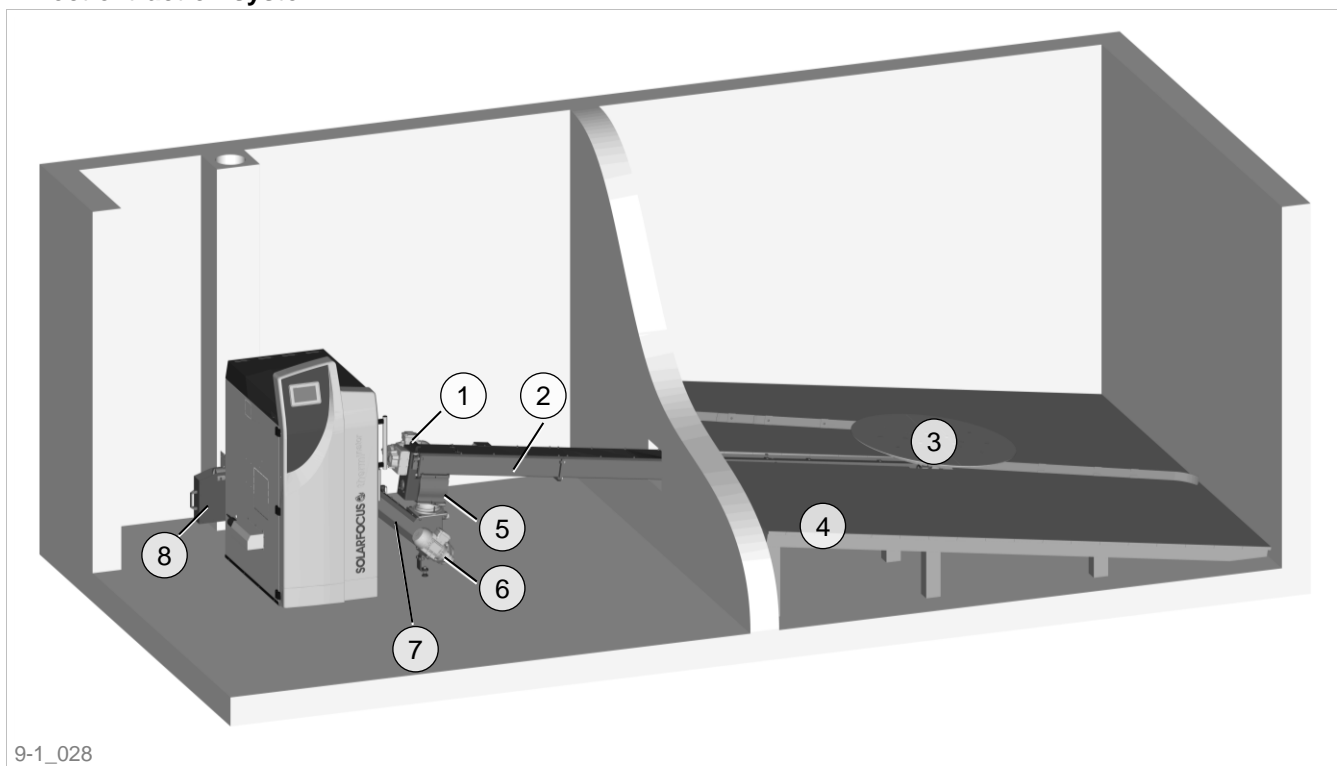
Pellet box with auger extraction



Pellet box with suction system

## 9.5 Overview: Wood chip system types

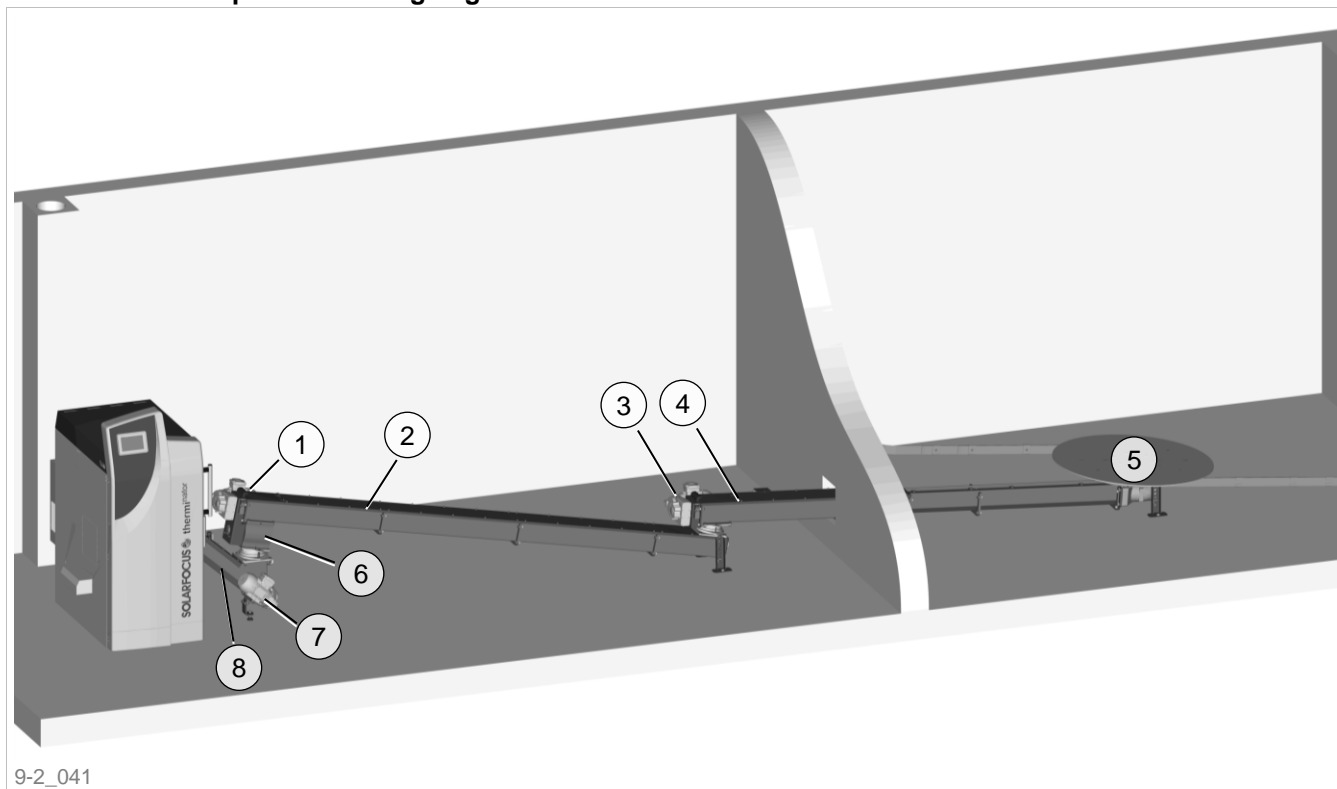
### Direct extraction system



9-1\_028

1 Motor of the direct extraction auger (M1) 2 Direct extraction auger 3 Agitator with spring leaves 4 Sloping floor 5 Single axis rotary valve 6 Motor of the feed auger (M2) 7 Feeder unit 8 Flue ash container

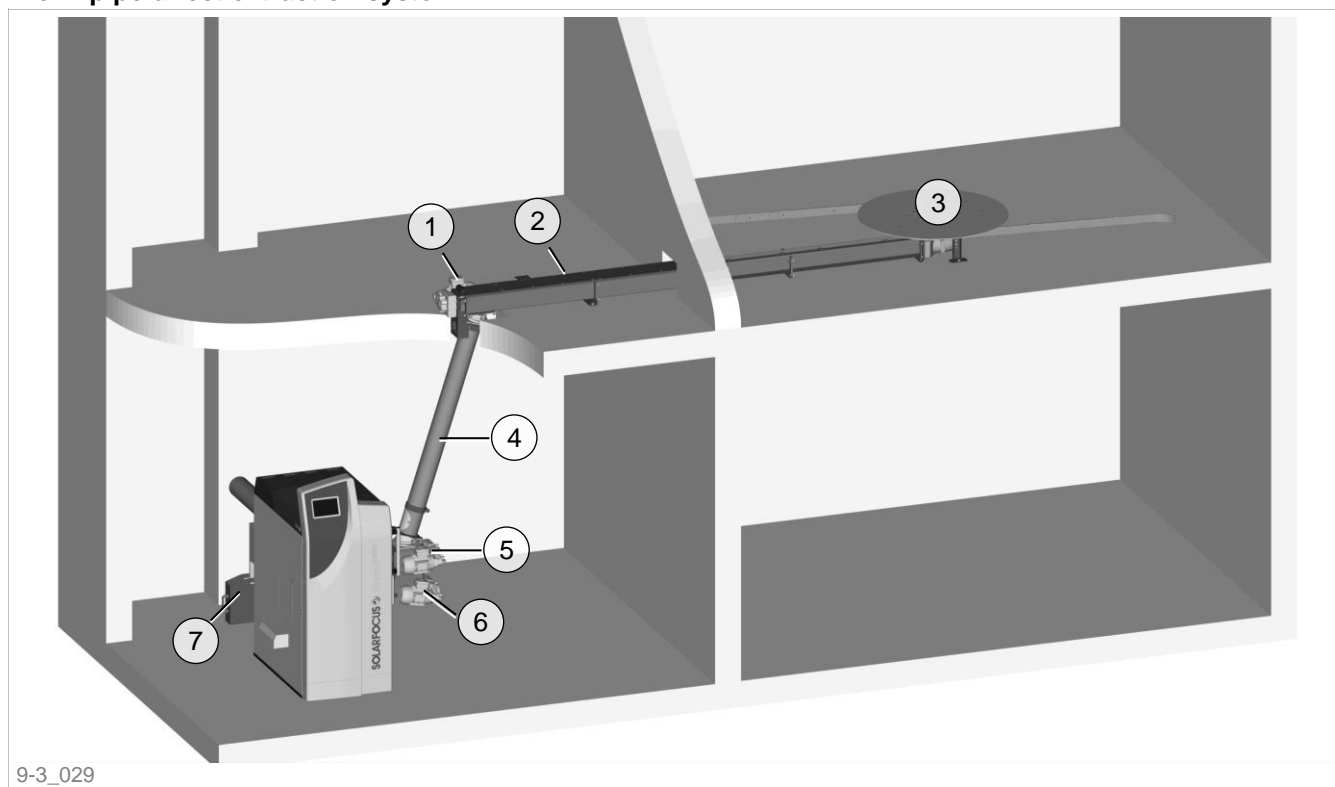
### Direct extraction plus ascending auger



9-2\_041

1 Motor of the intermediate auger (M1) 2 Intermediate auger 3 Motor of the direct extraction auger (M2) 4 Direct extraction auger 5 Agitator with spring leaves 6 Single axis rotary valve 7 Motor of the feed auger (X23) 8 Feeder unit

### Downpipe direct extraction system



9-3\_029

1 Motor of the direct extraction auger (M2) 2 Direct extraction auger 3 Agitator with spring leaves 4 Downpipe 5 Single axis rotary valve (motor M1) 6 Motor of the feed auger (X23) 7 Flue ash container

## 9.6 Commissioning log

**SOLARFOCUS GmbH, Werkstraße 1, A-4451 St.Ulrich/Steyr**

e-mail: [office@solarfocus.at](mailto:office@solarfocus.at)  
web: [www.solarfocus.com](http://www.solarfocus.com)

Tel.: +43 (0) 7252 / 50 002 - 0  
Fax: +43 (0) 7252 / 50 002 - 10



### Commissioning log for biomass heating systems

DR-0074-EN / v15-202102



> Return by fax +43 7252 / 50002-953 or by e-mail [service@solarfocus.at](mailto:service@solarfocus.at)

#### System operator

First name / surname .....  
Street .....  
Postcode / city .....  
Phone .....  
Email .....

#### Service representative

Company .....  
Street .....  
Postcode / city .....  
Phone .....  
Email .....

#### 1. Heating system data

##### a) Boiler

Serial number: .....

- ecotop<sup>zero</sup>**       15    20    24  
**ecotop<sup>light</sup>**       15    20    24  
**octo<sup>plus</sup>**       10    15    15.5    22  
**pellet<sup>elegance</sup>**       10    15    20    24  
**pellet<sup>top</sup>**       35    45    49    70  
**thermi<sup>nator</sup> II touch**       18    22    27    30    36  
     40    45    49    60  
**maxi<sup>imus</sup>**       150    200    250    300

##### b) Pellet storage

- Storage room       Pellet box (fabric silo)  
 Intermediate store 110    Intermediate store 250  
 Underground tank

##### c) Pellet transport

- Auger extraction       Downpipe  
 Vacuum output with ...  
 Individual suction head    Suction auger  
 Automatic diverter for suction heads, with  
      max. 6 heads    max. 12 heads  
 Manual diverter for suction heads  
 Pellets-Distribution Box    Mole

##### d) Wood chip transport

- Direct extraction       Downpipe  
 Intermediate auger

##### e) Hydraulic installation acc. to...

- Schematic No. ....  
 Schematic acc. to supplementary sheet

#### f) Control

- Heating circuit       DHW tank  
 Buffer tank       Circulation control  
 Solar system

#### g) Other

- Flue gas pipe connection:  Upwards    Rearwards  
 Condensing module  
 Electrostatic dust collector  
 Room-sealed operation  
 Central control



**2. Commissioning: Activities, controls**

- 1. Checked for transport damage
- 2. Boiler assembly: Tightness, operating pressure, return flow boosting mounted
- 3. Assembly of the delivery system: Storage room, impact protection mat, ...
- 4. Mounting of the pellet hoses: correct direction, earthing, fire protection collars
- 5. Thermal overload protection installed
- 6. Flue gas pipe installation: Tightness, insulation, chimney draught stabiliser installed
- 7. Electrical supply line: Power connection is made directly  or by means of a Schuko plug
- 8. System connected to potential equalisation: Heating pipework system, electronic module, filling/intake pipe, extraction
- 9. Diverter for suction heads connected to potential equalisation
- 10. Direction of rotation: ID fan, mixer and drive motors, pumps
- 11. Sensor positioning: Flow, return, DHW tank, buffer tank
- 12. DHW tank 750 and 1000 l: Parasitic current anode connected and functional
- 13. Test operation: Log wood, automatic log wood function, automatic pellet or wood chip function
- 14. Chimney draught: cold = ..... hPa, hot = ..... hPa
- 15. Pellet or wood chip quality OK: Dust content, humidity, ...
- 16. Heating water - measured pH value: .....
- 17. Boiler and cleaning equipment as well as all necessary sensors supplied
- 18. Set parameters according to prog. Version ..... documented
- 19. Menus, choice of fuel and fire lighting explained (in accordance with the operation manual)
- 20. Cleaning intervals and activities declared (according to operation manual)
- 21. Walkthrough for pellet storage area according to VDI 3464 has taken place
- 22. Notes on safety controls (at the factory - warranty condition)
- 23. Error messages and troubleshooting measures explained
- 24. Note on extended warranty / maintenance contract is completed
- 25. Photo of finished installation, customer allows use as reference
- 26. Work report and invoice via e-mail requested

Here any additions to individual items lead

No  
.....  
No  
.....  
No  
.....  
No  
.....  
No  
.....  
No  
.....  
No  
.....

**3. Status, conclusion**

- The system was shut down due to safety faults. The system may be put into operation only after the faults have been fully rectified. The listed deficiencies are resolved...  
by (date) .....
- by the heating engineer     by customer service  
 by the system operator
- The system operator / heating engineer hereby confirms the professional installation and functionality of the system; local installation regulations have been complied with by the system installer.
- The system operator has been instructed in terms of the operation, mode of operation, as well as maintenance and cleaning of the biomass system, and the operation manual / commissioning form was handed over to him.
- Commissioning carried out on .....
- Signature of qualified personnel  
.....
- Signature of system operator  
.....

The goods remain the property of SOLARFOCUS GmbH until full payment. Only our terms and conditions apply – available on the internet. The place of jurisdiction for disputes is 4400 Steyr. The domestic jurisdiction in Austria is agreed.



## 9.7 Customer service order form



DR-0075-EN / v15-201707

### Customer service order form for biomass heating

Return by Fax +43 7252 / 50002-953 or by e-mail [service@solarfocus.at](mailto:service@solarfocus.at)

System operator	Service representative
First name / surname .....	Company.....
Street .....	Street .....
Postcode / city .....	Postcode / city .....
Telephone .....	Telephone .....
Email .....	Email .....
Is the system operator present on the date <input type="checkbox"/> yes <input type="checkbox"/> no	

**The form sender is the**
 System operator  Heating engineer  Wholesaler
**Desired date**

1) ..... 2) .....

**SOLARFOCUS representative responsible**

.....

**Requirement type**
 Commissioning  Customer service  Recall  Other
**Invoice to**
 System operator  Heating engineer  Wholesaler
**Wholesaler responsible / location**

.....

**Heating system data****Boiler**

Serial number.....

Revision number.....

octo<sup>plus</sup> 10  15  15.5  22pellet<sup>elegance</sup> 10  15  20  24pellet<sup>top</sup> 15  25  35  45  49 70thermi<sup>nator</sup> II 18  22  27  30  36 40  49  60**Pellet transport** Pellet supply via auger Downpipe system

Suction system with...

 Individual suction head Extraction auger for vacuum

system

 Automatic diverter for suctionheads,  max. 6 heads, max. 12 heads Diverter for suction heads -

manual

 Pellet distribution box Mole**Pellet storage** Storage area Pellet box (fabric tank) Intermediate store  110  250 Underground tank**Wood chips transport** Direct extraction Downpipe system Intermediate auger**Hydraulic installation acc. to** Schematic acc. to supplemen-

tary sheet

 Schematic No. ....**Controller** Heating circuit Domestic hot water tank Buffer tank Recirculation control Solar system**Other** Room sealed appliance (RSA) Central control**Description** (request, service order, ...)

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Date, Signature (Form Sender)

With my signature, I confirm that the information provided is correct and that installation of the system (hydraulic & electrical) will be completed by the date set for commissioning, incl. an adequate supply of fuel. Waiting times and/or additional assignments will be charged separately.

To be completed by SOLARFOCUS

Date confirmed for (date/time): .....	COMM ordered acc. to cus- tomer service order form .....	Paid <input type="checkbox"/> Yes <input type="checkbox"/> No	Processed by SOLARFOCUS .....	Service engineer .....
--	--	--	----------------------------------	---------------------------

**SOLARFOCUS GmbH, Werkstraße 1, A-4451 St. Ulrich/Steyr**e-mail: [office@solarfocus.at](mailto:office@solarfocus.at)

Tel.: +43 (0) 7252 / 50 002 - 0

web: [www.solarfocus.at](http://www.solarfocus.at)

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### Austria

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Tel.: +43 (0) 7252 / 50 002 - 0

web: [www.solarfocus.at](http://www.solarfocus.at)

Fax: +43 (0) 7252 / 50 002 - 10

### Germany

**SOLARFOCUS GmbH, Marie-Curie-Str. 14-16, D-64653 Lorsch**

e-mail: [office@solarfocus.de](mailto:office@solarfocus.de)

Tel.: +49 (0) 6251 / 13 665 - 00

web: [www.solarfocus.de](http://www.solarfocus.de)

Fax: +49 (0) 6251 / 13 665 - 50