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29/11/22

To whom it may concern

Whalley Farm – Air Quality Statement

The following Air Quality Statement has been produced to support the Whalley Farm Planning Application (Planning Portal Ref: PP-11723692).

1.0 Introduction

1.1 Proposed Works

Two Solarfocus Pelletop 70kW biomass boilers are to be installed at Whalley Farm. Along with the boiler, ancillary components will also be installed, this includes two flue stacks which will run up internally within the building, then pass through the roof and extend ~1m above the apex of the building it will be housed in.

1.2 Site Description

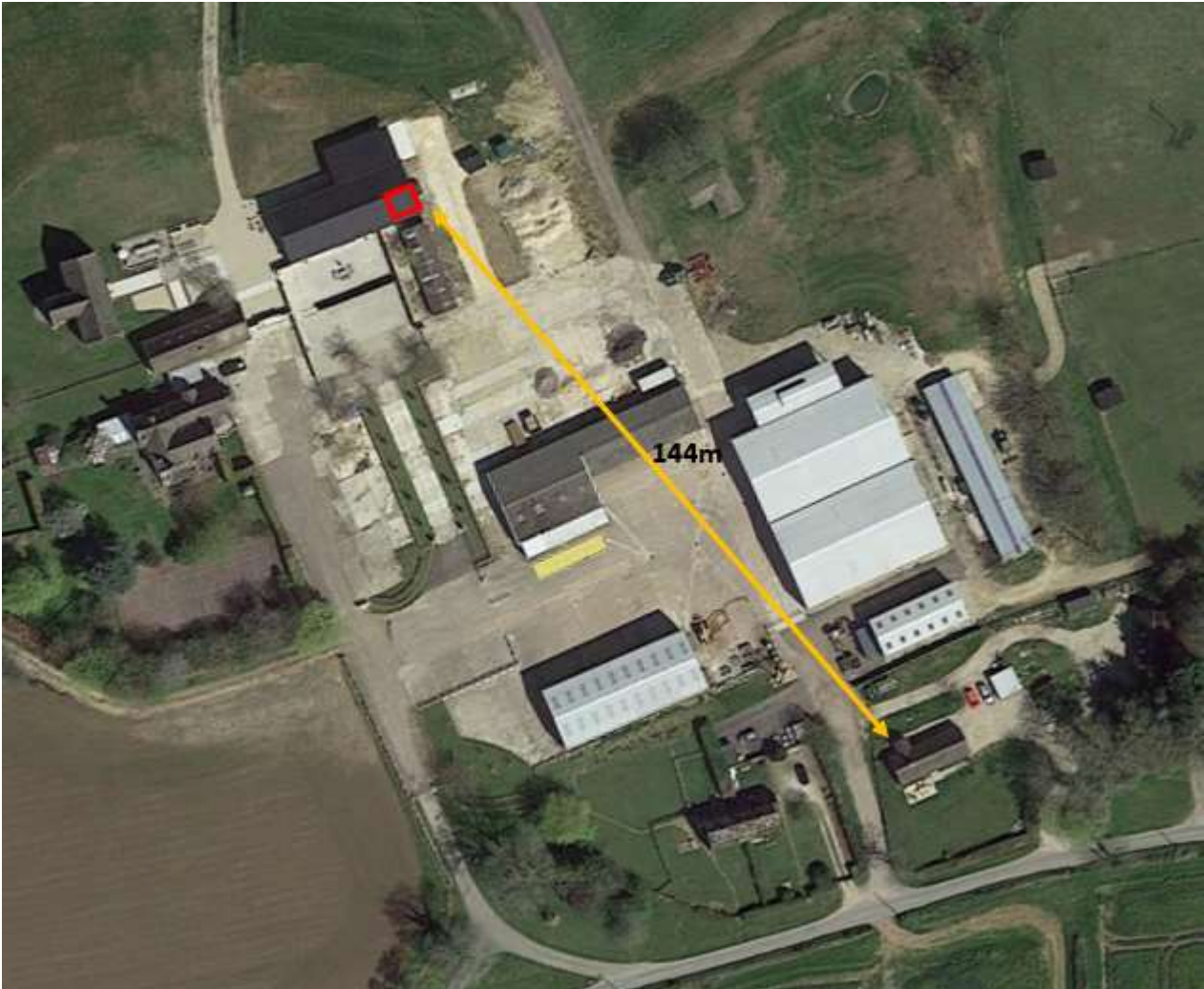
Whalley Farm is located off Ham Road, approximately 5.5km to the South East of Cheltenham City Centre. The biomass boilers will be located in a section of a building on the site which is currently used to house the plant for a swimming pool, along with being used for general storage. The closest neighbor is a residential property located approximately 144m to the South East of the proposed flue stack locations. The site boundary where the biomass equipment will be housed and distance to the nearest neighbours are highlighted in Figure 1.

1.3 Format of Submission

In order to assist consideration of this application, the following supporting information has been provided as addendums to this document:

- Solarfocus brochure
- Smoke Control Exempt Appliance Certificate
- RHI Emission Certificate for the Solarfocus Pelletop
- Flue height calculations
- Elevation drawing

Figure 1: - Position of biomass boilers on site and nearest neighbour



2.0 System

2.1 Biomass boiler

The chosen biomass boiler is the Pelletop 70kW from an award winning Austrian biomass boiler manufacturer called Solarfocus.

The boiler has a PLC to automatically control combustion. This is done by using a number of sensors within the combustion and flue system where combustions temperature, oxygen levels, draught are all monitored and altered accordingly by the balanced introduction of primary and secondary air into the system, changing fuel feed rates and increasing fan speed to create more draught in the system. This automatic process ensures high levels of burn efficiency are kept

throughout the process, even with varying fuel qualities, which in itself minimises emissions of particulate matter.

The boiler has a modulation system that when it needs more heat supplied to the water system it will increase the boilers output up to 100%, when the boiler detects the water demand is satisfied the boiler will modulate (reduce its output) and will sit as low as 30% of maximum output, whilst maintaining high efficiencies of combustion.

The heat exchanger is automatically cleaned to remove ash deposits. All ash from it and that produced in the combustion chamber are automatically fed into sealed external containers.

A brochure for the boiler is presented in Addendum A.

3.0 Emissions

3.1 Smoke Control Exempt Appliance

The boiler is classified as an exempt appliance, as such it meets the criteria for use within Smoke Control Areas. Whilst we do not believe the site is within a Smoke Control Area, this does demonstrate that the boilers meet the requirements to be able to be installed in locations where there are additional restrictions in relation to air quality. The link below takes you to the DEFRA Smoke Control Website where the certificate for this boiler can be viewed, with an extract of this shown in Figure 2 and the full certificate in Addendum B.

<https://smokecontrol.defra.gov.uk/appliance-details.php?id=715>

Figure 2: Screen shot from Smoke Control Exempt Appliance List

Appliance name	Pellettop 35, pellettop 49 and pellettop 70 wood pellet boilers
Output	n/a
Fuel Type	Wood based
Appliance Type	Boiler
Manufacturer	SOLARFOCUS GmbH, Werkstrasse 1 4451 St.Ulrich, Steyr, Austria

3.2 RHI Emission Certificate

As demonstrated by the certificate in Addendum C, the Solarfocus Pellettop 70kW meets the stringent emissions limits that are required for systems to be used on the governments Renewable Heat Incentive scheme.

3.4 Target Emission Rates

In terms of air quality issues, we are able to undertake a screening assessment to identify if this in indeed any issue at this site. The first step in ascertaining this is to use the boiler emissions rates for PM and NO_x that are detailed on the RHI emissions certificate as 14g/GJ and 73g/GJ. These values are then converted to g/s using the following formula $((\text{Combined Boiler Power/kWh in 1GJ}) \times \text{g/GJ}) / 3600$, this equates to the following:

a) PM – $((140 / 277.778) \times 14) / 3600 = 0.00196\text{g/s}$

b) NO_x – $((140 / 277.778) \times 73) / 3600 = 0.01021\text{g/s}$

We can now decide if the emissions from the boiler would have a significant impact on the existing background emissions. Local emissions data was gathered by using the background emissions published by DEFRA (<https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>). The flue stacks are located at approximately 400490,221397 with the closest location to this where annual mean back ground emissions data is recorded is found at 400500,221500. The annual mean background emissions at this location records PM₁₀ at 12.670 ug/m³, PM_{2.5} at 8.372 ug/m³, NO₂ at 6.678 ug/m³, and NO_x at 8.505 ug/m³.

For the assessment a flue stack height of 7.25m m has been entered. Specialist software has been used to demonstrate that the stack height is sufficient to achieve the correct draught through for the boiler. These calculations are included in Addendum D, with an elevation drawing presented in Addendum E showing the visible flue. As there are no taller buildings within five times this stack height, the height to the apex of the building the biomass plant will be housed in which is 6.33m has been used in the DEFRA Screening Assessment.

Using the LAQM biomass emission screening assessment tool on the DEFRA website (<https://laqm.defra.gov.uk/air-quality/air-quality-assessment/biomass-emissions-screening/>), we are able to calculate target emission rates for both PM and NO_x. Screen shots of this are presented below in Figures 3 to 6.

Figure 3: Calculation of PM₁₀ target emission rate

PM ₁₀ Emissions from Biomass Combustion Stacks (Individual Installations)		
The target emissions of PM ₁₀ in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the 24-hour objective for PM ₁₀ in England, Wales and Northern Ireland or the annual mean objective in Scotland.		
Enter required information in Yellow Cells Resulting Emission in Red Bold		
Building height	6.33	m
Stack diameter	0.2	m
Stack height	7.25	m
Location	Rest of UK	
PM ₁₀ Annual mean background concentration (include roadside contribution at relevant receptors)	12.67	µg/m ³
Calculated Effective stack height	1.5	m
Target Emission Rate	0.015	g/s
If the maximum stack emission rate is less than the target above then it is not likely that the most stringent objective for PM ₁₀ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.		

Figure 4: Calculation of PM_{2.5} target emission rate

PM _{2.5} Emissions from Biomass Combustion Stacks (Individual Installations) - Annual Mean		
The target emissions of PM _{2.5} in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the annual mean cap for PM _{2.5} in England, Wales and Northern Ireland or the annual mean objective in Scotland. The cap is 25 µg/m ³ in England, Wales and Northern Ireland, whilst an objective of 10 µg/m ³ applies in Scotland.		
Enter required information in Yellow Cells Resulting Emission in Red Bold		
Building height	6.33	m
Stack diameter	0.2	m
Stack height	7.25	m
Location	Rest of UK	
PM _{2.5} Annual mean background concentration (include roadside contribution at relevant receptors)	8.372	µg/m ³
Calculated Effective stack height	1.5	m
Target Emission Rate	0.0374	g/s
If the maximum stack emission rate is less than the target above then it is not likely that either the cap or objective for PM _{2.5} will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.		

Figure 5: Calculation of NOx annual target emission rate

NO _x Emissions from Biomass Combustion Stacks (Individual Installations) - Annual Mean NO ₂ Objective		
The target emissions of NO _x in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the annual mean objective for NO ₂ .		
Enter required information in Yellow Cells Resulting Emission in Red Bold		
Building height	<input type="text" value="6.33"/>	m
Stack diameter	<input type="text" value="0.2"/>	m
Stack height	<input type="text" value="7.25"/>	m
Location	<input type="text" value="Rest of UK"/>	
NO ₂ Annual mean background concentration (include roadside contribution at relevant receptors)	<input type="text" value="6.678"/>	µg/m ³
Calculated Effective stack height	<input type="text" value="1.5"/>	m
Target Emission Rate	<input type="text" value="0.075"/>	g/s
If the maximum stack emission rate is less than the target above then it is not likely that the annual mean objective for NO ₂ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.		

Figure 6: Calculation of NOx 1 hour target emission rate

NO _x Emissions from Biomass Combustion Stacks (Individual Installations) - 1-Hour Mean NO ₂ Objective		
The target emissions of NO _x in g/s from biomass combustion source emissions are calculated for your given stack details. Greater emission rates may result in exceedance of the 1-hour mean objective for NO ₂ .		
Enter required information in Yellow Cells Resulting Emission in Red Bold		
Building height	<input type="text" value="6.33"/>	m
Stack diameter	<input type="text" value="0.2"/>	m
Stack height	<input type="text" value="7.25"/>	m
Location	<input type="text" value="Rest of UK"/>	
NO ₂ Annual mean background concentration (include roadside contribution at relevant receptors)	<input type="text" value="6.678"/>	µg/m ³
Calculated Effective stack height	<input type="text" value="1.5"/>	m
Target Emission Rate	<input type="text" value="0.0343"/>	g/s
If the maximum stack emission rate is less than the target above then it is not likely that the 1-hour mean objective for NO ₂ will be exceeded. If your emissions are greater then please refer to LAQM.TG(16) for further advice.		

A comparison of the target emission rates and calculated boiler emission rates are detailed in Table 1. It can be seen that in all instances the calculated boiler emission rates are lower than the target emission rates, as such the most stringent objective for both PM and NOx will not be exceeded.

Table 1: Comparison of emission rates

Emission	Target emission rate (g/s)	Boiler emission rate (g/s)	Pass or Fail
PM ₁₀	0.015	0.00196	Pass
PM _{2.5}	0.0374	0.00196	Pass
NOx annual	0.075	0.01021	Pass
NOx 1 hour	0.0343	0.01021	Pass

4.0 Conclusion

The conclusion reached is that the proposed development is in accordance with national and local policy, and no adverse impacts arise as a result of the use in terms of air quality. As such, it is respectfully requested that no objections are raised in relation to flue height and air quality when it comes to the planning decision.

Best regards,



Ben Bevan

Director

Addendum A – Solarfocus Brochure

Pellet boiler

pellet^{top} touch



- ✓ Powerful products
- ✓ Modern design
- ✓ Low emissions



Pellets



Wood gasification technology

- ✓ Heating comfort creates living comfort!
- ✓ Our experience is your advantage!
- ✓ Good heat grows!

SOLARFOCUS

Comfort starts with heating!





Heating comfort is living comfort!

- High efficiency
- Compact structure
- Touch-screen-control

It works so easily

Based on its compact structure, the **pellet^{top}** can be easily fitted in to boiler room. The space requirement is no greater than for an oil-fired boiler.

Due to the "ready" delivery of the **pellet^{top}** (wired, assembled, inspected and pre-set), install time and costs are reduced.

Your benefit

- Technologies that set new standards
- Independence from fossil fuels like oil and gas

pellet^{top} Pellet boiler

pellet^{top} – The classic one

- Boiler efficiency: up to 94,8%.
- Compact structure – fits in almost every boiler room
- Modern touch-screen-control. Possibility for visualisation on smartphones, tablets and PCs!
- Ambient air-independent operation possible
- Power ratings: 15, 25, 35, 45, 49 and 70 kW suitable for cascade controls up to 420 kW.

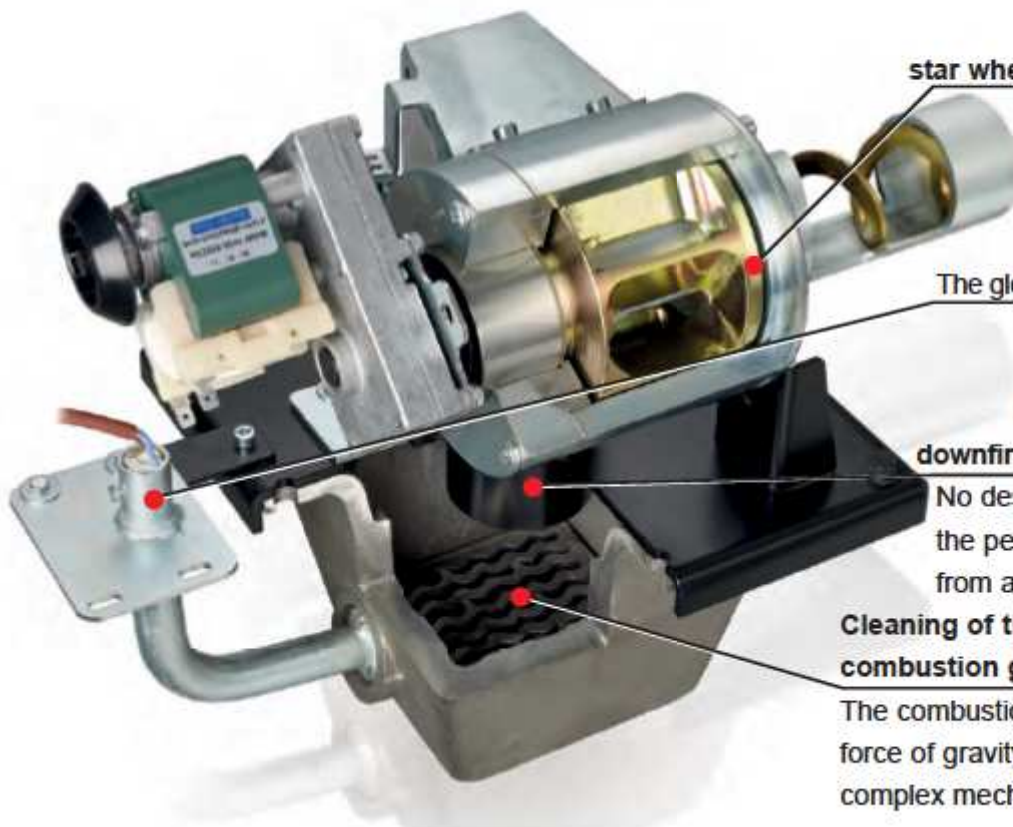
Applications

- ✓ New buildings and renovation
- ✓ Single- and multi-family houses
- ✓ Hotel business, Industry and Commerce



Your benefits

Compact burning unit



Screw feeder with Rotary star wheel backburning protection

No chains and gears - quiet and maintenance-free.

Automatic ignition

The glow pencil only requires 260 W.

Stepped grate system with downfiring combustion technology

No destruction of the fire bed, as the pellets drop onto the fire bed from above.

Cleaning of the stainless steel combustion grate

The combustion grate is cleaned by the force of gravity, with no moving parts or complex mechanisms.

Gasifier technology

Complete burning by top flame temperatures about 1.200°C.



Lambda sensor

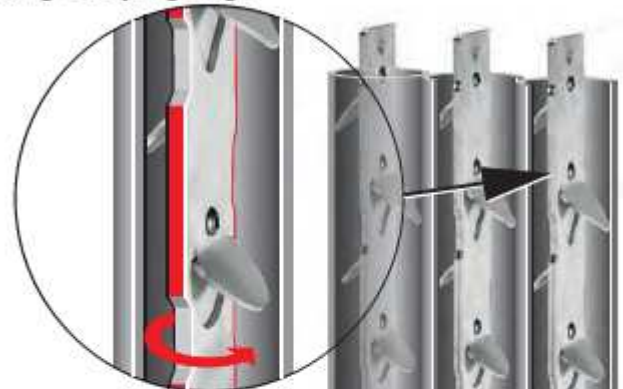
Lambda technology which has been used since 1981, is essential to ensure maximum efficiency with different load ranges.



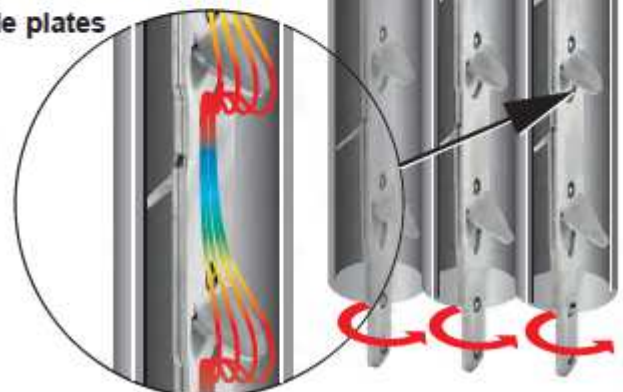
Heat exchanger cleaning

Turbulators with flow-optimised guide plates clean the heat exchangers automatically and ensure low flue gas temperatures.

Rotating scraping edge



Flow-optimised guide plates



Sophisticated technology in detail

Intermediate container for pellets (1) with suction turbine (2)

- The **pellet^{top}** has a generous intermediate container. The vacuum system turbine enables filling of the intermediate container within pre-set times in a closed circuit, maintenance-free system.
- The boiler room and pellet storage room do not have to be directly adjacent to each other. The vacuum turbine is directly mounted onto the intermediate container for pellets.

Auger feeder (3) with single axis rotary valve (4)

- The pellets are transported from the intermediate container by the feed auger into the single axis rotary valve. The single axis rotary valve hermetically seals-off the combustion chamber from the intermediate container. Six -chamber system - in one axis to the insert screw with a directly flanged, maintenance-free gear motor (5) .

- 100% backburn-proof even if there is a power failure. Minimum power consumption. No chains or gear wheels - low noise and maintenance free.

Stainless steel grate (6)

- The pellets fall from above through the single axis rotary valve onto the stainless steel combustion grate.
- The fire is not disturbed as the pellets feed from ABOVE on the fire-bed, with no mixing of ash and embers with the pellets = best efficiency!

Automatic ignition (7)

- Ignition of the pellets is fully automatic via a highly heat-resistant solid ceramic glow pencil.
- The glow pencil only requires 260 W. The glow pencil operates quietly and is maintenance-free.

Downfiring combustion technology/ pellets gasification (8)

- When using downfiring combustion technology (8) (wood gasification technology) the released gas is sucked through the grate and burned (residue-free) in the combustion chamber (9) with a flame tip temperature of approx. 1,200°C.
- Efficient fuel utilization, highest efficiencies.

Stainless grate cleaning

- The downfiring combustion technology automatically transports the ash downwards into the ash pan.
- In underfeed and case stage systems, the ash has to be removed mechanically via a complex mechanism (reversible stainless , tilting grate , grate, ...).

Induced draft fan (10)

- The combustion air sucked in is regulated by the ID fan.
- Efficient external rotor motor with stainless steel fan vanes, low noise, maintenance free with speed monitoring.

Lambda sensor (11)

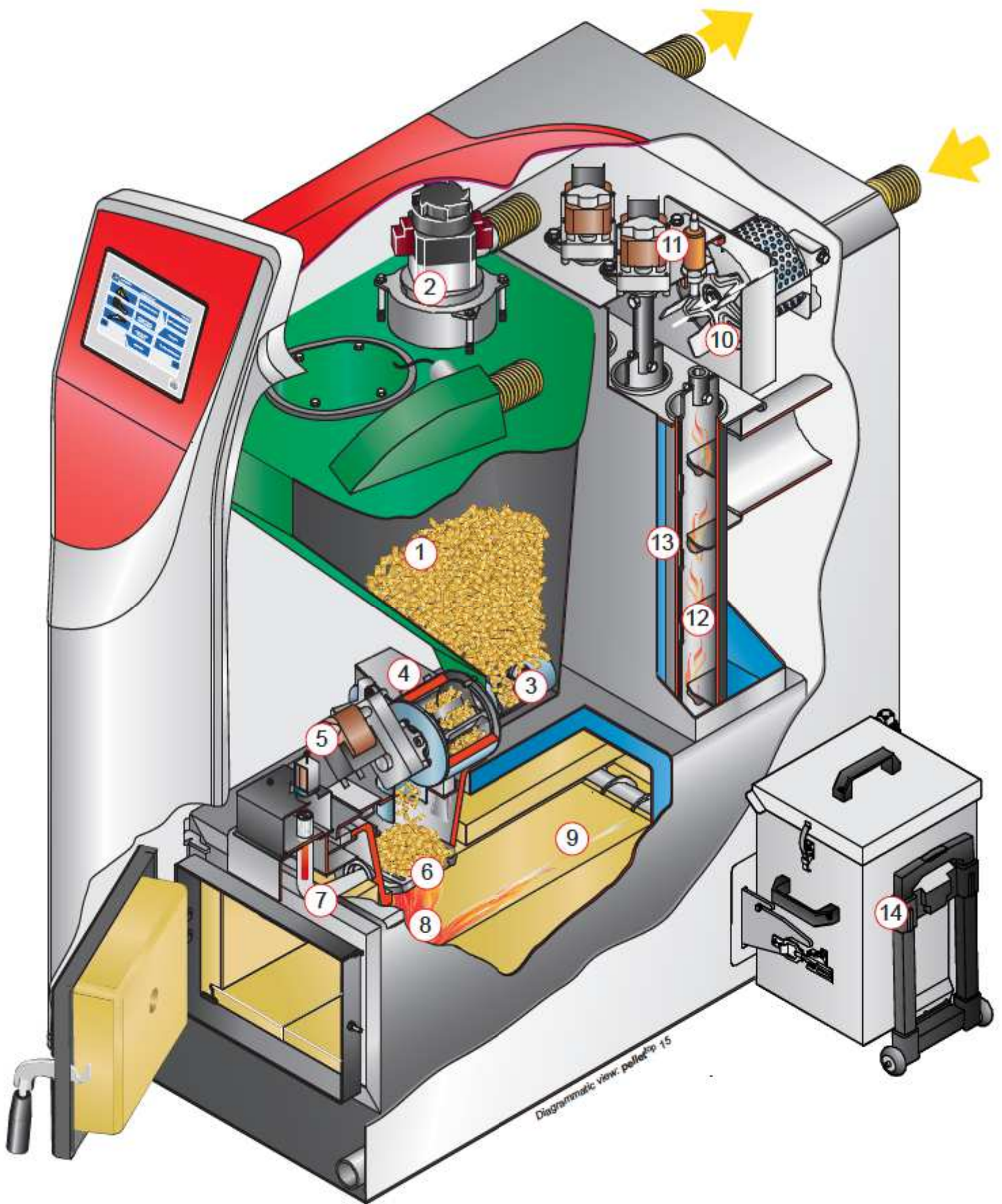
- The Lambda technology enables uniform combustion of the pellets in the **pellet^{top}**. Lambda technology is essential to ensure maximum efficiency with different load ranges.
- Guarantees environmentally-friendly, energy-saving combustion in all load ranges. Decades of experience using Lambda technology since 1981.

Heat exchanger cleaning system (12)

- Turbulators (12) clean the walls of the heat exchanger (13) at regular preset intervals. Increased exhaust gas temperature results in a loss of efficiency. Clean fuel exchangers save fuel!
- **AUTOMATIC** means **AUTOMATIC!** Uniform efficiency saves energy costs! Manual cleaning is not required. Maintenance free.

Automatic ash extraction (14)

- Ash box standard for **pellet^{top}** 35 and 45, for **pellet^{top}** 15 and 25 optional available.
- Long emptying intervals make for a convenient heating.



The leader among pellet boilers!

For more power

pellet^{top} 49 - 70



Cascading solutions up to 420 kW

The pellet boilers pellet^{top} 49 and 70 has been developed especially for commercial applications. With the suitability for cascading controls can be realized power ratings up to 420 kW.

In the summer or during the transitional period, when only part of the full performance is required, one single pellet^{top} 70 kW can handle the full energy requirement. The other boilers remain cold. This enhanced efficiency compared to large boilers helps you save fuel!

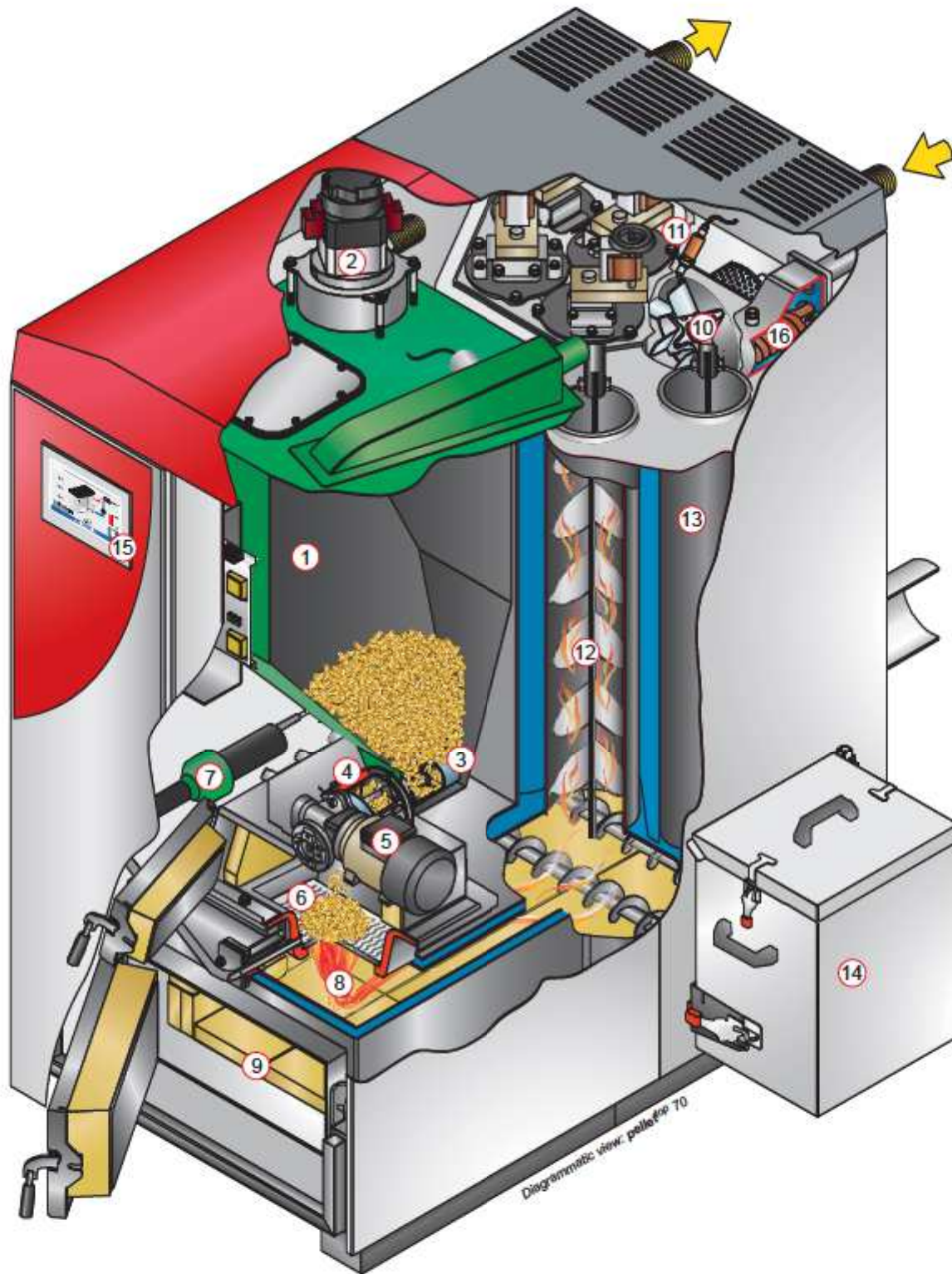
Statistics show that maximum performance from a boiler is needed only for 10% of the time in a year. The boiler runs at partial load or in the low-performance range (or in cycle mode) for the remaining 90% of the time; so it is not utilised to the optimum. Cascading solutions are an effective way to combat such inefficiencies.

The extended power range and cost benefits with fuel help achieve very short payback periods.



Your benefit

- ✓ Highest possible operational safety: This combination also allows maintenance work to be carried out easily.
- ✓ The flexible combination of performance classes enables customised adaptation.



Diagrammatic view: pellet^{top} 70

- | | | |
|----------------------------|------------------------------------|--|
| 1 Intermediate container | 7 Automatic ignition | 13 Heat exchanger |
| 2 Suction turbine | 8 Downfiring combustion technology | 14 Automatic ash removal with ash box |
| 3 Pellet auger | 9 Combustion chamber | 15 User-friendly touchscreen |
| 4 Single axis rotary valve | 10 Suction fan | 16 Heat exchanger for thermal process safety |
| 5 Gear drive | 11 Lambda sensor | |
| 6 Stainless steel grate | 12 Turbulators | |

Intelligent control

Everything under control with **eco**manager-touch





The core of your heating system the intelligent control *eco*manager-*touch*

To meet your daily comfort requirements, the controller is particularly important. The user determines when the heating comes on and how warm it should be.

- 7" VGA colour touch display: Guarantees simple, logical operation. Powerful microprocessor with power-saving standby mode.
- 1 weather-controlled heating circuit
3-point heating circuit curve, up to 8 modules are possible (option).
- 1 DHW tank charging circuit, up to 4 modules are possible (option).
- Fresh water module controllable with or without recirculation pump (option).
- 2 x three-circuit or 4 x two-circuit solar controllers possible (option). Also suitable for high-efficiency pumps.
- **mySOLARFOCUS** app: App for smartphone (Android and Apple) with attractive design for intuitive operation of the main heating parameters, such as room and flow temperature incl. heating times. Possibility to visualise the solar yield with installed heat quantity meter and control via *eco*manager-*touch*
- **Weatherman** function: Takes the weather forecast for the system's location into consideration. In conjunction with a solar-thermal system, prevents uneconomical start of the boiler when the weather forecast is good.

*eco*manager-*touch*

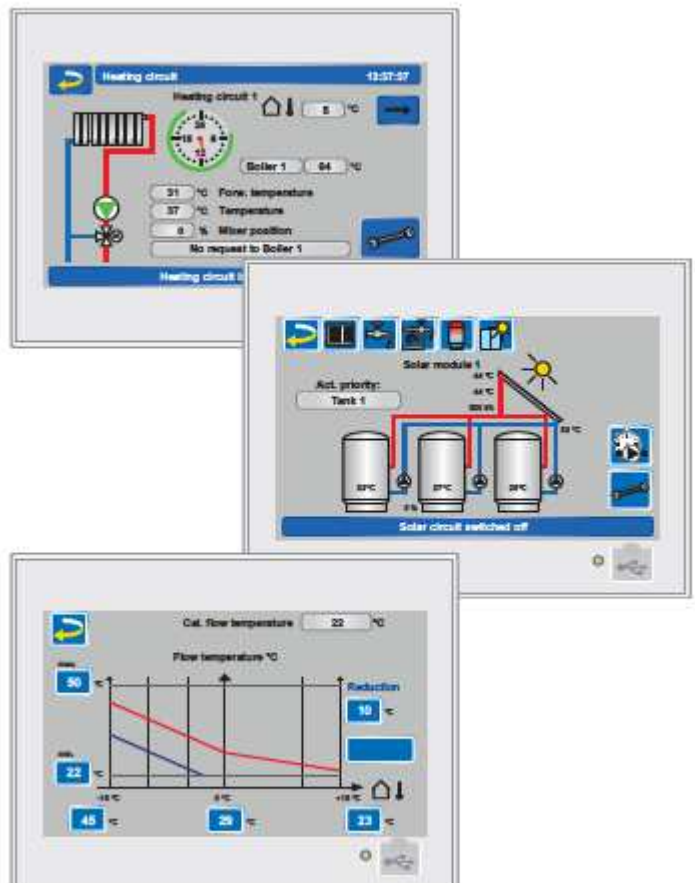
helps you to measure and control!

Changing outdoor temperatures have to be taken into consideration as precisely as very personal living habits. If the boiler is used in combination with a solar energy system, the burner only starts when the required heating energy cannot be fully provided by the solar energy system. This prevents any uneconomical boiler starts.

The *eco*manager-*touch* is very easy to use. It enables individual settings and ensures a perfectly tailored heating system.



Weather-depending control + mySOLARFOCUS app



Sustainable – renewable – cost-efficient

Now switch to pellets!
Comfortable delivery with tank truck



- Pellets are blown into the storage room with a tank truck similar to oil.
- Heating value: 1 kg pellets approx. 4,9 kWh
2 kg pellets = 1 l fuel oil
- Storage volume: 1 m³ approx. 650 kg

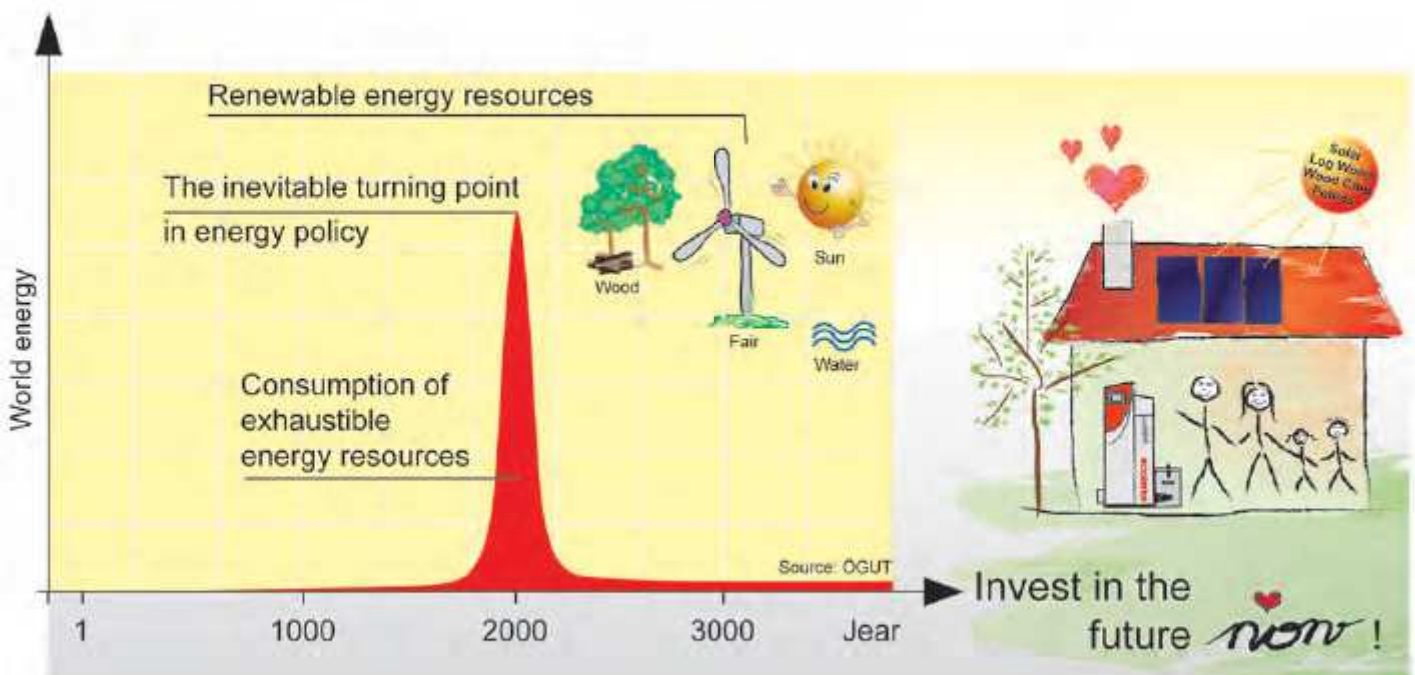
Make sure you get good-quality pellets



**ENplus –
Der neue Maßstab
für Holzpellets**

- Using pellets of good quality has several advantages: High-quality pellets achieve higher efficiency rates. They also mean that the boiler needs cleaning less frequently and has a longer service life.
- SOLARFOCUS recommends that you use only tested pellets. EN 14961-2-ENplus-A1 – the new benchmark for wood pellets. This means optimum heating values and protects your heating system.

Fossil energy use is geologically very short-lived



Together into the right direction!

Storage and feeding systems

pellet^{top} suction system with suction heads manual or automatic

- Maximum hose length 20 m
Maximum auger height 2.5 m
- Optimum utilisation of space
Minimum installation effort
For damp storage areas/rooms



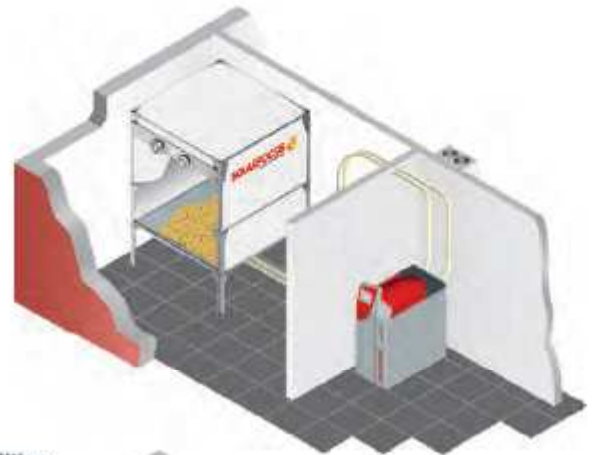
pellet^{top} with pellet box 350 litre with suction head, manually fillable or pellet box with suction system

Extraction with auger

- Maximum hose length 35 m
Maximum auger height 5 m

Extraction with suction heads

- Maximum hose length 20 m
Maximum auger height 2.5 m



Pellet box 350 litre for manual filling
or with suction system

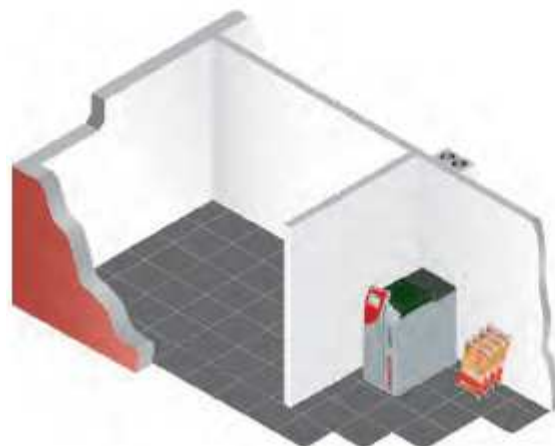
pellet^{top} vacuum system with extraction auger

- Maximum hose length 35 m
Maximum auger height 5 m
- Maximum auger length 6 m
- Complete storage room emptying



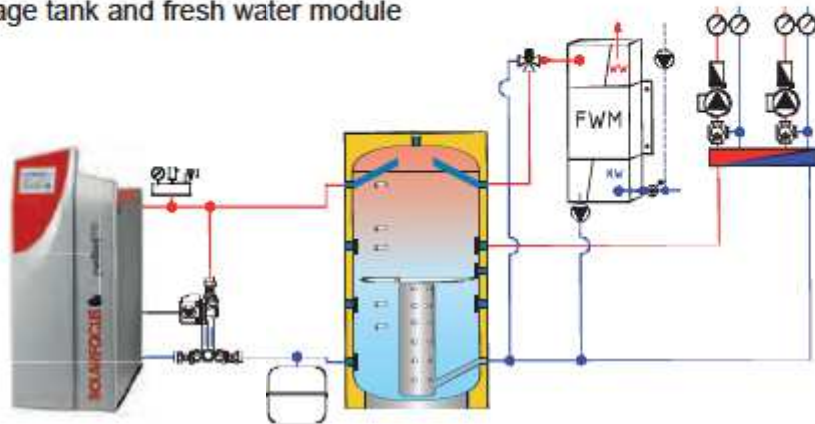
pellet^{top} manual storage container

- Available for pellet^{top} 15 and pellet^{top} 25
- Volume of the storage container:
pellet^{top} 15: 110 litre
pellet^{top} 25: 125 litre

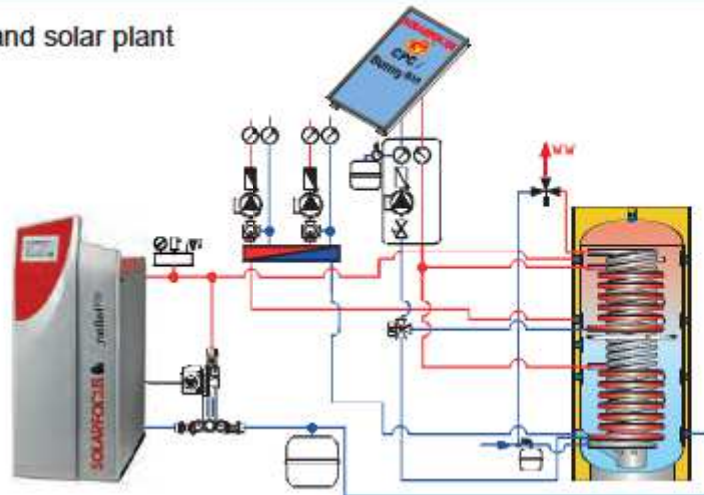


Perfectly combined with solar plant

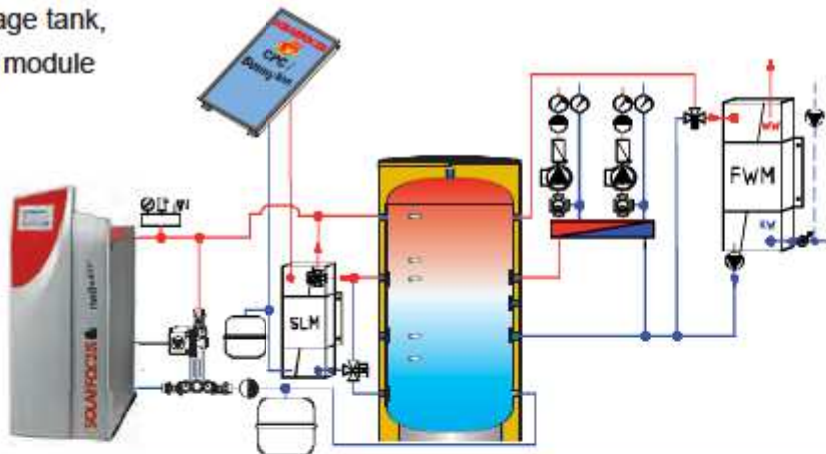
pellet^{top} with stratified buffer storage tank and fresh water module



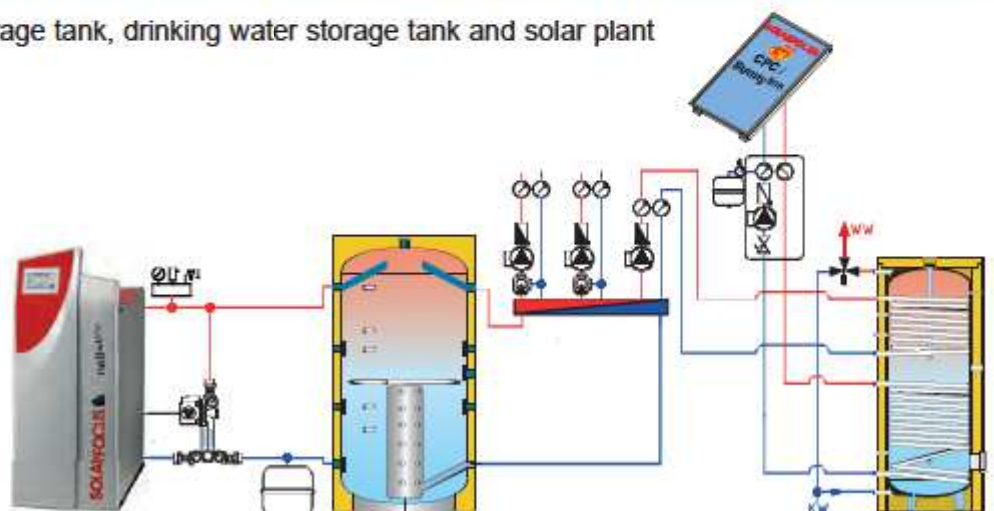
pellet^{top} with HYKO storage tank and solar plant



pellet^{top} with stratified buffer storage tank, stratified load module, fresh water module and solar plant



pellet^{top} with stratified buffer storage tank, drinking water storage tank and solar plant



More hydraulic schemes are available - we can help you by planning!



INNOVATION - ECONOMY – QUALITY

SOLARFOCUS shapes the future with products that serve mankind and protect the environment.

SOLARFOCUS is committed to researching, developing, manufacturing and selling environmental technology in the fields of:

Biomass heating,
Solar systems,
Storage technology and
Fresh water technology

SOLARFOCUS are one step ahead: The research, development and cooperation with research institutes and prestigious partners has led to our dynamic development. Our products are on offer throughout Europe. The courses and seminars held on a permanent basis with our partners guarantee personalised advice and professional installers for you.

AWARDS:

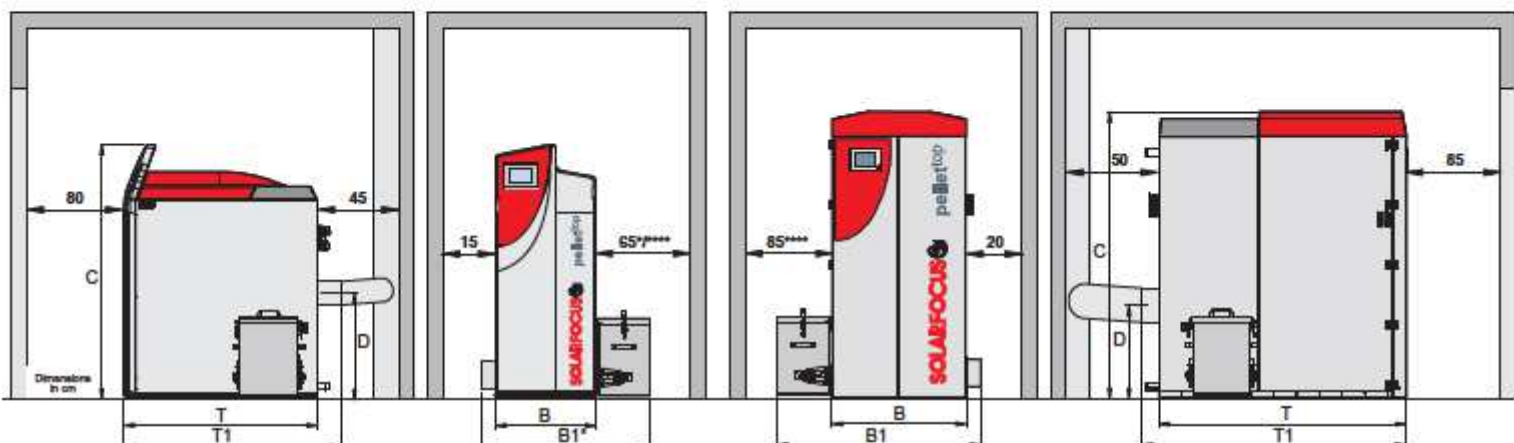
- Young entrepreneur's Award
- Innovations Award 1995
- Pegasus in Gold
- Environmental Protection Award of the Upper Austrian Region
- Innovation Award "EnergieGenie" 2003
- House Technology Award 2004
- Innovation Award "EnergieGenie" 2011
- Italian innovation prize for energy-efficient technologies 2012
- Polish Innovation Award „Zloty Medal" 2012 and 2013
- Slovenian Innovation Award „Energetika" 2014
- Best Business Award 2014
- UK Built It Award 2015
- Innovation Award "EnergieGenie" 2016

and many more confirm our philosophy.



pellet^{top} 15*, 25*, 35 and 45

pellet^{top} 49 and 70



pellet ^{top}		15*	25*	35	45	49	70
Power	[kW]	4.5 - 14.9	7.3 - 25	10.5 - 35	13.4 - 45	14.7 - 49	21 - 70
Depth without fan (T)	[cm]	107	117	134	134	145	145
Total depth (T1)	[cm]	120	130	144	144	155	155
Width (B)	[cm]	55.5	55.5	55.5	55.5	79	79
Width incl. ash box (B1)	[cm]	92*	92*	94	94	120	120
Height incl. adjustable feet** (C)	[cm]	143	156	156	156	172	172
DM flue pipe	[cm]	13	13	15	15	20	20
Height flue pipe centre** (D)	[cm]	60	77	46	46	59	59
Weight	[kg]	279	368	554	560	882	882
Water content	[l]	51	66	58	58	130	130
Pellet storage container	[l]	71/110***	87/125***	95	95	250	250

* Optionally with ash removal ** Adjustable feet at maximum depth of thread *** Pellets storage container for manual filling
 **** Access to the rear side of the boiler must be provided (at least 45 cm on the left or right)

Everything from one supplier

Solar systems – Biomass heating – Storage technology – Fresh water technology

Tested leading-edge technology – EN ISO 9001 certified



Your specialised dealer



SOLARFOCUS GmbH, Werkstrasse 1, A-4451 St. Ulrich/Steyr
 e-mail: office@solarfocus.com Tel.: +43 (0) 7252 / 50 002 - 0
 web: www.solarfocus.com Fax: +43 (0) 7252 / 50 002 - 10

Addendum B – Smoke Control Exempt Appliance Certificate

**Defra****Domestic AQ 2020 Regulations****Smoke control areas**

Authorised fuels

Exempt appliances

Search for fuels & appliances

Appliance: Pellettop 35, pellettop 49 and pellettop 70 wood pellet boilers[« Return to Exempt Appliances](#)

The appliances listed below are exempt in the relevant country or countries when using the specified fuel(s), when operated in accordance with the instruction and installation manuals and when any conditions are met.

Available information about this appliance is shown below:

Download as PDF

Download as CSV

Appliance name	Pellettop 35, pellettop 49 and pellettop 70 wood pellet boilers
-----------------------	---

Output	n/a
---------------	-----

Fuel Type	Wood based
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Appliance Type	Boiler
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Manufacturer	SOLARFOCUS GmbH, Werkstrasse 1 4451 St.Ulrich, Steyr, Austria
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The fireplace must be installed, maintained and operated in accordance with the following specifications:

Instruction manual title	See conditions if applicable
---------------------------------	------------------------------

Instruction manual date	See conditions if applicable
--------------------------------	------------------------------

Instruction manual reference	See conditions if applicable
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Installation manual title	See conditions if applicable
----------------------------------	------------------------------

Installation manual date	See conditions if applicable
---------------------------------	------------------------------

Installation manual reference	See conditions if applicable
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Additional conditions	Pellettop Operating Manual dated August 2012, reference: pellettop_operating_manual_201209v1
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Permitted fuels	Wood pellets ¹
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England Status Date first exempt	Exempt (Footnote 4) See Footnotes or SI Link
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Wales Status Date first exempt	Exempt (SI 2015 No.1513) See Footnotes or SI Link
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Scotland Status Date first exempt	Exempt (Footnote 6) See Footnotes or SI Link
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N. Ireland Status Date first exempt	Exempt (Footnote 8) See Footnotes or SI Link
--	---

Footnotes

1. The fuel must not contain halogenated organic compounds or heavy metals as a result of treatment with wood-preservatives or coatings.
2. The conditions of exemption have been amended to remove references to fuels which are either no longer available or which cannot be used without contravening the Environmental Permitting (England and Wales) Regulations 2010 (S.I. 2010/675) or the Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013 (S.R. 2013 No. 160)
3. The Environmental Permitting Regulations (England and Wales) 2010 (SI 2010/675) may apply to the burning of some of these wastes.
4. Previously exempted by The Smoke Control Areas (Exempted Fireplaces) (England) Order 2015 (SI 2015/307), no longer in force as of 1 October 2015. Now exempted by publication of this list by the Secretary of State in accordance with changes made to sections 20 and 21 of the Clean Air Act 1993 by section 15 of the Deregulation Act 2015.
5. Exempted for use in England by publication of this list by the Secretary of State in accordance with changes made to sections 20 and 21 of the Clean Air Act 1993 by section 15 of the Deregulation Act 2015.
6. Previously exempted by The Smoke Control Areas (Exempted Fireplaces) (Scotland) Regulations 2014 (SI 2014/316), no longer in force as of 30th June 2014. Now exempted by publication of this list by Scottish Ministers under section 50 of the Regulatory Reform (Scotland) Act 2014.
7. Exempted for use in Scotland by publication of this list by Scottish Ministers under section 50 of the Regulatory Reform (Scotland) Act 2014.
8. Previously exempted by the Smoke Control Areas (Exempted Fireplaces) (No. 2) Regulations (Northern Ireland) 2013 (S.R. 2013 No. 292), as amended, no longer in force as of 10th October 2016. Now exempted by the publication of this list by the Department of Agriculture, Environment and Rural Affairs in accordance with changes made to Article 17(7) of the Clean Air (Northern Ireland) Order 1981 by section 16 of the Environmental Better Regulation Act (Northern Ireland) 2016.
9. Exempted for use in Northern Ireland by publication of this list by the Department of Agriculture, Environment and Rural Affairs in accordance with changes made to Article 17(7) of the Clean Air (Northern Ireland) Order 1981 by section 16 of the Environmental Better Regulation Act (Northern Ireland) 2016.

Some of the information provided here has been prepared on behalf of the Department for Environment, Food & Rural Affairs (Defra) and for convenience as part of the services Defra offer. No representation, warranty or undertaking (expressed or implied) is made in relation to it. Defra, the Devolved Administrations, and its contractors cannot accept any liability for the adequacy, reliability, completeness or accuracy of the information or the assumptions on which it is based and accepts no liability to any third party for any loss or damage arising from any interpretation or use of the information or reliance on anything expressed therein.

The information provided here in respect of England, Scotland and Northern Ireland only, however, constitutes the publication of lists of exemptions and approvals required by statute. Nothing in this disclaimer shall operate to exclude or restrict our liability where such exclusion or restriction would not be permitted by law.

Addendum C - RHI Emission Certificate



Non-Domestic Renewable Heat Incentive

www.ofgem.gov.uk/ndrhi

22 JUN 2018

Emissions Certificate

In order to accredit any biomass boiler or stove applications received for the domestic or non-domestic Renewable Heat Incentive (RHI) schemes, Ofgem must be satisfied that a valid emissions certificate exists for the specific model in the application (or alternatively for the non-domestic RHI, an environmental permit for the site). This template incorporates all information required to demonstrate that the tested plant meets the air quality requirements of the RHI. It must be fully completed and issued by a testing laboratory in order to be a valid certificate.

1. TEST HOUSE	
a) Name and address of the testing laboratory that has carried out the required tests and issued this certificate * <i>*if different, include details of both</i>	TÜV AUSTRIA SERVICES GMBH Wiener Bundesstraße 8 A-4060 Leonding  <i>Former address (June 1993-Sep 2017)</i> Am Thalbach 15 A-4600 Thalheim / Wels
b) Name and signature of the person authorised by the testing laboratory to issue the certificate	Name: Gerald Schrögendorfer Signature: 
c) Date of issue of this certificate, together with certificate reference number for this certificate <i>*Please see Note A</i>	Date: 07/06/2019 Certificate reference number: RHI Cert Solarfocus_TÜV Austria_pellettop 35-49_190607 <i>Optional: reference number of original test report on which this certificate is based:</i> 11-UW/Wels-EX-212/2
d) If the testing laboratory that has carried out the required tests is accredited to BS EN ISO/IEC 17025:2005, date of accreditation and accreditation number <i>(if testing conducted on or after 24 September 2013, the testing laboratory must be BS EN ISO/IEC 17025:2005 accredited at the time of testing)</i>	Date: 01/07/2007 Accreditation number: Id-No. (PSID): 274 before 01/07/2007 accredited as TÜV Austria, Id-No. (PSID) 10

2. PLANT - Please see Note B	
a) Name of the plant tested (model family of design)	pellet ^{top}
b) Model of the plant tested* <i>*Please ensure this is the same as in the manufacturer's documentation and boiler nameplate</i>	pellet ^{top} 35
c) Manufacturer of the plant tested	Solarfocus GmbH, A-4451 Steyr
d) Installation capacity* of the tested plant in kilowatts (kW) <i>*The total installed peak heat output capacity</i>	35 kW
e) Is the plant a <u>manually stoked, natural draught</u> plant? (without a fan providing forced or induced draught)	yes/no

<p>f) (i) Date the plant was tested*</p> <p>(ii) Please confirm that NOx and PM have been tested on the same occasion</p> <p><i>*This is in reference to the emissions testing for PM and NOx, not any wider range of tests. A specific date is required. Please provide the date of test performed at ≥85% of the installation capacity.</i></p> <p><i>If more than one model has been tested or testing has been conducted on different dates for different fuels, please list each date with details.</i></p>	<p>Fuel wood pellets: 09/08/2011</p> <p>yes/no</p>
<p>g) Please list all the plants in the type-testing range* of the tested plants to which the certificate applies, if any.¹ Please include the installation capacity of each model.</p> <p><i>*This must follow the ratio rules:</i></p> <p><i>If the smallest plant in the range is 500kW or less, the largest plant in the range can't be more than double the smallest.</i></p> <p><i>If the smallest plant in the range is over 500kW, the largest plant in the range can't be more than 500kW greater than the smallest.</i></p>	<p>- pellet^{top} 35 (35.0 kW)</p> <p><i>interpolated between pellet^{top} 35 / pellet^{top} 70:</i></p> <p>- pellet^{top} 45 (44.9 kW)</p> <p>- pellet^{top} 49 (49 kW)</p>

<p>3. FUELS</p>	
<p>a) Types of fuels used when testing</p> <p><i>(Where relevant, the fuel should be classified according to EN303-5, referencing the relevant EN14961 standard for specific classification (superseded by EN17225). We don't expect broader categories such as 'beech'.</i></p>	<p>Wood pellets according to</p> <ul style="list-style-type: none"> - EN 303-5:2012, class C1 - EN ISO 17225-2, class A1
<p>b) Based on the testing, list the range of fuels that can be used in compliance with the emission limits of 30 grams per gigajoule (g/GJ) net heat input for particulate matter (PM), and 150 g/GJ net heat input for oxides of nitrogen (NOx)</p> <p><i>(Where relevant, the fuel should be classified according to EN303-5, referencing the relevant EN14961 standard for specific classification (superseded by EN17225). We don't expect broader categories such as 'beech'.</i></p>	<p>Wood pellets according to</p> <ul style="list-style-type: none"> - EN 303-5:2012, class C1 - EN ISO 17225-2:2014, class A1
<p>c) Moisture content of the fuel used during testing. (If multiple fuel types have been tested state all.)</p>	<p>Wood pellets: w=6.6 %</p>

¹ The type-testing approach enables testing laboratories to provide assurance that all boilers in a given range meet the air quality requirements, without needing to specifically test each boiler.

<p>d) Maximum allowable moisture content* of fuel that can be used with the certified plant(s) that ensures RHI emission limits are not exceeded. <i>*This value may be obtained from ranges specified in relevant EN14961 standard for specific fuel classifications or EN303-5 when not applicable. Different fuel types should state different maximum allowable moisture contents.</i></p>	<p>Wood pellets according to - EN 303-5:2012, class C1; w=10% - EN ISO 17225-2, class A1; w=10%</p>

<p>4. TESTS</p>	
<p>Confirm which requirements the emissions of NOx and PM have been tested in accordance with. <u>Either 4a or 4b must be confirmed to be a valid RHI certificate.</u></p>	
<p>a) Was the testing carried out in accordance* with all of the provisions relevant to emissions of PM and NOx in either BS EN 303-5:1999 or BS EN 303-5:2012?² <i>*It is not a requirement that the tested plant must be within the scope of one of these standards, as long as the test lab can confirm that all of the relevant provisions were followed appropriately</i></p>	<p>EN 303-5:1999 yes/☐</p>
<p>b) Was the testing carried out in accordance with <u>all</u> of the following requirements? (i) - EN 14792:2005 in respect of NOx emissions - EN 13284-1:2002 or ISO 9096:2003 in respect of PM emissions³ (ii) emissions of PM represent the average of at least three measurements of emissions of PM, each of at least 30 minutes duration (iii) the value for NOx emissions is derived from the average of measurements made throughout the PM emission tests.</p>	<p>- yes/☐ - yes/☐ (in fulfilment of annex A of EN 303-5:2012) Tested according to 4a Tested according to 4a</p>
<p>c) Please confirm the plant was tested at ≥85% of the installation capacity of the plant.</p>	<p>yes/☐</p>
<p>d) Please confirm the test shows that emissions from the plant were no greater than 30 g/GJ PM and 150 g/GJ NOx.</p>	<p>yes/☐</p>
<p>e) Measured* emissions of PM in g/GJ net heat input <i>*This average value should be from the test confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.</i></p>	<p>Wood pellets: 14</p>

² BS EN303-5:1999 and 2012 explain what should be measured and when.

³ These standards explain how to make the PM and NOx measurements.

<p>f) Measured* emissions of NOx in g/GJ net heat input <i>*This average value should be from the test confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.</i></p>	<p>Wood pellets: 69</p>
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Note A: If details from a previously issued certificate or an original test report are being transferred to this RHI emission certificate template, please note that this document must be **issued by the testing laboratory** as a separate certificate. The issue date and certificate reference number should be in relation to *this* certificate produced using the RHI template, not the issue date and reference number of the original certificate or test report.

Note B: If you are including multiple tested plants on one certificate, please ensure that all sections are completed for each tested plant, and are laid out such that it is clear which details relate to which tested plant. If a type-testing range is included as well, please show clearly which type-testing range relates to which tested plant(s), following the type-testing range ratio rules outlined in 2g.



Non-Domestic Renewable Heat Incentive

www.ofgem.gov.uk/ndrhi

22 JUN 2018

Emissions Certificate

In order to accredit any biomass boiler or stove applications received for the domestic or non-domestic Renewable Heat Incentive (RHI) schemes, Ofgem must be satisfied that a valid emissions certificate exists for the specific model in the application (or alternatively for the non-domestic RHI, an environmental permit for the site). This template incorporates all information required to demonstrate that the tested plant meets the air quality requirements of the RHI. It must be fully completed and issued by a testing laboratory in order to be a valid certificate.

1. TEST HOUSE	
a) Name and address of the testing laboratory that has carried out the required tests and issued this certificate * <i>*if different, include details of both</i>	TÜV AUSTRIA SERVICES GMBH Wiener Bundesstraße 8 A-4060 Leonding  <i>Former address (June 1993-Sep 2017)</i> Am Thalbach 15 A-4600 Thalheim / Wels
b) Name and signature of the person authorised by the testing laboratory to issue the certificate	Name: Gerald Schrögendorfer Signature: 
c) Date of issue of this certificate, together with certificate reference number for this certificate <i>*Please see Note A</i>	Date: 07/06/2019 Certificate reference number: RHI Cert Solarfocus_TÜV Austria_pellettop 35-49_190607 <i>Optional: reference number of original test report on which this certificate is based:</i> 11-UW/Wels-EX-212/1
d) If the testing laboratory that has carried out the required tests is accredited to BS EN ISO/IEC 17025:2005, date of accreditation and accreditation number <i>(if testing conducted on or after 24 September 2013, the testing laboratory must be BS EN ISO/IEC 17025:2005 accredited at the time of testing)</i>	Date: 01/07/2007 Accreditation number: Id-No. (PSID): 274 before 01/07/2007 accredited as TÜV Austria, Id-No. (PSID) 10

2. PLANT - Please see Note B	
a) Name of the plant tested (model family of design)	pellet ^{top}
b) Model of the plant tested* <i>*Please ensure this is the same as in the manufacturer's documentation and boiler nameplate</i>	pellet ^{top} 70
c) Manufacturer of the plant tested	Solarfocus GmbH, A-4451 Steyr
d) Installation capacity* of the tested plant in kilowatts (kW) <i>*The total installed peak heat output capacity</i>	70 kW
e) Is the plant a <u>manually stoked, natural draught</u> plant? (without a fan providing forced or induced draught)	yes/no

<p>f) (i) Date the plant was tested* (ii) Please confirm that NOx and PM have been tested on the same occasion <i>*This is in reference to the emissions testing for PM and NOx, not any wider range of tests. A specific date is required. Please provide the date of test performed at ≥85% of the installation capacity. If more than one model has been tested or testing has been conducted on different dates for different fuels, please list each date with details.</i></p>	<p>Fuel wood pellets: 08/06/2011 yes/∅</p>
<p>g) Please list all the plants in the type-testing range* of the tested plants to which the certificate applies, if any.¹ Please include the installation capacity of each model. <i>*This must follow the ratio rules: If the smallest plant in the range is 500kW or less, the largest plant in the range can't be more than double the smallest. If the smallest plant in the range is over 500kW, the largest plant in the range can't be more than 500kW greater than the smallest.</i></p>	<p>- pellet^{top} 70 (70.0 kW) <i>interpolated between pellet^{top} 35 / pellet^{top} 70:</i> - pellet^{top} 45 (44.9 kW) - pellet^{top} 49 (49 kW)</p>

<p>3. FUELS</p>	
<p>a) Types of fuels used when testing (Where relevant, the fuel should be classified according to EN303-5, referencing the relevant EN14961 standard for specific classification (superseded by EN17225). We don't expect broader categories such as 'beech'.</p>	<p>Wood pellets according to - EN 303-5:2012, class C1 - EN ISO 17225-2, class A1</p>
<p>b) Based on the testing, list the range of fuels that can be used in compliance with the emission limits of 30 grams per gigajoule (g/GJ) net heat input for particulate matter (PM), and 150 g/GJ net heat input for oxides of nitrogen (NOx) (Where relevant, the fuel should be classified according to EN303-5, referencing the relevant EN14961 standard for specific classification (superseded by EN17225). We don't expect broader categories such as 'beech'.</p>	<p>Wood pellets according to - EN 303-5:2012, class C1 - EN ISO 17225-2:2014, class A1</p>
<p>c) Moisture content of the fuel used during testing. (If multiple fuel types have been tested state all.)</p>	<p>Wood pellets: w=6.9 %</p>

¹ The type-testing approach enables testing laboratories to provide assurance that all boilers in a given range meet the air quality requirements, without needing to specifically test each boiler.

<p>d) Maximum allowable moisture content* of fuel that can be used with the certified plant(s) that ensures RHI emission limits are not exceeded. <i>*This value may be obtained from ranges specified in relevant EN14961 standard for specific fuel classifications or EN303-5 when not applicable. Different fuel types should state different maximum allowable moisture contents.</i></p>	<p>Wood pellets according to - EN 303-5:2012, class C1; w=10% - EN ISO 17225-2, class A1; w=10%</p>

<p>4. TESTS</p>	
<p>Confirm which requirements the emissions of NOx and PM have been tested in accordance with. <u>Either 4a or 4b must be confirmed to be a valid RHI certificate.</u></p>	
<p>a) Was the testing carried out in accordance* with all of the provisions relevant to emissions of PM and NOx in either BS EN 303-5:1999 or BS EN 303-5:2012?² <i>*It is not a requirement that the tested plant must be within the scope of one of these standards, as long as the test lab can confirm that all of the relevant provisions were followed appropriately</i></p>	<p>EN 303-5:1999 yes/nø</p>
<p>b) Was the testing carried out in accordance with <u>all</u> of the following requirements? (i) - EN 14792:2005 in respect of NOx emissions - EN 13284-1:2002 or ISO 9096:2003 in respect of PM emissions³ (ii) emissions of PM represent the average of at least three measurements of emissions of PM, each of at least 30 minutes duration (iii) the value for NOx emissions is derived from the average of measurements made throughout the PM emission tests.</p>	<p>- yes/nø - yes/nø (in fulfilment of annex A of EN 303-5:2012) Tested according to 4a Tested according to 4a</p>
<p>c) Please confirm the plant was tested at ≥85% of the installation capacity of the plant.</p>	<p>yes/nø</p>
<p>d) Please confirm the test shows that emissions from the plant were no greater than 30 g/GJ PM and 150 g/GJ NOx.</p>	<p>yes/nø</p>
<p>e) Measured* emissions of PM in g/GJ net heat input <i>*This average value should be from the test confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.</i></p>	<p>Wood pellets: 14</p>

² BS EN303-5:1999 and 2012 explain what should be measured and when.

³ These standards explain how to make the PM and NOx measurements.

<p>f) Measured* emissions of NO_x in g/GJ net heat input <i>*This average value should be from the test confirmed in 4c. Results from partial load tests are not required. This value must be in the specified units.</i></p>	<p>Wood pellets: 73</p>
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Note A: If details from a previously issued certificate or an original test report are being transferred to this RHI emission certificate template, please note that this document must be **issued by the testing laboratory** as a separate certificate. The issue date and certificate reference number should be in relation to *this* certificate produced using the RHI template, not the issue date and reference number of the original certificate or test report.

Note B: If you are including multiple tested plants on one certificate, please ensure that all sections are completed for each tested plant, and are laid out such that it is clear which details relate to which tested plant. If a type-testing range is included as well, please show clearly which type-testing range relates to which tested plant(s), following the type-testing range ratio rules outlined in 2g.

Addendum D – Flue Height Calculations

Calculation of Chimneys according to EN 13384-1

Date 24/10/2022

Design of Plant - Single Appliance

Calculated according to EN 13384-1
Chimney House Chimney
Position/Run Inside Building
Fresh Air Supply Dependent on Room Air
Air Supplied by From Installaion Room
Sections Connector: 1, Chimney: 1
Outlet Open Outlet Zeta = 0

Environment

Geodetic Height 50 m
Safety Factor SE 1.5
Correction Factor SH 0.5
Ambient Air Temperatures (Standards)
At top Outlet 0 °C (Temperature Requirement)
Outside Area 0 °C (Temperature Requirement)
In Unheated Areas 0 °C (Temperature Requirement)
In Heated Areas 20 °C (Temperature Requirement)
Ambient Air 15 °C (Pressure Requirement)

Appliance

Category Pellets Heating
Manufacturer, Model SolarFocus PelletTop 70
Fuel Wooden Pellets

	High Fire	Low Fire
Nominal Output (Net)	70 kW	21 kW
Nominal Output (Gross)	93.33 kW	28 kW
CO2 Level	17.1 %	12.7 %
Mass Flow	55 g/s	20 g/s
Temperature	140 °C	100 °C
Required Feed Pressure	5 Pa	5 Pa
Appliance Outlet	Round 200 mm	
Required Air (Factor Beta)	1.34	

Installation Room



Category	Special Boiler Room
Fresh Air	Opening from Outside
Extract Air	Opening to Outside

Connector - Construction



Category	Twin Wall Connector
Manufacturer, Model	SFL Nova SM
Cross Section	Round 200 mm
Thermal Resistance	0.5 m ² K/W
Thickness	26 mm
Inner Wall Material	Stainless Steel
Rugosity	1 mm
Product Classification	EN 1856-1/2 - T450 N1 D V2 L50050 G50
Suitable acc. to	Declaration of conformity CE-0086-CPD-496040

Connector - Geometrie



Resistances	Bend 90 °
Effective Height	832 mm
Drawn Length	1075 mm
Portion in outside areas	0 %
Portion in unheated areas	0 %
Portion in heated areas	100 %

Chimney - Construction



Category	Twin Wall Chimney
Manufacturer, Model	SFL Nova SM
Cross Section	Round 200 mm
Thermal Resistance	0.5 m ² K/W
Thickness	26 mm
Inner Wall Material	Stainless Steel
Rugosity	1 mm
Product Classification	EN 1856-1 - T450 N1 D V2 L50050 G50
Chimney Classification	EN 15287 - T450 N1 D 3 G50 (R0.50)
Suitable acc. to	Declaration of conformity CE-0086-CPD-496040

Chimney - Geometrie



Resistances	None
Effective Height	6700 mm
Drawn Length	6.7 m

Chimney - Course (Inside Building)



Portion in outside areas	20 %
Portion in unheated areas	0 %
Portion in heated areas	80 %
Building Contact	All Sides

Additional Insulation

Outside Area	No
In Unheated Areas	canceled

Outlet Resistance



Outlet Resistance	Open Outlet
Zeta	0

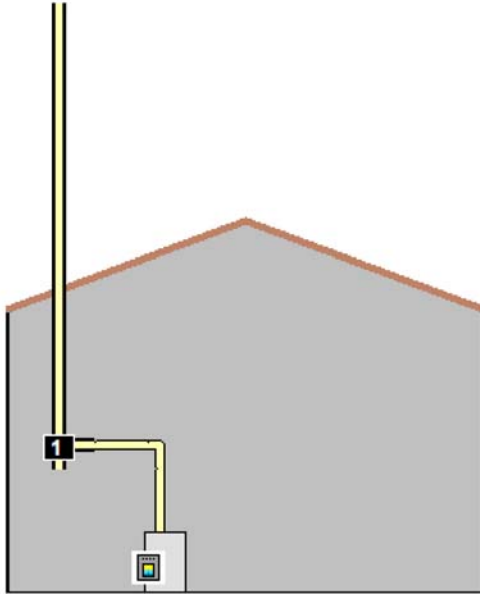
Entry



Resistance

Tee 45 °

Schematic Representation of the Plant



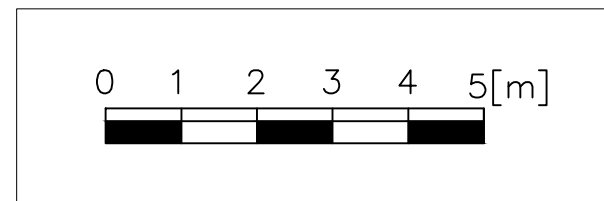
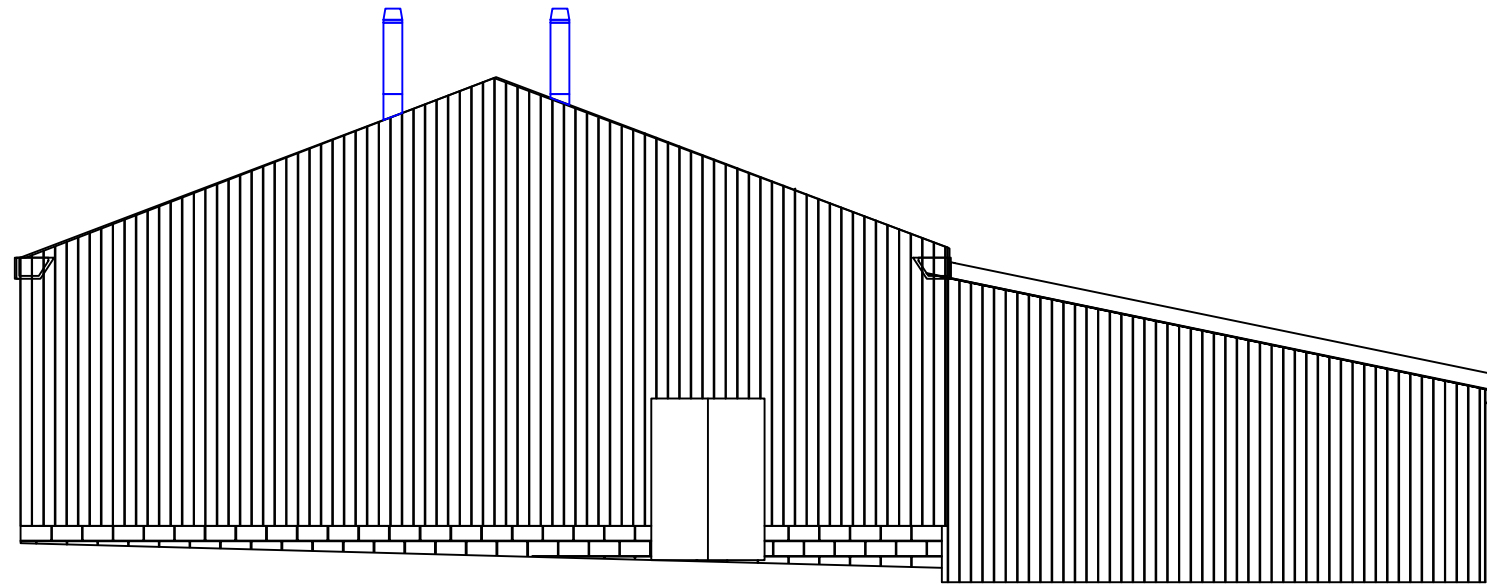
Result of Calculation - Chimney



Mode		Planned With Negative Pressure, Dry				
Requirement	Form.	Unit	High Fire		Low Fire	
Pressure Requirement	$P_z - P_{ze}$	Pa	9.7	+++	7.2	+++
Low Pressure Condition	$P_z - P_{LU}$	Pa	13.3	+++	10.3	+++
Temperature Requirement	$t_{iob} - t_g$	°C	53.5	+++	6.1	+
Additional Information						
Chimney Velocity	W_m	m/s	2.05		0.67	

All of the mentioned conditions for the check of the function of the chimney are fulfilled. The plant fits all conditions of standard EN 13384-1.

Addendum E – Elevation Drawing



-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
B	ALTERED FURTHER TO CLIENT COMMENT	IJM	-	-	07/11/22
A	FIRST ISSUE	IJM	-	-	25/10/22
MK	REVISIONS	DRN	CHK	APP	DATE

WHALLEY FARM
WHILTINGTON
GL54 4HA

PROPOSED EAST ELEVATION

PLANNING

ORIGINAL DRAWING SIZE A3 SCALE: 1:100

DRAWING NUMBER	REV
T772 - P - EAST	B



TRECO Ltd,
Pyramid House
1 Tiverton Way
Tiverton Business Park
Tiverton
Devon
EX16 6TG

Tel. 01884 250790
Web: www.tresco.co.uk
e-mail: info@tresco.co.uk