

**PE1c PELLET**

PELLET FUELLED **CONDENSING BOILER**



**BETTER HEATING**  
**WITH INNOVATIVE**  
**CONDENSING**  
**TECHNOLOGY**

**fröling**



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## ENVIRONMENTALLY RESPONSIBLE HEATING, ECONOMICALLY ATTRACTIVE

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The price changes for different energy sources in recent years show the benefits of wood pellets: the ecological way of heating is also economically attractive. Wood is a renewable energy source that is also CO<sub>2</sub>-neutral. Pellets are made of natural wood. The large volumes of wood shavings and sawdust generated by the wood-processing

industry are compacted and pelleted without being treated beforehand. Pellets have a high energy output and are easy to deliver and store. These are just some of the advantages that make pellets the perfect fuel for fully automatic heating systems. Pellets are delivered by tanker and unloaded directly into your store.

For almost sixty years Froling has specialised in the efficient use of wood as a source of energy. Today the name Froling stands for modern biomass heating technology. Froling firewood, wood chip and pellet boilers are successfully in operation all over Europe. All of our products are manufactured in our factories in Austria and Germany. Froling's extensive service network ensures that we can handle all enquiries quickly.

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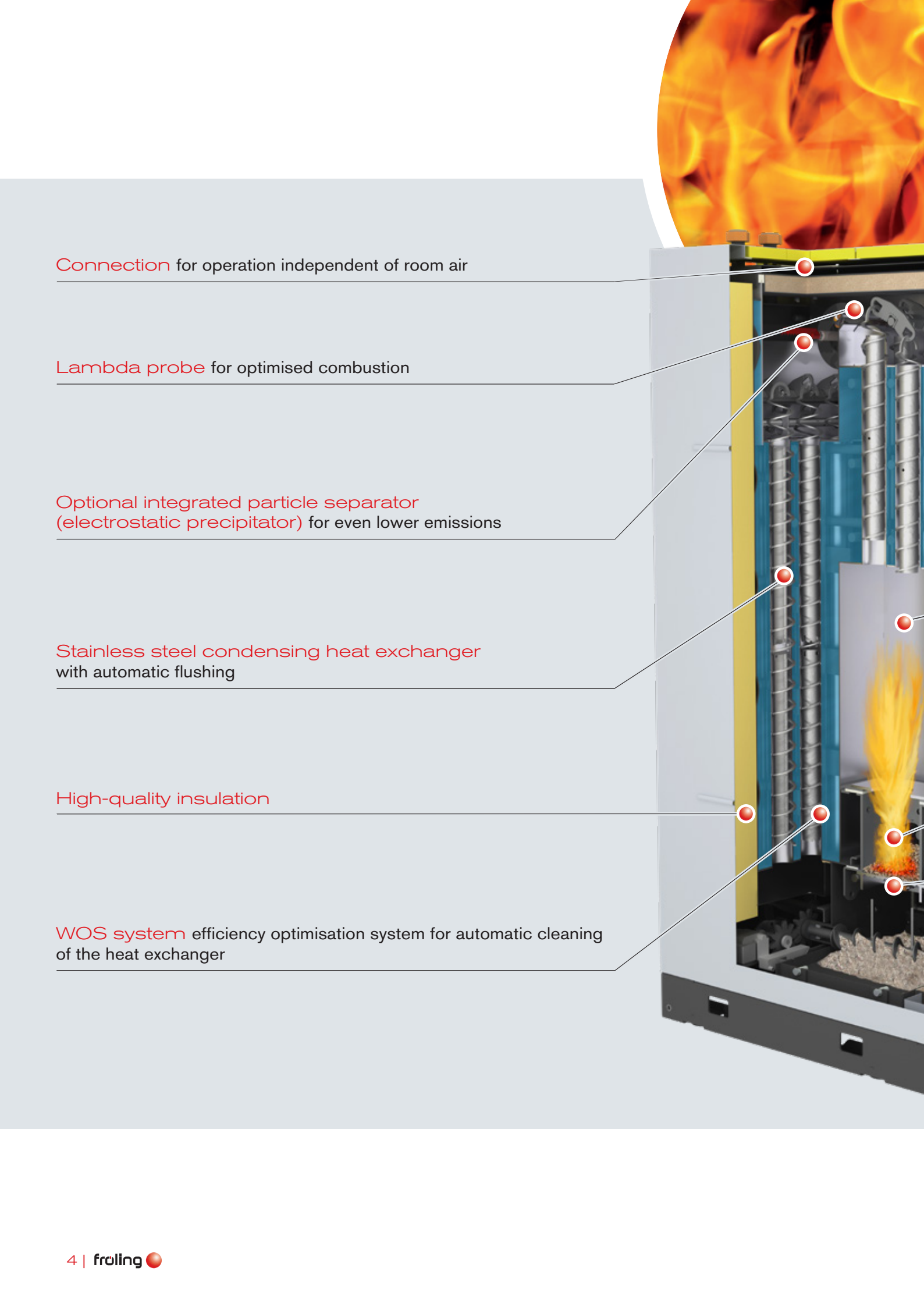
GUARANTEED  
QUALITY AND  
RELIABILITY  
FROM AUSTRIA

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- International pioneer in technology and design
- Sophisticated fully automatic operation
- Excellent environmental compatibility
- Environmentally responsible energy efficiency
- Renewable and CO<sub>2</sub>-neutral fuel
- Ideal for all types of house
- Up to 5 year Froling-warranty (subject to warranty conditions)

Der neu entwickelte Pellets-Brennwertkessel PE1c Pellet ist serienmäßig mit innovativer Brennwerttechnik ausgestattet. Auf kleinstem Raum sorgt diese neue Technologie für noch höhere Wirkungsgrade und einen sparsamen und äußerst leisen Betrieb. Darüber hinaus punktet der neue PE1c Pellet mit hohem Komfort, niedrigen Emissionen und geringem Stromverbrauch.





**Connection** for operation independent of room air

**Lambda probe** for optimised combustion

**Optional integrated particle separator  
(electrostatic precipitator)** for even lower emissions

**Stainless steel condensing heat exchanger  
with automatic flushing**

**High-quality insulation**

**WOS system** efficiency optimisation system for automatic cleaning  
of the heat exchanger



Air-cooled heat exchanger casing  
for maximum efficiency and low surface temperatures

7" touch display with LED status indication  
for simple and intuitive operation

Boiler of stainless steel  
for maximum service life

High-quality pellet burner  
with power-saving ceramic igniter

Automatic slide valve  
for fully automatic ash clearance and cleaning

Generously-sized ash container  
for long intervals between emptying



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# WORLD FIRST CONDENSER + ELECTROSTATIC PRECIPITATOR

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## Integrated condensing boiler technology

The condensing boiler is fabricated completely of stainless steel. It delivers maximum efficiency and saves up to 10 percent of your fuel costs. Deflectors in the turbulators guide the exhaust gas upwards through the heat exchanger pipes, thus ensuring maximum energy capture.

- Advantages:
- High efficiency
  - Low fuel costs
  - For radiator systems, wall heating and underfloor heating



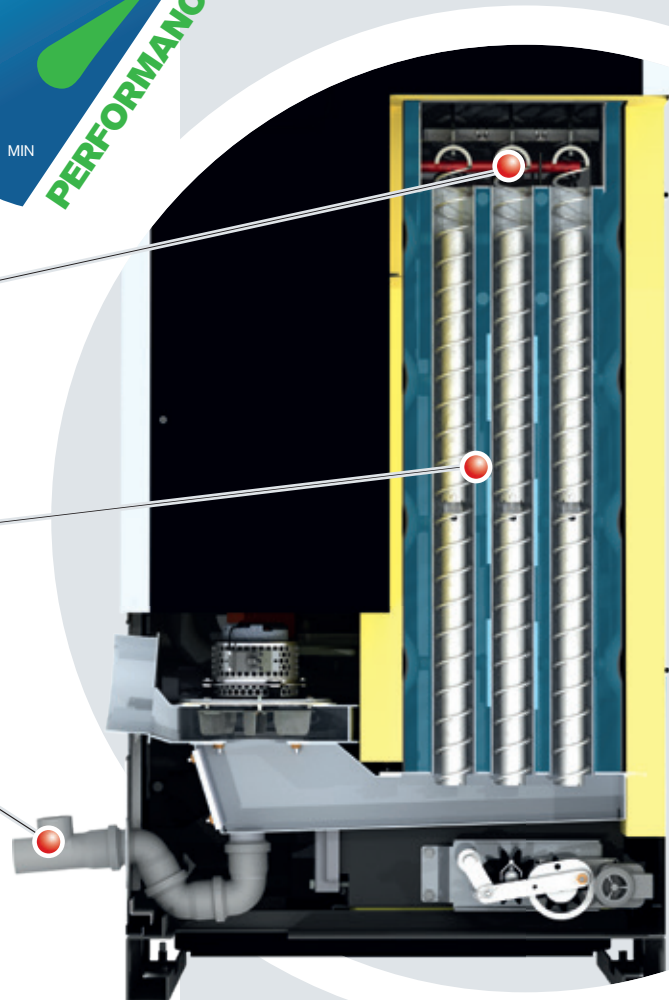
## Automatic flushing equipment

The cleaning is triggered by the operating hours, so flushing is performed only when really necessary.

## Heat exchanger completely of stainless steel

## Drain with siphon to drain condensation

Siphon pipe with an inspection opening for ease of cleaning.





### Room air independent operation

In traditional boiler rooms there can be uncontrolled heat loss from necessary ventilation openings. Boilers independent of room air avoid this, because they have a direct air intake connection. The combustion air that is fed in is also pre-heated by an integrated system, increasing the efficiency of the system.

- Advantages:
- No ventilation opening is required in the boiler room
  - Maximum efficiency



### Optional integrated particle separator (electrostatic precipitator)

The optionally available particle separator (electrostatic precipitator) can be added at any time without additional space requirement and thereby considerably reduces the fine dust emissions from the boiler. Particles become charged in the stainless steel heat exchanger; the generously-proportioned heat exchanger area and the turbulators with deflectors then serve at the same time as precipitation surfaces. Cleaning is performed fully automatically, using the integrated flushing device.

- Advantages:
- Can be retrofitted on site
  - No additional space required
  - Combined cleaning with heat exchanger optimisation system (WOS)

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## A WELL-DESIGNED HOME FOR GREATER CONVENIENCE

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### Speed regulated EC induced draught fan

The speed-regulated EC induced draught fan ensures the exact air quantity for combustion. As the induced draught fan is speed-regulated, it stabilises combustion throughout and adjusts the output to requirements. Working together with the lambda control, it ensures optimum combustion conditions. The EC air intake fan has significantly higher efficiency than conventional air intake fans using an AC motor. This results in significant power savings.

- Advantages:**
- Maximum ease of use
  - Continuous optimisation of combustion
  - Up to 40 % less power consumption



### Gate valve combined with secondary air

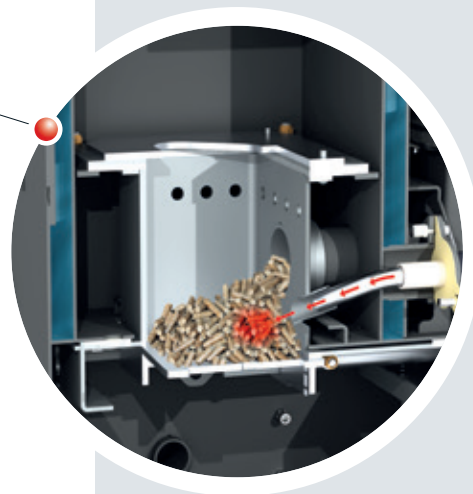
Combustion in the PE1c Pellet is controlled by underpressure. Combined with the EC air intake fan, this guarantees extremely high operating safety. The innovative control of the secondary air distribution in conjunction with the gate valve is a new feature. Primary and secondary air are optimally adjusted to the conditions in the combustion chamber with only one actuator. This, combined with the lambda controller which comes as standard, ensures that emissions are kept to a minimum.



### Fast, energy-saving ignition

The silent ceramic igniter ensures safe and energy-saving ignition of the fuel. The underpressure control continuously monitors the flow of air across the ceramic igniter.

- Advantages:**
- Silent ceramic igniter for reliable ignition
  - Automatic combustion of residual embers
  - No separate blower fan required







#### Store gate valve

When fuel is being fed from the store to the pellet container, the store gate valve opens. The gate valve for the burner closes simultaneously.

#### Large pellet container

The large pellet container with a capacity of 60 ltr reduces the frequency of pellet feed. The pellet container is filled fully automatically by the integrated suction turbine.

Advantages:

- Easy loading
- Efficient operation

#### Double protection system

The gate valve for the store and the gate valve for the burner provide a double valve system ensuring maximum operating safety.

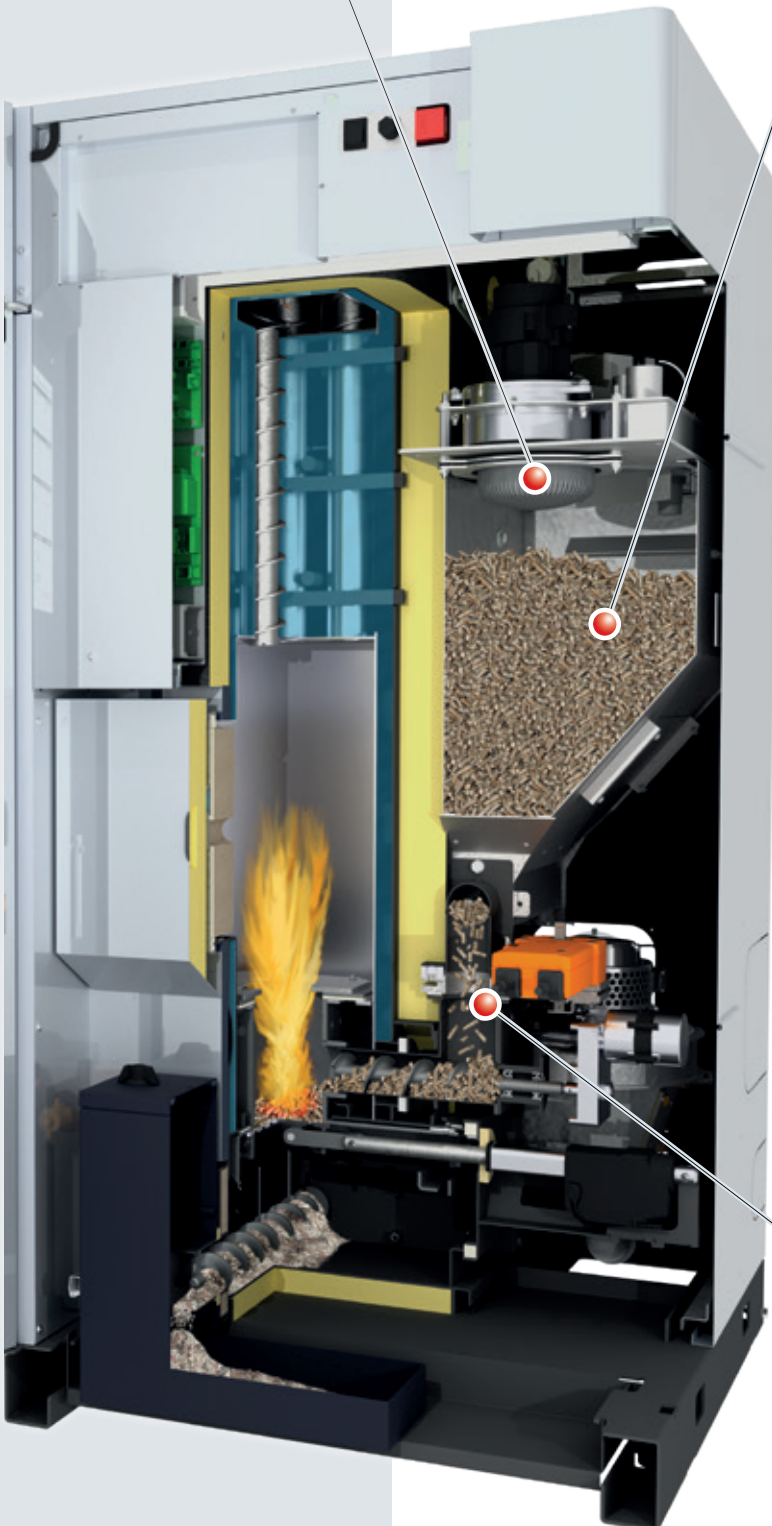
Advantages:

- The highest possible operating safety
- Maximum back-fire protection



#### Burner gate valve

In this way the double protection system ensures a reliable closure between the store and the pellet burner, guaranteeing maximum burn back protection.



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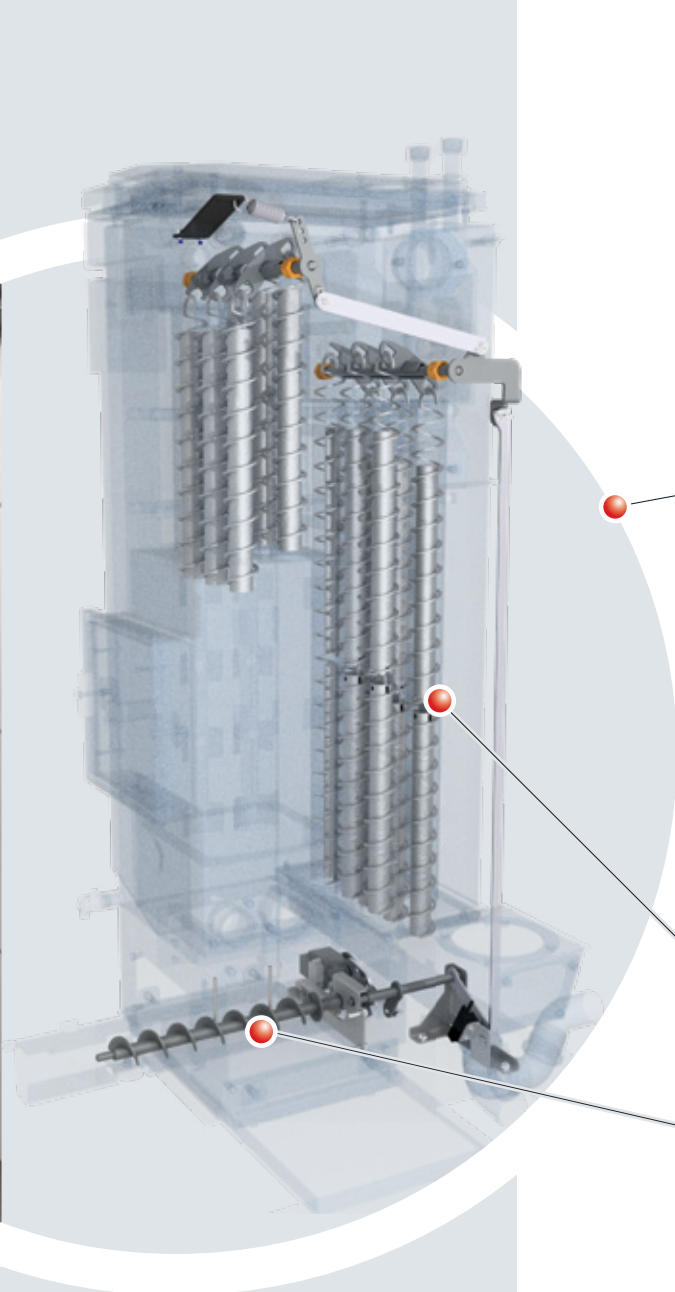
## SPACE-SAVER WITH THE LATEST TECHNOLOGY

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- 1 Up to three sets of pumps can be mounted directly on the boiler (mixed/unmixed)
- 2 The suction hose can be attached at the top or at the back
- 3 Perfect connection to the flue using the FRÖLING connection pipe FAR
- 4 Flue pipe connection and discharge drain at the back or optionally to the right





#### Drive for WOS system and ash clearance

The Efficiency Optimisation System (WOS), which comes as standard, consists of special turbulators, which are placed in the heat exchanger pipes. The use of a single drive for the WOS Efficiency Optimisation System reduces the electrical power requirement to a minimum. An additional benefit: clean heating surfaces ensure higher efficiency and thus lower fuel consumption.

- Advantages:
- Even more efficient
  - Fuel economy
  - Common drive

#### Special heat exchanger pipe

#### Optimum ash discharge



#### Convenient ash clearance

We never compromise on convenience. The ash that remains is automatically fed into an enclosed ash container by means of the ash screw conveyor.

When the ash container requires emptying, a message appears on the display or can be sent to a smartphone.

- Advantages:
- Interval between emptying
  - Convenient emptying

# INDIVIDUAL CONTROL UNIT OF THE HEATING SYSTEM

## Lambdatronic P 3200 control unit

Fröling provides a future-oriented Lambdatronic P 3200 and a new 7" touch display. Intelligent control management makes it possible to connect up to 18 heating circuits, up to 4 storage tanks and up to 8 hot water storage tanks. The control unit ensures that the operating statuses are clearly shown. The menu structure is ideally organised to allow easy operation. All essential functions can be selected by simply pressing icons on the large colour display.



- Advantages:**
- Precise combustion control by a Lambda control using a Lambda probe
  - Connection for up to 18 heating circuits, 8 water heaters and up to 4 storage tank management systems
  - Integration capability for a solar panel system
  - LED frame for status display with illuminated presence detection
  - Simple and intuitive operation
  - Various smart home options (such as Loxone)
  - Remote control from the living room (remote control 3200 and RGB 3200 Touch) or via Internet (froeling-connect.com)



## SIMPLE & INTUITIVE OPERATION

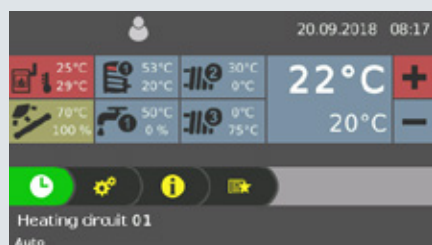


Fig. 1 General overview of the heating circuit (start screen)



Fig. 2 View of the heating times (individually adjustable)

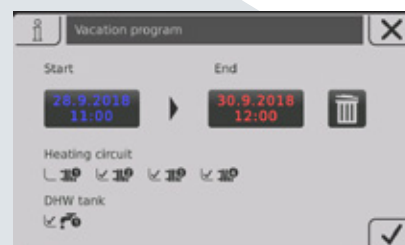


Fig. 3 Overview of the new holiday mode





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## KEEP TRACK OF EVERYTHING WITH THE FROLING APP

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The Froling App allows you to check and control your Froling boiler online from anywhere, at any time. You can read and modify the main status information and settings easily and conveniently online. You can also specify which status messages you want to be informed about via SMS or e-mail (e.g. when the ash box is to be emptied or in the event of a fault message).

Froling boiler (software core module from version V50.04 B05.16) with boiler touch display (from version V60.01 B01.34) a broadband internet connection and a tablet/smartphone with iOS or Android operating system are required. Once the boiler has been connected to the internet and activated, the system can be accessed 24/7 from anywhere using a web-enabled device (mobile, tablet, PC, etc.). The app is available in the Android Play Store and iOS App Store.

NEW! Desktop version  
with even more options.



- Simple and intuitive operation of the boiler
- Status information can be called up and changed within seconds
- Individual naming of the heating circuits
- Changes of status are notified directly to the user (e.g. via e-mail or push notifications)
- No additional hardware required (such as an Internet gateway)

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## SMART HOME

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Enjoy smart, convenient and piece-of-mind living with the Smart Home connection options from Froling.

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### Loxone

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Combine your Froling heating system with the Loxone Miniserver and the new Froling Extension and implement individual boiler control on the basis of the single room control of the Loxone Smart Home.

**Advantages:** Easy operation and viewing of the heating circuit via the Loxone Miniserver, immediate notification of status changes and individual operating modes for each situation (presence, holiday, economy mode, etc.)

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### Modbus

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Via the Froling modbus interface, the system can be integrated into a building management system.





## ACCESSORIES FOR EVEN GREATER CONVENIENCE

### FRA room temperature sensor

By using the FRA room temperature sensor, sized just 8x8 cm, the main modes of the corresponding heating circuit can be easily selected and adjusted. The FRA can be connected both with and without affecting the store. The adjusting wheel allows you to change the room temperature by up to  $\pm 3^{\circ}\text{C}$ .



### RBG 3200 room console

For even more convenience you can use the RBG 3200 room console and the new RBG 3200 Touch. You can control the heating system easily from your living room. Important system data is clearly displayed and settings can be changed at the push of a button.



### RBG 3200 Touch room console

The RBG 3200 Touch has an impressive touchpad interface. The menu structure means it is intuitive and easy to use. The 17x10 cm console with colour screen shows the most important functions at a glance and automatically adjusts the background lighting to the conditions. The room consoles are connected to the boiler controller using a bus cable.



### Heating circuit module

With wall casing and one contact sensor as heating circuit control for up to two mixer heating circuits.



### Hydraulic module

With wall casing and two immersion sensors to control one or two pumps and one isolating valve with up to six sensors.

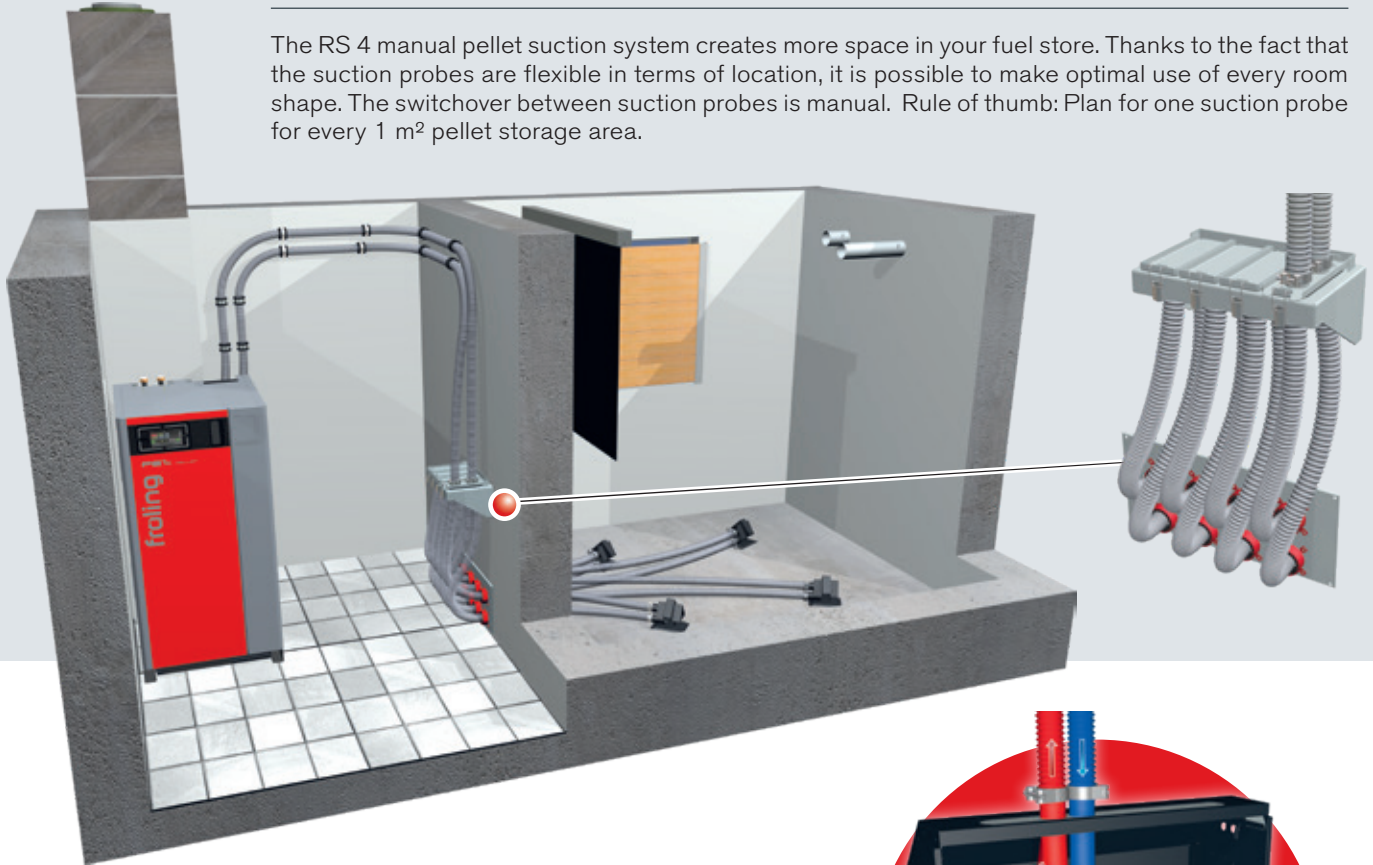


### WMZ solar package kit

Set for measuring heat quantity, consisting of a volume pulse transmitter ETW-S 2.5, a collector sensor and two contact sensors for recording flow and return temperatures.

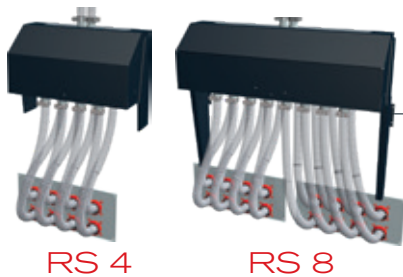
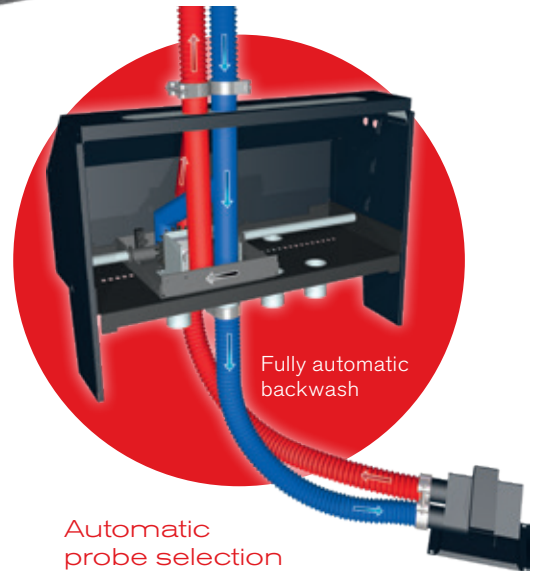
#### 4 probe manual suction system

The RS 4 manual pellet suction system creates more space in your fuel store. Thanks to the fact that the suction probes are flexible in terms of location, it is possible to make optimal use of every room shape. The switchover between suction probes is manual. Rule of thumb: Plan for one suction probe for every 1 m<sup>2</sup> pellet storage area.



#### Pellet filler pipes

The pellets are delivered by tanker and blown into the store through a filling pipe. The second pipe is used for controlled and dust free removal of the escaping air.

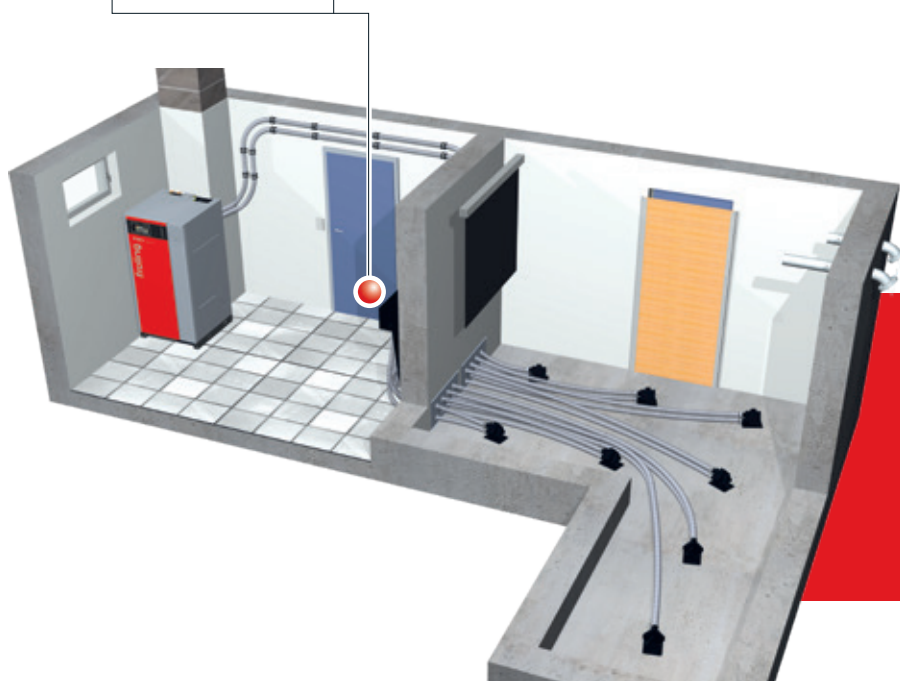


#### Pellet suction system RS 4 / RS 8

Design as above, however with the difference of automatic switchover between the suction probes.

#### Automatic probe selection

It automatically selects 4 or 8 suction probes in specified cycles, it is controlled by the pellet boiler. If, however, the suction probe fails unexpectedly, it is remedied by a fully automatic reversal of the air supply (back flushing).

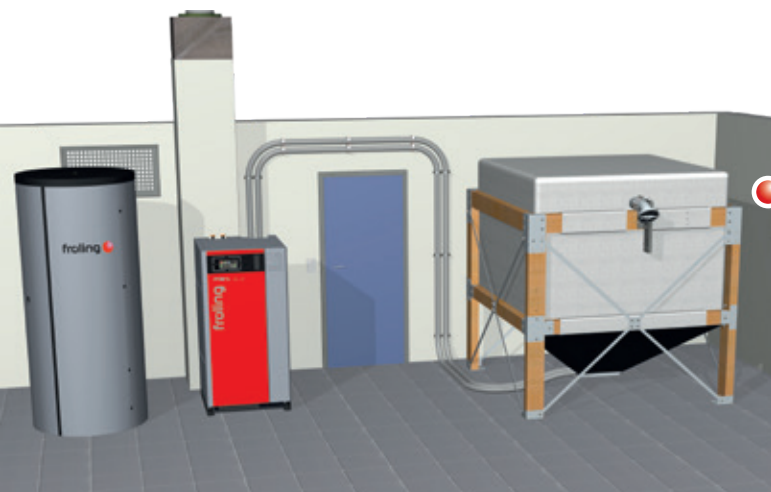


#### Pyramid for fuel store optimisation

#### Advantages at a glance:

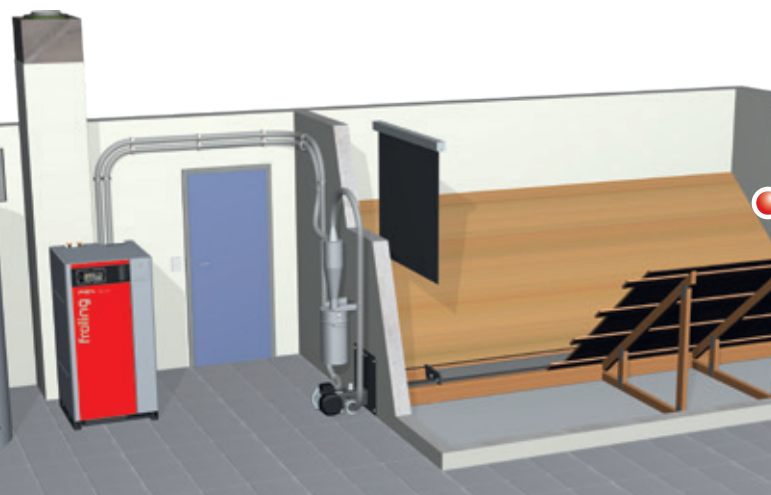
- easy to assemble
- no sloping slides necessary in the bunker
- more store space (30%)
- automatic switching between the probes
- automatic back flushing
- maintenance-free system

More information can be found on the Froling brochure "Discharge systems for pellets"



### Bag silo

The bag silo system is a flexible, simple way of storing pellets. Available in 9 different footprints (from 1.5 m x 1.25 m to 2.9 m x 2.9 m) with a capacity of between 1.6 and 7.4 tonnes, depending on the bulk density. There are other advantages to using a bag silo. It is easy to assemble and dustproof. You can also fit rainproof and sunproof covers and install the silo outside.



### Suction screw system

The Froling screw suction system is the ideal solution for rectangular rooms with front-end removal. The deep and horizontal position of the discharge screw means the space in the room is used optimally and complete emptying of the store is guaranteed. Combined with a suction system from Froling it also enables flexible boiler installation.



### Cube 330/500S pellet supply bin

The Cube 330/500S is the optimal and most cost-effective solution for low fuel requirements. Manually filled (e.g. pellets in sacks) it can store a total of 330 kg/495 kg of pellets. The pellets are transported to the boiler by means of a suction probe, which is also included in delivery.



### Pellet Mole®

This pellet discharge system is easy to install and makes full use of the store space. The Pellet Mole® draws the pellets from above, ensuring an optimum fuel feed to the boiler. The Pellet Mole moves automatically into every corner of the store to empty it as efficiently as possible.



### Pellet Mole E3®

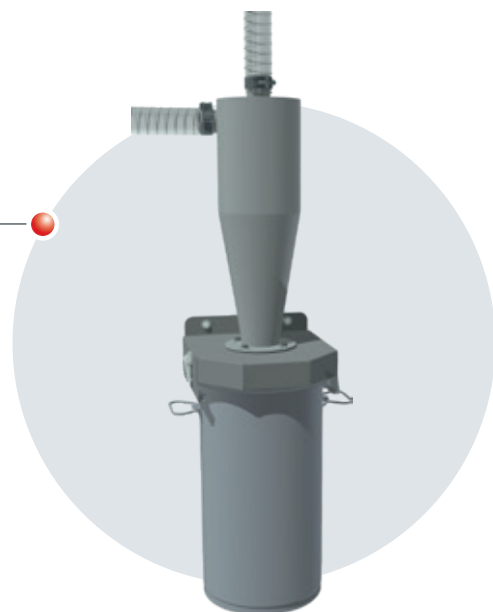
The E3 is designed for larger pellet plants with boiler outputs from 40 to 300 kW and an annual pellet demand of several hundred tonnes. The typical storage sizes are up to 40 tons or 60 m3 capacity. The star-shaped Round brushes made of high-loadable polyamide dose the pellet gently before the suction port and move the E3 smoothly over the pellet supply.



### Option: Fuel tuning with the PST pellet deduster

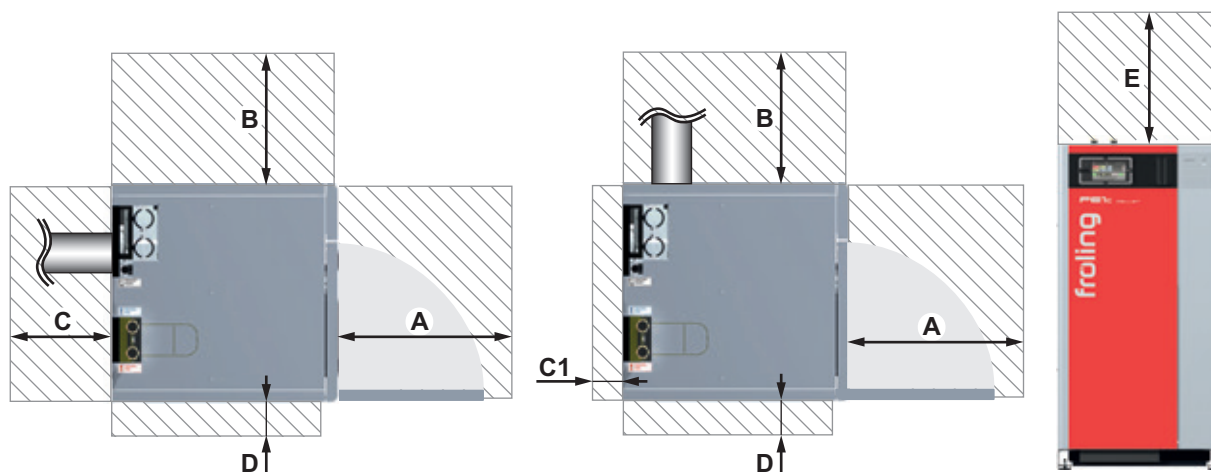
Wood pellets are clean and of very high quality. Any remaining wood dust can be filtered from the fuel using the PST pellet deduster. This optimises the efficiency of the combustion zone over the years. The PST pellet deduster can be fitted in any position in the return air line of the pellet suction system.

The suction cyclone design means that the dust particles are separated from the return air and deposited internally. The container is convenient to remove and transport to the emptying point. The system can be retro-fitted at any time and it is maintenance-free.



# PELLET-FUELLED CONDENSING BOILER PE1c

## CLEARANCES & TECHNICAL SPECIFICATIONS



Minimum distances [mm]	16-22
A Distance – front of boiler to wall	550
B Distance between side of boiler and wall	500
C Clearance between the rear of boiler and the wall (flue gas pipe back) <sup>1</sup>	400
C1 Clearance between the rear of boiler and the wall (flue gas pipe right) <sup>2</sup>	100
D Clearance between the rear of boiler and the wall (door stop side)	30 (70 <sup>3</sup> )
E Maintenance area above the boiler <sup>4</sup>	500
Minimum space (length x width)	1360 x 1280

<sup>1</sup> Rear flue pipe connection

<sup>2</sup> Fit the flue pipe connection to the right-hand side of the boiler

<sup>3</sup> For distributor bars for three pump assemblies

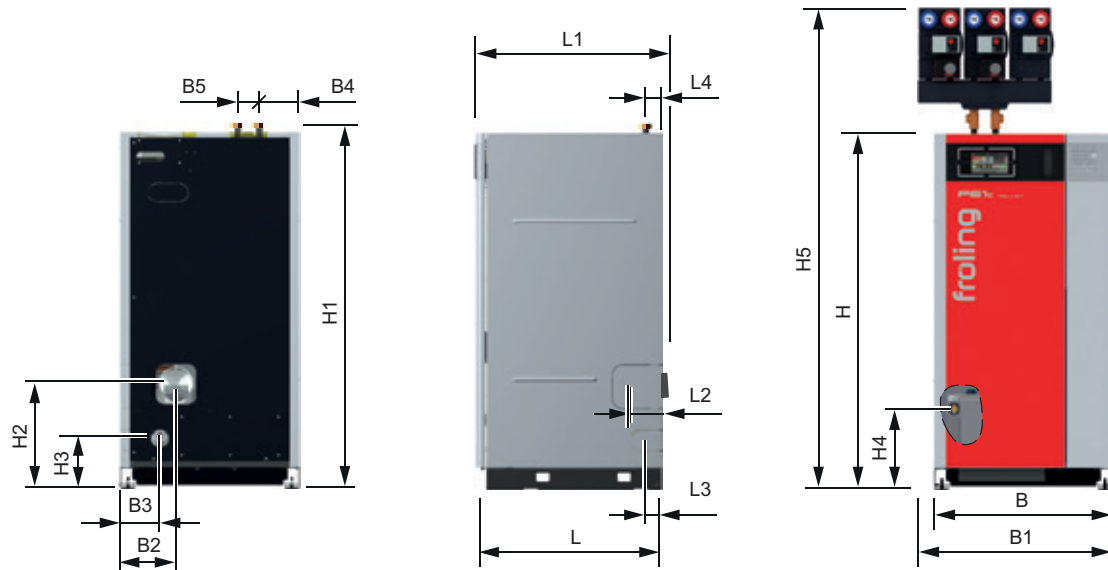
<sup>4</sup> Maintenance area to expand the WOS springs upwards

Technical data		16	22
Nominal heat output	[kW]	15	20
Nominal thermal output (condensation)	[kW]	16,2	22
Thermal output range	[kW]	4,5 - 15	6 - 20
Thermal output range (condensation)	[kW]	4,8 - 16,2	6,4 - 22
Energy (ErP) label*		A++	A++
Electrical connection	[V/Hz/A]	230V / 50Hz / abgesichert C16A	
Weight of boiler (including stoker, without water)	[kg]	370	375
Total boiler capacity (water)	[l]	75	
Pellet container capacity	[l]	60	
Ashcan / ash box capacity	[l]	18	
Condensate per nominal load hour	[l]	1,0 - 1,5	1,8 - 2,2
Necessary water pressure for the flushing device	[bar]	2	

\* Efficiency label boiler + controller



## DIMENSIONS



Dimensions [mm]		16-22
L	Length of boiler	780
L1	Total length incl. flue gas pipe connection	810
L2	Clearance at the flue gas pipe connection side	126
L3	Clearance at the condensate drain side	90
L4	Clearance flow / return	70
B	Width of boiler	750
B1	Width of boiler incl. distributor bar for three pump assemblies (A) <sup>1</sup>	820
B2	Clearance for the flue gas pipe connection at the back	234
B3	Clearance for the condensation drain at the back	167
B4	Clearance from the return to the boiler	168
B5	Clearance from the flow to the return	90
H	Height of the boiler / connection for the suction system / connection for the flushing water	1500
H1	Height of the flow connection / return	1525
H2	Height of the flue gas pipe connection	450
H3	Height of the condensation drain connection	220
H4	Height of the drainage connection	335
H5	Height of the boiler incl. distributor for three / two pump assemblies (A) <sup>1</sup>	2005
Flue spigot diameter (inner)		132

<sup>1</sup> For an optional pump assembly with distributor

The ecodesign requirements according to VO (EU) 2015/1189, Annex II, point 1. are met.



#### Pellet boiler

PE1 Pellet	7 - 35 kW
PE1c Pellet	16 - 22 kW
P4 Pellet	48 - 105 kW



#### Firewood boiler

S1 Turbo	15 - 20 kW
S3 Turbo	20 - 45 kW
S4 Turbo	22 - 60 kW

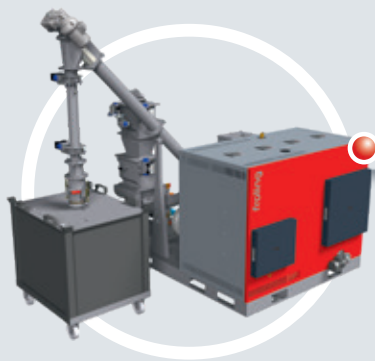
#### Dual fuel boiler

SP Dual compact	15 - 20 kW
SP Dual	22 - 40 kW



#### Wood chip / Large boilers

T4e	20 - 350 kW	TI	350 kW
Turbomat	150 - 550 kW	Lambdamat	750 - 1500 kW



#### Wood combined heat and power

Fixed-bed gasifier CHP	45 - 500 kWel
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Your Fröling partner

Fröling Heizkessel- und Behälterbau Ges.m.b.H.

A-4710 Grieskirchen, Industriestr. 12

AT: Tel +43 (0) 7248 606-0

Fax +43 (0) 7248 606-600

DE: Tel +49 (0) 89 927 926-0

Fax +49 (0) 89 927 926-219

E-mail: [info@froeling.com](mailto:info@froeling.com)

Web: [www.froeling.com](http://www.froeling.com)

