



# T4



# Heating with wood chips and pellets

For more than 50 years, Froling has specialised in efficiently using 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 inquiries quickly.



## The fuels: wood chips and pellets



Wood chips are a local and environmentally-friendly fuel which is not subject to the crises and fluctuations of the market. Furthermore, wood chip production provides jobs for local residents. That is why wood chip is the perfect fuel, not just from an economic perspective but also from an environmental point of view. Leftover branches and treetops and sawmill waste are shredded into wood chips. The quality class is determined by the wood used.



Wood 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.

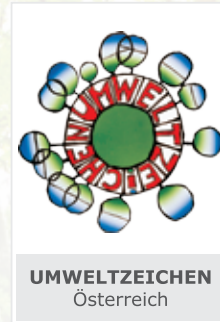


Switchgrass or elephant grass (Latin name: miscanthus) is a plant from the Poaceae family native to south-east Asia. Miscanthus is a so-called C4 plant, which has a higher growth rate than the C3 plants native to western Europe. This fast-growing plant grows up to 3 metres high and is increasingly used as a fuel because of its high calorific value and small carbon footprint.



## Multiple award-winning

Particular attention was paid to energy efficiency, durability and stability during the development of the T4. This priority was clearly confirmed when the boiler was awarded the Blue Angel (for the wood chips and pellets) and the Austrian Ecolabel. The T4 consumes little electricity during operation, keeping the operating costs down.



## The new Froling T4

User-friendly, compact, economical and safe: the new T4 from Froling meets all your needs. This boiler can efficiently burn both wood chips and pellets due to its intelligent fully-automatic system.

With the silicon carbide combustion chamber, the T4 ensures a high level of efficiency (up to 94.2%) with very low emissions. Well-planned use of energy-saving drives ensures extremely low energy consumption.

Thanks to its modular construction and compact dimensions, the Froling T4 is particularly easy to position and install.





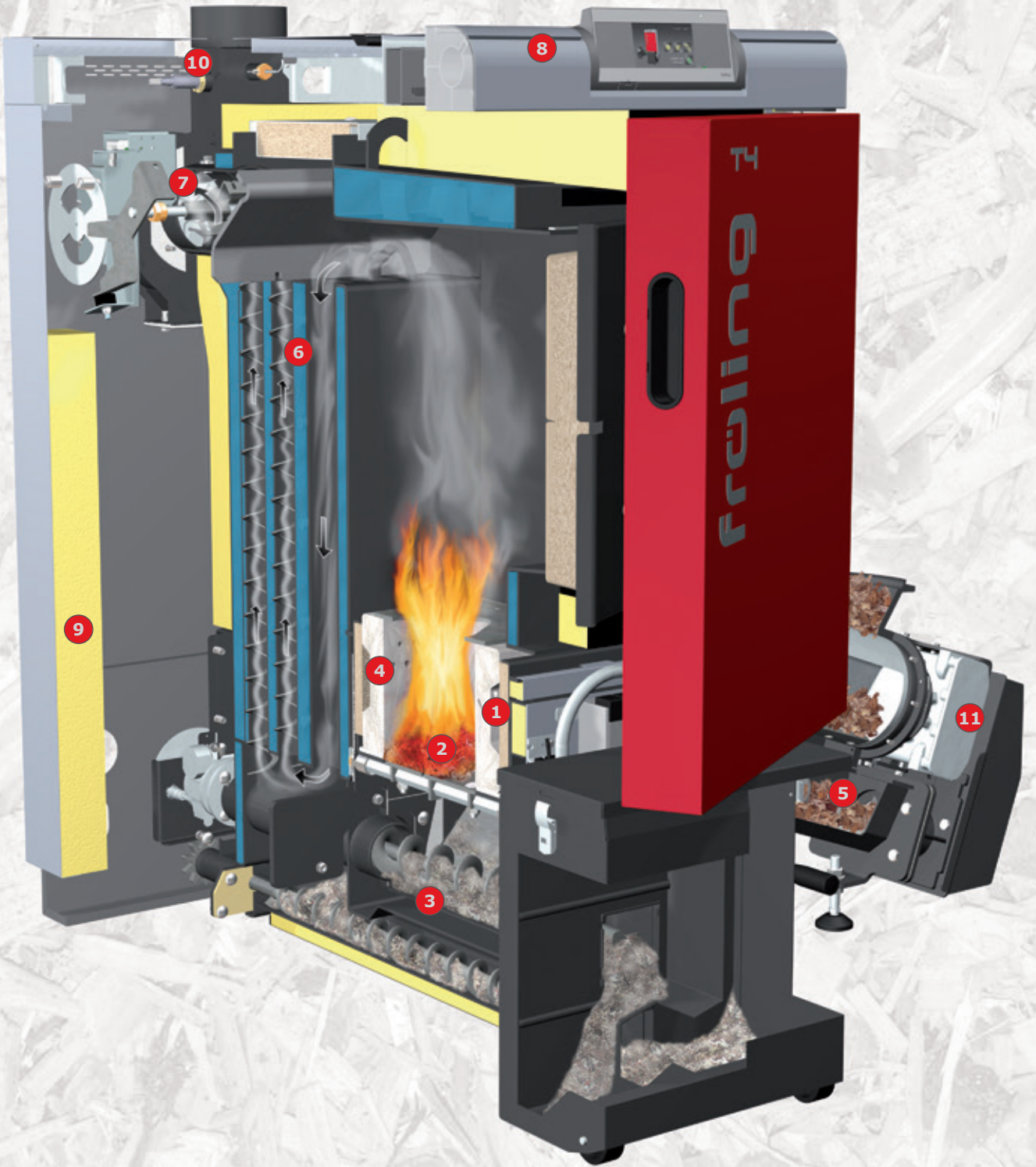
# Robust technology with intelligent features



## The new Froling T4 with special benefits:

- 1 Durable high-temperature silicon carbide combustion chamber for effective combustion with a high level of efficiency and very low emissions.
- 2 Multi-part combustion grate consisting of a fixed insertion zone and the automatic tipping grate for cleaning away ash and foreign bodies.
- 3 Automatic ash removal from the combustion chamber and the heat exchanger to the generously-sized mobile ash container.
- 4 Underpressure-controlled combustion air supply for primary and secondary air.
- 5 Stoker screw with coupled rotary valve for optimal fuel supply and maximum safety.
- 6 3-pass heat exchanger with Efficiency Optimisation System - EOS (turbulators for automatic cleaning of the heat exchanger pipes).
- 7 Speed-controlled induced-draught fan with function monitor for maximum operational reliability.
- 8 Lambdatronic H 3200 controller with innovative bus technology for complete system solutions. New boiler console with 4.3" touch display for simple, intuitive operation.
- 9 Fully insulated to minimize radiant heat loss.
- 10 Broadband Lambda probe for automatic adjustment to different fuel qualities.
- 11 Energy-saving drives with spur gears for extremely low power consumption.





# A well-designed inside

## Feature: easy to assemble on-site

- Advantages:
- quick assembly
  - compact design
  - stoker unit on the left or right as desired.

The T4 is supplied assembled and wired, you just need to fit the stoker unit and connect the chosen discharge system to the rotary valve. This saves time and money. Thanks to the well-planned layout of the units and its compact design, the T4 can also be used in very confined spaces.



You can select a right or left-hand stoker unit.



## Feature: high-temperature silicon carbide combustion chamber and quick ignition

- Advantages:
- optimal emission values
  - economical fuel consumption
  - automatic ignition using residual embers

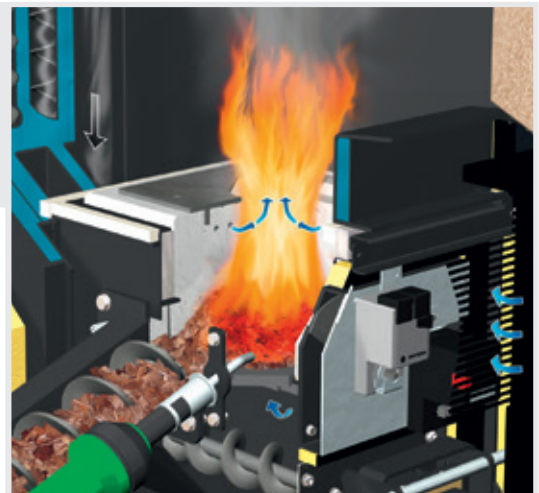
The combustion chamber is fully lined with high-quality fireproof material (silicon carbide). The exceptionally hot combustion zone ensures optimal combustion and very low emissions. The patented shaping of the firebrick stones gives the air supply in the combustion chamber particularly good airtightness without the need to use expensive wearing seals. The new shape of the stones also simplifies the maintenance of the combustion chamber as they can be removed easily.

Thanks to the hot combustion zone, after short periods in idle mode the fuel is automatically reignited by the residual embers. It is only necessary to start the ignition fan after longer combustion pauses. When necessary, the hot air blower ignites very quickly.

## Feature: optimum combustion control

- Advantages:
- optimal emission values
  - adapts automatically to varying fuel qualities

Combustion in the T4 is controlled by underpressure. Combined with the induced draught fan, this guarantees extremely high operating safety. The innovative control of air distribution in the combustion zone is a new feature - primary and secondary air are optimally adjusted to the conditions in the combustion chamber with a joint actuator. This, combined with the lambda controller which comes as standard, ensures that harmful emissions are kept to a minimum.

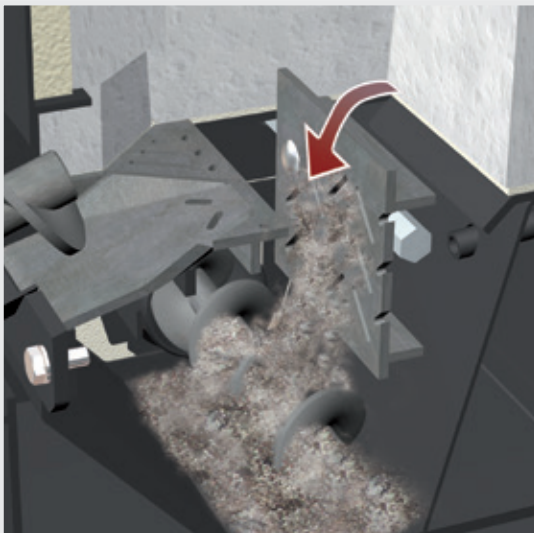
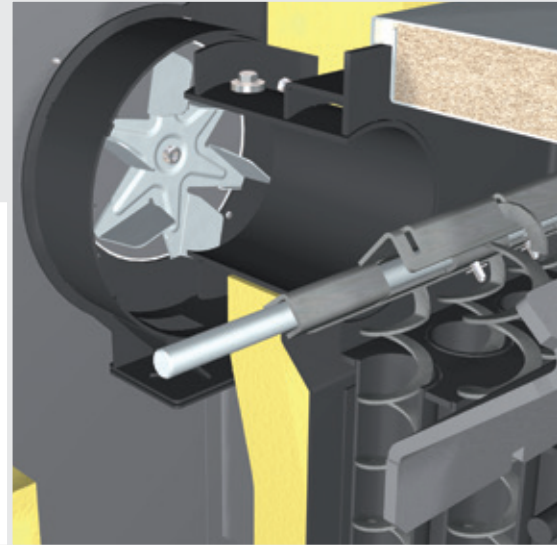




**Feature: speed-regulated induced draught fan**

- Advantages:
- maximum ease of use
  - constant stabilisation of combustion
  - quiet and energy-saving operation

The speed-regulated induced draught fan, which comes as standard, ensures the exact air quantity and constant underpressure throughout combustion. As the induced draught fan is speed-regulated, it stabilises combustion throughout and adjusts the output to requirements. The induced draught fan is also very quiet and energy-saving.

**Feature: smart grate technology**

- Advantages:
- ideal combustion conditions
  - automatic self-cleaning

The combustion grate is divided in several sections to ensure optimal combustion of wood chips or pellets. The stationary lifting grate ensures even distribution of the fuel in the combustion zone. The centrally-supported tipping grate can pivot through 90°, and reliably cleans ash and residue from the combustion chamber. This grate is made of a special fire-proof alloy to guarantee a long service life.

**Feature: easy to clean**

- Advantages:
- automatic ash removal
  - simple emptying of the ash container

The ash accumulated in the combustion chamber and the heat exchanger during combustion is automatically fed into a shared ash container. The boiler controller informs you when the ash bucket should be emptied. It is easy to handle thanks to its transport wheels and holding bar. A cover flap also ensures that no ash can fall out of the container during transportation.



# Systematic convenience

- 1 Robust agitator head.
- 2 Maintenance-free agitator gearbox.
- 3 Strong spring blade packs ensure even filling of the feed screw.
- 4 Screw channel with progressive screw for smooth operation.
- 5 Ball joint for continuously adjustable inclination of the feed screw.
- 6 Patented twin-chamber rotary valve for top burn back protection.
- 7 Sturdy stoker screw for reliable fuel feed with automatic turn control.
- 8 Energy-saving spur gears.
- 9 Temperature monitoring device in the fuel store (only required in Austria).
- 10 Easy access to the shear edge through an accessible opening.
- 11 Monitored gravity shaft cover.

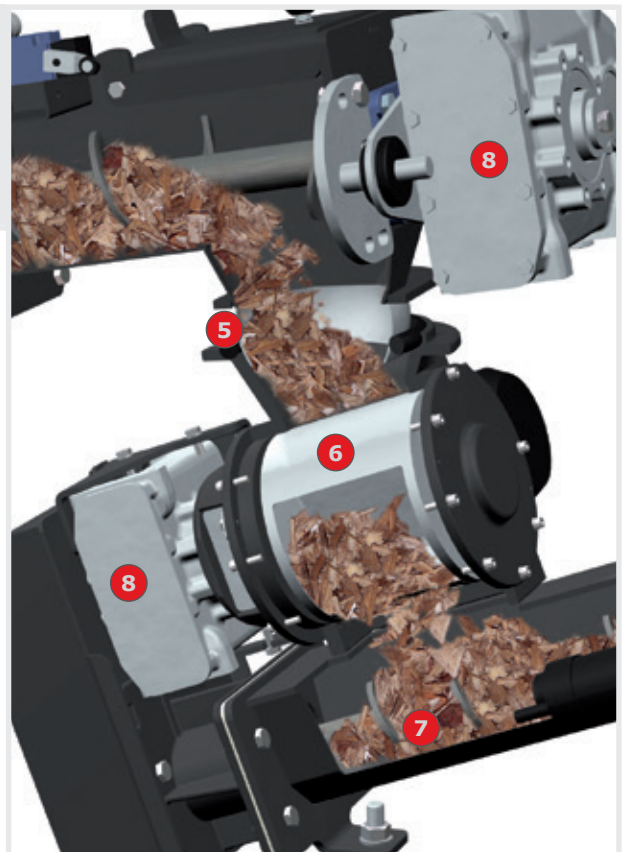


## Feature: flexible ball joint and robust stoker unit

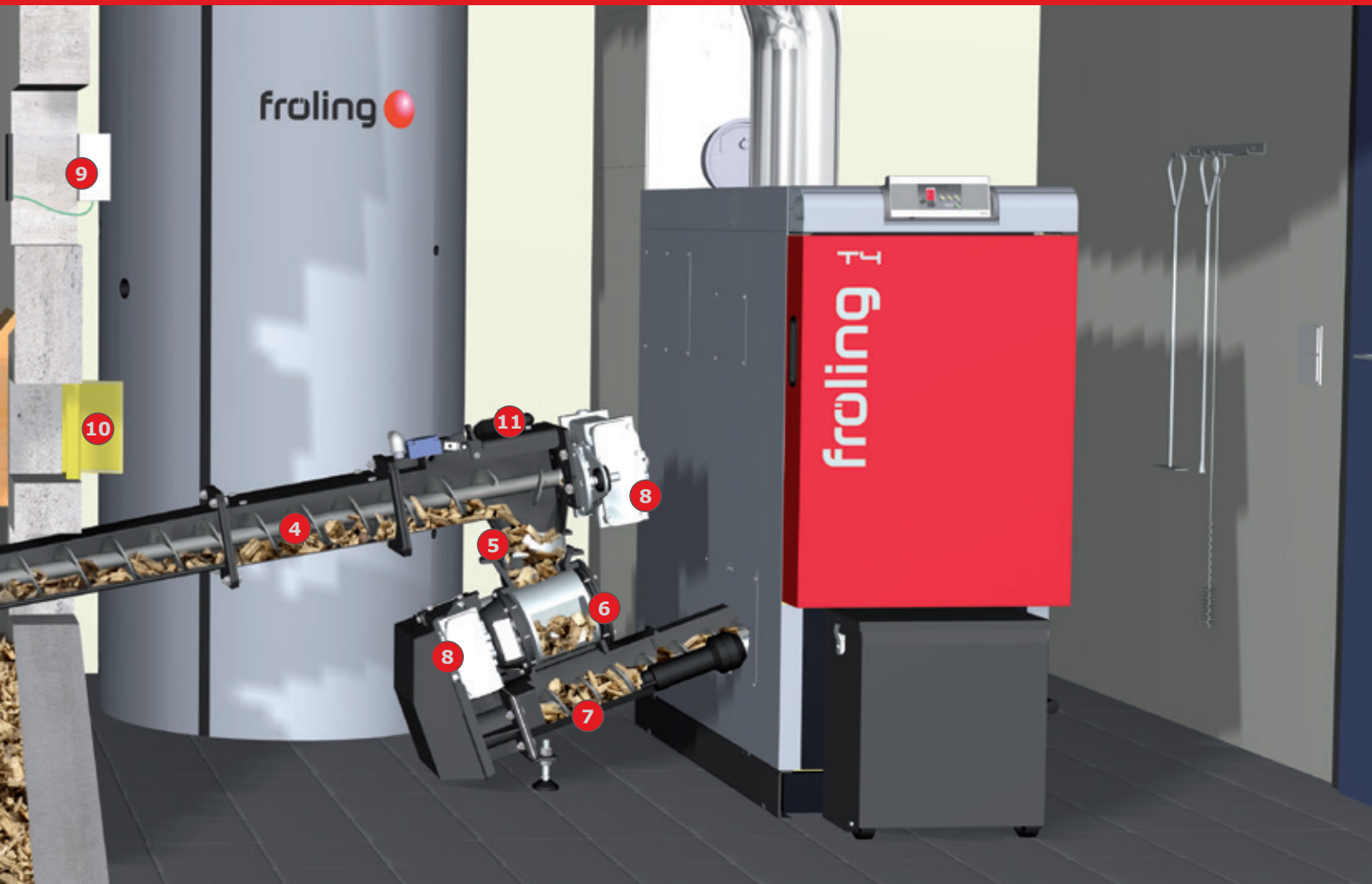
- Advantages:
- flexible set-up
  - top burn-back protection
  - low energy consumption

The ball joint is a flexible connecting piece between the discharge screw and the stoker unit. Offering continuous adjustment of the inclinations (up to max. 15°) and angles, the ball joint enables an optimum adjustment to the space requirements.

The highly compact stoker unit of the T4 together with the patented rotary valve guarantee top burn back protection and reliable fuel feed into the combustion zone. The stoker unit is driven jointly with the rotary valve by an energy-saving geared motor (spur gears), guaranteeing maximum energy efficiency. Froling offers the stoker screw in two sizes (Ø 80 mm and Ø 100 mm) for the optimum solution for safe fuel transport from wood chips to P45A (previously G50). From the T4 40, the stoker screw has Ø 100 mm.







**Feature:** **patented twin-chamber rotary valve**

- Advantages:
- continuous flow of material
  - top burn-back protection
  - suitable for P45A (previously G50) wood chips

The patented twin-chamber rotary valve offers maximum operating safety. The rotary valve forms a reliable separation between the discharge system and the feed unit, providing optimal burn back protection. The advanced system design with two spacious chambers ensures that the fuel is transported continuously to the combustion zone. This optimal fuel metering ensures the best possible combustion values.

The two large chambers are especially suitable for transporting wood chips up to P45A (previously G50). The high-quality cutting edges can be replaced and also easily cut through coarser pieces. High resistance is recognised automatically. The rotary valve and screw move backwards (several times depending on the parameters set) until transport can be restarted. The rotary valve is extremely quiet and uses only minimal power.



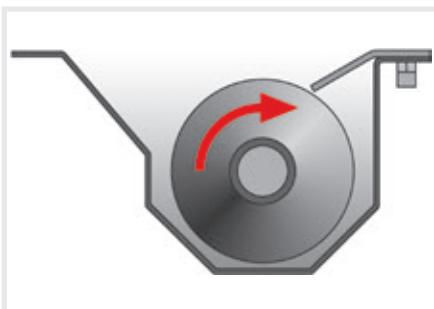
# Froling discharge systems

## Spring blade agitator (SBA)



For discharging wood chips from bunkers with a maximum working diameter of 5.0 metres. The system is maintenance-free and especially designed for easily pourable fuels (e.g. wood chips P16A/P45A to M35; previously G30/G50 to W35). The simple and effective design of the discharge ensures smooth operation. Any problematic materials (e.g. foreign bodies) are automatically detected and removed by a reverse turn of the screws (turn control). The feed screw with progressive screw blade ensures low energy consumption.

## Details and models



### Screw channel

The special trapezoidal shape of the channel ensures that fuel transport runs smoothly. The system is easy to operate so it saves energy even when feeding in the maximum amount of pellets.



### Shear edge

The robust shear plate with cutting edge breaks up larger pieces of fuel guaranteeing continuous fuel feed.



### Spring blades

The strong spring packs ensure that the feed screw has an even filling level. During filling the springs fold underneath the cover plate. When fuel is withdrawn, the spring blades return to ensure reliable fuel feed.



## Torsion arm agitator (TAA)



For discharging wood chips from bunkers with a maximum working diameter of 6.0 metres. The system is low maintenance and is especially designed for fuels with greater discharge power due to their limited ability to trickle. The patented design guarantees quiet and effective operation.

Any problematic materials (e.g. foreign bodies) are automatically detected and removed by a reverse turn of the screws (turn control). The feed screw with progressive screw blade ensures low energy consumption.

## Details and models



### Torsion spring joint

The joints are strengthened with torsion springs. The spring strengthening can be set in three stages, meaning the joints can be adjusted optimally to the current conditions.



### Articulated arms

The two robust articulated arms ensure reliable fuel transport. The arms are folded to reduce the resistance when the store is full.



### Tearing hooks

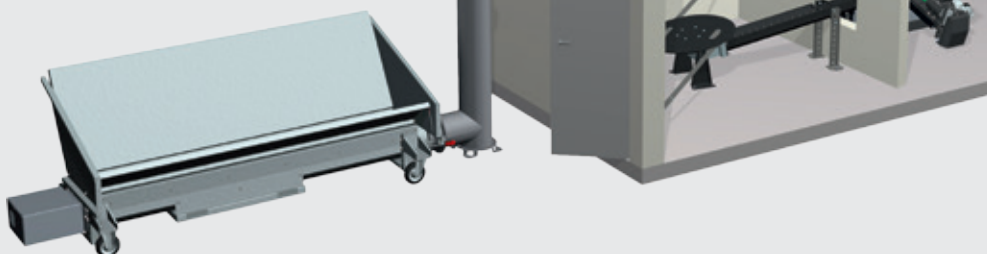
The robust tearing hooks loosen the fuel and ensure the store empties.

# Bunker filling systems

## Vertical feed screw

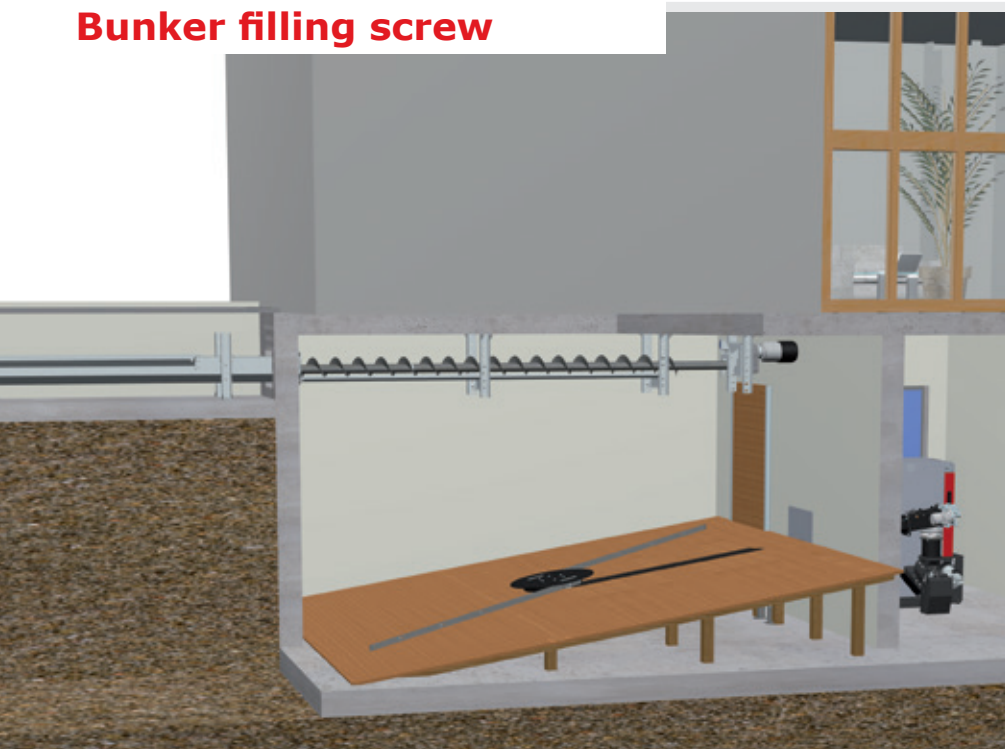


also available with vertical feed screw



The vertical feed screw sets new standards for feed output (up to 45 m<sup>3</sup>/h), operating safety and effective distribution. The wood chips are pushed from the tipping gutter into the vertical feed system, which transports the fuel to the desired height for the distribution device. In this way, the vertical feed screw enables dust-free filling of the store, guaranteeing even distribution of the fuel.

## Bunker filling screw



The bunker filling screw transports the fuel reliably into the fuel store and stops automatically when the bunker is full.

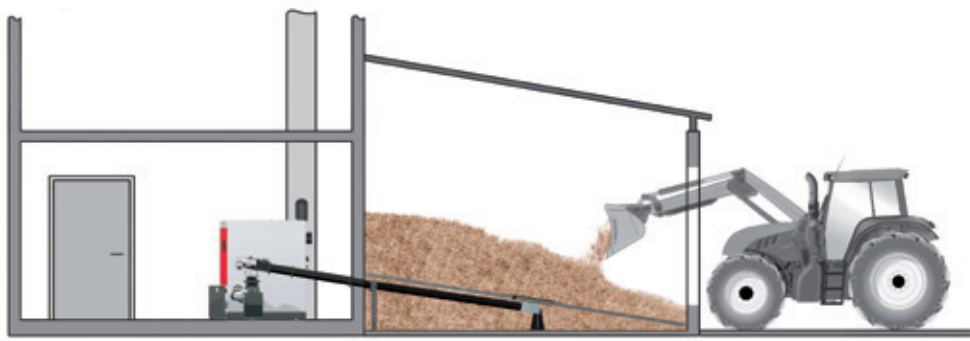
The fuel is transported using the bunker filling screw into the store space via the tipping chute which is located outside the store.

The sloping floor in the store is not essential.



## Some examples from a wide range of set-up options

### Filling at ground level



The boiler room is on the same level as the storage room which can be an inexpensive addition.

The fuel store can be filled easily using a front loader or similar through the large store door.

### Filling from above



The storage room is under the access level. The fuel is tipped into the store from above. This again can be an inexpensive addition. The raised floor shown is not essential from a technical point of view.

### Filling with a vertical screw



The storage room is above the boiler room. Fuel is fed into the boiler using a downpipe. The rotary valve (strictly required) is included in standard delivery. The store can be filled conveniently using the vertical feed screw or by blowing in the fuel.

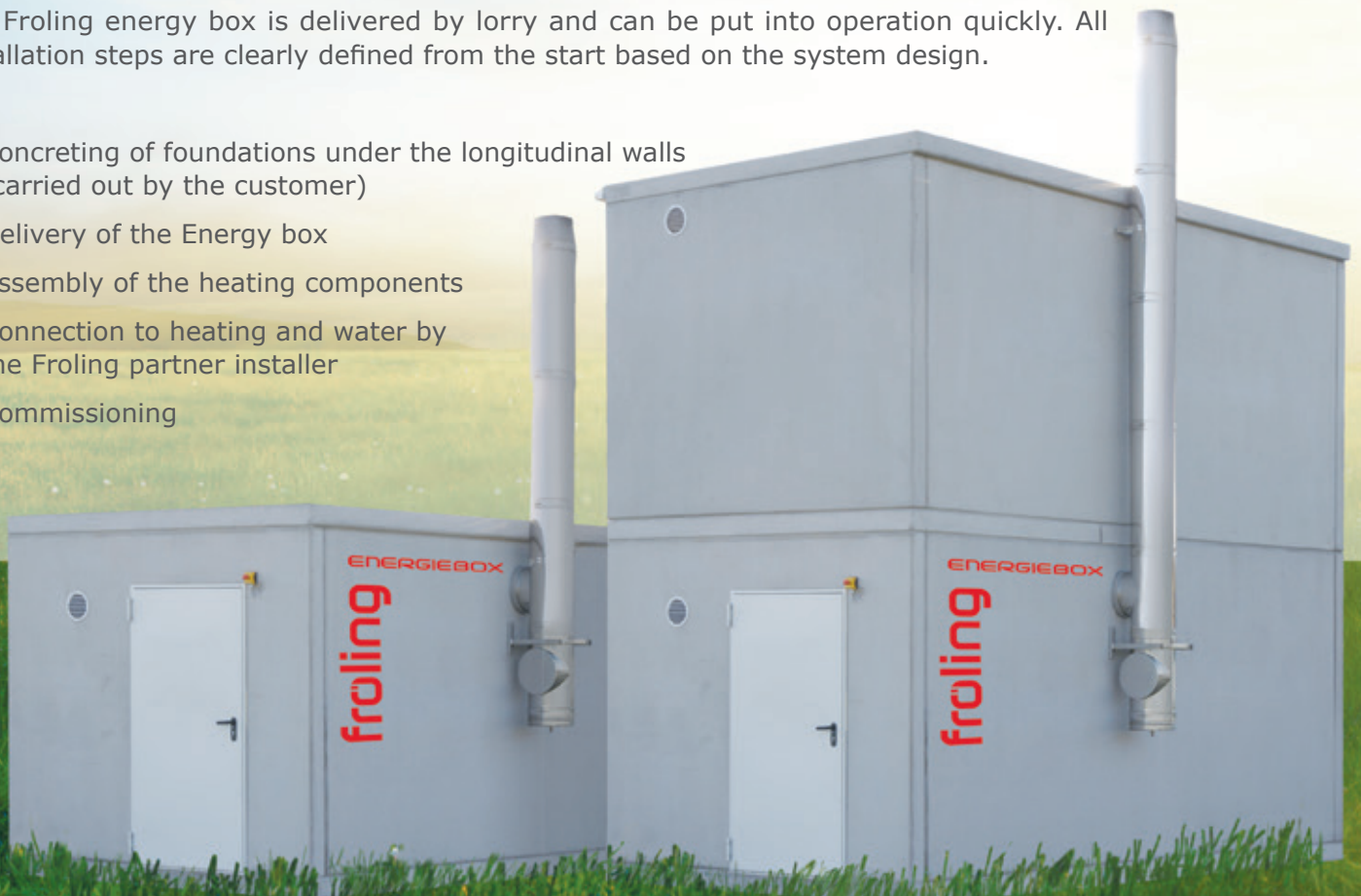
# Flexible complete solutions

## NEW: Froling energy box

Heating containers make it possible to move the boiler room and store, ensuring space savings and enabling installation of biomass heating, particularly during renovation of an existing building. The Froling energy box has been planned carefully down to the last detail: the boiler, feed system, fuel store (and the storage tank and chimney system depending on the design) are perfectly matched.

The Froling energy box is delivered by lorry and can be put into operation quickly. All installation steps are clearly defined from the start based on the system design.

- Concreting of foundations under the longitudinal walls (carried out by the customer)
- Delivery of the Energy box
- Assembly of the heating components
- Connection to heating and water by the Froling partner installer
- Commissioning



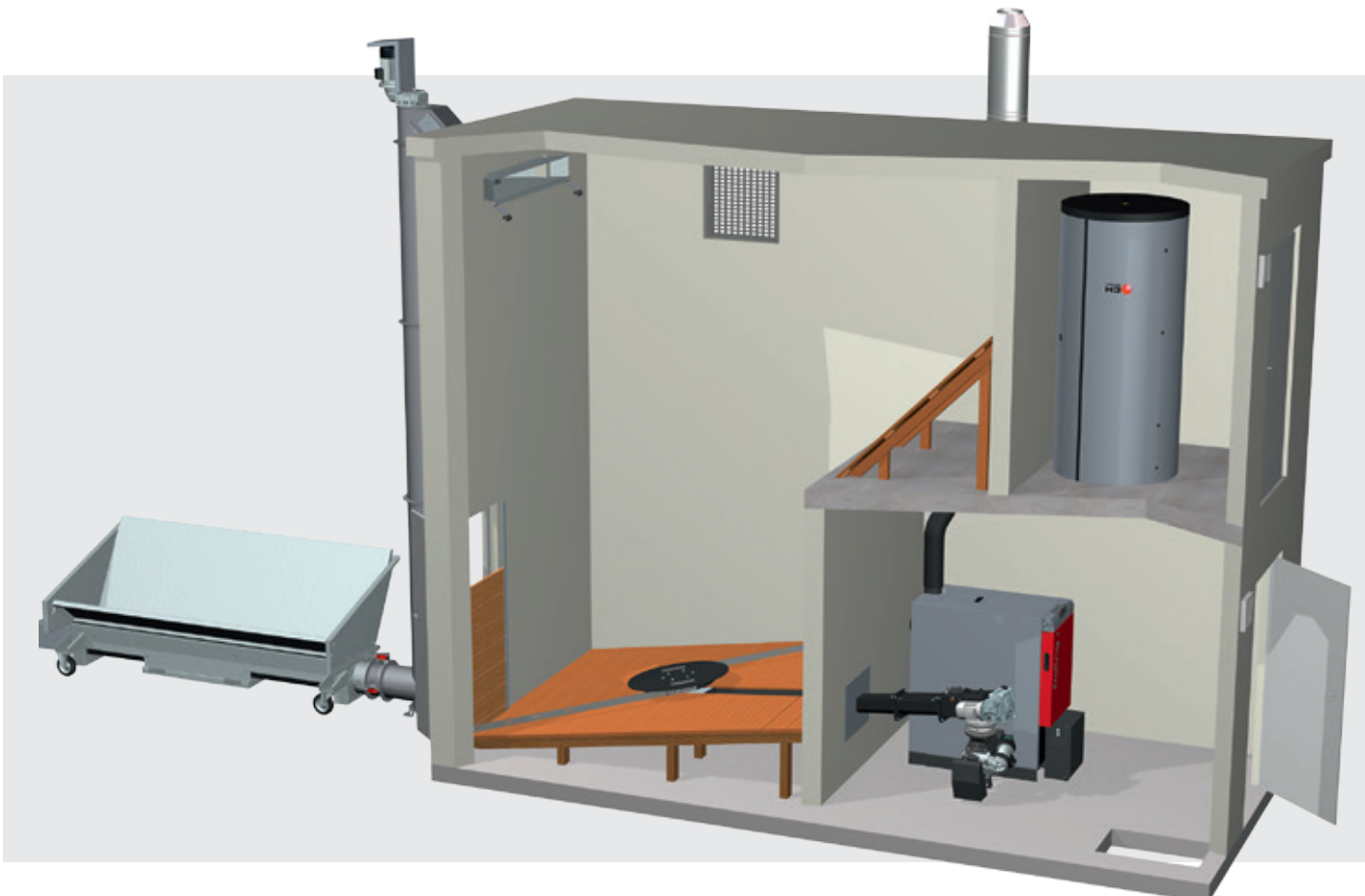
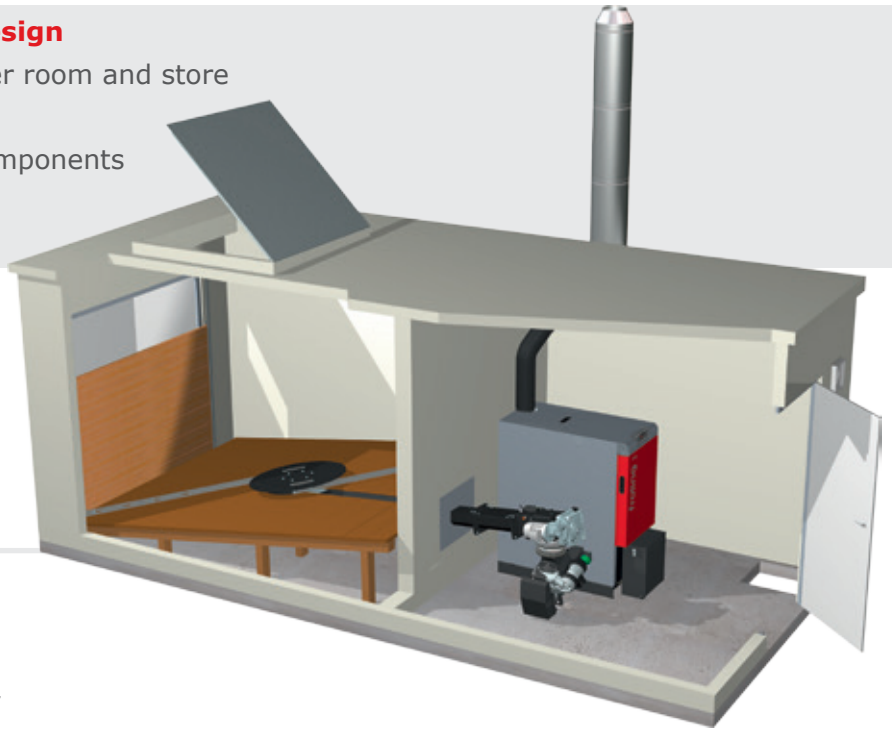


**Feature: intelligent system design**

- Advantages:
- relocation of the boiler room and store
  - all-in-one system
  - perfectly matched components

The Froling Energy box is an all-in-one complete solution. All components are perfectly matched to each other.

- Froling T4 wood chip system
- spring blade agitator SBA
- high-quality stainless steel chimney
- store door 80x200 cm
- prefabricated reinforced concrete container with all necessary recesses and openings
- wide range of special accessories (bunker filling systems, layered tanks, etc.)



# Systematic convenience

## Feature: **Lambdatronic H 3200 control**

- Advantages:
- exact combustion control with broadband lambda control as standard
  - large, clear control unit
  - control the heating from your living room (optional)
  - new boiler console with touch display



With the new Lambdatronic H 3200 boiler controller with touch display, Froling is taking a step into the future. 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 colour display.



By using the Froling **FRA room temperature sensor**, the main modes of the corresponding heating circuit can be easily selected and adjusted. The adjusting wheel allows you to change the room temperature by up to  $\pm 3^{\circ}$  C.

For even more convenience there's 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 changes can be set by pushing a button. The room console is connected to the boiler controller using a bus cable.

The RBG 3200 Touch has an impressive touchpad interface. The menu structure means it is intuitive and easy to use and its 4.3" colour display shows the most important functions at a glance.





## NEW: froeling-connect.com online control

Froeling's new online control, froeling-connect.com, allows you to check and control your Froeling boiler with boiler touch display anytime, anywhere. You can read or modify the main status information and settings easily and conveniently online (from your PC, smartphone, tablet PC, etc.). You can also specify which status messages you would like to receive by text message or e-mail.

The new froeling-connect.com service allows the owner of the heating system to enable additional users - for example the installer, a neighbour, etc. - to access the boiler and monitor the heating system, during holidays for instance.

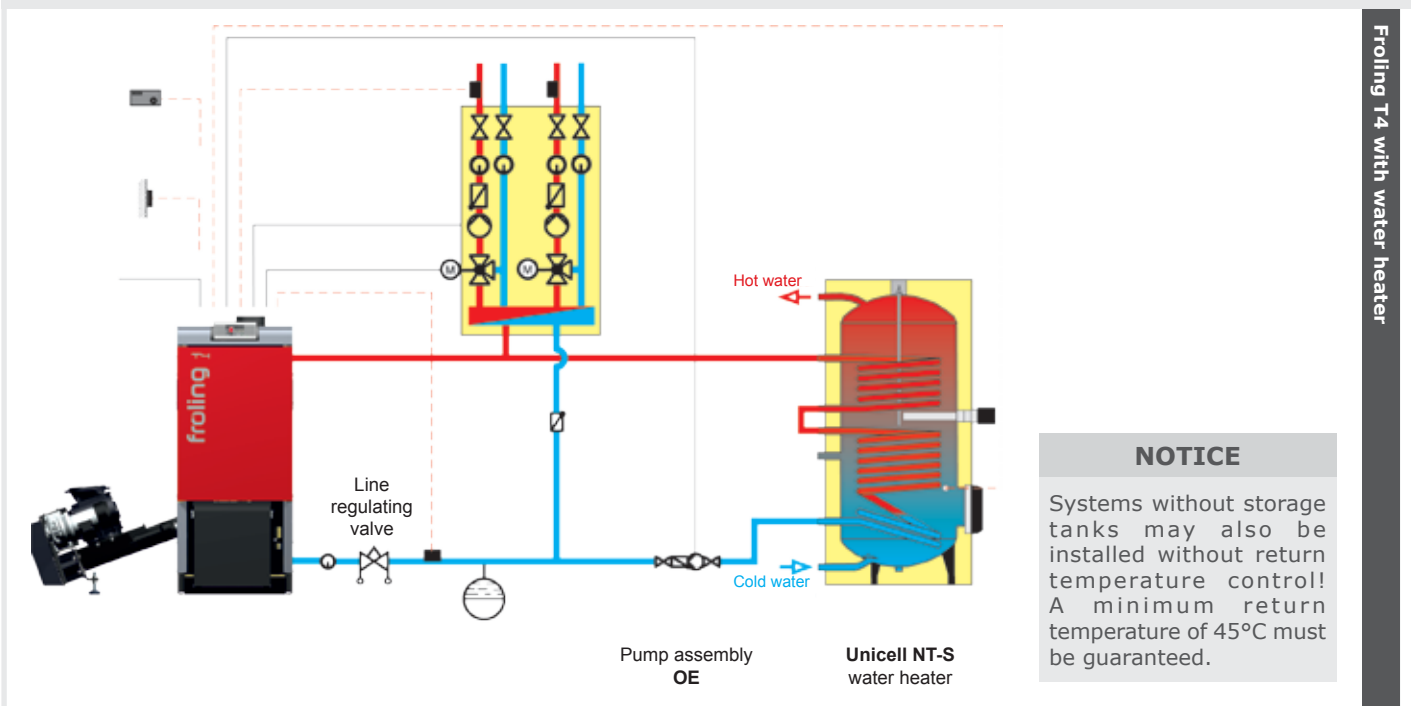


System requirements:

- Froeling boiler (core module software version V54.04, B05.09) with boiler touch display (software version V60.01, B01.20)
- broadband internet connection
- Froeling boiler internet connection via network
- web-enabled terminal device (smartphone/tablet PC/laptop/PC) with web browser

### Feature: systems engineering for optimum energy consumption

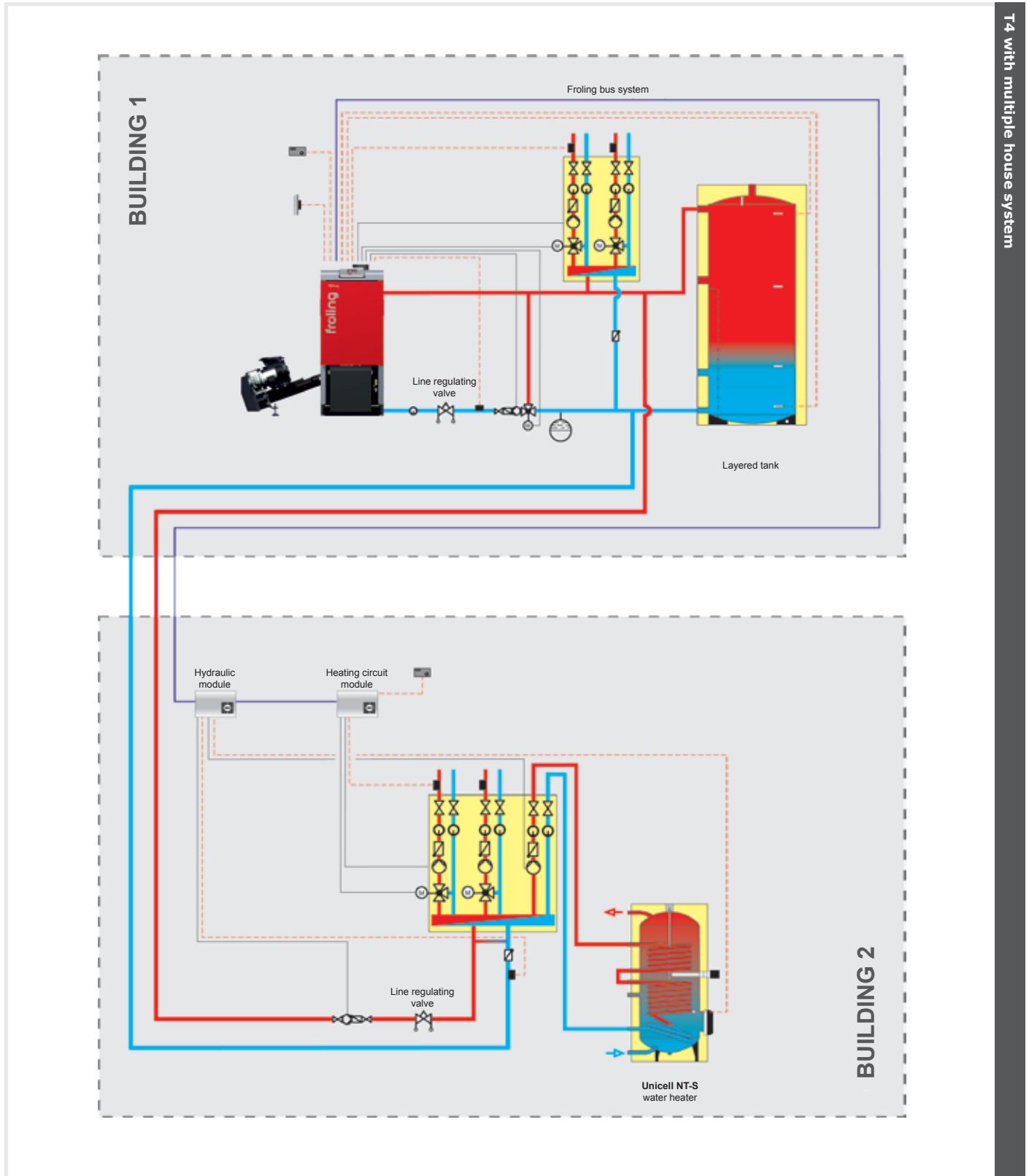
- Advantages:
- complete solutions for all requirements
  - the components work perfectly together
  - integrated solar power



**NOTICE**  
Systems without storage tanks may also be installed without return temperature control! A minimum return temperature of 45°C must be guaranteed.

# Perfect connections

The **Froling bus system** makes it possible to install extension modules at any location. The local controls can be installed wherever they are needed: at the boiler, at the heat distributor, at the tank, in the living room or in the house next door. Additionally, electric cables are kept to a minimum.





## Calculating the fuel requirement

The fuel requirement depends on the fuel quality. The following rule of thumb can be used to make a rough estimate:

### Wood chips:

Hard wood P16A/M30: **2.0 bulk cubic metres per kW heating load**  
(previously G30/W30)

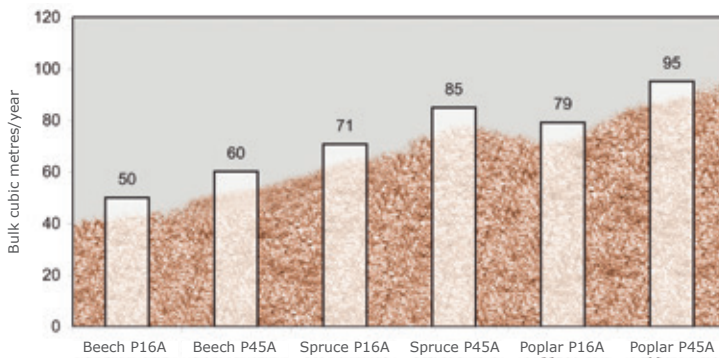
Soft wood P16A/M30: **2.5 bulk cubic metres per kW heating load**  
(previously G30/W30)

**Pellets:** **1 m<sup>3</sup> per kW heating load**

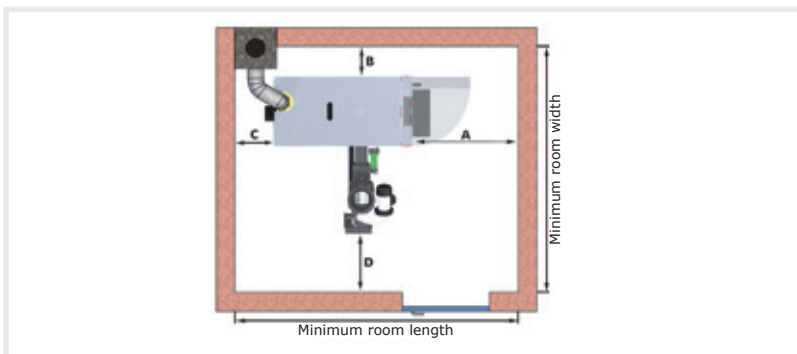
### Annual wood chip requirement in bulk cubic metres

Source: Bayerische Forstverwaltung

E.g. annual consumption approx. 57,500 kWh  
(T4 30 kW, 1,600 full load hours, 91% efficiency, M30 wood chips previously W30)



## Recommended minimum distances



Minimum distances [mm]	24/30	40/50	60/75	90 - 150
A Distance insulating door to wall	600	800	800	900
B Distance boiler side to wall	200	200	200	200
C Distance back to wall	500	500	200	500
D Distance stoker to wall	300	300	300	300
Minimum room length	2300	2500	2870	3305
Minimum room width	1860	2030	2030	2140
Minimum room height	1700	1900	1900	2150



### Wood chip fuel specification

#### P16A woodchips (previously G30)

Length 10 - 30 mm (20% up to 85 mm)  
Width 2.5 - 16 mm

#### P45A woodchips (previously G50)

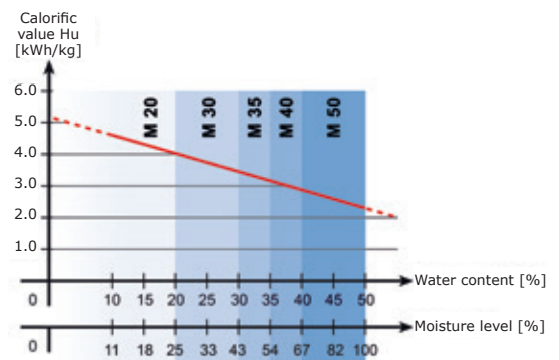
Length 30 - 50 mm (20% up to 120 mm)  
Width 5.6 - 31.5 mm

Water content max. 35%

Bulk weight approx. 210 - 250 kg/bulk cubic metres

Energy content 3.5 kWh/kg

### Heating value depending on water content and moisture



### Pellets fuel data

Length 5 - 30 mm (20% up to 45 mm)  
Diameter 6 mm

Water content max. 10%

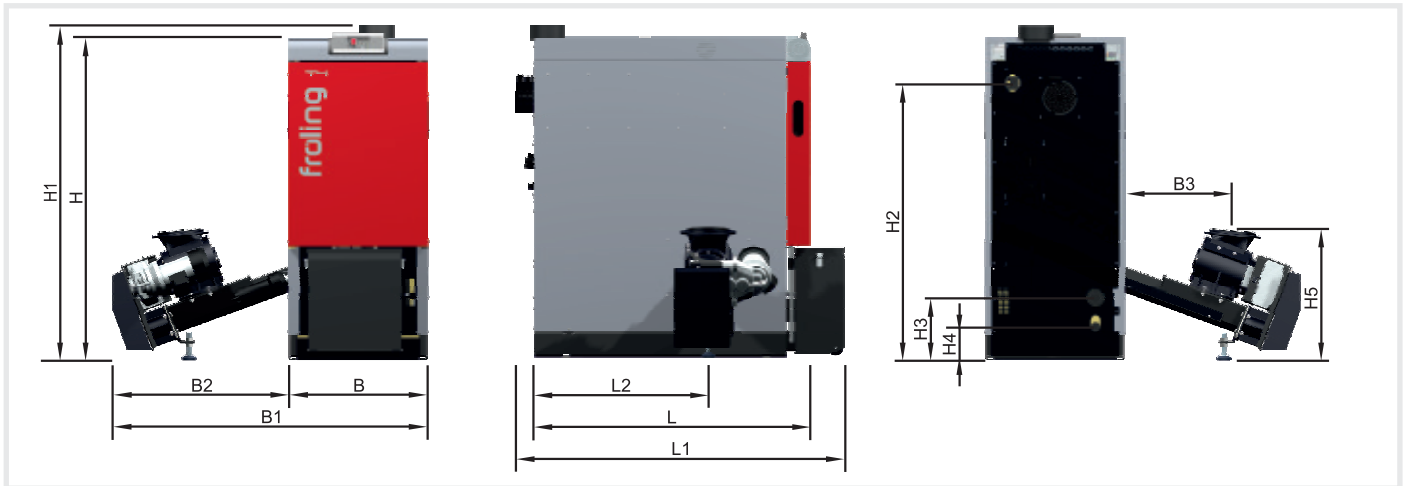
Bulk weight approx. 650 kg/m<sup>3</sup>

Ash content max. 0.5%

Dust content max. 2.3%

Energy content 4.9 kWh/kg

# Technical specifications



T4 dimensions		24 / 30	40 / 50	60 / 75	90 / 100 / 110	130 / 150	
H	Height of boiler	[mm]	1390	1620	1620	1720	1720
H1	Height of flue gas pipe connection	[mm]	1440	1670	1670	1770	1770
H2	Height of flow connection	(mm)	1195	1425	1425	1530	1540
H3	Height of return connection	(mm)	270	270	270	170	200
H4	Height of drain	[mm]	140	140	140	140	140
H5	Height of stoker connection	[mm]	580	650	650	650	650
B	Width of boiler (=positioning width)	[mm]	600	770	770	880	880
B1	Total width with stoker unit	[mm]	1360	1530	1530	1640	1640
B2	Width of stoker unit	[mm]	760	760	760	760	760
B3	Distance from side of the boiler to stoker connection	[mm]	470	470	470	470	470
L	Length of boiler (=length for positioning)	[mm]	1200	1200	1570	1570	1905
L1	Total length incl. ID fan and ash container	[mm]	1430	1430	1920	1920	2300
L2	Distance from back of boiler to stoker connection	[mm]	755	755	1045	1045	1305

T4 technical specifications		24	30	40	50	60	75	90	100	110	130	150
Rated heat output	[kW]	24	30	40	50	60	75	90	99	110	130	150
Output range	[kW]	7.2-24	9-30	12-40	15-50	18-60	22.5-75	27-90	30-100	33-110	39-130	45-150
Power connection		400 V / 50 Hz fused C16A										
Electrical power consumption (Pellets / wood chips)	[W]	74/115	84/142	86/150	88/158	102/176	122/204	142/232	156/250	156/250	210/240	264/262
Boiler weight (incl. stoker unit, excl. water)	[kg]	620	640	840	860	1060	1080	1350	1360	1370	1730	1750
Boiler water capacity	[L]	105	105	160	160	220	220	260	260	260	340	340
Maximum boiler temperature setting	[°C]	90										
Maximum operating pressure	[bar]	3										
Flue gas pipe diameter	[mm]	150	150	150	150	180	180	200	200	200	200	200

Your Froling partner:



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