



Wood chip, shaving and pellet boiler\_\_\_\_\_

# Lambdamat

COMMUNAL  
INDUSTRY



# High-tech without limits



Froling is a family business specialising in the efficient use of wood as an energy source for more than five decades. Today the name Froling represents state-of-the-art biomass heating technology. Our firewood, wood chip and pellet boilers are in successful use right across Europe. All of our products are manufactured in company-owned factories in Austria and Germany. Our extensive service network guarantees full coverage and reliability

## Wood chips, shavings, pellets and more



In particular, wood chips are a local and environmentally-friendly fuel which is not susceptible to the crises and fluctuations of heating oil. Furthermore, the manufacture of wood chips secures local jobs. Looking at it from an environmental and economical point of view, wood chips are the ideal fuel. Scrap wood such as branches, twigs and sawmill cuttings are shredded into wood chips. Depending on the source used, the quality classes of wood vary.



Wood pellets are made of natural wood. Large amounts of wood shavings and sawdust as a by-product in the wood-processing industry are compressed into pellets without any further treatment. Pellets have a high energy density and are easy to deliver and store. These are just some of the advantages that make pellets the ideal fuel for fully automatic heating systems. Pellets are delivered by tanker and unloaded directly into your storage tank.



Shavings are a waste material and a by-product of the wood-processing industry, and are therefore logically the ideal fuel for this industry. The characteristics of this exceptional dry heating material require robust combustion technology.

## The result of systematic research and development!

Froling's Lambdamat is a unique, fully automatic heating system for burning wood chips, shavings and pellets. It not only offers innovative combustion technology, but also offers a high level of convenience and operational reliability. The two different types of boiler system cover the following application requirements: an "Industry" model for dry fuels and a "Communal" model for fuels with up to 50 % water content.

### Lambdamat Industry

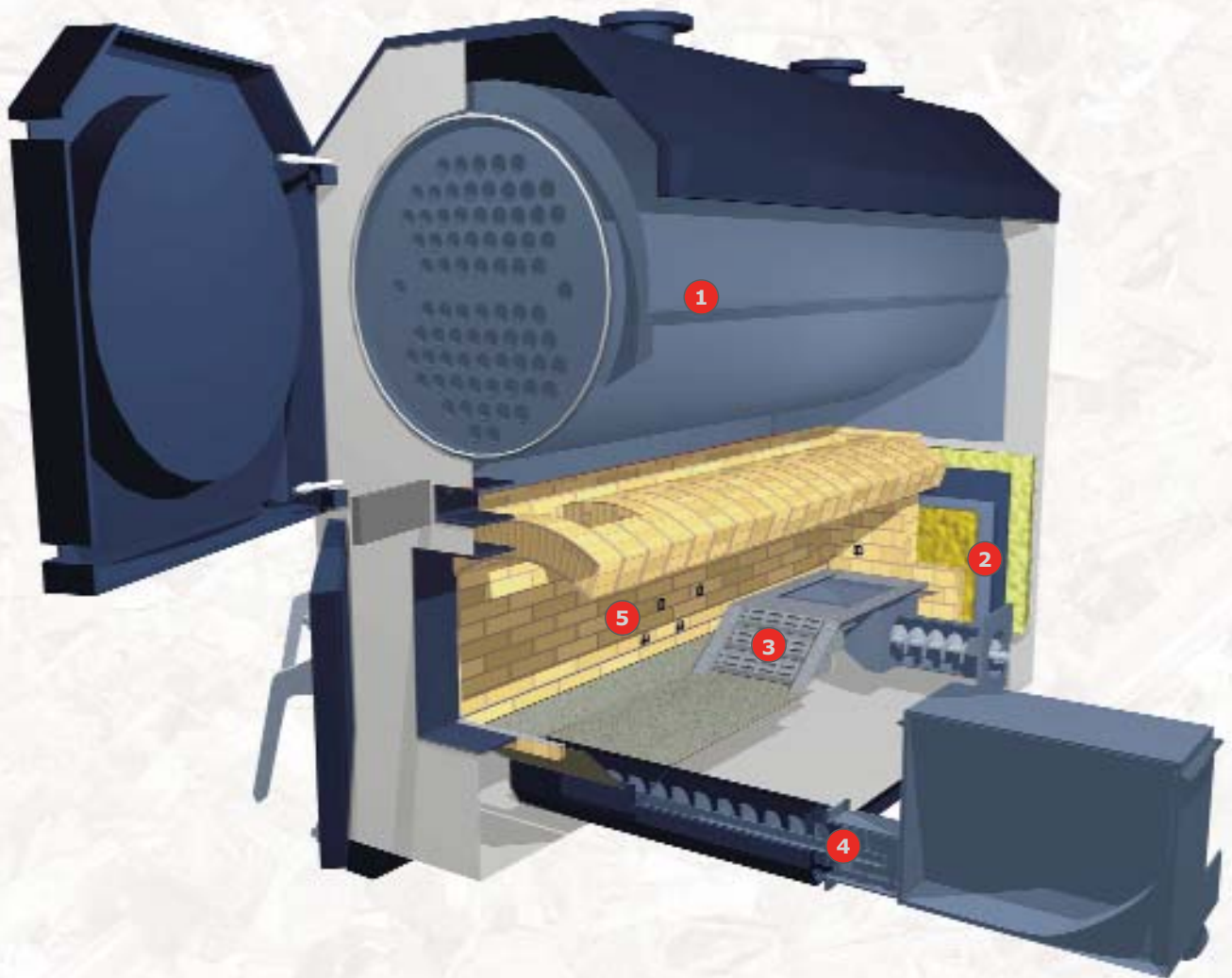
The Froling Lambdamat Industry scores with its compact design. The boiler is easy to install, even in difficult locations, since it is delivered in two separate parts. The connection to the loading systems on the right, left or rear is simple and easy to do with the reliable variable stoker connection.

### Lambdamat Communal

The special combustion chamber shape featured in the Froling Lambdamat Communal is ideal for burning damp fuel (up to 50 % water content possible) and high bark content. The hydraulic conveyor grate continuously transports the fuel through the combustion chamber, ensuring that even heavy fuels are completely burned. Next to full loading by feed screws, this boiler technology can also be supplied with a hydraulic loading system.

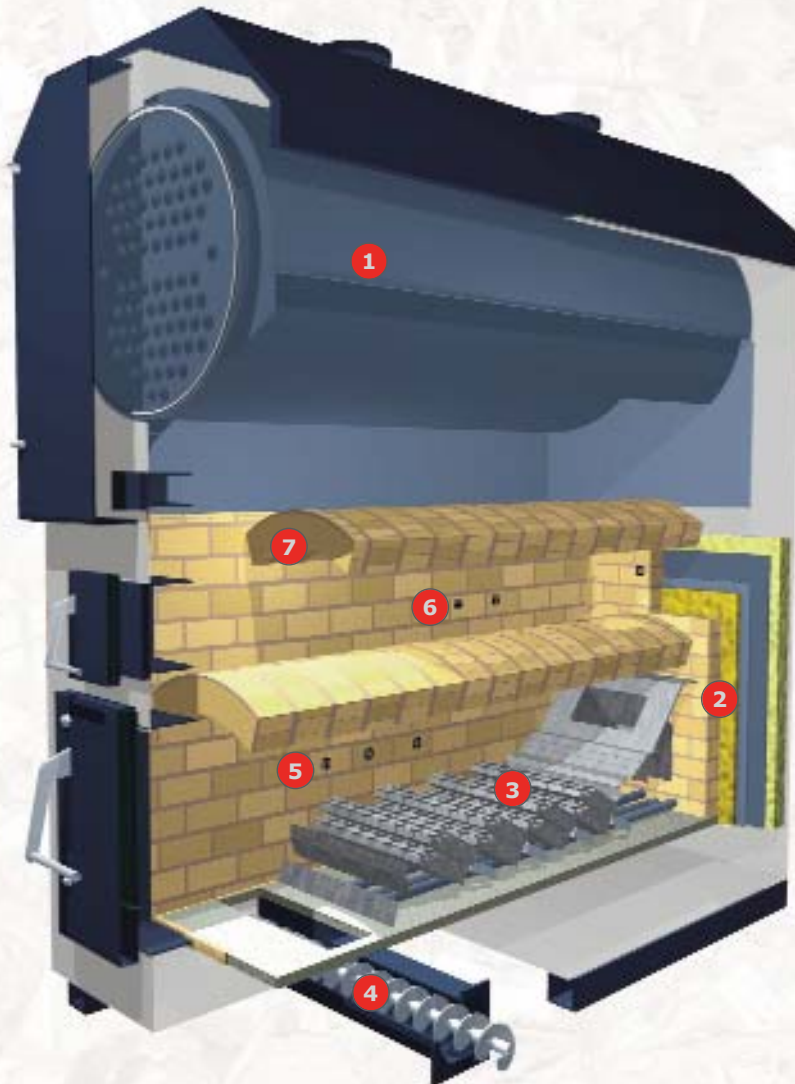


# Sturdy technology with smart details



## Highlights:

- 1 Multifunctional heat exchanger which features large heat exchanger surfaces. Convenient maintenance is ensured by large and easy to reach cleaning and maintenance openings.
- 2 Multi-layer high temperature combustion chamber for high efficiency and clean combustion.
- 3 The moving step grate with primary air intake system enables automatic grate cleaning and ash removal - thus almost maintenance-free operation.
- 4 Fully automatic ash removal in one ash container.
- 5 The secondary air openings ensure optimum combustion and a complete burn-out.



## Highlights:

- 1 Multifunctional heat exchanger which features large heat exchanger surfaces. Convenient maintenance is ensured by large and easy to reach cleaning and maintenance openings.
- 2 Multi-layer high temperature combustion chamber for high efficiency and clean combustion.
- 3 The hydraulically operated conveyor grate with primary air intake system keeps the fuel moving continuously and ensures complete burn-out (even with heavy fuels).
- 4 Fully automatic ash removal.
- 5 The secondary air openings ensure optimum combustion and a complete burn-out.
- 6 Tertiary air vents for increased efficiency during combustion. The fully controlled flue gas recirculation AGR (optional) optimises burning (output, emissions etc.) with particularly demanding fuels.
- 7 The double tunnel vault guarantees the optimum burn-out of fuels with a high water content.

# Systematic convenience

## Feature: **Lambdatronic H 3000 control**

- Advantages:
- Optimum combustion control
  - Adjusts to different fuel characteristics
  - Remote maintenance (optional)

The Lambdatronic's modular control concept ensures ideal combustion. The boiler automatically adjusts to the various characteristics of the fuels being used. Furthermore, the Lambdatronic control system provides weather-activated control of different heating circuits and precise control of the storage systems. Using a modem, maintenance can be carried out directly by Froling through a remote system. The Lambda control with precise primary and secondary air control, combustion chamber temperature sensor and underpressure control (monitors the strength of the ember bed) ensure perfect combustion. The Lambdamat Communal 750/1000 kW ensures with the additional tertiary air control and flue gas recirculation FGR (optional) a maximum efficiency and a perfect combustion process (output, emissions, etc.).

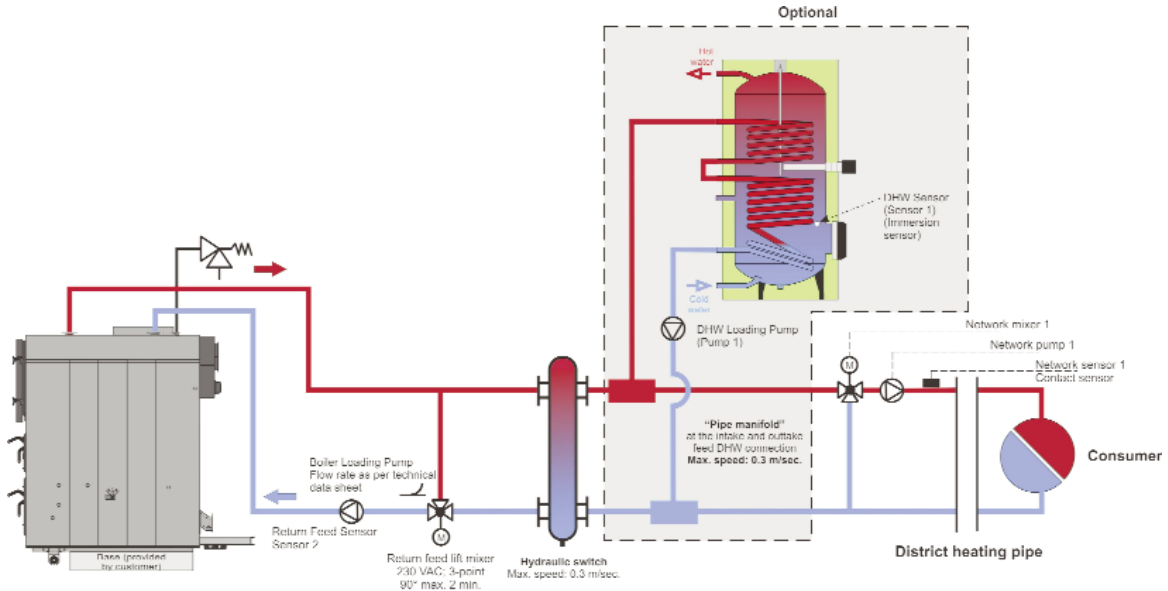


## Feature: **Froling Display Software**

- Advantages:
- Monitor and operate from your PC
  - Record boiler data
  - Remote monitoring via modem

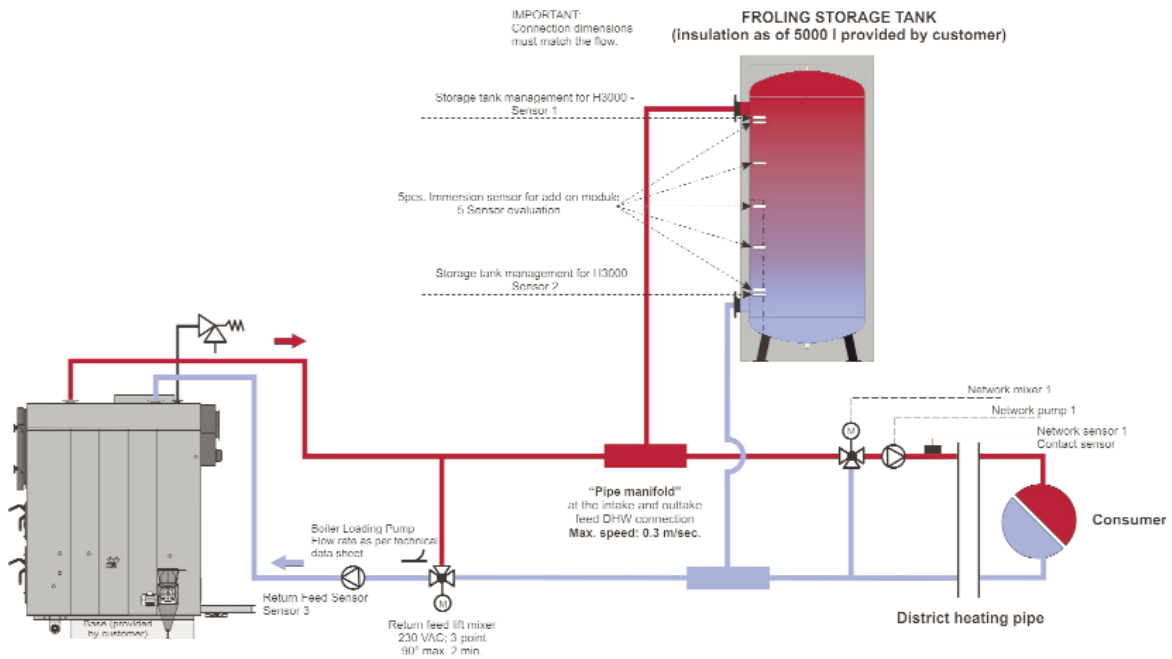
The optional boiler display software enables convenient remote control of the system from a computer. All operating values and customer parameters can be displayed and modified. The common Windows interface and clearly laid out menu structure make it easy to use.

In combination with a modem, it is possible to connect to the display software via the telephone network. The secondary air openings ensure optimum combustion and a complete burn-out.



**FROLING LAMBDMAT**  
wood chip burner with  
control: Lambdatronic H3000

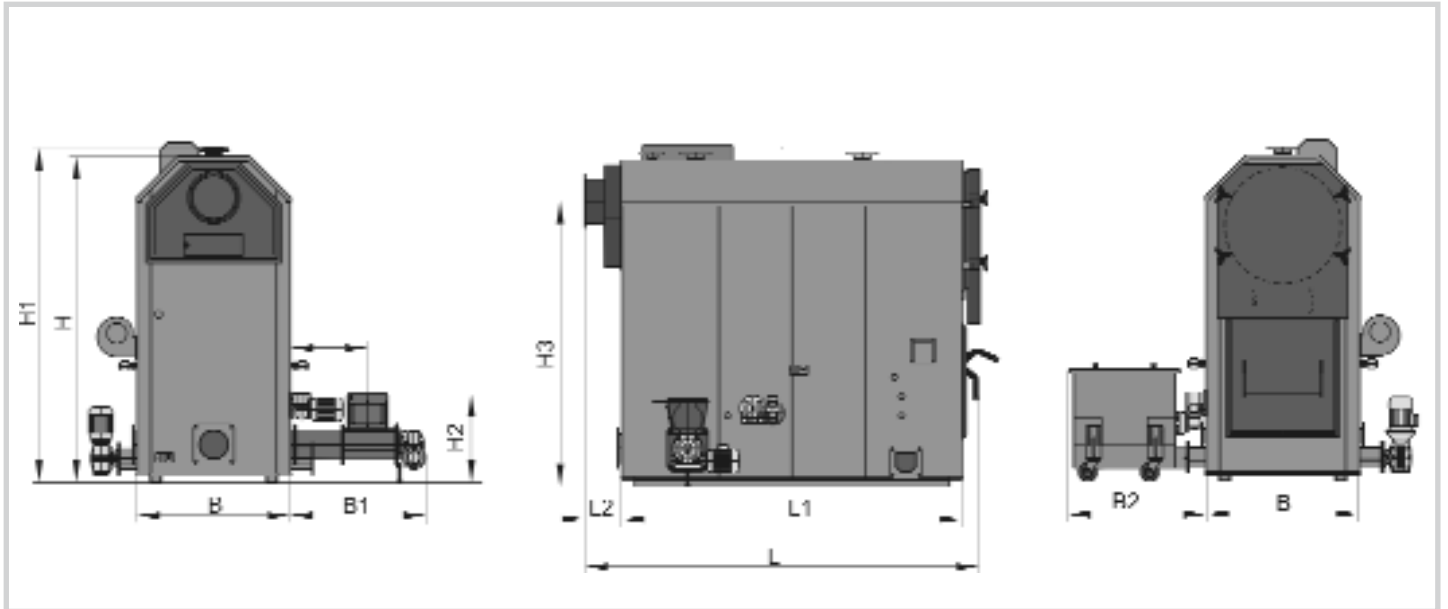
**IMPORTANT:** Using a hydraulic switch instead of a storage tank requires a continuous and a constant or slightly variable power consumption!



**FROLING LAMBDMAT**  
wood chip burner with  
control: Lambdatronic H3000

# Technical specifications

## Lambdamat Industry



DIMENSIONS		150	220	320	500	750	
H	Boiler height <sup>1)</sup>	[mm]	1971	2243	2243	2501	2867
H1	Height, intake & outtake	[mm]	2030	2300	2300	2550	2930
H2	Height, Stoker	[mm]	609	609	609	675	705
H2	Height, flue gas pipe	[mm]	1709	1961	1961	2207	2520
B	Boiler width	[mm]	926	1066	1066	1266	1500
B1	Width, stoker incl. gears	[mm]	960	970	970	970	950
B2	Width, ash can 180 l / 300 l	[mm]	975 / 1038	975 / 1040	975 / 1040	975 / 1039	993/996
L	Total length	[mm]	2165	2715	2715	2760	3070
L1	Boiler length	[mm]	1806	2356	2356	2356	2710
L2	Length, flue gas collection box	[mm]	254	257	257	302	250

1) Height, excl. safety heat exchanger.

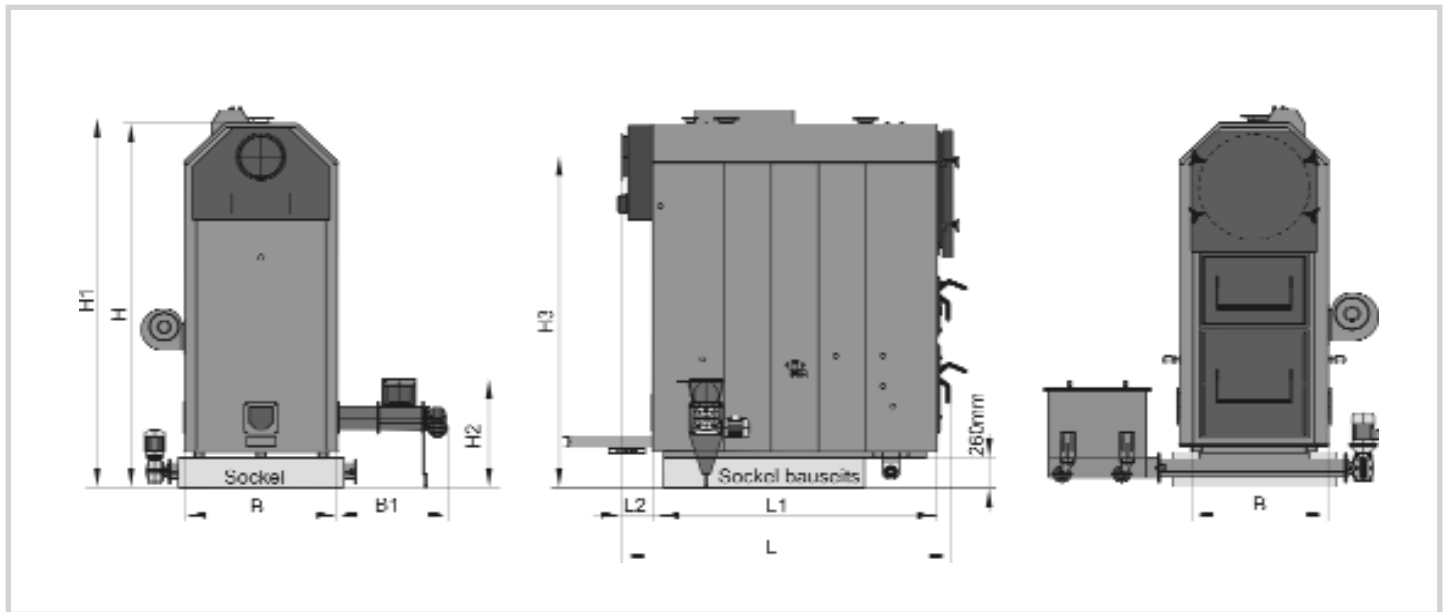
2) Length, incl. door and flue gas collection box.

TECHNICAL SPECIFICATIONS		150	220	320	500	750
Rated heat output <sup>1)</sup>	[kW]	150	200	300	499	750
Required fuel consumption at G50/W20	[kg/h]	45	70	100	155	230
Flue gas pipe diameter	[mm]	200	250	300	350	400
Weight - boiler	[kg]	2166	3693	3878	5019	8510
Boiler capacity (water)	[l]	440	850	760	1060	1740
Maximum permitted operating temperature	[°C]	110	110	110	110	110
Permitted operating pressure	[bar]	4	4	4	4	4
Flue gas temperature	[°C]	220	220	220	220	220

1) The use of dry fuels (pellets, carpentry materials (shavings), etc.) can result in a limited output range.



## Lambdamat Communal



DIMENSIONS		320	500	750	1000	
H	Boiler height <sup>1)</sup>	[mm]	2745	3174	3597	3849
H1	Height, intake & outtake <sup>1)</sup>	[mm]	2802	3224	3656	3910
H2	Height, stoker (incl. BBF) <sup>1)</sup>	[mm]	950	950	1270	1040
H3	Height, flue gas pipe <sup>1)</sup>	[mm]	2210	2880	3150	3300
B	Boiler width	[mm]	1070	1270	1630	1630
B1	Length, stoker incl. gears	[mm]	912	900	1260	1011
L	Total length <sup>2)</sup>	[mm]	2715	2715	3070	3740
L1	Boiler length	[mm]	2350	2350	2710	3350
L2	Length, flue gas collection box	[mm]	257	257	257	257

1) Height incl. base to be constructed on-site (H = 260 mm).

2) Length, incl. door and flue gas collection box.

TECHNICAL SPECIFICATIONS		320	500	750	1000
Rated heat output <sup>1)</sup>	[kW]	300	499	750	999
Required fuel consumption at G50/W20	[kg/h]	100	155	230	305
Flue gas pipe diameter	[mm]	300	350	400	450
Weight - boiler	[kg]	5780	7350	11440	13950
Boiler capacity (water)	[l]	790	1100	1840	2390
Maximum permitted operating temperature	[°C]	110	110	110	110
Permitted operating pressure	[bar]	4	4	4	4
Flue gas temperature	[°C]	220	220	220	220

1) The use of dry fuels (pellets, carpentry materials (shavings), etc.) can result in a limited output range.

# Fuel feed systems

## Froling discharge systems - design development perfected over decades

Froling has expertise designing discharge systems spanning many years. Covering systems which are large or small, Froling provides sturdy feeder systems, which meet the highest technical standards. For example, the Lambdamat Communal can be connected to a hydraulic feeder system, which is ideal for bulky or bundled fuels.

### Torsion arm agitator (TGR)



For discharging fuels 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.

### Inclined screw feeding unit



Mainly used as a silo discharge screw in the wood-processing industry. Provides even and reliable fuel discharge from high silos.

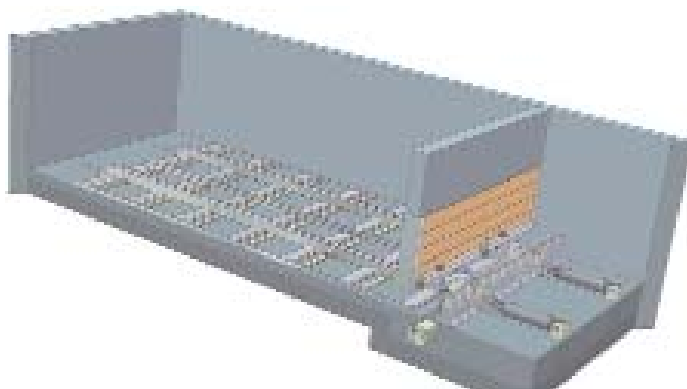
# Froeling discharge silo systems

## Horizontal screw feeding unit



Sturdy construction to take in extremely high feed loads when discharging from high silos. Especially designed for shavings and large diameter bunkers.

## Sliding floor feeding unit



Optional design for rectangular storage rooms. Suitable for all common biomass fuels. The sliding floor feeding unit is extremely sturdy and has proven to be specifically suitable for discharging fuels from large wood chip stores.

Furthermore, there are numerous flexible solutions available for individual fuel transport, such as scraper chain conveyors, conveyor belts, vertical transport systems, feeder systems without screws, fully hydraulic loading systems, etc.

**Please contact our sales engineers for further details.**

# In operation across Europe



## FRANCE - Angers municipal nursery

Boiler: 2x Lambdamat Industry 500 kW - double boiler system  
Discharge unit: 2x articulated arm feeding units / diameter 5.7 metres  
Fuel: Wood chips



## ITALY - Idrochianti

Boiler: Lambdamat Industry 320 kW  
Discharge unit: Articulated arm feeding unit / diameter 3.0 metres  
Fuel: Wood chips



## AUSTRIA - Ritzlhof College

Boiler: Lambdamat Communal 750 kW and Turbomat 500 kW  
Discharge unit: Sliding floor feeding unit  
Fuel: Wood chips



## GERMANY - Zschadraß Christian social welfare organisation

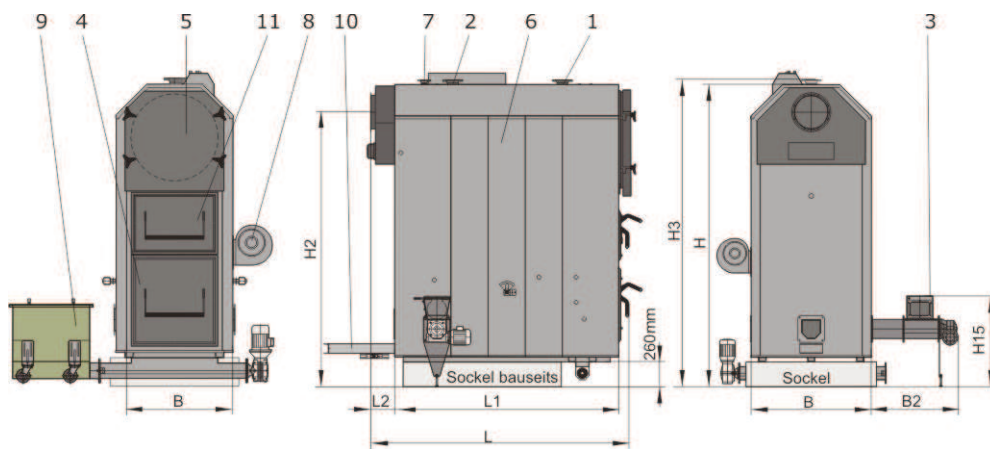
Boiler: Lambdamat Industry 999 kW  
Discharge unit: Hydraulic pusher discharge unit with transverse conveyor screw  
Fuel: Wood chips

Further technical details on request.  
Always at your disposal to advise you.

**froling** 

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- 1 ...Boiler flow connection
- 2 ...Boiler return connection
- 3 ...Stokerunit
- 4 ...Combustion chamber
- 5 ...Heat exchanger
- 6 ...Insulation
- 7 ...Safety valve connection
- 8 ...Combustion air blower fan
- 9 ...Ash container combustion chamber
- 10 ...Grate drive

Lambdamat KOM		320	500	750	1000	
Rated heat output at W30	kW	300	500	750	999	
Permitted boiler working overpressure	bar	4	4	4	4	
Permitted outfeed temperature	°C	95	95	95	95	
Minimum return feed temperature	°C	65	65	65	65	
Boiler capacity (water)	Litres	790	1100	1840	2390	
Total dry boiler mass	kg	5780	7350	11440	13950	
Firebrick weight	kg	2500	2600	4320	5750	
Chamber/Heat exchanger	kg	2000 / 1280	2700 / 2010	3620 / 3500	3900 / 4300	
Water-side resistance (dT = 20 K)	mbar	18	15	15	27	
Flow rate (dt = 20 K)	m <sup>3</sup> /h	13,78	21,49	32,24	42,99	
Flow rate (dt = 15 K)	m <sup>3</sup> /h	18,34	28,66	42,99	57,32	
<b>Boiler data for dimensioning the flue gas system</b>						
Flue gas temperature	°C	220	220	220	220	
Quantity of wood chip fuel required W20	kg/h	100	155	230	305	
Flue gas mass flow	kg/h	1409	2201	3302	4402	
Flue gas mass flow	m <sup>3</sup> /h	1003	1567	2351	3134	
Feed pressure required	Rated load	Pa	2	2	2	
Flue pipe diameter	mm	300	350	400	450	
<b>Dimensions</b>						
L	Boiler depth	mm	2715	2710	3070	3740
B	Boiler width	mm	1070	1270	1630	1630
H	Boiler height	mm	2745	3174	3597	3849
B12	Length of ash trolley 180 l / 300 l	mm	973 / 1036	945 / 1038	971 / 1034	954 / 1017
L12	Width of ash trolley 180 l / 300 l	mm	540 / 1020	540 / 1020	540 / 1020	540 / 1020
L1	Length of boiler	mm	2350	2305	2710	3380
L2	Depth of settling chamber	mm	257	252	252	252
L15	Distance from centre of stoker to boiler	mm	522	509	860	610
H2	Height of flue pipe	mm	2463	2880	3250	3560
H3	Outfeed / return feed height	mm	2802	3224	3656	3910
H15	Gravity shaft height (including BBF)	mm	950	950	1270	1040
Outfeed / return feed connection	DN/PN6		100	100	100	125
Safety valve connection	DN/PN6		50	50	65	65