**When it comes to sustainability,
we think from the ground up.**

GILLES BIOMASS BOILER

The most efficient way to heat on a low to zero carbon fuel

remeha
renewable technologies

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REMEHA COMMERCIAL - HIGH PERFORMANCE, HIGH EFFICIENCY BIOMASS BOILER TECHNOLOGY

Remeha Commercial has been manufacturing and supplying high performance low-carbon and energy-efficient heating products since 1935. Climate change is globally considered to be one of the most pressing and challenging issues of our time. As a company, Remeha is committed to creating a more sustainable future with new products that will support businesses and organisations in meeting our UK environmental and legislative targets and the nation in achieving decarbonisation.

Climate change is caused by the emission of harmful greenhouse gases which act like a blanket over the Earth's surface, trapping heat in the atmosphere and raising surface and atmospheric temperatures with devastating results to the planet. Carbon dioxide (CO_2) is one of the primary greenhouse gases.

Heating currently accounts for almost half of the UK's carbon emissions. Using biomass as a fuel to produce deliver low carbon heating and hot water from a renewable source could significantly reduce this. The Carbon Trust suggests that lifetime CO_2 emissions for woodchip biomass are in the range of 10-23 kg CO_2/MWh compared with 263-302 kgCO_2/MWh for natural gas. As technology advances, biomass boilers now offer greater ease of use and flexibility making them one of the most popular of all renewable technologies.

Remeha's range of high performance biomass boilers provide controllable, environmentally-friendly, low-carbon heating with efficiencies of up to 96% GCV and emission levels significantly below the new minimum levels of Building Regulations. Biomass boilers are often specified in conjunction with gas condensing boilers. The Remeha range of biomass boilers is fully-compatible with our market-leading, renewable-ready, high-efficiency gas condensing boilers, offering a quality solution to energy-efficient, low to zero carbon heating from a single supplier. With our technologically-advanced range of biomass boilers, our knowledgeable team and our experience of around 600 installations across the UK, when the heat is required on demand, Remeha Commercial can help.

BIOMASS AND CLIMATE CHANGE

One of the most important environmental benefits of using sustainably produced wood for energy in place of fossil fuels is its positive impact in helping moderate long-term global climate change.

Fossil fuel combustion takes carbon that was locked away underground (as crude oil, gas, or coal) millions of years ago and transfers that carbon to the atmosphere as new CO_2. When wood is burned, on the other hand, it recycles carbon that was already in the natural carbon cycle, which is recaptured through sustainable forest growth. Consequently, the net long-term effect of burning wood fuel is considerably less, as long as the sources from which the wood came are sustainably managed.

Biomass offers three key advantages over fossil fuel alternatives:

Carbon savings: using solid biomass for heating typically gives reductions in carbon of around 80 to 90 per cent compared with fossil fuel alternatives.

Fuel price savings: biomass is up to 80% cheaper than heating oil.

RHI funding: Government support through the Renewable Heat Incentive means that biomass generates considerable annual payments for the amount of heat it generates and uses. This funding is dependent on boiler size and heat output

The Remeha range of fully-automated wood chip and wood pellet biomass boilers uses advanced combustion technology to achieve an outstanding combustion efficiency of up to 96%, resulting in lower fuel consumption and reduced ash of just 0.5-1%.

With emission levels significantly below the new minimum levels of Building Regulations, Remeha biomass boilers meet all environmental regulations and are eligible for RHI funding.

FUEL CHOICES

This guide is to help the designer decide which wood fuel to choose and assumes that the choice to burn wood chips or pellets as a fuel has been made and that the different characteristics of the fuel need to be considered before making a final decision.

Wood pellets have a calorific value and a higher bulk density than Wood chip, this could make them more suitable for installations with a limited storage capacity or where frequent fuel deliveries are not viable (the calorific value of 5m³ of Wood pellet is equivalent to approximately 18m³ of Wood chip).

Wood pellets Vs Wood chips

- Pellets flow freely whereas chips do not
- Pellets are a more dense form of fuel than chips therefore take less storage space per kW/hr
- Pellets are generally more expensive per kW/hr than chips
- A wood chip boiler can burn pellets whereas a pellet boiler can't burn wood chip

Summary

At the time of writing chips are about 60% of the cost per kW/hr of Natural Gas and pellets are about the same as Natural Gas, therefore chips do have the possibility of giving a payback as well. Pellets are about 50% the cost of Gas Oil per kW/hr.

If fuel storage space, on site labour or a local supply of chips are unavailable, it is evident that pellets will give a significant carbon reduction over traditional heating fuels.

	Wood pellet	Wood chip
Density kg/m³ approx	650	200
Heat output kW hr/m³ approx	3000	800

WOOD FUEL STORAGE

Consideration now needs to be given to the type of fuel store suitable for the different fuels as each has a different requirement. There is however one overriding consideration to bear in mind for both fuels: it is easier to move the heating system water than wood fuel, so try to keep the fuel store as close to the wood boiler as possible. The simpler the fuel route the better!

What capacity does the fuel store need to be?

Calculation of the fuel store capacity is dependent upon a number of factors:

- What output is the boiler in kW?
- How many hours per week will it be in operation?
- Which type of fuel is being used – pellet or chip?
- How often are fuel deliveries feasible?
- What is the capacity of the delivery vehicle?

Wood chip example

A 160kW boiler in a school working 6hrs per day at full output burning wood chip will burn the following amount of fuel per week.

160kW x 6hrs per day x 5 days per week = 4800 kW/hrs per week.

4800 divided by 800 (the amount of kW/hrs per m³ of chips) = 6m³ per week.

Most fuel delivery vehicles carry approximately 30m³ of fuel so in this instance if a 36/38m³ store could be created a delivery would be required approximately every 6 weeks without the store needing to be fully empty to receive a full load.

Wood pellet example

A 100kW boiler in a sports centre working approximately 12hrs per day at full output burning pellets will burn the following amount of fuel per week.

100kW x12hrs per day x 7 days per week = 8400kW/hrs per week.

8400 divided by 3000 (the amount of kW/hrs per m³ of pellets) = 2.8m³ per week.

That would require a full load approximately every 10 weeks or a half load every month or so.

CALCULATIONS AT A GLANCE:

Wood chip

Boiler output (kW) x hrs run per day x day run per week = kW/hrs produced per week.

kW/hrs per week divided by 800 (kW/hrs per m³ of chips) = m³ required per week.

Wood pellet

Boiler output (kW) x hrs run per day x day run per week = kW/hrs produced per week.

kW/hrs per week divided by 3000 (kW/hrs per m³ of Pellet) = m³ required per week.

Wood chip storage

As mentioned previously, chips do not free flow so are not suitable for the sort of storage used for pellets. To move chips from the store to the transport system, a Sweep Auger needs to be used.

In operation the auger, which is driven by an electric motor, transfers its drive into a gearbox underneath the circular disc which then makes the arms rotate and drag the fuel to the auger. The fuel is then transported to the boiler via auger(s) like wood pellets.

Choose the largest diameter sweep collector that will fit between the fuel store walls to minimise fuel left around the edges.

Sweep collector operation undermines fuel causing it to fall inwards and then be fed into the feed auger. One motor drives the sweep collector and feed auger.

The wood chip store should be as square as possible to minimise the fuel left in the corners.

Wood pellet storage

As previously mentioned, pellets will flow freely so they can be kept in a fuel store with a sloping floor to a central feed auger (ideal slope of 40 degrees or more). The fuel can then be moved using augers to the boiler or feed another auger to take the fuel further using extra augers. Alternatively, if no fuel storage room is available or you do not want to adapt one, other pellet storage options are available.

BIOMASS FUEL CALCULATOR FOR 5 DAY WEEK

Chip (800kW/hrs/m³ @ 200kgs)

Boiler Output kW	Full Load Operating Hours/Day																			
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	0.78	0.94	1.09	1.25	1.41	1.56	1.72	1.88	2.03	2.19	2.34	2.50	2.66	2.81	2.97	3.13	3.28	3.44	3.59	3.75
50	1.56	1.88	2.19	2.50	2.81	3.13	3.44	3.75	4.06	4.38	4.69	5.00	5.31	5.63	5.94	6.25	6.56	6.88	7.19	7.50
75	2.34	2.81	3.28	3.75	4.22	4.69	5.16	5.63	6.09	6.56	7.03	7.50	7.97	8.44	8.91	9.38	9.84	10.31	10.78	11.25
100	3.13	3.75	4.38	5.00	5.63	6.25	6.88	7.50	8.13	8.75	9.38	10.00	10.63	11.25	11.88	12.50	13.13	13.75	14.38	15.00
125	3.91	4.69	5.47	6.25	7.03	7.81	8.59	9.38	10.16	10.94	11.72	12.50	13.28	14.06	14.84	15.63	16.41	17.19	17.97	18.75
150	4.69	5.63	6.56	7.50	8.44	9.38	10.31	11.25	12.19	13.13	14.06	15.00	15.94	16.88	17.81	18.75	19.69	20.63	21.56	22.50
175	5.47	6.56	7.66	8.75	9.84	10.94	12.03	13.13	14.22	15.31	16.41	17.50	18.59	19.69	20.78	21.88	22.97	24.06	25.16	26.25
200	6.25	7.50	8.75	10.00	11.25	12.50	13.75	15.00	16.25	17.50	18.75	20.00	21.25	22.50	23.75	25.00	26.25	27.50	28.75	30.00
225	7.03	8.44	9.84	11.25	12.66	14.06	15.47	16.88	18.28	19.69	21.09	22.50	23.91	25.31	26.72	28.13	29.53	30.94	32.34	33.75
250	7.81	9.38	10.94	12.50	14.06	15.63	17.19	18.75	20.31	21.88	23.44	25.00	26.56	28.13	29.69	31.25	32.81	34.38	35.94	37.50
275	8.59	10.31	12.03	13.75	15.47	17.19	18.91	20.63	22.34	24.06	25.78	27.50	29.22	30.94	32.66	34.38	36.09	37.81	39.53	41.25
300	9.38	11.25	13.13	15.00	16.88	18.75	20.63	22.50	24.38	26.25	28.13	30.00	31.88	33.75	35.63	37.50	39.38	41.25	43.13	45.00
325	10.16	12.19	14.22	16.25	18.28	20.31	22.34	24.38	26.41	28.44	30.47	32.50	34.53	36.56	38.59	40.63	42.66	44.69	46.72	48.75
350	10.94	13.13	15.31	17.50	19.69	21.88	24.06	26.25	28.44	30.63	32.81	35.00	37.19	39.38	41.56	43.75	45.94	48.13	50.31	52.50
375	11.72	14.06	16.41	18.75	21.09	23.44	25.78	28.13	30.47	32.81	35.16	37.50	39.84	42.19	44.53	46.88	49.22	51.56	53.91	56.25
400	12.50	15.00	17.50	20.00	22.50	25.00	27.50	30.00	32.50	35.00	37.50	40.00	42.50	45.00	47.50	50.00	52.50	55.00	57.50	60.00
425	13.28	15.94	18.59	21.25	23.91	26.56	29.22	31.88	34.53	37.19	39.84	42.50	45.16	47.81	50.47	53.13	55.78	58.44	61.09	63.75
450	14.06	16.88	19.69	22.50	25.31	28.13	30.94	33.75	36.56	39.38	42.19	45.00	47.81	50.63	53.44	56.25	59.06	61.88	64.69	67.50
475	14.84	17.81	20.78	23.75	26.72	29.69	32.66	35.63	38.59	41.56	44.53	47.50	50.47	53.44	56.41	59.38	62.34	65.31	68.28	71.25
500	15.63	18.75	21.88	25.00	28.13	31.25	34.38	37.50	40.63	43.75	46.88	50.00	53.13	56.25	59.38	62.50	65.63	68.75	71.88	75.00

Pellet (3000kW/hrs/m³ @ 650kgs)

Boiler Output kW	Full Load Operating Hours/Day																			
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	0.21	0.25	0.29	0.33	0.38	0.42	0.46	0.50	0.54	0.58	0.63	0.67	0.71	0.75	0.79	0.83	0.88	0.92	0.96	1.00
50	0.42	0.50	0.58	0.67	0.75	0.83	0.92	1.00	1.08	1.17	1.25	1.33	1.42	1.50	1.58	1.67	1.75	1.83	1.92	2.00
75	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13	2.25	2.38	2.50	2.63	2.75	2.88	3.00
100	0.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50	2.67	2.83	3.00	3.17	3.33	3.50	3.67	3.83	4.00
125	1.04	1.25	1.46	1.67	1.88	2.08	2.29	2.50	2.71	2.92	3.13	3.33	3.54	3.75	3.96	4.17	4.38	4.58	4.79	5.00
150	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
175	1.46	1.75	2.04	2.33	2.63	2.92	3.21	3.50	3.79	4.08	4.38	4.67	4.96	5.25	5.54	5.83	6.13	6.42	6.71	7.00
200	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00	5.33	5.67	6.00	6.33	6.67	7.00	7.33	7.67	8.00
225	1.88	2.25	2.63	3.00	3.38	3.75	4.13	4.50	4.88	5.25	5.63	6.00	6.38	6.75	7.13	7.50	7.88	8.25	8.63	9.00
250	2.08	2.50	2.92	3.33	3.75	4.17	4.58	5.00	5.42	5.83	6.25	6.67	7.08	7.50	7.92	8.33	8.75	9.17	9.58	10.00
275	2.29	2.75	3.21	3.67	4.13	4.58	5.04	5.50	5.96	6.42	6.88	7.33	7.79	8.25	8.71	9.17	9.63	10.08	10.54	11.00
300	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00	10.50	11.00	11.50	12.00
325	2.71	3.25	3.79	4.33	4.88	5.42	5.96	6.50	7.04	7.58	8.13	8.67	9.21	9.75	10.29	10.83	11.38	11.92	12.46	13.00
350	2.92	3.50	4.08	4.67	5.25	5.83	6.42	7.00	7.58	8.17	8.75	9.33	9.92	10.50	11.08	11.67	12.25	12.83	13.42	14.00
375	3.13	3.75	4.38	5.00	5.63	6.25	6.88	7.50	8.13	8.75	9.38	10.00	10.63	11.25	11.88	12.50	13.13	13.75	14.38	15.00
400	3.33	4.00	4.67	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00	10.67	11.33	12.00	12.67	13.33	14.00	14.67	15.33	16.00
425	3.54	4.25	4.96	5.67	6.38	7.08	7.79	8.50	9.21	9.92	10.63	11.33	12.04	12.75	13.46	14.17	14.88	15.58	16.29	17.00
450	3.75	4.50	5.25	6.00	6.75	7.50	8.25	9.00	9.75	10.50	11.25	12.00	12.75	13.50	14.25	15.00	15.75	16.50	17.25	18.00
475	3.96	4.75	5.54	6.33	7.13	7.92	8.71	9.50	10.29	11.08	11.88	12.67	13.46	14.25	15.04	15.83	16.63	17.42	18.21	19.00
500	4.17	5.00	5.83	6.67	7.50	8.33	9.17	10.00	10.83	11.67	12.50	13.33	14.17	15.00	15.83	16.67	17.50	18.33	19.17	20.00

BIOMASS FUEL CALCULATOR PER DAY

Chip (800kW/hrs/m³ @ 200kgs)

Boiler Output kW	Full Load Operating Hours/Day																			
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	0.16	0.19	0.22	0.25	0.28	0.31	0.34	0.38	0.41	0.44	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.69	0.72	0.75
50	0.31	0.38	0.44	0.50	0.56	0.63	0.69	0.75	0.81	0.88	0.94	1.00	1.06	1.13	1.19	1.25	1.31	1.38	1.44	1.50
75	0.47	0.56	0.66	0.75	0.84	0.94	1.03	1.13	1.22	1.31	1.41	1.50	1.59	1.69	1.78	1.88	1.97	2.06	2.16	2.25
100	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13	2.25	2.38	2.50	2.63	2.75	2.88	3.00
125	0.78	0.94	1.09	1.25	1.41	1.56	1.72	1.88	2.03	2.19	2.34	2.50	2.66	2.81	2.97	3.13	3.28	3.44	3.59	3.75
150	0.94	1.13	1.31	1.50	1.69	1.88	2.06	2.25	2.44	2.63	2.81	3.00	3.19	3.38	3.56	3.75	3.94	4.13	4.31	4.50
175	1.09	1.31	1.53	1.75	1.97	2.19	2.41	2.63	2.84	3.06	3.28	3.50	3.72	3.94	4.16	4.38	4.59	4.81	5.03	5.25
200	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00
225	1.41	1.69	1.97	2.25	2.53	2.81	3.09	3.38	3.66	3.94	4.22	4.50	4.78	5.06	5.34	5.63	5.91	6.19	6.47	6.75
250	1.56	1.88	2.19	2.50	2.81	3.13	3.44	3.75	4.06	4.38	4.69	5.00	5.31	5.63	5.94	6.25	6.56	6.88	7.19	7.50
275	1.72	2.06	2.41	2.75	3.09	3.44	3.78	4.13	4.47	4.81	5.16	5.50	5.84	6.19	6.53	6.88	7.22	7.56	7.91	8.25
300	1.88	2.25	2.63	3.00	3.38	3.75	4.13	4.50	4.88	5.25	5.63	6.00	6.38	6.75	7.13	7.50	7.88	8.25	8.63	9.00
325	2.03	2.44	2.84	3.25	3.66	4.06	4.47	4.88	5.28	5.69	6.09	6.50	6.91	7.31	7.72	8.13	8.53	8.94	9.34	9.75
350	2.19	2.63	3.06	3.50	3.94	4.38	4.81	5.25	5.69	6.13	6.56	7.00	7.44	7.88	8.31	8.75	9.19	9.63	10.06	10.50
375	2.34	2.81	3.28	3.75	4.22	4.69	5.16	5.63	6.09	6.56	7.03	7.50	7.97	8.44	8.91	9.38	9.84	10.31	10.78	11.25
400	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00	10.50	11.00	11.50	12.00
425	2.66	3.19	3.72	4.25	4.78	5.31	5.84	6.38	6.91	7.44	7.97	8.50	9.03	9.56	10.09	10.63	11.16	11.69	12.22	12.75
450	2.81	3.38	3.94	4.50	5.06	5.63	6.19	6.75	7.31	7.88	8.44	9.00	9.56	10.13	10.69	11.25	11.81	12.38	12.94	13.50
475	2.97	3.56	4.16	4.75	5.34	5.94	6.53	7.13	7.72	8.31	8.91	9.50	10.09	10.69	11.28	11.88	12.47	13.06	13.66	14.25
500	3.13	3.75	4.38	5.00	5.63	6.25	6.88	7.50	8.13	8.75	9.38	10.00	10.63	11.25	11.88	12.50	13.13	13.75	14.38	15.00

Pellet (3000kW/hrs/m³ @ 650kgs)

Boiler Output kW	Full Load Operating Hours/Day																			
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
25	0.04	0.05	0.06	0.07	0.08	0.08	0.09	0.10	0.11	0.12	0.13	0.13	0.14	0.15	0.16	0.17	0.18	0.18	0.19	0.20
50	0.08	0.10	0.12	0.13	0.15	0.17	0.18	0.20	0.22	0.23	0.25	0.27	0.28	0.30	0.32	0.33	0.35	0.37	0.38	0.40
75	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.33	0.35	0.38	0.40	0.43	0.45	0.48	0.50	0.53	0.55	0.58	0.60
100	0.17	0.20	0.23	0.27	0.30	0.33	0.37	0.40	0.43	0.47	0.50	0.53	0.57	0.60	0.63	0.67	0.70	0.73	0.77	0.80
125	0.21	0.25	0.29	0.33	0.38	0.42	0.46	0.50	0.54	0.58	0.63	0.67	0.71	0.75	0.79	0.83	0.88	0.92	0.96	1.00
150	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	1.20
175	0.29	0.35	0.41	0.47	0.53	0.58	0.64	0.70	0.76	0.82	0.88	0.93	0.99	1.05	1.11	1.17	1.23	1.28	1.34	1.40
200	0.33	0.40	0.47	0.53	0.60	0.67	0.73	0.80	0.87	0.93	1.00	1.07	1.13	1.20	1.27	1.33	1.40	1.47	1.53	1.60
225	0.38	0.45	0.53	0.60	0.68	0.75	0.83	0.90	0.98	1.05	1.13	1.20	1.28	1.35	1.43	1.50	1.58	1.65	1.73	1.80
250	0.42	0.50	0.58	0.67	0.75	0.83	0.92	1.00	1.08	1.17	1.25	1.33	1.42	1.50	1.58	1.67	1.75	1.83	1.92	2.00
275	0.46	0.55	0.64	0.73	0.83	0.92	1.01	1.10	1.19	1.28	1.38	1.47	1.56	1.65	1.74	1.83	1.93	2.02	2.11	2.20
300	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80	1.90	2.00	2.10	2.20	2.30	2.40
325	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30	1.41	1.52	1.63	1.73	1.84	1.95	2.06	2.17	2.28	2.38	2.49	2.60
350	0.58	0.70	0.82	0.93	1.05	1.17	1.28	1.40	1.52	1.63	1.75	1.87	1.98	2.10	2.22	2.33	2.45	2.57	2.68	2.80
375	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13	2.25	2.38	2.50	2.63	2.75	2.88	3.00
400	0.67	0.80	0.93	1.07	1.20	1.33	1.47	1.60	1.73	1.87	2.00	2.13	2.27	2.40	2.53	2.67	2.80	2.93	3.07	3.20
425	0.71	0.85	0.99	1.13	1.28	1.42	1.56	1.70	1.84	1.98	2.13	2.27	2.41	2.55	2.69	2.83	2.98	3.12	3.26	3.40
450	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	3.00	3.15	3.30	3.45	3.60
475	0.79	0.95	1.11	1.27	1.43	1.58	1.74	1.90	2.06	2.22	2.38	2.53	2.69	2.85	3.01	3.17	3.33	3.48	3.64	3.80
500	0.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50	2.67	2.83	3.00	3.17	3.33	3.50	3.67	3.83	4.00

TRANSPORT SYSTEMS

Standard, rising and kinked pellet augers

Pellet auger with gear motor, multiple bearings and support feet for stability.

Auger channel for conveying the pellets with progressive pitch auger flights. After the system starts the augers convey the pellets from the storage room towards the boiler into the cell wheel on the pellet burner. The special layout of the auger ensures smooth and trouble-free fuel transport.

Special features

Transport auger with progressive pitch (for gentle and easy transport of the pellets to the burner)

Gear box protection coupling prevents the auger and gear box from overload

Standard hinged sweep collector for woodchip

The main components are the spur gears used specifically by GILLES. They have a torque of 5000Nm and special seals that effectively and continuously prevent the penetration of dust and cuttings.
The robust design of the double-arm telescopic collector is also unmatched. This technology used by GILLES is the first to allow safe, fully automatic and convenient wood combustion. Two standard hinged arms make working in a small space radius possible. The ripping hook prevents blockages in that larger wood chips are automatically pushed down and cut in the cell wheel. Included is the pressure disc, the gear motor and the pre-tensioning device.

Max. delivery height for wood chip: 5m.

Includes safety device.

Over heat protection valve (OPV) for automatic extinguishing. By means of the controlled overrun of the stoker auger, the fuel supply chain is interrupted and eliminates back burning.

Incl. diameter adjustment.

- Massive auger shaft.

- 8 mm strong auger flights.

- Continuously welded progressive pitch auger flights.

- Suitable for material size of G50 at maximum.

Standard auger

Rising auger

Kinked auger

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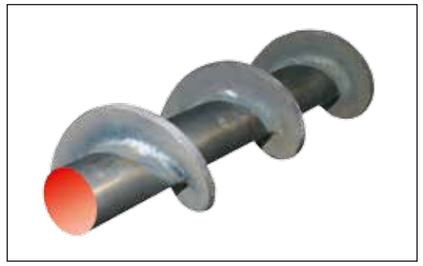
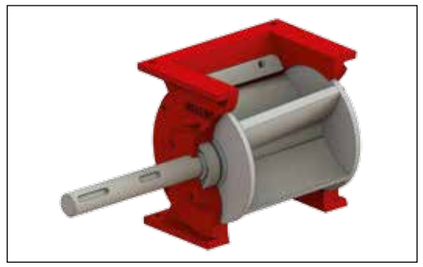
Ripping hook



Continuously welded 8 mm auger flights



Cell wheel

Special features

Ripping hook prevents blockages in that larger wood chips are automatically pushed down to then be cut in the cell wheel.

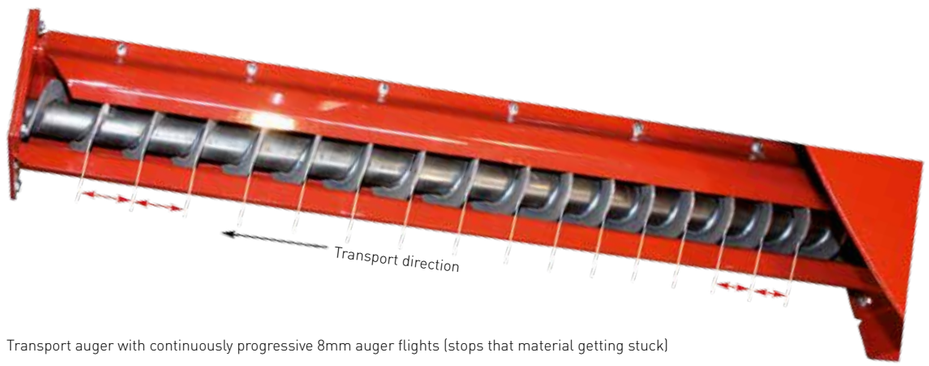
Transport auger with continuously welded 8mm auger flights and progressive pitch (prevents blockages)

Cell wheel and combustion chamber

The cell wheel is a multi tested full-metal cell wheel reliably interrupts the boiler with the storage room and thus provides 100% protection against burnback. The blades attached to the running wheel are slightly curved which prevents noise generation and reduces compressive forces. From HPK-RA 75 these blades are running at an offset angle to the rotary axis to enhance the cutting action with a fixed cutting edge integrated in the stable noise-damping cast enclosure.

Combustion chamber

High combustion temperatures guaranteed in all performance ranges and the best possible use of your fuel. Well designed air guidance is a precondition for highest quality of combustion. Years of experience, high tech development, resistant materials guarantee clean combustion and long service life.



Transport auger with continuously progressive 8mm auger flights (stops that material getting stuck)

HPK-RA PELLET

HPK-RA WOOD CHIP

OVERVIEW

Gilles HPK-RA boilers are suitable for both pellet and woodchip, the high-performance boiler is produced as a tension-free welded construction to maximise the strength and durability of the boiler. Welded high-performance multiple-draught boiler in thick-walled boiler plate S235JR 6mm width. Horizontal heat exchanger tubes in seamless drawn thick-wall boiler pipe. 70mm thick external insulation.

Suitable for automatic combustion of wood chip and pellets and without any adjustments suitable for using pieces of wood in emergency operation, thanks to an additional combustion chamber opening and grate.

- Operational pressure max 3 bar
- Boilers have efficiency of >90%
- Modulation down to 30% of nominal output
- Automatic Ignition, Heat Exchanger cleaning and Ash removal
- 'Cell Wheel' burn back protection device
- Gilles touch heating control
- Bespoke fuel storage and transport system design

Suitable fuel characteristics:

Wood Chip
G50, W30 as per EN 14961-4 Property Class A1

Pellet
6mm ø as per EN 14961-2 Property Class A1

BOILER CONTROLS

The Gilles Touch control panel incorporates state of the art programming and instrumentation. Alongside conventional sensors the boiler benefits from independently controlled primary and secondary combustion zones managed by the control system. This enables clean and complete burning of the fuel and achieves 95% efficiency, optimising emissions.

The Gilles Touch, via an internet connection, allows access and maintenance of the system from any computer, Smartphone or tablet device, this allows adjustment of the specific heatload without being in the vicinity of the boiler allowing you to change the requirements as and when needed. The advanced control system and high capacity heat exchangers in the boiler enables unrivalled modulation according to your specific demands.

Benefits

- Settings for different fuels
- Setting and alteration of all heating requirements via PC/Mac, Smartphone or tablet
- Modulation of the boiler
- Remote servicing of the boiler via internet
- Cascade control of up to 5 boilers
- Trend logging over 6 months (exportable to USB stick and can be shown in Excel)
- Automatic error notification via email
- Password protected

Optional

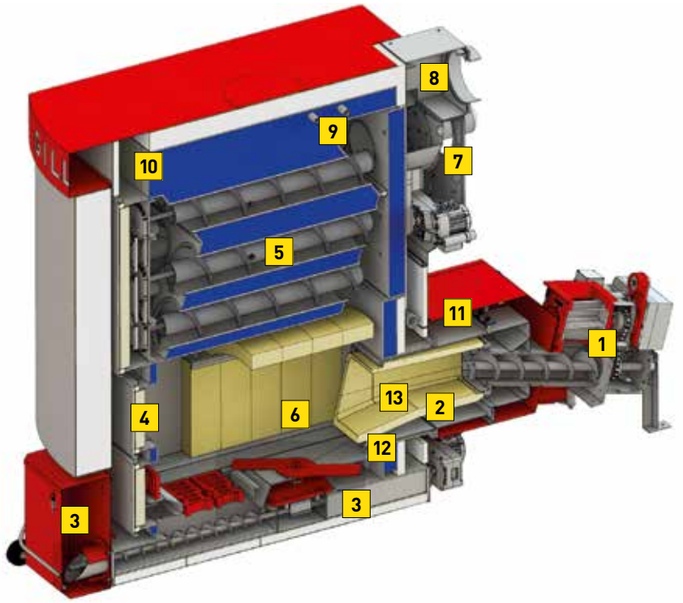
- Automatic error notification via SMS
- Status request and alterations possible via SMS (current boiler temperature, operating mode, boiler status, etc.)

HPK-RA PELLET

Key Features

1. Pellet burner in highly heat-resistant steel for HPK-RA 12.5 – 60 or ceramic for HPK-RA 75 – 160
2. Ash removal via ash agitator with special drive technology – ash compression resulting in long emptying intervals – rolling ash container
3. Combustion chamber door for log wood operation (no changeover required)
4. Horizontal pipe heat exchanger with automatic cleaning
5. Flue gas fan for optimal ignition process and permanent negative pressure in the boiler
6. Lambda probe for fuel detection and optimised, clean combustion process
7. Overheat protection
8. Welded multiple-draught boiler in 6 mm boiler plate
9. Shunt circuit with pump and mixing valve available
10. Primary air modulating variable
11. Secondary air modulating variable

HPK-RA WOOD CHIP



Key Features

1. Cell wheel
2. Wood chip burner in high-quality heat-resistant ceramic
3. Ash removal via ash agitator with special drive technology – ash compression resulting in long emptying intervals
4. Combustion chamber door for log wood operation (no changeover required)
5. Horizontal pipe heat exchanger with automatic cleaning
6. Ceramic-lined afterburning chamber with individually offset heat-resistant fire bricks
7. Flue gas fan for optimal ignition process and permanent negative pressure in the boiler
8. Lambda probe for fuel detection and optimised, clean combustion process
9. Overheat protection
10. Welded multiple-draught boiler in 6 mm boiler plate
11. Shunt circuit with pump and mixing valve available
12. Primary air modulating variable
13. Secondary air modulating variable

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HPK-RA
OUTPUT 49 - 153kW
PELLET & WOOD CHIP

HPK-RA 49

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 49**		**HPK-RA 49**	
Product Code		401011		401028	
Full Load	kW	49		49	
Part Load	kW	15		15	
Boiler Dry Weight	kg	724		724	
Dimensions L x W x H	mm	1430 x 765 x 1445		1430 x 765 x 1445	
Hydraulic Pressure Drop	mbar 11K mbar 20K	36.5 11		36.5 11	
Water Flow Rate	l/s 10k l/s 20k	1.17 0.59		1.17 0.59	
Thermal Efficiency Full Load	%	93.7		91,7-93,1	
Thermal Efficiency Part Load	%	93.7		92.8	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/OENORM M7135/DIN		CEN/TS 14961 (P16, P45)	
Burner Type		Forward fired		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~10		~12	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level		n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm²		~3/400V 50Hz 16A 5x2,5mm²	
Flue Size	Ø mm	180		180	
Height Central Line Flue Gas Outlet	mm	1325		1325	
Flue Gas Volume Full Load	m³/hr	86		101	
Flue Gas Volume Part Load	m³/hr	32.3		37.1	
Flue Gas Temperature	High °C Low °C	126 94		154 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		According to test report		Range tested	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m³	82	113	94-105	129-145
NOX Part Load*2*3*4	mg/m³	77	106	101	138
Organic "C" Full Load*2*4	mg/m³	5	8	1	1-2
Organic "C" Part Load*2*4	mg/m³	2	3	5	7
Dust Full Load*2*4	mg/m³	15	20	11-29	15-40
Dust Full Load*2*4	mg/m³	19	26	19	26
CO Full Load*2*4	mg/m³	33	45	19-53	24-73
CO Part Load*2*4	mg/m³	22	31	163-224	224
NOX Full Load*2*3	mg/MJ	54		66-72	
NOX Part Load*2*3	mg/MJ	50		69-96	
Organic "C" Full Load*2	mg/MJ	4		1	
Organic "C" Part Load*2	mg/MJ	1		4	
Dust Full Load*2	mg/MJ	10		8-19	
Dust Full Load*2	mg/MJ	12		13	
CO Full Load*2	mg/MJ	21		12-36	
CO Part Load*2	mg/MJ	15		112	
PM10		N/A		N/A	
Delivery Dimensions	mm				
Residual Fan Pressure Full Load	Pa	9		7	
Residual Fan Pressure Part Load	Pa	7		8	
Boiler Volume (Water)	Litre	150		150	
Ash Container Volume	Litre	43		43	
Flow Connection		1 1/2"		1 1/2"	
Return Connection		1 1/2"		1 1/2"	
Overheat Protection Valve Connection		1/2"		1/2"	
Burner Position		Left or right		Left/right or rear	
Ignition Method		Electric/Automatic		Electric/Automatic	
Feature		Log wood operation possible		Log wood operation possible	
Performance and Combustion Control		Programmable logic controller		Programmable logic controller	
Back Burn Protection by		Full-metal cell wheel		Full-metal cell wheel	
Ventilation Dependent Operation		Yes		Yes	
Type of Fans		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

HPK-RA 60

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 60**		**HPK-RA 60**	
Product Code		401012		401029	
Full Load	kW	60		60	
Part Load	kW	18		18	
Boiler Dry Weight	kg	1330		1330	
Dimensions L x W x H	mm	1540 x 935 x 1785		1540 x 935 x 1785	
Hydraulic Pressure Drop	mbar 11K mbar 20K	6.1 1.8		6.1 1.8	
Water Flow Rate	l/s 10k l/s 20k	1.43 0.71		1.43 0.71	
Thermal Efficiency Full Load	%	93.1		91.7	
Thermal Efficiency Part Load	%	93.7		92.8	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/OENORM M7135/DIN		CEN/TS 14961 (P16, P45)	
Burner Type		Forward fired		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~12		~15	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level	dB	n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm²		~3/400V 50Hz 16A 5x2,5mm²	
Flue Size	Ø mm	200		200	
Height Central Line Flue Gas Outlet	mm	1640		1640	
Flue Gas Volume Full Load	m³/hr	108		126	
Flue Gas Volume Part Load	m³/hr	39.9		46	
Flue Gas Temperature	High °C Low °C	144 94		154 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		According to test report		Range tested	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m³	101	138	94	129
NOX Part Load*2*3*4	mg/m³	77	106	101	138
Organic "C" Full Load*2*4	mg/m³	4	6	1	1
Organic "C" Part Load*2*4	mg/m³	2	3	5	7
Dust Full Load*2*4	mg/m³	16	23	11	15
Dust Full Load*2*4	mg/m³	19	26	19	26
CO Full Load*2*4	mg/m³	21	29	17	24
CO Part Load*2*4	mg/m³	22	32	163	224
NOX Full Load*2*3	mg/MJ	77		66	
NOX Part Load*2*3	mg/MJ	50		96	
Organic "C" Full Load*2	mg/MJ	2		1	
Organic "C" Part Load*2	mg/MJ	1		4	
Dust Full Load*2	mg/MJ	19		8	
Dust Full Load*2	mg/MJ	12		13	
CO Full Load*2	mg/MJ	22		12	
CO Part Load*2	mg/MJ	15		112	
PM10		N/A		N/A	
Delivery Dimensions	mm				
Residual Fan Pressure Full Load	Pa	11		10	
Residual Fan Pressure Part Load	Pa	6		9	
Boiler Volume (Water)	Litre	220		220	
Ash Container Volume	Litre	43		43	
Flow Connection		1 1/2"		1 1/2"	
Return Connection		1 1/2"		1 1/2"	
Overheat Protection Valve Connection		1/2"		1/2"	
Burner Position		Left or right		Left/right or rear	
Ignition Method		Electric/Automatic		Electric/Automatic	
Feature		Log wood operation possible		Log wood operation possible	
Performance and Combustion Control		Programmable logic controller		Programmable logic controller	
Back Burn Protection by		Full-metal cell wheel		Full-metal cell wheel	
Ventilation Dependent Operation		Yes		Yes	
Type of Fans		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

HPK-RA 75

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 75**		**HPK-RA 75**	
Product Code		401014		401031	
Full Load	kW	75		75	
Part Load	kW	23		23	
Boiler Dry Weight	kg	1570		1570	
Dimensions L x W x H	mm	1780 x 935 x 1785		1780 x 935 x 1785	
Hydraulic Pressure Drop	mbar 11K mbar 20K	9.4 2.9		9.4 2.9	
Water Flow Rate	l/s 10k l/s 20k	1.79 0.88		1.79 0.88	
Thermal Efficiency Full Load	%	93.1-94.6		91.7-93.5	
Thermal Efficiency Part Load	%	93.7-94.1		92.8-92.9	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/OENORM M7135/DIN		CEN/TS 14961 (P16, P45)	
Burner Type		Forward fired		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~15		~29	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level	dB	n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm²		~3/400V 50Hz 16A 5x2,5mm²	
Flue Size	Ø mm	200		200	
Height Central Line Flue Gas Outlet	mm	1640		1640	
Flue Gas Volume Full Load	m³/hr	134		157	
Flue Gas Volume Part Load	m³/hr	49.9		57.7	
Flue Gas Temperature	High °C Low °C	109-144 81-94		115-154 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		Range tested		Range tested	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m³	101-134	138-184	94-106	129-146
NOX Part Load*2*3*4	mg/m³	77-117	106-161	101-104	138-143
Organic "C" Full Load*2*4	mg/m³	<1-4	<1-6	<1-1	1-2
Organic "C" Part Load*2*4	mg/m³	<1-2	<2-3	<2-5	2-7
Dust Full Load*2*4	mg/m³	16-28	23-59	11-35	15-49
Dust Full Load*2*4	mg/m³	19-23	26-32	19-26	26-35
CO Full Load*2*4	mg/m³	8-21	12-29	17-19	24-26
CO Part Load*2*4	mg/m³	18-22	25-32	74-163	102-224
NOX Full Load*2*3	mg/MJ	77-89		66-73	
NOX Part Load*2*3	mg/MJ	50-78		76-96	
Organic "C" Full Load*2	mg/MJ	<1-2		<1-1	
Organic "C" Part Load*2	mg/MJ	<1-1		<1-4	
Dust Full Load*2	mg/MJ	19-28		8-24	
Dust Full Load*2	mg/MJ	12-15		13-19	
CO Full Load*2	mg/MJ	6-22		12-13	
CO Part Load*2	mg/MJ	12-15		54-112	
PM10		N/A		N/A	
Delivery Dimensions	mm				
Residual Fan Pressure Full Load	Pa	8		6	
Residual Fan Pressure Part Load	Pa	8		6	
Boiler Volume (Water)	Litre	320		320	
Ash Container Volume	Litre	43		43	
Flow Connection		1 1/2"		1 1/2"	
Return Connection		1 1/2"		1 1/2"	
Overheat Protection Valve Connection		1/2"		1/2"	
Burner Position		Left/right or rear		Left/right or rear	
Ignition Method		Electric/Automatic		Electric/Automatic	
Feature		Log wood operation possible		Log wood operation possible	
Performance and Combustion Control		Programmable logic controller		Programmable logic controller	
Back Burn Protection by		Full-metal cell wheel		Full-metal cell wheel	
Ventilation Dependent Operation		Yes		Yes	
Type of Fans		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

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HPK-RA 85

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 85**		**HPK-RA 85**	
Product Code		401015		401032	
Full Load	kW	85		85	
Part Load	kW	26		26	
Boiler Dry Weight	kg	1570		1570	
Dimensions L x W x H	mm	1780 x 935 x 1785		1780 x 935 x 1785	
Hydraulic Pressure Drop	mbar 11K mbar 20K	12.2 3.7		12.2 3.7	
Water Flow Rate	l/s 10k l/s 20k	2.03 1.02		2.03 1.02	
Thermal Efficiency Full Load	%	93.1-94.6		91.7-93.5	
Thermal Efficiency Part Load	%	93.7-94.1		92.8-92.9	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/ÖNORM M7135/G50			
Burner Type		Forward fired ceramic		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~17		~21	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level	dB	n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm^2		~3/400V 50Hz 16A 5x2,5mm^2	
Flue Size	Ø mm	200		200	
Height Central Line Flue Gas Outlet	mm	1640		1640	
Flue Gas Volume Full Load	m^3/hr	153		181	
Flue Gas Volume Part Load	m^3/hr	57.2		65.8	
Flue Gas Temperature	High °C Low °C	109-144 81-94		115-154 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		Range tested		Range tested	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m^3	101-134	138-184	94-106	129-146
Organic "C" Full Load*2*4	mg/m^3	77-117	106-161	101-104	138-143
Organic "C" Part Load*2*4	mg/m^3	<1-4	<1-6	<1-1	1-2
Dust Full Load*2*4	mg/m^3	<1-2	<2-3	<2-5	2-7
Dust Full Load*2*4	mg/m^3	16-28	23-59	11-35	15-49
CO Full Load*2*4	mg/m^3	19-23	26-32	19-26	26-35
CO Part Load*2*4	mg/m^3	8-21	12-29	17-19	24-26
NOX Full Load*2*3	mg/MJ	18-22	25-32	74-163	102-224
NOX Part Load*2*3	mg/MJ	77-89		66-73	
Organic "C" Full Load*2	mg/MJ	50-78		76-96	
Organic "C" Part Load*2	mg/MJ	<1-2		<1-1	
Dust Full Load*2	mg/MJ	<1-1		<1-4	
Dust Full Load*2	mg/MJ	19-28		8-24	
CO Full Load*2	mg/MJ	12-15		13-19	
CO Part Load*2	mg/MJ	6-22		12-13	
PM10	mg/MJ	12-15		54-112	
Delivery Dimensions		N/A		N/A	
Residual Fan Pressure Full Load	mm				
Residual Fan Pressure Part Load	Pa	6		3	
Boiler Volume (Water)	Pa	6		3	
Ash Container Volume	Litre	320		320	
Flow Connection	Litre	43		43	
Return Connection		1 1/2"		1 1/2"	
Overheat Protection Valve Connection		1 1/2"		1 1/2"	
Burner Position		1/2"		1/2"	
Ignition Method		Left/right or rear		Left/right or rear	
Feature		Electric/Automatic		Electric/Automatic	
Performance and Combustion Control		Log wood operation possible		Log wood operation possible	
Back Burn Protection by		Programmable logic controller		Programmable logic controller	
Ventilation Dependent Operation		Full-metal cell wheel		Full-metal cell wheel	
Type of Fans		Yes		Yes	
		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

HPK-RA 100

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 100**		**HPK-RA 100**	
Product Code		401769		401771	
Full Load	kW	100		100	
Part Load	kW	30		30	
Boiler Dry Weight	kg	1963		1963	
Dimensions L x W x H	mm	2155 x 935 x 1785		2155 x 935 x 1785	
Hydraulic Pressure Drop	mbar 11K mbar 20K	13.1 4		13.1 4	
Water Flow Rate	l/s 10k l/s 20k	2.38 1.19		2.38 1.19	
Thermal Efficiency Full Load	%	94.6		93.5	
Thermal Efficiency Part Load	%	94.1		92.9	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/ÖNORM M7135/		CEN/TS (P16, P45)	
Burner Type		Forward fired ceramic		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~20		~25	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level	dB	n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm^2		~3/400V 50Hz 16A 5x2,5mm^2	
Flue Size	Ø mm	250		250	
Height Central Line Flue Gas Outlet	mm	1640		1640	
Flue Gas Volume Full Load	m^3/hr	174		205	
Flue Gas Volume Part Load	m^3/hr	65.4		75.3	
Flue Gas Temperature	High °C Low °C	109 81		115 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		According to test report		According to test report	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m^3	134	184	106	146
Organic "C" Full Load*2*4	mg/m^3	117	161	104	143
Organic "C" Part Load*2*4	mg/m^3	<1	<1	<1	<2
Dust Full Load*2*4	mg/m^3	<1	<2	<2	<2
Dust Full Load*2*4	mg/m^3	43	59	35	49
CO Full Load*2*4	mg/m^3	23	32	26	35
CO Part Load*2*4	mg/m^3	8	12	19	26
NOX Full Load*2*3	mg/MJ	18	25	74	102
NOX Part Load*2*3	mg/MJ	89		73	
Organic "C" Full Load*2	mg/MJ	78		76	
Organic "C" Part Load*2	mg/MJ	<1		<1	
Dust Full Load*2	mg/MJ	<1		<1	
Dust Full Load*2	mg/MJ	28		24	
CO Full Load*2	mg/MJ	15		19	
CO Part Load*2	mg/MJ	6		13	
PM10	mg/MJ	12		54	
Delivery Dimensions		N/A		N/A	
Residual Fan Pressure Full Load	mm				
Residual Fan Pressure Part Load	Pa	12		11	
Boiler Volume (Water)	Pa	10		10	
Ash Container Volume	Litre	495		495	
Flow Connection	Litre	80		80	
Return Connection		1 1/2"		1 1/2"	
Overheat Protection Valve Connection		1 1/2"		1 1/2"	
Burner Position		1/2"		1/2"	
Ignition Method		Rear only		Rear only	
Feature		Electric/Automatic		Electric/Automatic	
Performance and Combustion Control		Log wood operation possible		Log wood operation possible	
Back Burn Protection by		Programmable logic controller		Programmable logic controller	
Ventilation Dependent Operation		Full-metal cell wheel		Full-metal cell wheel	
Type of Fans		Yes		Yes	
		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

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REMEHA GILLES BIOMASS BOILER HPK-RA 100 TECHNICAL SPECIFICATION

HPK-RA 120

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 120**		**HPK-RA 120**	
Product Code		401770		401772	
Full Load	kW	120		120	
Part Load	kW	36		36	
Boiler Dry Weight	kg	1963		1963	
Dimensions L x W x H	mm	2155 x 935 x 1785		2155 x 935 x 1785	
Hydraulic Pressure Drop	mbar 11K mbar 20K	18.9 5.8		18.9 5.8	
Water Flow Rate	l/s 10k l/s 20k	2.86 1.43		2.38 1.43	
Thermal Efficiency Full Load	%	93,2 - 94,6		91,3-93,5	
Thermal Efficiency Part Load	%	94.1		92.9	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/OENORM M7135/		G50	
Burner Type		Forward fired ceramic		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~24		~30	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level	dB	n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm²		~3/400V 50Hz 16A 5x2,5mm²	
Flue Size	Ø mm	250		250	
Height Central Line Flue Gas Outlet	mm	1640		1640	
Flue Gas Volume Full Load	m³/hr	212		248	
Flue Gas Volume Part Load	m³/hr	79.8		91.8	
Flue Gas Temperature	High °C Low °C	109-131 81		115-143 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		Range tested		Range tested	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m³	114-134	157-184	106-111	146-153
Organic "C" Full Load*2*4	mg/m³	117	161	104	143
Organic "C" Part Load*2*4	mg/m³	<1	<1-<2	<1	<2
Dust Full Load*2*4	mg/m³	<1	<2	<2	<2
Dust Full Load*2*4	mg/m³	28-36	50-59	31-35	43-49
CO Full Load*2*4	mg/m³	23	32	26	35
CO Part Load*2*4	mg/m³	8-25	12-35	19-62	26-85
NOX Full Load*2*3	mg/MJ	18	25	74	102
NOX Part Load*2*3	mg/MJ	74-89		73-81	
Organic "C" Full Load*2	mg/MJ	78		76	
Organic "C" Part Load*2	mg/MJ	<1		<1-1	
Dust Full Load*2	mg/MJ	<1		<1	
Dust Full Load*2	mg/MJ	23-28		23-24	
CO Full Load*2	mg/MJ	15		19	
CO Part Load*2	mg/MJ	6-16		13-45	
PM10		12		54	
Delivery Dimensions	mm	N/A		N/A	
Residual Fan Pressure Full Load	Pa	10		6	
Residual Fan Pressure Part Load	Pa	10		6	
Boiler Volume (Water)	Litre	495		495	
Ash Container Volume	Litre	80		80	
Flow Connection		1 1/2"		1 1/2"	
Return Connection		1 1/2"		1 1/2"	
Overheat Protection Valve Connection		1/2"		1/2"	
Burner Position		Rear only		Rear only	
Ignition Method		Electric/Automatic		Electric/Automatic	
Feature		Log wood operation possible		Log wood operation possible	
Performance and Combustion Control		Programmable logic controller		Programmable logic controller	
Back Burn Protection by		Full-metal cell wheel		Full-metal cell wheel	
Ventilation Dependent Operation		Yes		Yes	
Type of Fans		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

HPK-RA 145

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 145**		**HPK-RA 145**	
Product Code		401019		401036	
Full Load	kW	145		145	
Part Load	kW	44		44	
Boiler Dry Weight	kg	2463		2463	
Dimensions L x W x H	mm	2620 x 935 x 1785		2620 x 935 x 1785	
Hydraulic Pressure Drop	mbar 11K mbar 20K	27.6 8.4		27.6 8.4	
Water Flow Rate	l/s 10k l/s 20k	3.45 1.73		3.45 1.73	
Thermal Efficiency Full Load	%	93.2		91.3	
Thermal Efficiency Part Load	%	94.1		92.9	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/OENORM M7135/		G50	
Burner Type		Forward fired ceramic		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~30		~37	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level	dB	n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm²		~3/400V 50Hz 16A 5x2,5mm²	
Flue Size	Ø mm	250		250	
Height Central Line Flue Gas Outlet	mm	1640		1640	
Flue Gas Volume Full Load	m³/hr	260		307	
Flue Gas Volume Part Load	m³/hr	97.5		113	
Flue Gas Temperature	High °C Low °C	131 81		143 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		Range tested		Range tested	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m³	114	157	111	153
Organic "C" Full Load*2*4	mg/m³	117	161	104	143
Organic "C" Part Load*2*4	mg/m³	<1	<2	<1	(<2)
Dust Full Load*2*4	mg/m³	<1	<2	<2	(<2)
Dust Full Load*2*4	mg/m³	36	50	31	43
CO Full Load*2*4	mg/m³	23	32	26	35
CO Part Load*2*4	mg/m³	25	35	62	85
NOX Full Load*2*3	mg/MJ	18	25	74	102
NOX Part Load*2*3	mg/MJ	74		81	
Organic "C" Full Load*2	mg/MJ	78		76	
Organic "C" Part Load*2	mg/MJ	<1		1	
Dust Full Load*2	mg/MJ	<1		<1	
Dust Full Load*2	mg/MJ	23		23	
CO Full Load*2	mg/MJ	15		19	
CO Part Load*2	mg/MJ	16		45	
PM10		12		54	
Delivery Dimensions	mm	N/A		N/A	
Residual Fan Pressure Full Load	Pa	6		7	
Residual Fan Pressure Part Load	Pa	5		7	
Boiler Volume (Water)	Litre	620		620	
Ash Container Volume	Litre	80		80	
Flow Connection		2"		2"	
Return Connection		2"		2"	
Overheat Protection Valve Connection		1/2"		1/2"	
Burner Position		Rear only		Rear only	
Ignition Method		Electric/Automatic		Electric/Automatic	
Feature		Log wood operation possible		Log wood operation possible	
Performance and Combustion Control		Programmable logic controller		Programmable logic controller	
Back Burn Protection by		Full-metal cell wheel		Full-metal cell wheel	
Ventilation Dependent Operation		Yes		Yes	
Type of Fans		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

REMEHA GILLES BIOMASS BOILER HPK-RA 145 TECHNICAL SPECIFICATION

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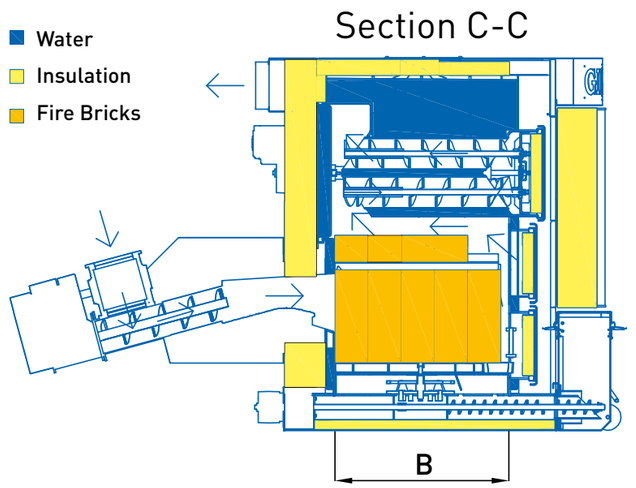
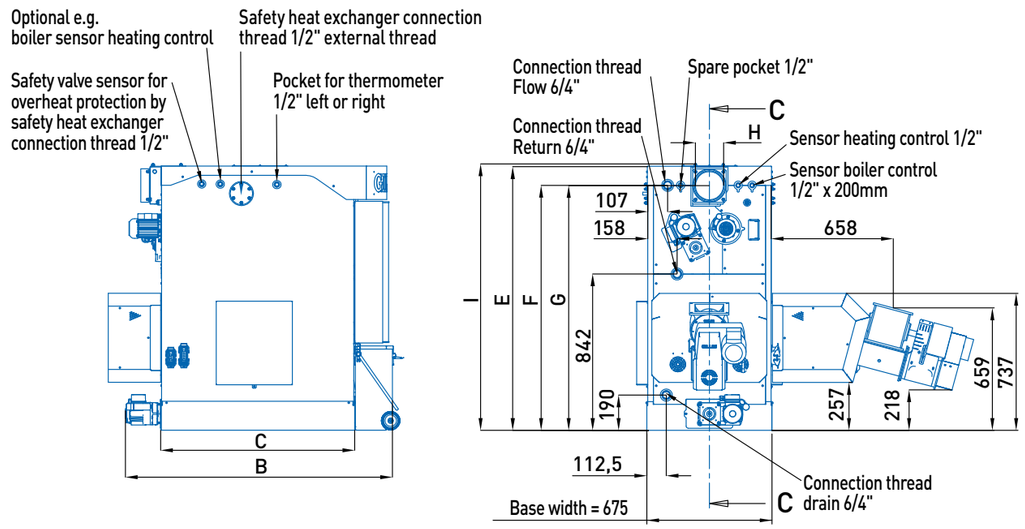
HPK-RA 160

		Wood Pellet		Wood Chip	
Boiler Model		**HPK-RA 160**		**HPK-RA 160**	
Product Code		4011534		401602	
Full Load	kW	153		150	
Part Load	kW	51		51	
Boiler Dry Weight	kg	2463		2463	
Dimensions L x W x H	mm	2620 x 935 x 1785		2620 x 935 x 1785	
Hydraulic Pressure Drop	mbar 11K mbar 20K	33.6 10.2		33.6 10.2	
Water Flow Rate	l/s 10k l/s 20k	3.58 1.79		3.58 1.79	
Thermal Efficiency Full Load	%	93.2		91.3	
Thermal Efficiency Part Load	%	94.1		92.9	
Flow Temperature Max	°C	95		95	
Return Temperature Min	°C	55		55	
Maximum Working Pressure	bar	3		3	
Fuel Type		Pellets acc. to EN14961-2/OENORM M7135/		G50	
Burner Type		Forward fired ceramic		Forward fired ceramic	
Consumption @ Full Load*1	kg/hr	~31		~39	
Burner Control On/Off		Modulating		Modulating	
Burner Noise Level	dB	n/a		n/a	
Max Electric Power Input	kW	3		3	
Max Current Consumption	A	4.6		4.6	
Electrical Supply		~3/400V 50Hz 16A 5x2,5mm²		~3/400V 50Hz 16A 5x2,5mm²	
Flue Size	Ø mm	250		250	
Height Central Line Flue Gas Outlet	mm	1640		1640	
Flue Gas Volume Full Load	m³/hr	275		318	
Flue Gas Volume Part Load	m³/hr	113		127	
Flue Gas Temperature	High °C Low °C	131 81		143 84	
Type Tested and Seal of Approval by		TÜV-Süd		TÜV-Süd	
Test Procedure		Range tested		Range tested	
		13% Vol-% 02	**10% Vol-% 02**	**13% Vol-% 02**	**10% Vol-% 02**
NOX Full Load*2*3*4	mg/m³	114	157	111	153
NOX Part Load*2*3*4	mg/m³	117	161	104	143
Organic "C" Full Load*2*4	mg/m³	<1	<2	<1	(<2)
Organic "C" Part Load*2*4	mg/m³	<1	<2	<2	(<2)
Dust Full Load*2*4	mg/m³	36	50	31	43
Dust Full Load*2*4	mg/m³	23	32	26	35
CO Full Load*2*4	mg/m³	25	35	62	85
CO Part Load*2*4	mg/m³	18	25	74	102
NOX Full Load*2*3	mg/MJ	74		81	
NOX Part Load*2*3	mg/MJ	78		76	
Organic "C" Full Load*2	mg/MJ	<1		1	
Organic "C" Part Load*2	mg/MJ	<1		<1	
Dust Full Load*2	mg/MJ	23		23	
Dust Full Load*2	mg/MJ	15		19	
CO Full Load*2	mg/MJ	16		45	
CO Part Load*2	mg/MJ	12		54	
PM10		N/A		N/A	
Delivery Dimensions	mm				
Residual Fan Pressure Full Load	Pa	6		6	
Residual Fan Pressure Part Load	Pa	5		5	
Boiler Volume (Water)	Litre	620		620	
Ash Container Volume	Litre	80		80	
Flow Connection		2"		2"	
Return Connection		2"		2"	
Overheat Protection Valve Connection		1/2"		1/2"	
Burner Position		Rear only		Rear only	
Ignition Method		Electric/Automatic		Electric/Automatic	
Feature		Log wood operation possible		Log wood operation possible	
Performance and Combustion Control		Programmable logic controller		Programmable logic controller	
Back Burn Protection by		Full-metal cell wheel		Full-metal cell wheel	
Ventilation Dependent Operation		Yes		Yes	
Type of Fans		Radial fan		Radial fan	

*1 based on wood chips 20% moisture, 800kWh/kg, 200kg/m3
*2 referring to 0°C and 1013mbar, dry fume, 13% Vol-% O_2
*3 calculated as NO_2
*4 referring to 0°C and 1013mbar, dry fume, 10% Vol-% O_2

WOODCHIP BOILER HPK-RA 49





Output kW	BS	Draughts	Volume l	Weight kg	Length in mm				Height in mm		Flue gas connection in mm			Combustion chamber
					A	B	C	D	E	F	G	H	I	J
49	8.1	6	150	724	1238	1445	1065	1000	1445	1355	1325	180	1480	685

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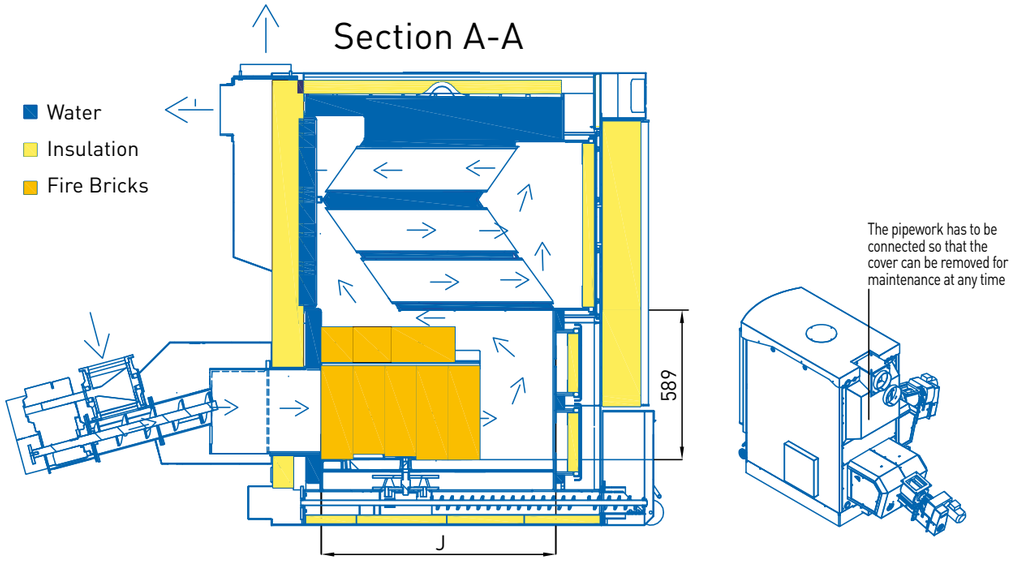
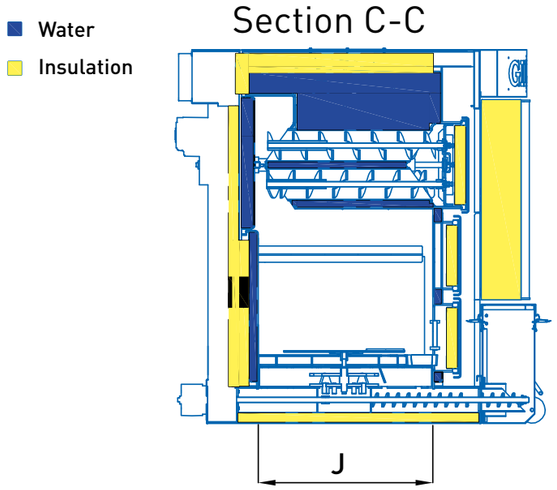
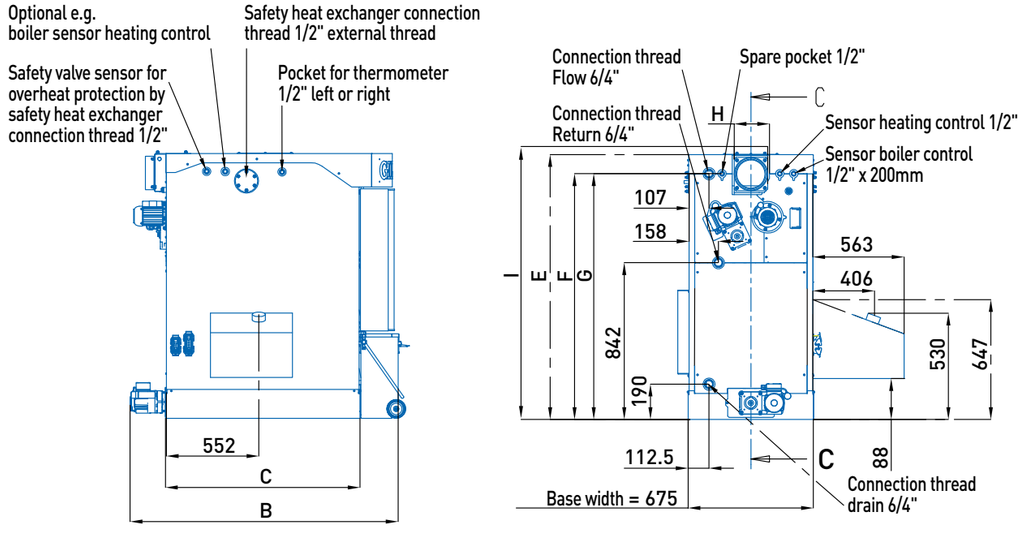
WOODCHIP BOILER HPK-RA 60-160



Output kW	BS	Draughts	Volume l	Weight kg	Length in mm				Height in mm		Flue gas connection in mm			Combustion chamber
					A	B	C	D	E	F	G	H	I	J
60	2.1	9	220	1330	1238	1445	1065	1000	1785	1670	1640	200	1820	925
75	3.1	9	320	1570	1478	1685	1305	1200	1785	1670	1640	200	1820	925
85	3.1	9	320	1570	1478	1685	1305	1200	1785	1670	1640	200	1820	925
100	10.1	9	495	1963	1853	2060	1680	1400	1785	1670	1640	250	1820	1300
120	10.1	9	495	1963	1853	2060	1680	1400	1785	1670	1640	250	1820	1300
145	4.1	9	620	2463	2318	2525	2145	1840	1785	1670	1640	250	1820	1765
150	4.1	9	620	2463	2318	2525	2145	1840	1785	1670	1640	250	1820	1765

PELLET BOILER HPK-RA 49





Output kW	BS	Draughts	Volume l	Weight kg	Length in mm				Height in mm		Flue gas connection in mm			Combustion chamber
					A	B	C	D	E	F	G	H	I	J
49	8.1	6	150	724	1238	1445	1065	1000	1445	1355	1325	180	1480	685

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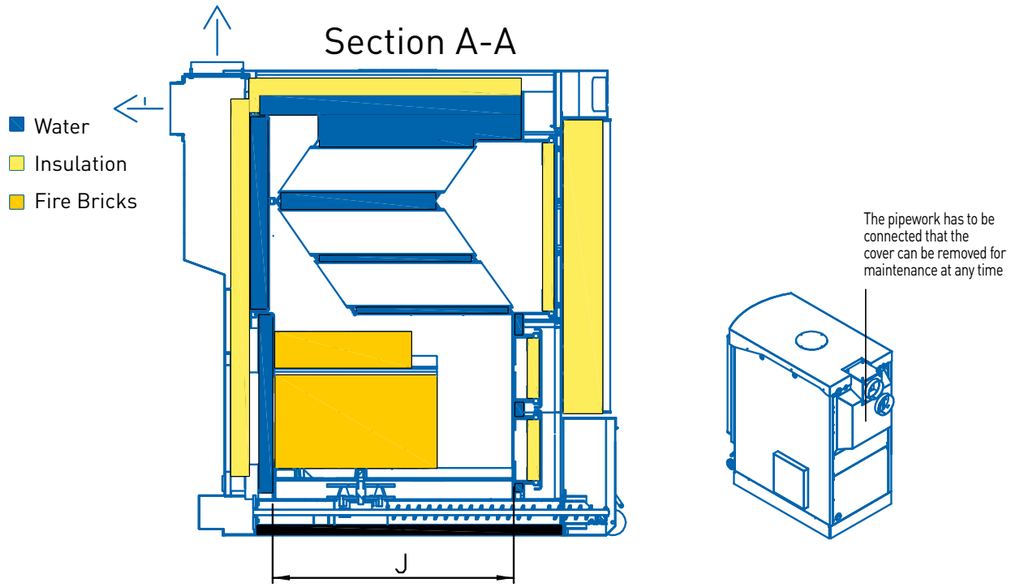
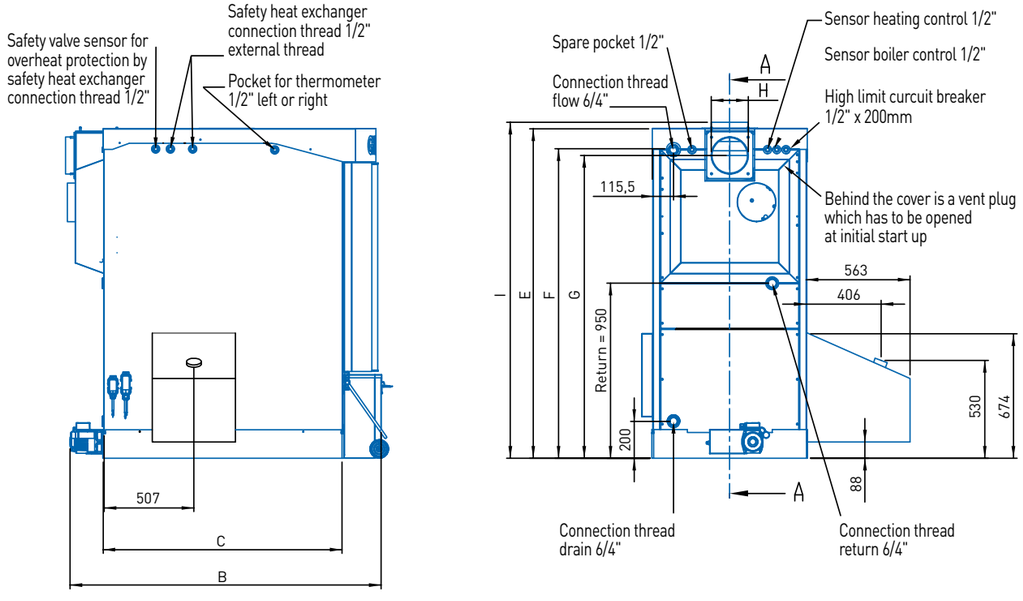
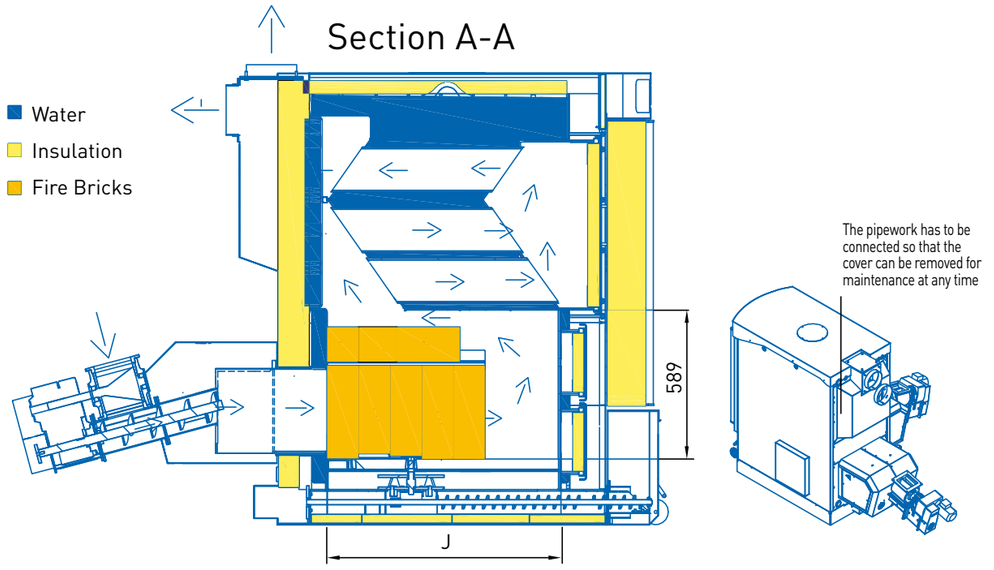
PELLET BOILER HPK-RA 60

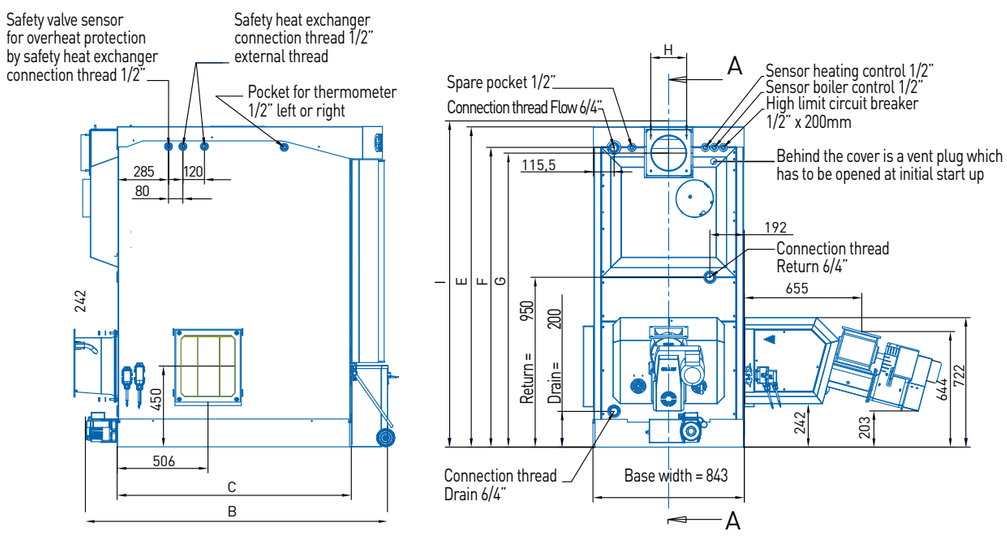




Output kW	BS	Draughts	Volume l	Weight kg	Length in mm				Height in mm		Flue gas connection in mm			Combustion chamber
					A	B	C	D	E	F	G	H	I	J
60	2.1	9	220	1330	1238	1445	1065	1000	1785	1670	1640	200	1820	925

PELLET BOILER HPK-RA 75-160





Output kW	BS	Draughts	Volume l	Weight kg	Length in mm				Height in mm		Flue gas connection in mm			Combustion chamber
					A	B	C	D	E	F	G	H	I	J
75	3.1	9	320	1570	1478	1685	1305	1200	1785	1670	1640	200	1820	925
85	3.1	9	320	1570	1478	1685	1305	1200	1785	1670	1640	200	1820	925
100	10.1	9	495	1963	1853	2060	1680	1400	1785	1670	1640	250	1820	1300
120	10.1	9	495	1963	1853	2060	1680	1400	1785	1670	1640	250	1820	1300
145	4.1	9	620	2463	2318	2525	2145	1840	1785	1670	1640	250	1820	1765
153	4.1	9	620	2463	2318	2525	2145	1840	1785	1670	1640	250	1820	1765

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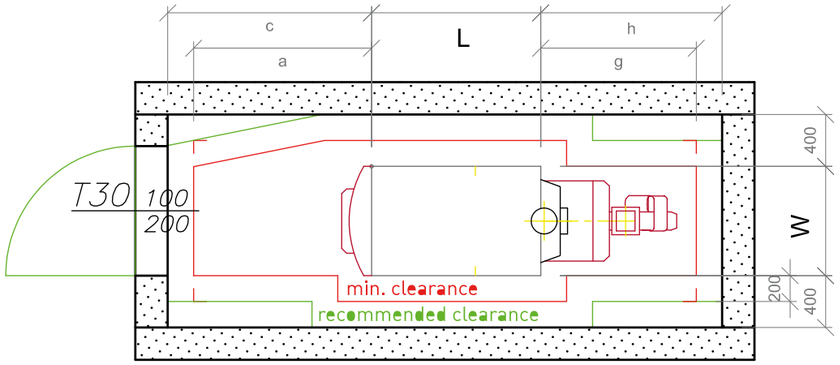
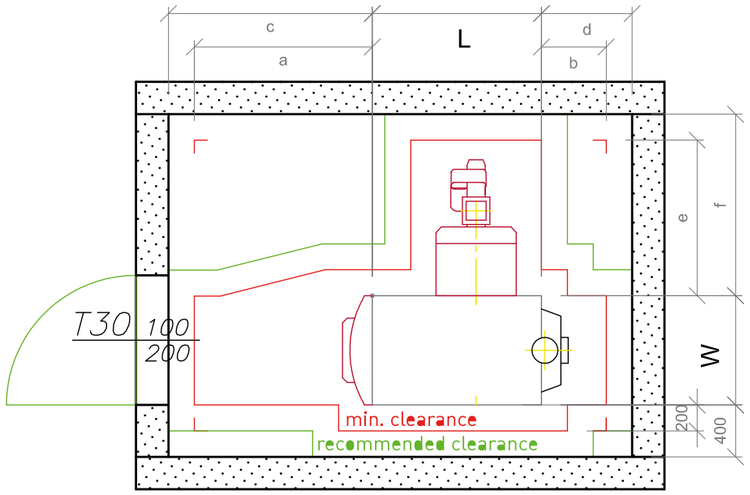
MINIMUM CLEARANCE HPK-RA 49-160





Type	HPK-RA	L	W	a	b	c	d	e	f	g	h
8.2-WC	49	1065	675	1170	500	1370	700	1200	1400	1200	1400
8.2-P	49	1065	675	1170	500	1370	700	800	1000	—	—
9.2-P	30/35/40	1065	675	1170	500	1370	700	1200	1400	—	—
2.3-P & WC	60	1065	843	1170	500	1370	700	1200	1400	1200	1400
3.3-P & WC	75/85	1305	843	1370	500	1570	700	1200	1400	1200	1400
10.2-P & WC	98/100/120	1680	843	1570	—	1770	—	—	—	1200	1400
4.2-P & WC	145/160	2145	843	2010	—	2210	—	—	—	1200	1400

HPKI-L 199

The high performance boiler is produced as a stress free welded construction. The thermally insulated door at the front swings out completely permitting completely free access for cleaning all the boiler flues. The boiler is constructed in accordance with the natural combustion process of the wood fuel. The gasification combustion chamber is built on a direct pass principle. High combustion temperatures and a long furnace duration of the gases is the guarantee for a clean burning process.

Industrial biomass boiler HPKI-L 199 is made of boiler steel thickness of 5mm or more. The heat exchanger is of seamless, boiler tubes. Efficiency is over 90% with pellets. Flue gas temperature at the exit is from 170°C to 190°C at full load.

It can be fed either from a silo or directly from a fuel store by a fuel auger. The boiler is equipped with pneumatic heat exchanger cleaning, automatic ash discharge and automatic transport of pellets.

Underfeed firing and ash discharge:
The combustion of the fuel is completed in the retort. The burnt material will be pushed towards the ash discharge augers. The two ash augers transfer the ash into two separate ash bins to be emptied regularly.

Heat exchanger cleaning:
The solenoid activated valves on the heat exchanger door, which periodically release the air pressure clean the boiler tubes from the ashes and soot.

Cyclone for separation of ash:
The cyclone built on the boiler back ensures low dust emission into the atmosphere.

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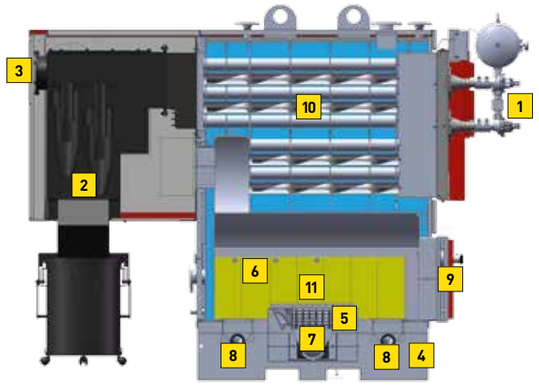
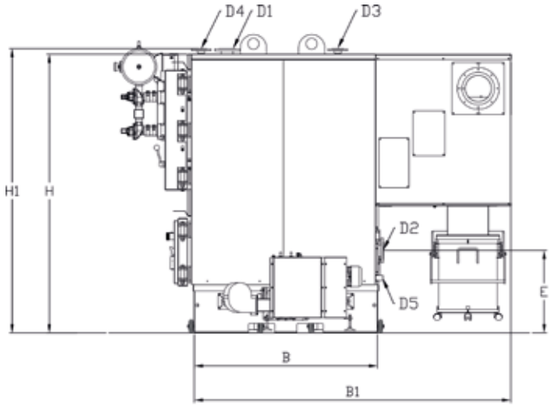
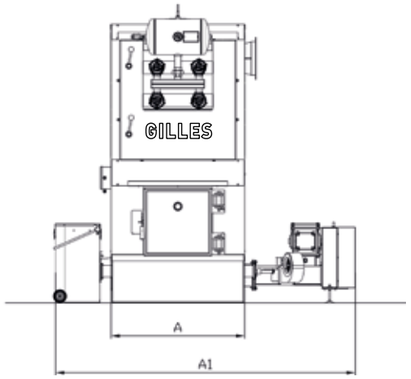
HPKI-L 199

Key Features

1. Automatic heat exchanger cleaning
2. Automatic flue gas dust removal
3. Flue gas fan
4. Insulation
5. Primary air
6. Secondary air
7. Fuel stocking
8. Automatic ash removal in
9. Combustion chamber door
10. Heat exchanger
11. Combustion chamber







Type		HPKI-L 199
Power	kW	199
Working Pressure	kPa	300
Test Pressure	kPa	450
Volume of water in boiler	Litre	920
Weight of boiler	Kg	1800
A	mm	1005
A1		2660
B		1400
B1		2120
Flue pipe connection		Ø 250
E		625
H		2125
H1		2275
D1 Flow		DN80 NP6
D2 Return		DN80 NP6
D3 Safety Flanges		DN40 NP16
D4 Safety Flanges		DN40 NP16
D5 Drain		1"

HPKI-K
OUTPUT 180-550kW
PELLET & WOOD CHIP

The HPK-IK high-performance boiler is produced as a tension-free welded construction. The heat insulated door at the front swings out completely permitting so a free access for cleaning all the boiler flues. Constructed in accordance with the natural combustion process of the fuel wood. The gasification combustion chamber built on the direct-current principle is lined with a ceramic variable (replaceable) radiant ceiling. The high combustion temperatures and a long persisting time of the gases in the furnace guarantee clean combustion.

- Primary and secondary combustion air zone with air flow reading in the supply air ducts and linear air dosage by rotary valve and actuator
- Ceramic lining in High-temperature resisting special fire concrete
- Underfeed fuel stoking with combustion retort in heat resistant steel, incl grate rods in fire resistant cast alloy.
- Combustion grate incl. Grate rods in fire resistant cast alloy with pull-out ash removing box under it.
- Combustion chamber door in front.

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incl. multi-cyclone flue dust interceptor

Flue dust interceptor for removing the flue dust from flue gases. The interceptor is installed compact on the boiler.

- Housing with phased installed cast metal cyclones.
- Ash discharge cone with appropriated outflow form discharge system / separated position of ash container.

incl. flue gas ventilator

For creating and regulating the negative pressure in the boiler.

- Sturdy housing in steel
- Radial running wheel welded and balanced dynamically
- Motor with shaft and heat diversion panel designed to cope with high temperatures
- Insulation class F.

Automatic cleaning of boiler tubes (optional)

The cleaning of the interior of the boiler tube is carried out by means of an intensive compressed air shock. This cleans the tube at high speed and loosens any ash sticking on the walls. Special valves with a very high air throughput with a very short opening time are used to achieve the air prop. The tube stays clean as a result of the application of this cleaning principle, keeping the expenses and effort involved in additional cleaning work to a minimum. The flue gas temperature is low. The efficiency of the boiler is also improved.

- Special air jets with fast closing valves are built into the boiler doors
- Compressed air tank directly adjacent to valves with pressure sensor and safety valve
- Automatic valve control for optional setting up of the cleaning interval

Suitable fuel: Wood chip max. 40% moisture content acc. ONORM M7133 or EN 14961

Wood pellets acc. ONORM M 7135 as well as DIN Plus or wood pellets Class A1 acc. to EN 14961-2

Cell wheel:

100% protection against burn-back! The multi-tested full-metal cell wheel reliably interrupts the boiler with the storage room and thus provides 100% protection against burn back. The blades are attached to the running wheel at an offset angle to the rotary axis to enhance the cutting action. In addition, the blades are slightly curved, which prevents noise generation and reduces compressive forces. A fixed cutting edge is integrated in the stable and noise dampening cast enclosure to reduce the size of longer pieces of material.

GILLES BOILER CONTROL for HPKI-K/R 180 – 550 kW for pellets and wood chip boilers

- Continuous output regulation in the range from 30 to 100 %
- Combustion optimalisation;
- Lambda control;
- Underpressure regulation;
- Air quantity regulation;
- Control and regulation of the complete process, starting in silo by fuel discharge up to the heating boiler by means of PLC suitable for industry usage;
- Programming in compliance with the standard IEC 61131-3 of world-wide validity
- Duly elaborated control thanks to the home long year well developed know-how;

Different control circuits enable to keep the low emissions level even in case, when using fuel of various humidity contents, of various size or heat efficiency;

- The control may be set up via CAN-Bus or modem locally and externally at any time.

INDUSTRIAL TRANSPORT SYSTEMS

Walking floor (push rod) transport system 180 – 550kW

The data in the following table should be observed when considering the push rods discharge system:

Static calculation was made for wood chip of size G 50 and W 50, the maximum apparent density of 440 kg/m³

	Width/rod	Width/rod	Width/rod	Width/rod
Length/rod	3.0m	2.5m	2.0m	1.5m
12m	2.3m *	2.8m *	3.5m *	4.7m *
10m	2.8m *	3.4m *	4.2m *	5.6m *
8m	3.5m *	4.2m *	5.3m *	7.0m *
6m	4.0m *	5.6m *	7.0m *	9.0m *

* max. delivery height

The permissible width of the push rods depends on the required length and intended delivery height

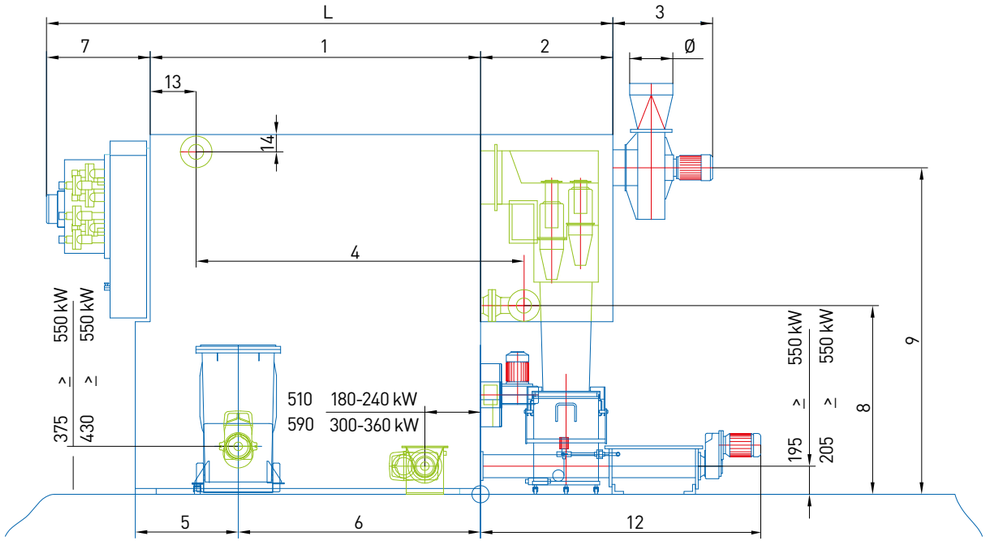
Example:
Intended bunker length is 10,0 m, intended delivery height is 4,0 m.

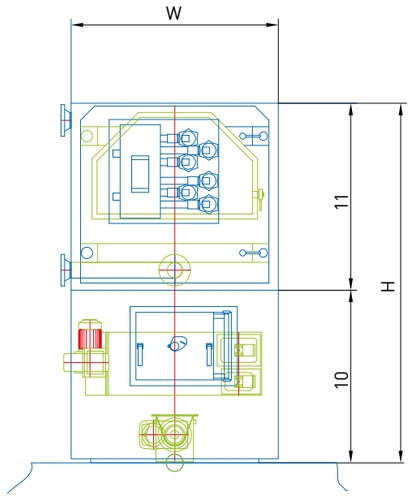
Pus rod may be used within 2,0 m at maximum.
In order to avoid the overbridging, the distance between push rods or wall should be 100 mm – 150 mm at maximum.

FEEDER TANK

Feeder tank HPK-IK for 2 dosing augers (suitable for pellet and wood chip).

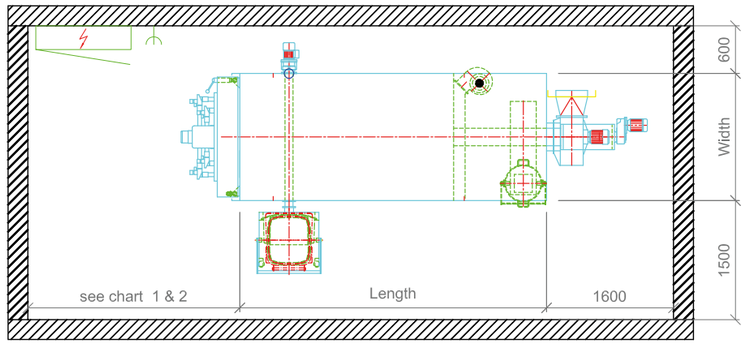
HPKI-K 180-550



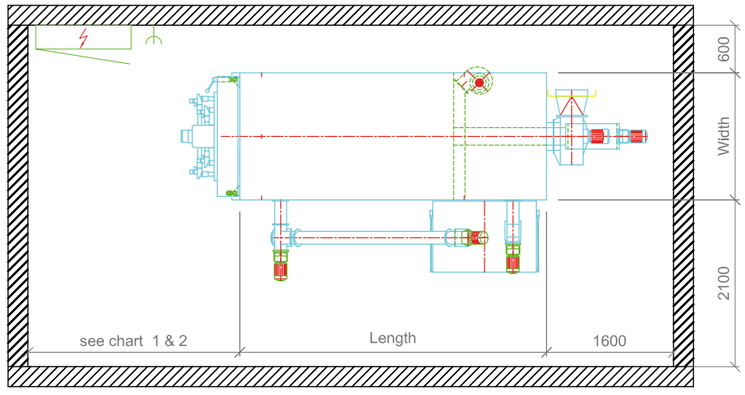


Output kW	L	W	H	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Flow/ Return DN	Ø mm	Weight Furnace in Tons	Weight Heat Exchanger in Tons	Water in Litre	Kpa at t20°C	Flow Coefficient in m^3/h
180	2990	1150	2200	1600	720	590	1450	530	1170	670	1150	1970	1050	1150	2000	250	150	65	180	2,34	1,32	830	2,6	48
195	3190	1150	2200	1600	920	590	1580	530	1170	670	1150	1970	1050	1150	2200	250	150	65	200	2,45	1,32	830	4,6	48
240	3190	1150	2200	1600	920	590	1580	530	1170	670	1150	1970	1050	1150	2200	250	150	65	200	2,45	1,32	830	4,6	48
300	3450	1250	2250	1800	920	590	1810	500	1400	730	1160	1990	1050	1200	2200	250	170	80	200	2,93	1,74	1100	3,2	72
360	3450	1250	2250	1800	920	670	1810	500	1400	730	1160	1990	1050	1200	2200	250	170	80	250	2,93	1,74	1100	4,6	72
450	3950	1440	2480	2300	920	670	2290	716	1684	730	1320	2270	1200	1280	2220	300	150	100	300	4,60	2,45	1550	3	110
550	3950	1440	2480	2300	920	670	2290	716	1684	730	1320	2270	1200	1280	2220	300	150	100	300	4,60	2,45	1550	4,6	110

MINIMUM CLEARANCE HPKI-K 180-550



min. clearance, boiler with 240l ash bin



min. clearance, boiler with 800l ash bin

Boiler specification	1 Minimum clearance	2 Recommended clearance	Length	Width
-180kW & 240kW	1150mm	1600mm	2320/2520mm	1150mm
-360kW & 360kW	1250mm	1800mm	2720mm	1250mm
-450kW & 550kW	1450mm	2300mm	3220mm	1450mm

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REMEHA GILLES BIOMASS BOILER 180-550KW TECHNICAL SPECIFICATION

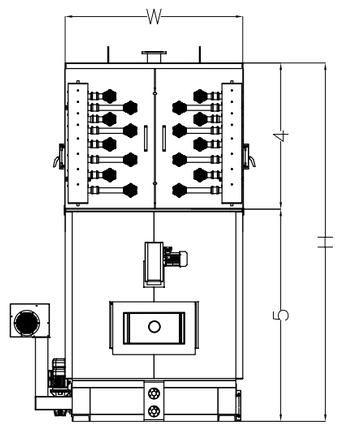
HPKI-R 999

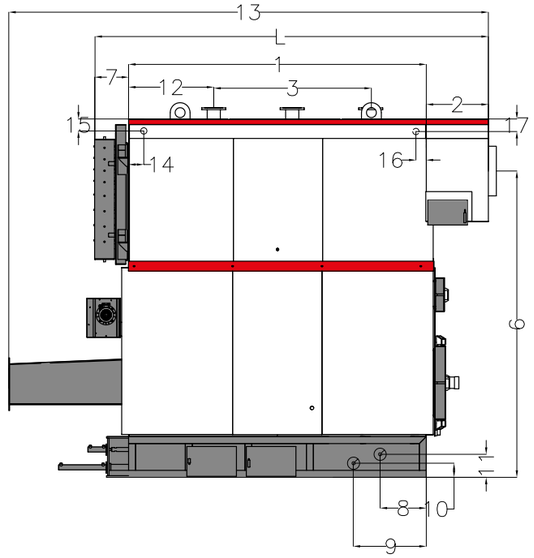
- Air cooled step grate boiler
- Handles fuel with a moisture content of 55%
- G100 Wood chips
- Efficiency >90%
- RHI Emission certificate

High efficient combustion

- Capable of full output burning
- Huge grate area, grates moved by dedicated hydraulic pump
- Pneumatic heat exchanger cleaning
- Touch screen control panel
- Fuel delivery by walking floor and cross conveyor
- Under grate ash discharge supplied as standard
- Cyclone supplied as standard, ceramic filter can be used in lieu

HPKI-R 999





Output in kW	L	W	H	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
999	3950	1790	3610	3000	630	1590	1470	2140	3090	320	465	735	142	232	860	4840	95	86	95	165

Flow/Retun DN	Ø mm	Weight furnace in tons	Weight heat exchanger in tons	Water in Litre	Kpa at T20°C	Flow coefficient in m³/h
125 / 125	500	14	6	3400	10	43

WATER TREATMENT

It is generally considered good practise to treat the system water. The biomass boilers have a steel heat exchanger so a suitable inhibitor should be used for steel and all other metals in the heating system.

BOILER ROOM VENTILATION REQUIREMENTS

Biomass boiler room ventilation can be determined by the following formula.

Boiler Output kW x 3.222 + 80 cm² = Free Area cm²

For example a 145kW boiler would need 547cm² of free area air inlet. A 100kW and a 45kW together in the same boiler house would have the same requirement.

Any conventionally flued appliances e.g pressure jet, water heater, atmospheric or conventionally flued Quinta etc will need their combustion/ventilation air in addition to the above in accordance with standard **BS6644** calculation.

FLUEING REQUIREMENTS

It is important to understand the Biomass boilers operate on a natural draught flue principle, therefore, it is assumed that there is no, or very little residual fan pressure available for the flue calculation.
In all instances a flue calculation must be carried out in accordance with EN13383, this will confirm safe removal of the flue gases in all but abnormal weather conditions.

The biomass boiler flue must be connected into a stainless steel twin wall flue system, with at least a 25mm insulation, the flue must also be suitable and approved for wood burning appliances, always contact a flue specialist for more guidance.

The cross sectional area of the boiler flue outlet must never be reduced in diameter, for longer flue runs or if additional bends are to be added, then this may include an increase in diameter.

If multiple biomass boilers are to be used, then each boiler must have its own flue and must not be shared with any other appliance.

The flue route must have a 1/3 - 2/3 rule applied, which means 1/3 is horizontal with 2/3 vertical, this should then bend 90° if at all possible. Offsets should be done with two 45° bends with the route taking an upward path, under no circumstances should the flue take a downward path.

If the flue route is difficult and natural draught will not occur, then an ID type fan could be fitted on the flue system, but specialist advice must be taken from the manufacturer.

There should be a negative flue draught reading between 12-18 Pa in all weather conditions, the draught stabiliser should be set accordingly.

The flue system must be fitted with an inspection tee piece, condensate trap and a draught stabiliser, these should be located as close as possible to the outlet of the boiler.

FLUEING ENVIRONMENTAL ISSUES

All combustion causes pollution. When selecting your fuel you are also inevitably selecting the pollution that comes as a consequence of that decision. All Remeha-Gilles boilers when correctly installed are certified by AEA Technology as suitable for use in Smokeless Zones and meet with all the UK regulatory standards. All equipment certification is given based on the use of clean fuel. Clean fuel is essential otherwise you may be in breach of emissions regulations.

Other air pollutants of concern, but by no means exclusive to biomass combustion include

- PM10 Particles – Remeha-Gilles fully automated boilers are class leaders with low PM10 emissions
- PM10 levels will vary significantly with fuel quality. Pellets produce less PM10 than chips and may be a more suitable fuel choice for built up areas. PM10 emissions are of less concern in rural and suburban areas where existing PM10 levels are likely to be low. PM10 and 2.5 can be reduced to virtually zero with the use of ceramic filters on the flue outlet, available from Remeha.
- Sulfur Oxides (SOx) cause acid rain. Modern wood systems have 1/6 the SO_2 emissions of fuel oil.
- Nitrogen Oxides (NOx) produced by all combustion processes cause ozone, smog, acid rain and respiratory problems.
- Carbon Monoxide (CO) is produced by all fuel combustion processes. The level produced by wood combustion depends very much on how well the system is set up and maintained. CO emissions from wood burning are of relatively minor concern to air quality, except in some areas that already have high levels of CO in the air from traffic exhaust.
- Volatile Organic Compounds (VOCs) are a large family of air pollutants, some of which are produced by fuel consumption. Some are toxic, others are carcinogenic. VOCs elevate ozone and smog levels in the lower atmosphere, causing respiratory problems. Both wood and oil combustion produce VOCs – wood is higher in some compounds and oil is higher in others. VOC emissions can be minimized with good combustion practices.

REMEHA GILLES BIOMASS BOILER IMPORTANT INFORMATION

NOTES

NOTES PAGE

NOTES

Remeha Commercial
Innovation House
3 Oaklands Business Centre
Oaklands Park
Wokingham
RG41 2FD
T: 0118 978 3434

biomass@remeha.co.uk
www.remeha.co.uk

September 2014

BlueEfficiency
CLEANER / GREENER / SMARTER

TreadLightly
ON THE PLANET

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