



HDG F20/25/30/40/50 with HDG Control

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Gasifying wood boiler for log woos (500mm) and pressed wood briquettes



The HDG F20-50 is a wood gasifying boiler for split logs up to 500 mm with downward combustion technology. It has the largest filler opening in its class which thus enables especially ergonomic and convenient boiler filling.

The separately supplied boiler cladding/heat insulation means that the boiler can easily be carried into existing boiler rooms. As an option the HDG F20-50 can also be supplied with HDG automatic ignition and HDG automatic cleaning. This makes wood heating even more convenient because the fuel in the fuel chamber is lit automatically on demand.

Can be converted for log/pellet fuel combination
(see pages 30-35)

Equipment features and specifications supplied

- High-quality flanged inner lining panels in fuel chamber for long boiler service life
- Integrated flue gas extractor in fuel chamber prevents smoke escaping when fuel chamber door is opened
- Ergonomic filling due to large fuel chamber door and low door aperture bottom edge
- Multi-piece burner-jet brick made of fireproof concrete and high-temperature resistant burner jet made of solid cast stainless steel to guarantee long service life
- Precise air volume control with vent-mounted actuators for primary/secondary air
- Modular-design high-temperature combustion chamber lined with separate firebricks for low-emission recombustion of combustion gases
- Long cleaning intervals due to generously dimensioned ash compartment and easy removal of combustion and fly ash to the front into the ash pan using the cleaning tool supplied
- Constantly high efficiency due to cleaning turbulators fitted as standard in the upright heat exchanger pipes
- Intuitive-to-operate heating and system controller with user-friendly 4.3" touch-screen display Combustion and output control assisted by oxygen sensor and flue gas temperature sensor Outside temperature sensor included

Design-type approved to DIN EN 303-5, certified to EU Pressure Equipment Directive 97/23/EC.


Boiler type HDG F20/25/30/40/50 (with HDG Control Touch)	Item no.	EURO	PG
HDG F20	15171020		1
HDG F25	15171025		1
HDG F30	15171030		1
HDG F40	15171040		1
HDG F50	15171050		1
HDG automatic ignition system for HDG F20-50 for mounting on RH side of boiler, consisting of: Ignition fan, differential pressure switch, cladding, mountings and fixings	16001009		7
HDG automatic cleaning system for HDG F20-50 for mounting on RH side of boiler, consisting of: Cleaning motor, limit switch, cladding, mountings and fixings	16001035		7
HDG convenience package for HDG F20-50 consisting of: Automatic ignition system and automatic cleaning system	16001036		7



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HDG Control Touch control panel	Item no.	EURO	PG
 HDG Control 4.3" touch-screen display for HDG F20-50 included as standard		Inc.	
HDG Control XL 7" touch-screen display for HDG F20-50 with integrated web visualisation Extra charge	16005011		7

The HDG Control can also control various plumbing system functions as well as the boiler. If the maximum number of the particular functions is exceeded, additional HDG Control touch-screen displays can be integrated in the system.

Control of the various plumbing system functions requires the appropriate inputs and outputs, e.g. for sensors, pumps and mixer valves. The requirements must be compared with the available inputs and outputs and expansion modules added if necessary. Expansion modules with displays are listed in Section E.

HDG Control sensor packages for controlling the following plumbing system functions (see Section E for details)	Inputs and outputs required			Max per display	Item no.	EURO	PG
	Sensor	Pump	Mixing v.				
Thermal store management (1 thermal store)¹ inc. recharging managem. 3 immersion sensors for top, middle and bottom of thermal store ①	3			1	16005050		7
Thermal store management (2 thermal stores) 3 immersion sensors for top, middle and bottom of thermal store	3			1	16005052		7
Thermal store management (2 thermal stores) with charge transfer system 3 immersion sensors for top, middle and bottom of thermal store	3	1	1		16005053		7
External heat source (e.g. oil/gas boiler) 1 immersion sensor	1 ²	1 ²	1 ²	1	16005055		7
Weather-compensated heating circuit , 1 heating circuit contact sensor ②	2 ³	1	1	6	16005005		7
Grid pump (for district heating grids) 1 contact sensor	1 ²	1	1 ²	2	16005056		7
Domestic water management , 1 immersion sensor ③	1	1		2	16005006		7
Solar charge on buffer tank , 1 collector sensor	1 ²	1	0-2 ²	1	16005008		7
Solar charge on water and possibly buffer , 1 collector sensor, 1 immersion sensor	2 ²	1	0-2 ²		16005015		7
Control hardware expansion: control of the packages requires the appropriate control hardware. The hardware can be selectively expanded	Available inputs and outputs				Item no.	EURO	PG
	Sensor	Pump	Mixing v.				
Central module for HDG F20-50 (fitted in boiler) ④	12	3	3				
EM4, expansion module for installation in boiler	4	2	1	1 ²	16005021		7
EM8, external expansion module in wall unit	8	3	2	3 ²	16005023		7
EM8+4, external expansion module in wall unit	12	5	3		16005025		7



¹ The HDG Control thermal store management supplementary package is required for operation of the HDG F20-50.

² Depending on plumbing configuration.

³ Sensor input is reserved for room programmer lite/indoor thermostat unit

⁴ For speed control of solar operation using a PWM signal, an EM4, EM8 or EM8+4 is required in the system network.

Function guaranteed only if installed according to HDG plumbing configuration diagrams and using HDG system components and correctly installed and commissioned by HDG-trained staff.

System and hydraulic components	Item no.	EURO	PG
 HDG return temperature control A DN 32 for HDG F20-50 ⑤ Return temperature control set DN 32 with insulation, energy-efficient circulation pump Wilo 30/1-7.5 w/o display, 180 mm, DN 50 ext. thread, inc. insulation, three-way mixer valve DN 32, actuator SM 4.6, running time 150 seconds, 230 V, 2 ball valves DN 32 int. thread, side DN 25 connection for boiler safety set, elbow, union/seal	16002081		7
 HDG return temperature control A for HDG F20-50 with energy-efficient circulation pump Wilo 30/1-7.5 w/o display, 180 mm, DN 50 ext. thread, inc. insulation, three-way mixer valve DN 40, int. thread DN 40, actuator SM 4.10, running time 150 seconds, 230 V, union/seal	16002080		7
Boiler safety set DN 25 , up to 50 kW, safety valve 3 bar DN 15, pressure gauge, automatic vent valve, insulation ⑥	15110030		7
Temperature-relief valve , DN 20 int. thread, immersion sleeve, 142 mm with DN 15 ext. thread ⑦	15110009		7

HDG system thermal stores and accessories can be found in Section F

Thermal store dimensioning for HDG F20-50

The thermal store size must be matched to the boiler model, the type of wood and the heat requirement of the building. According to the environmental pollution legislation applicable in Germany, thermal stores used with log wood boilers should have a volume of at least 12 l per litre of boiler fuel chamber capacity and/or a ratio of 55 l per kW of boiler output must be strictly adhered to. HDG recommends at least 2000 l for the HDG F20/25/30, and 3000 l for the HDG F40/50. Please also take account of DIN EN 303-5, VDI 2035 and the information on boiler and thermal store dimensioning. Function guaranteed only if installed according to HDG plumbing configuration diagrams and using HDG system components and correctly commissioned by HDG-trained staff.

HDG Starter-Pakete für HDG F20-50 für Standard-Hydrauliksysteme	Bestehend aus:	Passend für Kesseltyp:	Art.-Nr.	EURO	PG
Nur Pufferladung	① ④ ⑤ ⑥ ⑦	HDG F20-50	16095114		99
Pufferladung, 1 Heizkreis, Brauchwasserladung	① ② ③ ④ ⑤ ⑥ ⑦	HDG F20-50	16095117		99
Pufferladung, 2 Heizkreise, Brauchwasserladung	① ② ② ③ ④ ⑤ ⑥ ⑦	HDG F20-50	16095120		99



HDG F20/25/30/40/50 operating principle

Inverted-flame gasifying wood boiler

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The **connection board** (central module) for the HDG Control is easily accessible in the top part of the boiler. The circuit board is pre-installed in the boiler and can be easily connected to the necessary components using ready-made connecting leads.

The **HDG Control** is the central component of the entire combustion control system of the HDG F. It controls all electronic processes that are required for heat generation and optimum combustion. In addition, the HDG Control features an integrated heating and system controller with connection options for thermal store management and system-dependent heating circuit controllers.



Due to the extremely generously dimensioned **fuel chamber door** (47 cm x 42 cm on HDG F20/25/30 and 52 cm x 54 cm on HDG F40/50) with additional inner lining and low door aperture bottom edge (approx. 86 cm), the boiler is especially ergonomic and easy to fill. The door hinge of the fuel chamber door is on the right as standard but can be refitted on the left at any time on site.

The **cleaning lid** above allows easy access to the upright heat exchanger area. The few cleaning and maintenance tasks can be carried out easily from here.

The integrated, standard **cleaning turbulators** can be operated conveniently from the front. The turbulators are used for cleaning the upright heat exchanger. They also contribute to maintaining the boiler output to an optimum level. The optional **HDG automatic cleaning function** automatically operates the cleaning turbulators at the press of a button. Opening the integrated **flue gas flap** allows the boiler to be safely and conveniently cleaned and also reheated if necessary.



Flue gas flap closed



Flue gas flap open



The modularly structured hot **combustion chamber** is located directly under the fuel chamber according to the functional principle of downward combustion technology. The fuel gases produced are burned out here by addition of secondary air. The combustion chamber, which was specially developed for the HDG F, essentially consists of individual refractory concrete firebricks which sit on an additional water chamber. This protects the combustion chamber from overheating. This works to actively prevent early wearing.

The large **ash compartment** for flue ash, which is fitted with an additional water chamber, can be found under the combustion chamber. The flue ash can be easily drawn forward into the integrated ash pan. The insulated, air-cooled combustion chamber door with stainless-steel liner ensures low radiation losses and, like the fuel chamber door, can be converted from having the door hinge on the right to having it on the left.





HDG F20/25/30/40/50 operating principle

Inverted-flame gasifying wood boiler

The **fuel chamber capacity** of the HDG F20/25/30 is 155 l, and of the HDG F40/50 is 205 l. The fuel chamber casing consists of high-quality 6 mm steel sheet and is fully lined with high-quality flanged panel sections. The special construction of the side panels ensures the wood slips down and protects the panels against warpage. The fuel chamber capacity is an important reference point for the design of the required accumulator capacity.

The wood goes through four different temperature zones in the fuel chamber. In the upper section, the firewood is "preheated". The water bound in the firewood is evaporated at temperatures around 100°C. For non-polluting combustion, the firewood must be sufficiently split and contain less than 20% water content (25% wood moisture). Wood is composed of approximately 85 percent volatile components by weight, which account for about 70% of the heating energy. At temperatures up to approx. 600°C, the firewood is degassed with the addition of primary air. The added primary air also cools the lower parts of the side panels. The primary air is conducted through the side primary air opening into the lower fuel chamber area. The gases released in the first step are ultimately burned out with the addition of secondary air in the underlying hot combustion chamber (downward combustion technology).

The **HDG automatic ignition system** is available as an option for the HDG F. This makes wood heating even more convenient because the fuel in the fuel chamber is lit automatically on demand.

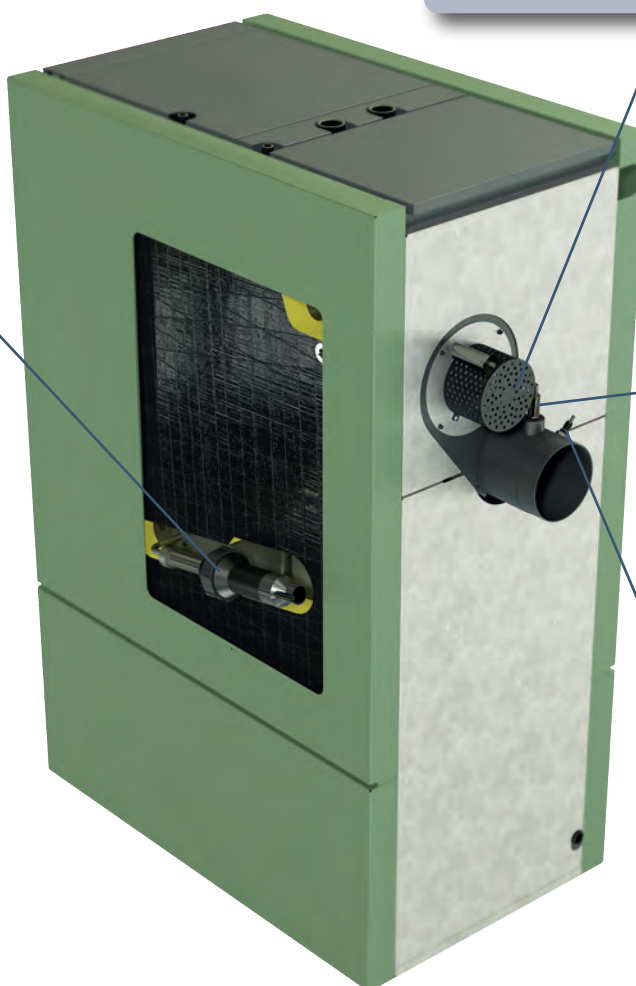
The **flue gas fan** assists generation of the necessary flue draught and provides the required depression in the fuel chamber. This makes heating up as well as cleaning a clean and speedy affair. The high-quality fan has a shaft cooling mechanism and is protected against overheating by a controller.

The fan control unit with the attached actuators for the **primary and secondary air** ensures the air quantity is regulated precisely during the entire burning cycle. The combustion air is pre-heated by the air-cooled combustion chamber door and thereby optimises the combustion process. After the burning cycle the actuators are closed automatically in order to reduce boiler cooling. If the boiler is not heated for more than seven days, the protective program ensures that the boiler is "aired" with opened actuators.

The **flue gas temperature sensor** is the reference variable for the required primary air and also defines the output of the boiler.

The high-temperature resistant, cast stainless steel **burner jet** is a floating fit in the split burner jet brick. The burner jet is a 2-piece design and extremely durable. Its special design allows the burner jet to expand evenly. The special design of the burner jet prevents the logs having an adverser effect on combustion gas extraction – which guarantees long service life and optimum operational safety and reliability. The split nozzle brick encloses the secondary air duct in which the secondary air is pre-heated. In return, the nozzle brick is protected from overheating.

The **oxygen sensor** measures the residual oxygen content after combustion and is the reference variable for the correct volume of recombination air, i.e. secondary air. It forms the basis for environmentally friendly combustion with low wood consumption and high efficiency. The oxygen sensor is fitted in a protective tube with a heat-resistant sealing washer. That makes the oxygen sensor reading a reliable and durable reference variable.





HDG F20/25/30/40/50

Technical data

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Boiler type	Unit	HDG F20	HDG F25	HDG F30	HDG F40	HDG F50
Performance data (measured according to DIN EN 303-5)						
Nominal thermal power	kW	20	25	30	40	50
Minimum thermal power	kW	15	15	15	25	25
Boiler efficiency at nominal thermal output ¹⁾	%	93.8	93.4	93.0	93.9	94.3
Electrical power consumption at nominal thermal power ¹⁾	W	78	82	85	74	63
Electrical connection: Voltage/frequency	V/Hz	230 / 50	230 / 50	230 / 50	230 / 50	230 / 50
Electrical connection: Back-up fuse	A	10	10	10	10	10
General boiler data						
Boiler class		5	5	5	5	5
Maximum permissible operating pressure	bar	3	3	3	3	3
Maximum supply temperature ²⁾	°C	95	95	95	95	95
Minimum return temperature	°C	60	60	60	60	60
Water capacity	l	125	125	125	180	180
Fuel chamber capacity	l	155	155	155	205	205
Fuel chamber depth	mm	570	570	570	570	570
Weight	kg	670	670	670	830	830
Dimensioning data for flue calculation (DIN EN 13384-1)						
Flue gas temperature (Tw) at nominal load	°C	155	160	165	160	165
Flue gas temperature (Tw) at lowest thermal power	°C	155	155	155	155	155
Flue gas mass flow at nominal load ¹⁾	kg/s	0.013	0.013	0.013	0.022	0.031
Flue gas mass flow at lowest thermal power ¹⁾	kg/s	0.010	0.010	0.010	0.014	0.014
CO ₂ content at nominal thermal power ¹⁾	%	14.2	14.2	14.2	14.4	14.6
CO ₂ content at lowest thermal power ¹⁾	%	13.3	13.3	13.3	14.5	14.5
Required flue draught (Pw)	Pa	10	10	10	10	10
Diameter of flue pipe connection	mm	150	150	150	150	150
Height to centre of flue connecting pipe	mm	1040	1040	1040	1070	1070
Water-side connections						
Flow and return connections (socket)	DN	32, int. thread	32, int. thread	32, int. thread	32, int. thread	32, int. thread
Temperature-relief heat exchanger connections (socket)	DN	15, ext. thread	15, ext. thread	15, ext. thread	15, ext. thread	15, ext. thread
Drain connection (socket)	DN	15, int. thread	15, int. thread	15, int. thread	15, int. thread	15, int. thread
Recommended minimum pipe dimensions	DN	32	32	32	32	32
Water-side resistance at nominal thermal power, 10K ¹⁾	Pa	1600	2000	2400	1500	1700
Water-side resistance at nominal thermal power, 20K ¹⁾	Pa	400	500	600	300	400
Other information						
Burning time per fuel filling according to fuel recommendations (Beech) approx.	h	Up to 7	Up to 6	Up to 5	Up to 6	Up to 5
Burning time per fuel filling according to fuel recommendations (Spruce) approx.	h	Up to 6	Up to 5	Up to 4	Up to 5	Up to 4
Sound pressure level	dB(A)	< 70	< 70	< 70	< 70	< 70
Min. Air inlet cross section ³⁾	cm ²	150	150	150	150	150
Label Boiler		A+	A+	A+	A+	A+
Label Boiler + Controller		A++	A++	A+	A++	A++

¹⁾ Figures as per type-approval test to DIN EN 303-5 by TÜV-Süd

²⁾ Maximum operating temperatures of up to 110 °C can also briefly occur.

³⁾ Observe country-specific guidelines

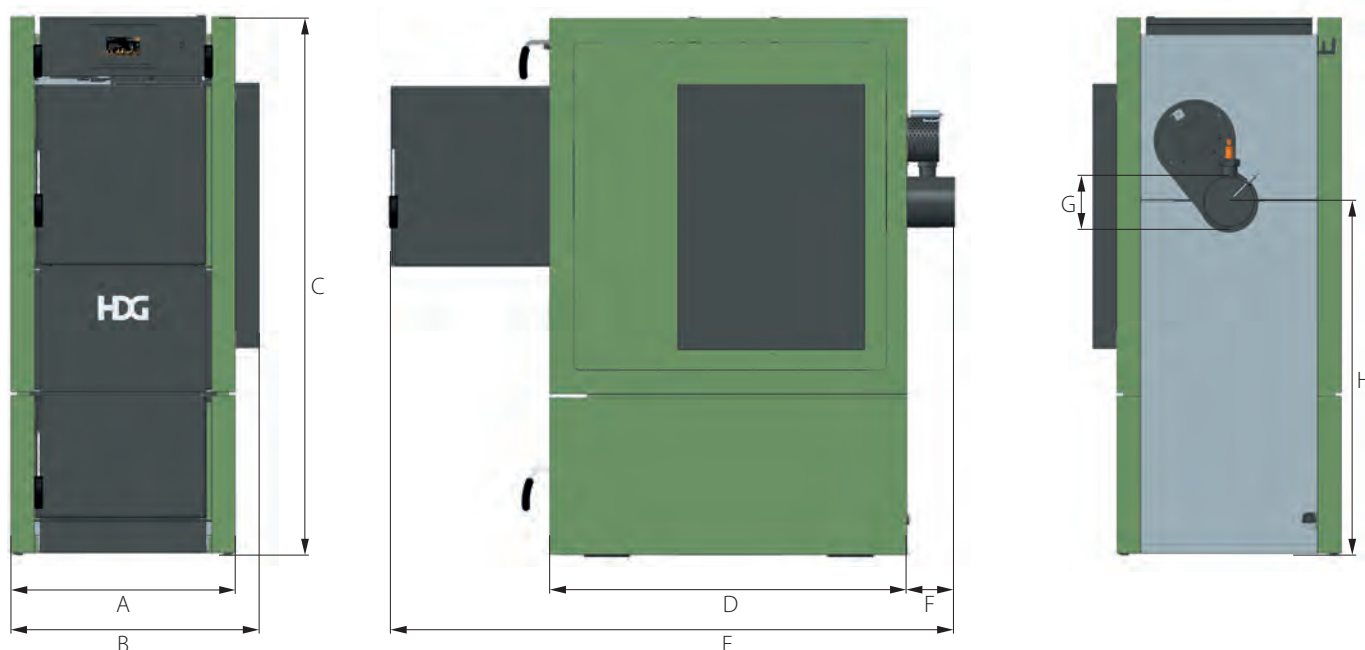


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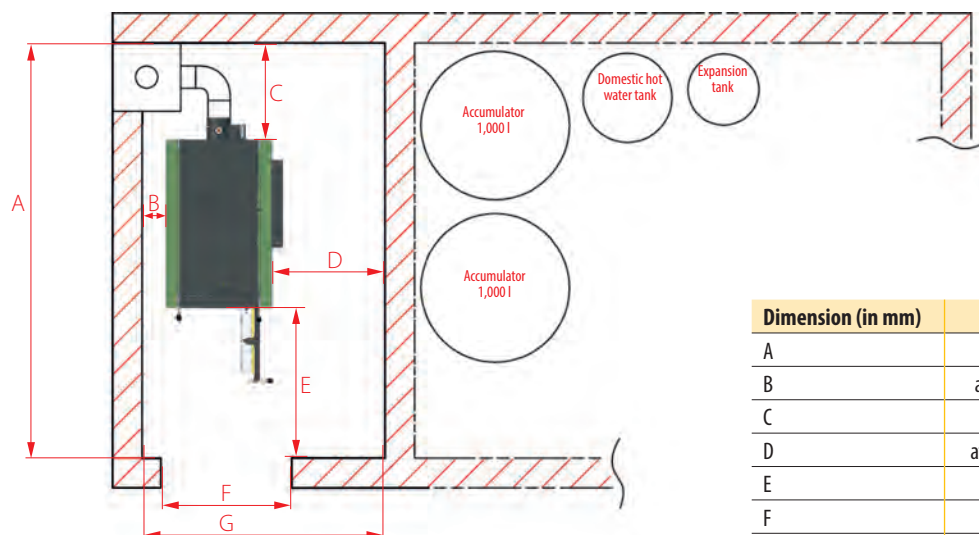
Technical drawings, minimum clearances

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Dimension (in mm)	Description	HDG F20/25/30	HDG F40/50
A	Width of boiler (excluding HDG automatic ignition/cleaning system)	660	760
B	Width of boiler (including HDG automatic ignition/cleaning system)	730	830
C	Height of boiler (equates to height of flow/return connection)	1590	1650
D	Length of boiler without attachments and flue gas pipe connection	1050	1100
E	Total length with open fuel chamber door including flue gas fan	1655	1760
F	Overhang of flue gas pipe connection	140	140
G	Diameter of flue pipe connection	150	150
H	Height to centre of flue connecting pipe	1040	1070
min. insertion dimensions (without cladding an add-on parts)		1025 x 650 x 1585	1075 x 750 x 1645



Minimum ceiling height:

HDG F20/25/30: 1.90 m

HDG F40/50: 2.00 m

Recommended ceiling height:: 2.30 m

Dimension (in mm)	HDG F20/25/30	HDG F40/50
A	At least 2200	At least 2300
B	at least 100 (or 600)	at least 100 (or 600)
C	At least 300	At least 300
D	at least 600 (or 100*)	at least 600 (or 100*)
E	At least 800	At least 800
F	At least 660	At least 760
G	At least 1400	At least 1500

Caution: observe the required access clearance and tilting height of the thermal store.

* Does not apply in connection with HDG automatic ignition system/automatic cleaning system