

## DESCRIPTION

## Hoval Max-3 plus



## Economical



## Saving Energy

- **Cost-effective solution** due to low investment cost
- **Highly efficient** due to being fitted with additional retarders/
- **Power Saving** due to large water capacity

## Ecological



## Low emissions

- **Environmentally Friendly** due to low NOx emissions
- **Low CO<sub>2</sub> emissions** due to minimal gas consumption
- **Outstanding emissions values** due to modulation of low NOx burners

## Easy to Use



## Simple Maintenance

- **Easy to use** due to intelligent design details.
- **User friendly controls** with TopTronic®E system
- **Service friendly** due to easy front door access

## Sophisticated



## Versatile Option

- **Large range of applications** due to flexible combination options
- **Space-saving** due to compact design
- **Simple installation** due to one piece heat exchanger.

## DESCRIPTION

**Hoval Max-3 plus  
Oil/gas boiler****Boiler**

- According to BSEN14394
- Three-pass steel shell boiler manufactured to European Standards for firing with Gas Oil and Natural Gas
- Max-3 plus complies with the Pressure Equipment Directive 97/23/EG
- Additional retarders fitted for enhanced efficiency
- Boiler completely welded
- Suitable for use with a Low NOx-burner having internal flue gas recirculation
- Insulation of the boiler body 80mm mineral wool mat
- Boiler completely cased with steel sheet panels, red powder coated
- Flue gas outlet to the rear
- Heating flow connection to the top, heating return connection to the rear, incl. mating flanges, nuts, bolts & washers and gaskets

**Optional**

- Side mounted TopTronic®E control panel with boiler control and limit thermostat suitable for different applications
- Free standing calorifier
- Boiler door hinges to the left

**Delivery**

- Boiler, insulation & casing, control panel and burner delivered separately packed

**On site**

- Fitting of insulation and casing, control panel, flue retarders and burner by the installer

CE-Product-ID-No. CE-0085BL0015  
according to Directive on appliances burning gaseous fuels 90/396/EG.

The boiler complies with the PED Pressure Equipment Directive 97/23EG.

**Control panel TopTronic®E13.4**

- For operating temperature up to 90°C  
For mounting on the left or the right hand side (right hand standard)
- Integrated control functions for:
  - 1 mixing circuit
  - 1 direct heating circuit
  - 1 hot water loading circuit
  - bivalent and cascade management
- Option to expand by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting or
  - module expansion universal
- Can be optionally networked with a total of up to 16 controller modules (incl. solar module)
- Consisting of:
  - electrical box
  - control panel
  - TopTronic®E control module
  - TopTronic®E basic module heat generator
  - burner control function device OFA-200
  - safety temperature limiter 110°C
  - burner cable cpl. 2-stage, L=5.0,
  - 1 X outdoor sensor TF/2P/5/6T/S1, L=5.0, with plug
  - contact sensor ALF/2P/4/t/S1, L=4.0m with plug

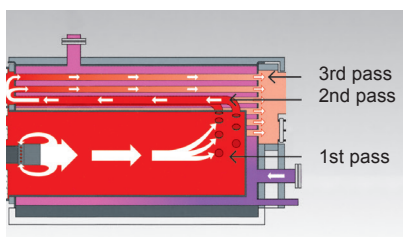
**Model range**

Max-3 plus	Output kW
(420)	147 - 420
(530)	185 - 530
(620)	217 - 620
(750)	263 - 750
(1000)	350 - 1000
(1250)	437 - 1250
(1500)	525 - 1500
(1800)	630 - 1800
(2200)	770 - 2200
(2700)	945 - 2700

**Control panel TopTronic®E13.5**

- As TopTronic®E/E13.4, but:
- For operating temperature up to 105°C
- Safety temperature limiter 120°C
- Configuration as control panel TopTronic®E/E13.4 above

DESCRIPTION



**Clean combustion**

With the proven three-pass technique, the hot combustion gases are immediately moved out of the high-temperature zone.

The flame temperature is reduced, and the pollutant emissions are minimised.



**Low operating costs of the Hoval 3-pass boiler can be taken for granted**

The Hoval three-pass boiler transforms the energy stored in oil and gas into valuable heat with impressive efficiency – this is demonstrated in a full load boiler efficiency in excess of 95%.

You, as the investor, will benefit from this high efficiency in the form of substantially lower heating costs.

The excellent insulation of the boiler lowers the stand-by losses and further reduces the energy consumption of the system. Maximum operating temperature is 90°C or 105°C depending on control panel type.



**Burners**

It is Hoval policy to supply boilers with matched burners from several recognised manufacturers.

Details of gas pressures, noise levels, gas boosters, acoustic shrouds etc. are given on individual quotations. Dual fuel burners are available on request.



**Intelligent command centre for your heating system**

The TopTronic®E control is the brain of every Hoval system. Innovative touchscreen technology ensures smooth, and continuously monitored operation.

With the addition of an optional Gateway module, remote access is available from your PC, tablet or smartphone.

Additionally, fault and other notifications can be e-mailed to your mobile phone, so you can always be in touch with your system.



**Installation wherever you want it!**

The compact dimensions of the boiler means that the Max-3 plus is perfect for plant rooms with low ceilings.

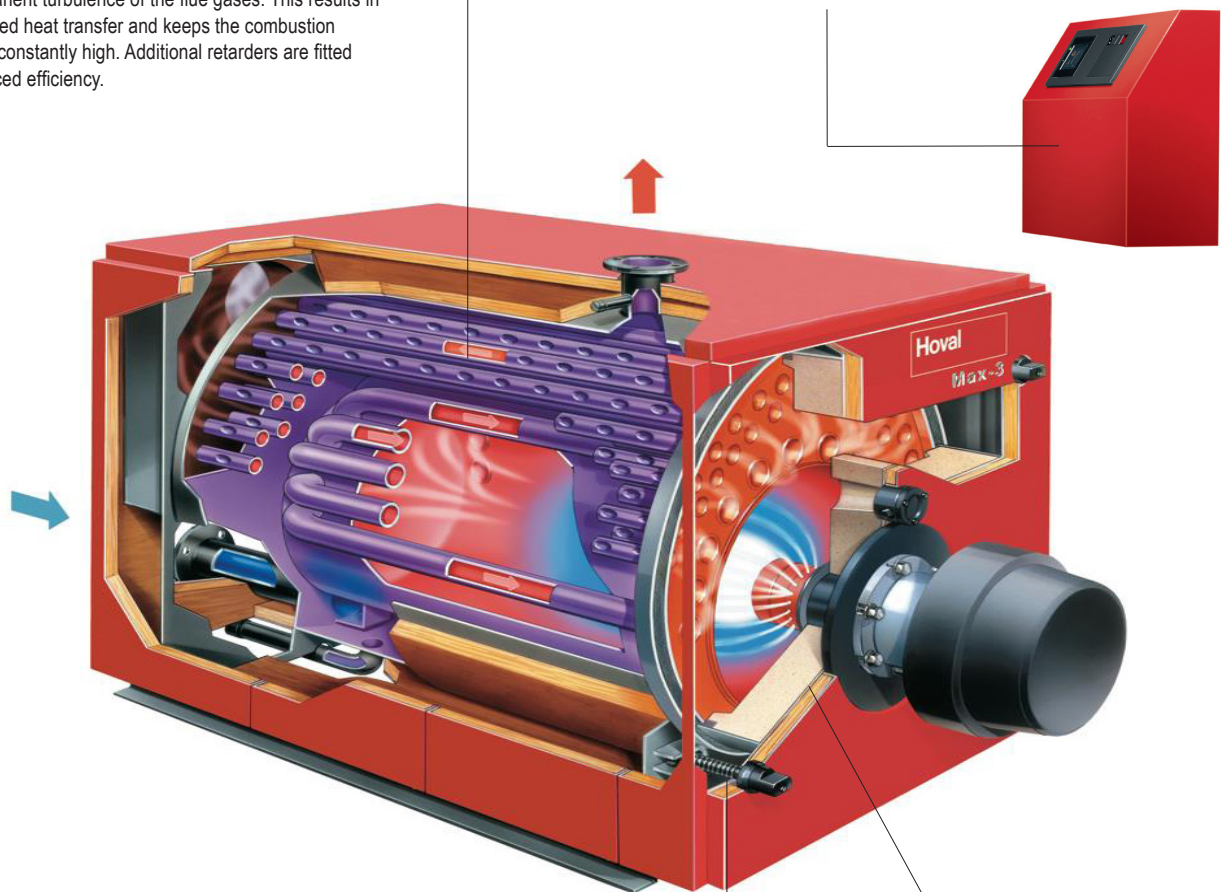
DESCRIPTION

**Dimpled tubes – Hoval’s patented development for constant high efficiency**

The unique design of the dimpled tubes allows a guaranteed and permanent turbulence of the flue gases. This results in an optimised heat transfer and keeps the combustion efficiency constantly high. Additional retarders are fitted for enhanced efficiency.

**Control panel**

Fitted with microprocessor-based TopTronic®E operating controls.



**Hinged door simplifies servicing**

Servicing the Hoval Max-3 plus' combustion components is made easier thanks to the hinged boiler door. The service technician has access to the combustion chamber and to the burner head. The handing of the boiler door can be changed to suit site layout.

**Insulated hinged front door**

for easy cleaning and quick access to the combustion chamber. An optional burner acoustic shroud is available to reduce noise level to a minimum.



## TECHNICAL DATA

Type		(420)	(530)	(620)	(750)	(1000)
• Output at 80/60°C	kW	420	530	620	750	1000
• Range of output at 80/60°C	kW	147-420	185-530	217-620	263-750	350-1000
• Burner input maximum	kW	441	557	651	788	1050
• Maximum operation temperature <sup>1</sup>	°C	90	90	90	90	90
• Minimum operation temperature	°C	See table operating conditions (below)				
• Minimum boiler return flow temperature	°C	See table operating conditions (below)				
• Minimum flue gas temperature	°C	See table operating conditions (below)				
• Safety temperature limiter setting (water-side) <sup>2</sup>	°C	110	110	110	110	110
• Working/test pressure	bar	6/9.6	6/9.6	6/9.6	6/9.6	6/9.6
• Boiler efficiency at full load and 80/60°C (net calorific value/gross calorific value) natural gas	%	95.2/85.8	95.2/85.8	95.2/85.8	95.2/85.8	95.2/85.8
• Efficiency at partial load 30% (according to EN 303) natural gas (net calorific value/gross calorific value)	%	97.1/87.5	97.1/87.5	97.1/87.5	97.1/87.5	97.1/87.5
• Part L seasonal efficiency (gross calorific value) for natural gas firing	%	87.2	87.2	87.2	87.2	87.2
• Stand-by loss qB at 70°C	Watt	1000	1035	1120	1180	1250
• Flue gas resistance at nominal output natural gas 10.8% CO <sub>2</sub> 500 m above sea level (Tolerance ± 20%)	mbar	6.5	8.0	8.2	9.5	10.0
• Flue gas mass flow at nominal output natural gas 10.8% CO <sub>2</sub>	kg/h	680	859	1004	1215	1619
• Flow resistance of boiler <sup>2</sup>	z-value	0.022	0.022	0.008	0.008	0.003
• Water-side resistance	at 10k mbar	28.5	45.4	22.6	33.1	22.0
• Water-side resistance	at 20k mbar	7.1	11.4	5.6	8.3	5.5
• Water flow volume at	at 10k m <sup>3</sup> /h	36.0	45.0	53.0	64.0	86.0
• Water flow volume at	at 20k m <sup>3</sup> /h	18.0	22.5	26.5	32.0	43.0
• Boiler water content	litres	552	520	969	938	1528
• Boiler gas volume	m <sup>3</sup>	0,583	0,602	0,846	0,872	1,350
• Insulation thickness boiler body	mm	80	80	80	80	80
• Dry weight (incl. casing) <sup>4</sup>	kg	1111	1171	1795	1831	2353
• Combustion chamber dimension	mm	606 / 1624	606 / 1624	684 / 1899	684 / 1899	782 / 2182
• Combustion chamber volume	m <sup>3</sup>	0.466	0.466	0.669	0.669	1.047
• Dimensions		See table of dimensions				
• Maximum draught in flue gas system (at boiler connection)	Pa	-50	-50	-50	-50	-50

<sup>1</sup> Limited by the boiler control to 90°C (E13.4) or to 105°C (E13.5).

<sup>2</sup> Maximum safety temperature for boiler control E13.4: 110°C; for E13.5: 120°C.

<sup>3</sup> Flow resistance boiler in mbar = volume flow (m<sup>3</sup>/h)<sup>2</sup> x z-value.

<sup>4</sup> Excludes weight of burner.

## Possible operating conditions

Fuel		Heating Oil EL	Natural Gas
min. boiler temperature	°C	65	75
min. return temperature	°C	55	65
Return temperature control (not by Hoval)		Required	Required

## TECHNICAL DATA

Type		(1250)	(1500)	(1800)	(2200)	(2700)
• Output at 80/60°C	kW	1250	1500	1800	2200	2700
• Range of output at 80/60°C	kW	437-1250	525-1500	630-1800	770-2200	945-2700
• Burner input maximum	kW	1313	1575	1890	2310	2835
• Maximum operation temperature <sup>1</sup>	°C	90	90	90	90	90
• Minimum operation temperature	°C	See table operating conditions (below)				
• Minimum boiler return flow temperature	°C	See table operating conditions (below)				
• Minimum flue gas temperature	°C	See table operating conditions (below)				
• Safety temperature limiter setting (water-side) <sup>2</sup>	°C	110	110	110	110	110
• Working/test pressure	bar	6/9.6	6/9.6	6/9.6	6/9.6	6/9.6
• Boiler efficiency at full load and 80/60°C (net calorific value/gross calorific value) natural gas	%	95.2/85.8	95.2/85.8	95.2/85.8	95.2/85.8	95.2/85.8
• Efficiency at partial load 30% (according to EN 303) natural gas (net calorific value/gross calorific value)	%	97.1/87.5	97.1/87.5	97.1/87.5	97.1/87.5	97.1/87.5
• Part L seasonal efficiency (gross calorific value) for natural gas firing	%	87.2	87.2	87.2	87.2	87.2
• Stand-by loss qB at 70°C	Watt	1380	1850	1950	2100	2300
• Flue gas resistance at nominal output natural gas 10.8% CO <sub>2</sub> 500 m above sea level (Tolerance ± 20%)	mbar	12.0	10.0	12.0	13.0	13.0
• Flue gas mass flow at nominal output natural gas 10.8% CO <sub>2</sub>	kg/h	2025	2429	2916	3564	4374
• Flow resistance of boiler <sup>2</sup>	z-value	0.003	0.002	0.002	0.002	0.002
• Water-side resistance	at 10k mbar	34.4	33.0	47.6	71.1	107.1
• Water-side resistance	at 20k mbar	8.6	8.3	11.9	17.8	26.8
• Water flow volume at	at 10k m <sup>3</sup> /h	107.0	129.0	154.0	189.0	231.0
• Water flow volume at	at 20k m <sup>3</sup> /h	53.5	84.5	77.0	94.5	115.5
• Boiler water content	litres	1478	2343	2750	3050	3550
• Boiler gas volume	m <sup>3</sup>	1,390	1,956	2,510	2,761	3,037
• Insulation thickness boiler body	mm	80	80	80	80	80
• Dry weight (incl. casing) <sup>4</sup>	kg	2643	3614	4693	5077	5649
• Combustion chamber dimension	mm	782/2182	880/2415	980/2595	980/2895	980/3200
• Combustion chamber volume	m <sup>3</sup>	1,047	1,58	2,07	2,30	2,41
• Dimensions		See table of dimensions				
• Maximum draught in flue gas system (at boiler connection)	Pa	-50	-50	-50	-50	-50

<sup>1</sup> Limited by the boiler control to 90°C (E13.4) or to 105°C (E13.5).

<sup>2</sup> Maximum safety temperature for boiler control E13.4: 110°C; for E13.5: 120°C.

<sup>3</sup> Flow resistance boiler in mbar = volume flow (m<sup>3</sup>/h)<sup>2</sup> x z-value.

<sup>4</sup> Excludes weight of burner.

## Possible operating conditions

Fuel		Heating Oil EL	Natural Gas
min. boiler temperature	°C	65	75
min. return temperature	°C	55	65
Return temperature control (not by Hoval)		Required	Required

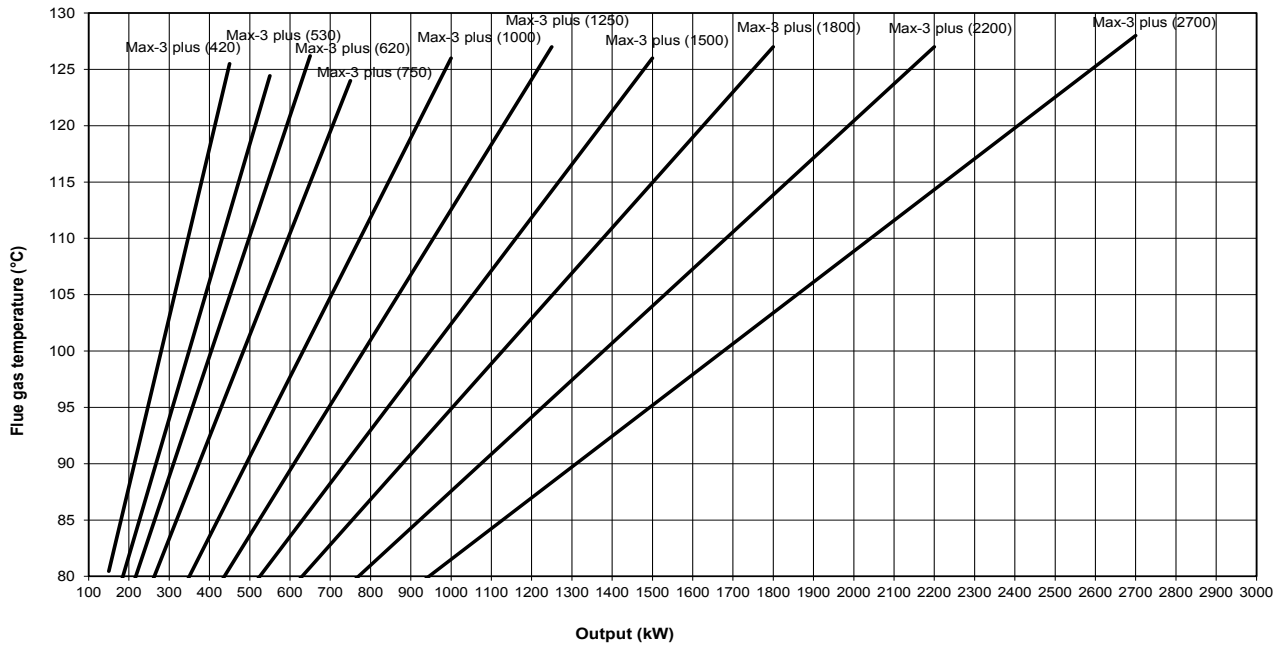
TECHNICAL DATA

Flue gas temperature and output range

In order to reach a good combustion quality, the indicated minimum temperature must be adhered to.

With new installations acidic condensate-proof chimneys should be fitted, or the flue gas temperature must be adjusted higher (min. 160°C).

The minimum flue gas temperature must be in accordance with the flue design, otherwise the formation of acidic condensate can cause long term damage.



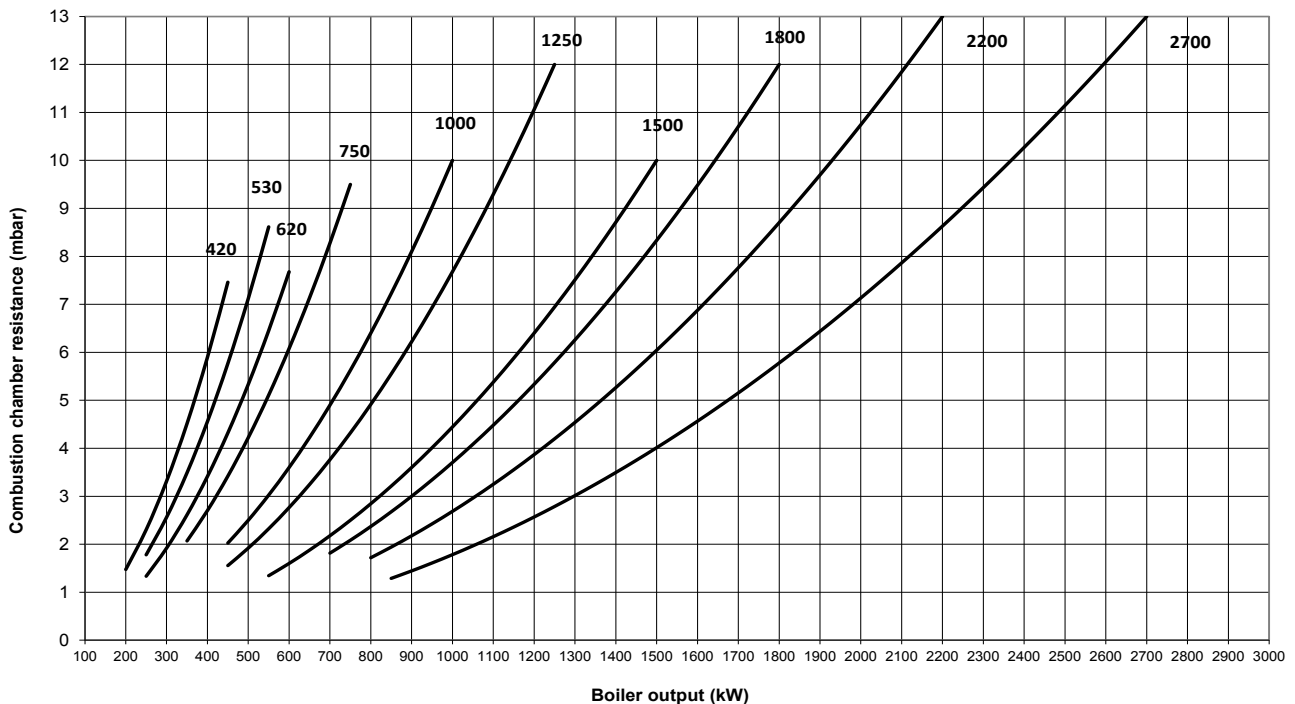
kW = Boiler output

°C = Flue gas temperature with clean heating surfaces, boiler flow temperature 80°C, return temperature 60°C (in accordance with DIN 4702).

- Operation with heating oil EL, natural gas  $\lambda = 1,11$  with max. burner output (CO<sub>2</sub> natural gas = 10,8 %)

- A reduction of the boiler water temperature of 10K causes a reduction of the flue gas temperature of approx. 6-8K.
- A change in the CO<sub>2</sub> emission value of +/-1% causes a change in the flue gas temperature of approx. +/-8K.

Combustion chamber resistance

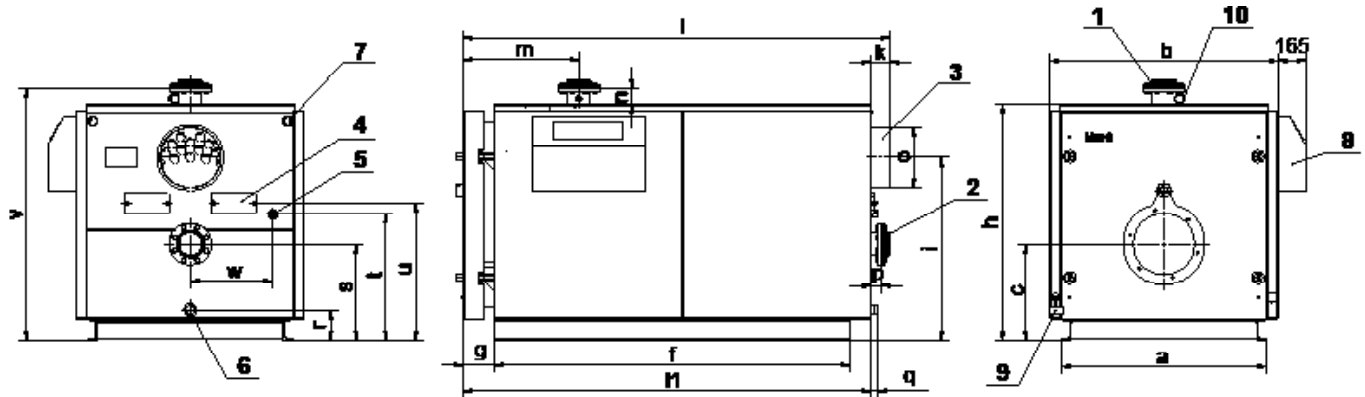


kW = Boiler output

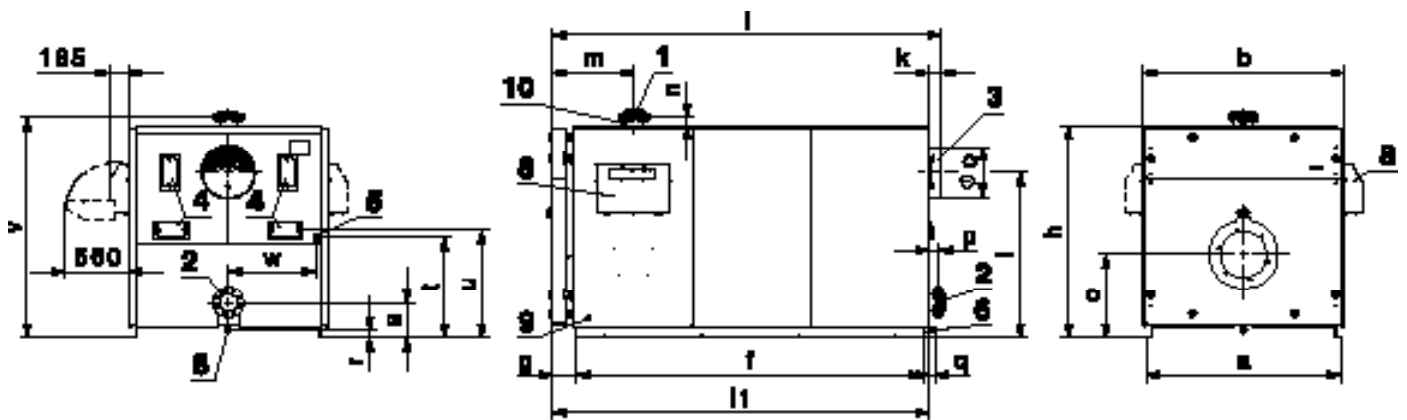
mbar = Flue gas resistance  $\lambda = 1,11$  (CO<sub>2</sub> natural gas = 10,8 %) 500 m above sea level (Tolerance +/- 20%)

DIMENSIONS

Max-3 plus (420-1250)  
(Dimensions in mm)



Max-3 plus (1500-2700)  
(Dimensions in mm)



- |   |      |  |  |   |        |  |  |   |                 |  |   |                  |   |  |   |             |   |               |   |               |   |                       |    |   |
|---|------|--|--|---|--------|--|--|---|-----------------|--|---|------------------|---|--|---|-------------|---|---------------|---|---------------|---|-----------------------|----|---|
| 1 | Flow | (420,530)<br>(620,750)<br>(1000,1250)<br>(1500-2200)<br>(2700) | DN 100, PN 6<br>DN 125, PN 6<br>DN 150, PN 6<br>DN 150, PN 6<br>DN 200, PN 6 | 2 | Return | (420,530)<br>(620,750)<br>(1000,1250)<br>(1500-2200)<br>(2700) | DN 100, PN 6<br>DN 125, PN 6<br>DN 150, PN 6<br>DN 150, PN 6<br>DN 200, PN 6 | 3 | Flue gas outlet |  | 4 | Cleaning opening | 5 | Flue gas collector cleaning opening R 1" | 6 | Drain R 1½" | 7 | Cable routing | 8 | Control panel | 9 | Electrical connection | 10 | Bushing Rp ¾" with immersion sleeve for boiler temperature sensor |
|---|------|--|--|---|--------|--|--|---|-----------------|--|---|------------------|---|--|---|-------------|---|---------------|---|---------------|---|-----------------------|----|---|

Max-3 plus Type	a	b	c	f	g	h	i	k	l	l1	m	n	Ø o	p	q	r
(420,530)	1060	1190	515	1770	181	1230	950	104	2178	2074	641	100	299	54	34	175
(620,750)	1180	1310	550	2045	181	1350	1050	105	2452	2347	666	95	349	55	35	170
(1000,1250)	1370	1500	635	2330	181	1550	1250	107	2739	2632	681	111	349	77	37	175
(1500)	1560	1610	665	2685	212	1710	1350	103	3040	2940	722	80	447	83	34	65
(1800)	1720	1770	735	3055	214	1870	1460	103	3424	3320	724	80	447	83	52	65
(2200)	1720	1770	735	3355	214	1870	1460	101	3724	3625	724	80	447	81	50	65
(2700)	1750	1800	755	3700	212	1900	1410	82	4032	3950	722	80	647	82	51	65

Max-3 plus Type	s	t	u	v	w	x
(420,530)	350	595	660	1330	450	-
(620,750)	550	722	786	1445	475	-
(1000,1250)	415	620	685	1660	590	-
(1500)	310	777	842	1790	695	1850
(1800)	310	890	952	1950	773	2040
(2200)	310	890	952	1950	773	2340
(2700)	370	917	982	1980	790	2670

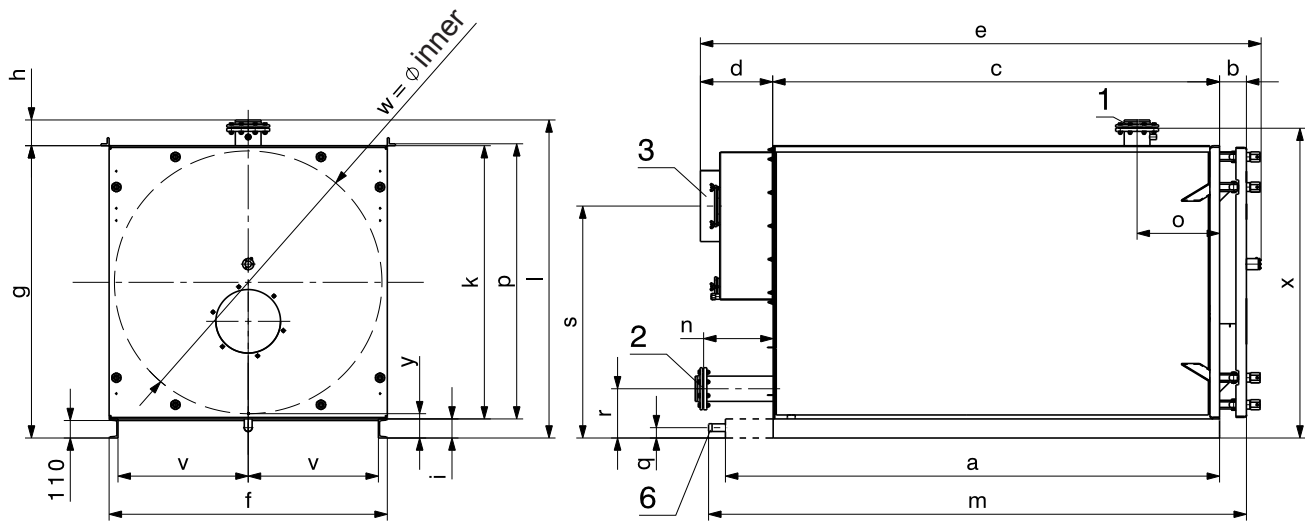
**Notes:** A safety valve must be fitted by the installer in the boiler flow pipework directly between the boiler and the downstream isolating valve. If fitting a boiler altitude gauge, a 3/8" BSP socket should be fitted by the installer in the flow pipework adjacent to the boiler to enable connection of the altitude gauge pipework.

It is recommended to mount the Max-3 plus boiler onto a suitable plinth at least 150mm high to facilitate the fitting of a drain valve.

Please also see important notes on the engineering guidelines page.



DIMENSIONS



Max-3 plus	a*	b	c	d	e	f	g	i	k	l	m	n	o	p
(420,530)	1920	150	1770	277	2222	1060	1180	120	1060	1376	2077	175	460	1072
(620,750)	2195	150	2045	228	2498	1180	1300	120	1180	1496	2353	172	485	1192
(1000,1250)	2480	150	2330	228	2783	1370	1500	120	1380	1660	2638	198	500	1392
(1500)	2685	164	2568	260	3083	1560	1680	120	1560	1842	2923	240	510	-
(1800)	3055	166	2760	450	3467	1720	1840	120	1720	2002	3325	430	510	-
(2200)	3355	166	3060	450	3767	1720	1840	120	1720	2002	3625	430	510	-
(2700)	3700	164	3390	430	4075	1750	1870	120	1750	2039	3953	430	510	-

Max-3 plus	q	r	s	v	w	x	y
(420,530)	175	350	950	475	990	-	-
(620,750)	170	550	1050	535	1110	-	-
(1000,1250)	175	415	1250	630	1298	-	-
(1500)	65	310	1350	725	1494	1790	153
(1800)	65	310	1460	805	1654	1950	153
(2200)	65	310	1460	805	1654	1950	153
(2700)	65	330	1410	820	1684	1980	153

\* Max-3 plus (1500-2700): Drain connection protrudes past the base channel

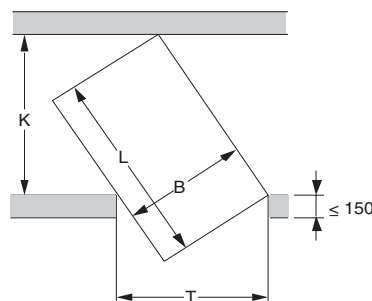
Required minimum width of door and corridor to bring in the boiler

The stated measurements are minimal dimensions

$$K = \frac{B}{T} \times L$$

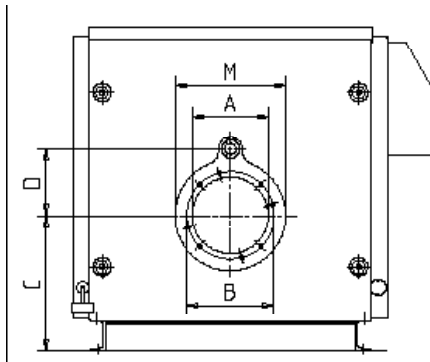
$$K = \frac{B}{T} \times L$$

- T = Door width
- K = Corridor width
- B = Boiler width
- L = max. length of boiler

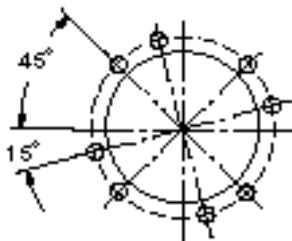
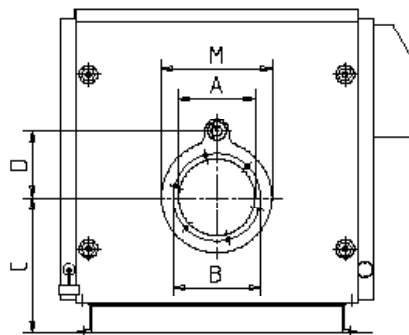


BURNER FLANGE DIMENSIONS

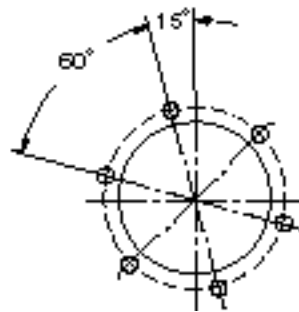
Max-3 plus (420,530)



Max-3 plus (620-2700)

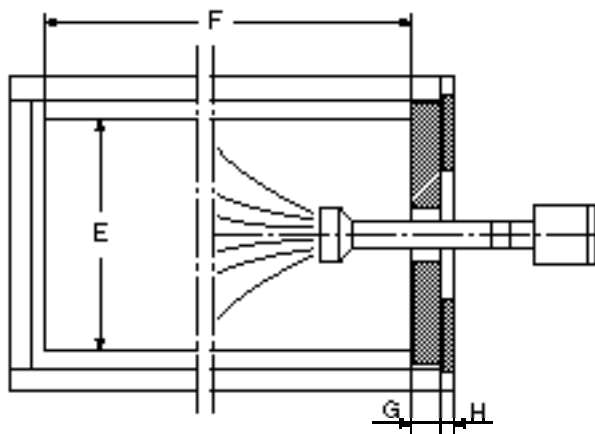


Screw joint flange  
Max-3 plus (420,530)  
4 x M12 (45°)  
4 x M12 (15°)

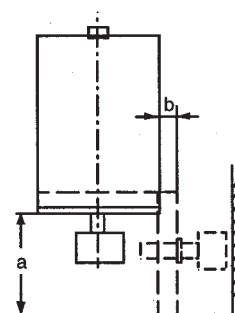


Screw joint flange  
Max-3 plus (620,750)  
6 x M12 (15°)

Screw joint flange  
Max-3 plus (1000-2700)  
6 x M16 (15°)



Swinging out of boiler door  
Boiler door is swivelling to the right or left  
(Dimensions in mm)



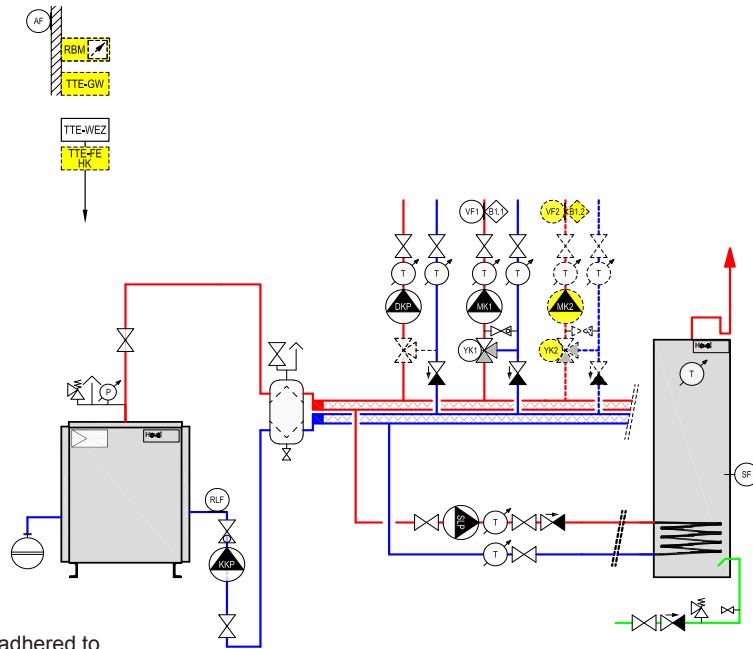
Dimensions  
(Dimensions in mm)

Max-3 plus Type	A	B	C	D	E	F	G	H	M
(420,530)	290	330	515	250	606	1624	163	30	420
(620,750)	350	400	550	310	684	1899	163	30	500
(1000,1250)	400	450	635	330	782	2182	163	30	550
(1500)	400	450	665	360	880	2417	170	30	600
(1800)	400	450	735	360	976	2605	170	30	600
(2200)	400	450	735	360	976	2905	170	30	600
(2700)	400	450	755	360	976	3233	170	30	600

Max-3 plus Type	a	b
(420)	1060	150
(530)	1060	150
(620)	1180	150
(750)	1180	150
(1000)	1370	150
(1250)	1370	150
(1500)	1520	175
(1800)	1680	175
(2200)	1680	175
(2700)	1700	175

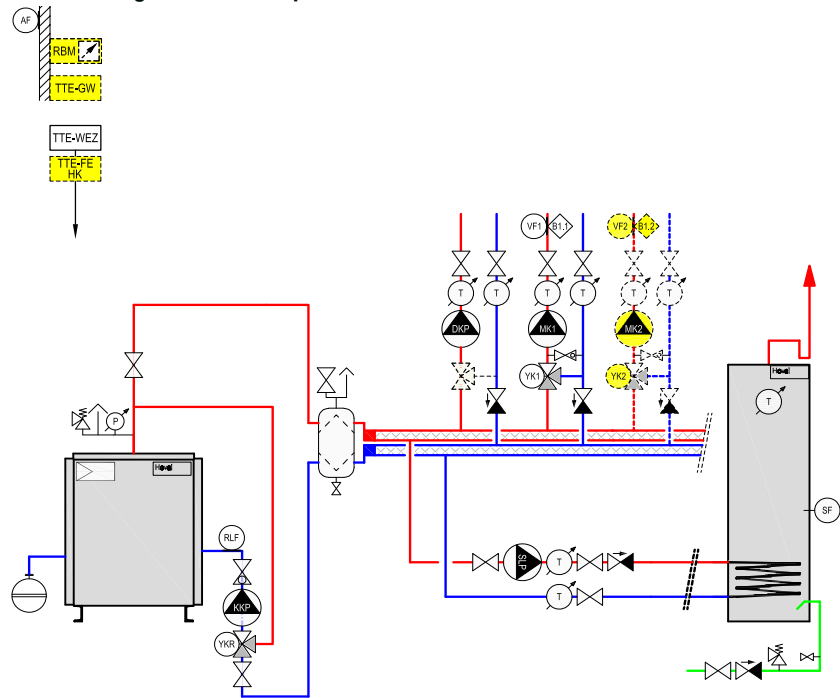
TYPICAL HYDRAULIC SCHEMATIC

Hydraulic principle schematic Max-3 plus with heating controller TopTronic®E  
Hydraulic schematic BEFE010



**Important!**  
Minimum return temperature must be adhered to.

Hydraulic principle schematic Max-3 plus with heating controller TopTronic®E  
Hydraulic schematic BEFE020



**Notes :**

- These hydraulic schematics are to be used for indicative purposes only. They do not contain all required items for the installation. The installation must comply with all relevant regulations.
- For underfloor heating, a flow temperature limiter must be installed.
- Safety valves must be fitted directly to the boilers (with no isolation valve). Lock shield valves must be used for the expansion vessel.
- Anti-thermal siphon loops must be installed to ensure natural circulation is not present.
- Pressure limiter (in accordance with BSEN12828 clause 4.6.2.2.2 - Heating Systems In Buildings).
- All Max-3 plus models should have an associated pressure limiter device fitted in the system pipework, as close as possible to the boiler itself (provided by the installer - not supplied, fitted or wired by Hoval).
- If the operating pressure of the heating system exceeds the given pressure limit, or in the case of auxiliary power interruption, the pressure limiter shall shut off the heating equipment and interlock against it restarting. The pressure limiter shall be adjusted so that it responds before the safety valve(s) operate. Not shown on these schematics.

RBM	Room station	B1	Flow temperature guard (if required)	YK1	Actuator mixer 1
AF	Outdoor sensor			YK2	Actuator mixer 2
RLF	Return sensor	MK1	Pump mixing circuit 1	YKR	Actuator return mixer
VF1	Flow sensor 1	MK2	Pump mixing circuit 2		
VF2	Flow sensor 2	SLP	Calorifier loading pump	TTE-GW	Gateway
SF	Calorifier heater sensor	DKP	Direct heating circuit	TTE-WEZ	Base module heat generator
		ZUP	Feed pump	TTE-FE HK	Extension module

ENGINEERING

Regulations and guidelines

The following regulations and guidelines must be observed:

- Hoval technical information and installation instructions.
- Relevant British Standards and Guidelines. Hydraulic and technical control regulations.

Water quality

Heating water:

- European standard BSEN 14868:2005 and VDI guideline 2035 must be observed. Particular note must be taken of the following regulations.
- Hoval boilers and water heaters are suitable for heating systems without significant oxygenation (system type 1 in accordance below with BSEN 14868:2005).
- Systems with;
  - **Continuous** oxygenation (e.g. floor heating without diffusion-proof plastic pipes) or,
  - **Intermittent** oxygenation (e.g. frequent topping up required) must be fitted with a system separator.
- Treated heating water must be checked at least once per year or more frequently as specified by the inhibitor manufacturer.
- If, in the case of existing systems (e.g. boiler replacement), the water quality of the existing heating water complies with VDI 2035, it is not recommended that the system be refilled. VDI 2035 also applies to top-up water.
- Before filling new systems, or, if applicable, existing systems, the heating system must be professionally cleaned and flushed. The heating system must be flushed before the boiler is filled.
- Components of the boiler / heat exchanger that come into contact with water are made of ferrous materials.
- Due to the risk of stress corrosion cracking, the combined chloride, nitrate and sulphate content of the heating water must not exceed a total of 200mg/l.
- Once the heating has been in operation for 6–12 weeks, the pH value of the heating water should be between 8.3 and 9.5.

Water for filling and topping up the system:

- Untreated drinking water is generally most suitable for filling and topping up a system with a Hoval boiler. However, the water quality of the untreated drinking water must always comply with VDI 2035 or must be demineralised and/or treated with inhibitors. The specifications of BSEN 14868:2005 must be observed.
- In order to maintain the boiler's high efficiency level and to avoid overheating of the heating surfaces, the values in the table

Important Notes!

A condensate trap must be fitted on the boiler flue outlet to prevent condensate entering the boiler.

A condensate drain point is provided in the flue outlet smoke box and this should be piped to drain via a drain trap to prevent flue gases escaping. No isolating valve should be fitted in this pipework.

below must not be exceeded. These values are calculated in relation to the boiler output (the smallest individual boiler in the case of multiple boiler systems) and the water content of the system.

- The total quantity of water used to fill and top up the system during the boiler's life must not exceed a value equivalent to three times the water content of the system.

Heating system

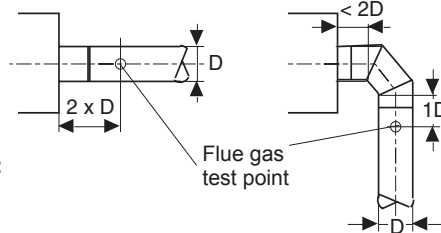
Combustion air

- A suitable supply of combustion air must be guaranteed. It must not be possible to close the air supply opening.
- Minimum free area for the air supply opening at low level is 4cm<sup>2</sup> per 1kW boiler input.
- Minimum free area for the air supply opening at high level is 2cm<sup>2</sup> per 1kW boiler input.

Chimney/flue gas system

Flue gas system

- Flue systems must comply with current British Standards and legislation.
- The flue must be pressure tight, able to withstand slight positive over pressure.
- Flue system must be able to cope with flue gas temperatures up to 190°C.
- The flue should be able to withstand the mildly acidic nature of any condensate that might form. Any condensate should not be allowed to collect in the flue and should be drained via a suitable trapped drain – not back via the boiler.
- A flue gas sampling point with an internal diameter 10-21mm should be included adjacent to the flue spigot, extending through any thermal insulation.
- The pressure condition at the boiler spigot ideally should be balanced – It can be slightly negative (up to -50Pa) or slightly positive depending on the matched burner. Check with Hoval Technical.
- A draught stabiliser may be required if the draught exceeds the figure indicated.



Burner mounting

- When mounting the burner an adapter flange may be required depending on the burner being used. If this is required this will be fitted to the boiler door and supplied with all additional fixings before it is dispatched from Hoval.
- The flexible oil pipes or gas pipework should be installed in such a manner that the door can be opened 90° with the burner still attached.
- All services must be fitted in such a manner that the boiler door can be opened fully.

Electrical connection

- A single phase 230V supply is required for the control panel operation. Single phase burners are electrically supplied via the control panel. Three phase burners require a separate three phase isolated supply (by the installer) direct to the burner. In this case control cables fitted with wieland plug/sockets will still run between the control panel and the burner. All power supplies to the burner/boiler/other associated equipment (ie.: gas booster, separate oil pump, etc.)

Noise attenuation

The following steps can be taken to reduce noise:

- Make the walls, ceiling and floor of the boiler plant room as solid as possible, fit sound absorbers in the air supply ducting, provide conduit supports and brackets with sound dampening fittings.
- If there are living quarters either above or below the boiler plant room, fit rubber vibration strips underneath the base channels of the boiler and connect conduits flexibly with flexible connections.
- Connect circulating pumps to the network with flexible connections. In order to dampen flame noise in the flue, sound absorbers can be fitted in the flue system (consider leaving space for subsequent installation).

Maximum filling quantity based on VDI 2035

	Total hardness of filling water up to...							
[mol/m <sup>3</sup> ] <sup>1</sup>	<0.1	0.5	1	1.5	2	2.5	3	>3.0
f°H	<1	5	10	15	20	25	30	>30
d°H	<0.56	2.8	5.6	8.4	11.2	14.0	16.8	>16.8
e°H	<0.71	3.6	7.1	10.7	14.2	17.8	21.3	>21.3
~mg/l	<10	50.0	100.0	150.0	200.0	250.0	300.0	>300
Conductivity	<20	100.0	200.0	300.0	400.0	500.0	600.0	>600
Boiler size of individual boiler	maximum filling quantity without demineralisation							
50 to 200kW	NO REQUI-	50l/kW	20l/kW	20l/kW				
200 to 600kW	RE-	50l/kW	50l/kW	20l/kW	Always desalinate			
over 600kW	MENT							

<sup>1</sup> Total of alkaline earths

<sup>2</sup> If the conductivity in µS/cm exceeds the value specified in the table a water analysis must be carried out