

Output range 420 to 2700 kW

Now with new TopTronic®E control



Why choose Max-3 plus?

The Hoval Max-3 plus boiler delivers market-leading efficiency and cost effective heating performance. Our wide range of boilers suit almost any customer's space heating requirements.

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 impact on the



Environment friendly

environment

 Low CO₂ emissions due to minimal gas consumption

due to low NOx emissions

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 operation

- Large range of applications due to flexible combination options
- Space-saving due to compact design
- Simple installation due to one piece heat exchanger
- High output achievable using double or multiple boilers with central controller

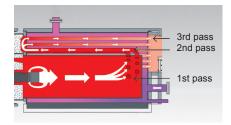
The complete Max-3 plus range extends from 420kW to 2700 kW. At Hoval we have the perfect system for almost any requirement.



Max-3 plus

Highly efficient, low carbon heating for commercial applications.

Max-3 plus Highly efficient, conventional three-pass boiler





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.



Installation wherever you want

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





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.





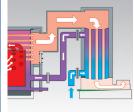
Intelligent command centre for your heating system

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.







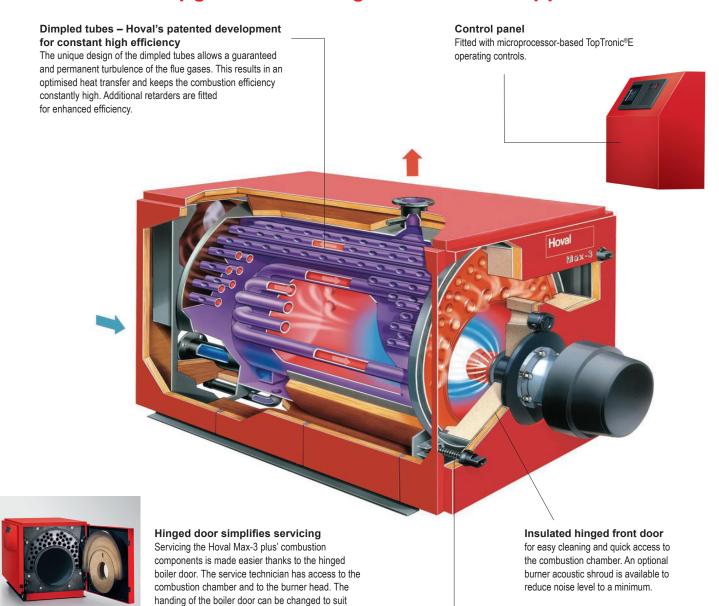
Up to 15% additional energy saving with the ThermoCondensor aluFer®

With the additional flue gas heat exchanger you benefit from even higher savings.

The Hoval ThermoCondensor aluFer® allows modern flue gas condensing. It is also possible to gain energy which in conventional boilers are lost through the chimney as flue gas loss.

The ThermoCondensor aluFer® is offered as a separate free-standing unit. All connections to the boiler and the condensor are designed for quick and simple installation.

Max-3 plus (420 - 2700) Perfect for upgrades and large commercial applications



	,							
Technical data Max-3 plus type:	Boiler output (kW)	Max operating temperature (°C) ¹	Working pressure (bar)	Water content (I)	Length (mm)*	Width (mm)	Height (mm)	Weight (kg)***
(420)	147 - 420	90/105	6	552	2178	1190	1435**	1111
(530)	185 - 530	90/105	6	520	2178	1190	1435**	1171
(620)	217 - 620	90/105	6	969	2452	1310	1555**	1795
(750)	263 - 750	90/105	6	938	2452	1310	1555**	1831
(1000)	350 - 1000	90/105	6	1528	2739	1500	1755**	2535
(1250)	437 - 1250	90/105	6	1478	2739	1500	1755**	2643
(1500)	525 - 1500	90/105	6	2343	3040	1813**	1790	3614
(1800)	630 - 1800	90/105	6	2750	3424	1973**	1950	4693
(2200)	770 - 2200	90/105	6	3050	3724	1973**	1950	5077
(2700)	945 - 2700	90/105	6	3550	4032	2003**	1980	5649

^{*} excludes burner

site layout.

Nominal boiler output at 80/60°C Figures subject to change without notice

^{**} control panel included

^{***} casing included, without water and burner

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,

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

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

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

Max-3 plus 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 ¹	°C	90	90	90	90	90
Minimum operation temperature	°C		See table	operating condition	ns (below)	
Minimum boiler return flow temperature	°C		See table	operating condition	ns (below)	
Minimum flue gas temperature	°C		See table	operating condition	ns (below)	
Safety temperature limiter setting (water-	°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)	%	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 ₂ , 500 m above sea level (Tolerance ± 20%)	mbar	6,5	8,0	8,2	9,5	10,0
\bullet Flue gas mass flow at nominal output natural gas 10.8% $\mathrm{CO}_{\scriptscriptstyle 2}$	kg/h	680	859	1004	1215	1619
• Flow resistance of boiler ³	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	m³/h	36,0	45,0	53,0	64,0	86,0
Water flow volume at - at 20K	m³/h	18,0	22,5	26,5	32,0	43,0
Boiler water content	litres	552	520	969	938	1528
Boiler gas volume	m³	0,583	0,602	0,846	0,872	1,350
Insulation thickness boiler body	mm	80	80	80	80	80
• Dry weight (incl. casing) ⁴	kg	1111	1171	1795	1831	2535
• Dry weight (without casing) ⁴	kg	943	1000	1590	1620	2360
Combustion chamber dimension	mm	606 / 1624	606 / 1624	684 / 1899	684 / 1899	782 / 2182
Combustion chamber volume	m³	0,466	0,466	0,669	0,669	1,047
• Dimensions			Se	e table of dimensio	ns	
Maximum draught in flue gas system (at boiler connection)	Ра	-50	-50	-50	-50	-50

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

Possible operating conditions

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

² Maximum safety temperature for boiler control E13.4: 110°C; for E13.5: 120°C.
³ Flow resistance belief in mbar = volume

flow $(m^3/h)^2 x$ z-value.

⁴ Excludes weight of burner.

Max-3 plus 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 ¹	°C	90	90	90	90	90
Minimum operation temperature	°C		See table	operating condition	ns (below)	
Minimum boiler return flow temperature	°C		See table	operating condition	ns (below)	
Minimum flue gas temperature	°C		See table	operating condition	ns (below)	
Safety temperature limiter setting (water-	°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)	%	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 ₂ , 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 ₂	kg/h	2025	2429	2916	3564	4374
• Flow resistance of boiler ³	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	m³/h	107,0	129,0	154,0	189,0	231,0
Water flow volume at - at 20K	m³/h	53,5	84,5	77,0	94,5	115,5
Boiler water content	litres	1478	2343	2750	3050	3550
Boiler gas volume	m³	1,390	1,956	2,510	2,761	3,037
Insulation thickness boiler body	mm	80	80	80	80	80
• Dry weight (incl. casing) ⁴	kg	2643	3614	4693	5077	5649
• Dry weight (without casing) ⁴	kg	943	1000	1590	1620	2360
Combustion chamber dimension	mm	782/ 2182	880/ 2415	980/ 2595	980/ 2895	980/ 3200
Combustion chamber volume	m³	1,047	1,58	2,07	2,30	2,41
• Dimensions			Se	ee table of dimension	ons	
Maximum draught in flue gas system (at boiler connection)	Pa	-50	-50	-50	-50	-50

Limited by the boiler control to 90°C (E13.4) or to 105°C (E13.5).

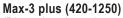
Possible operating conditions

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

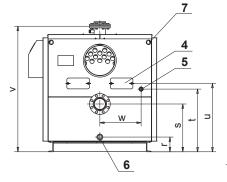
Maximum safety temperature for boiler control E13.4: 110°C; for E13.5: 120°C.

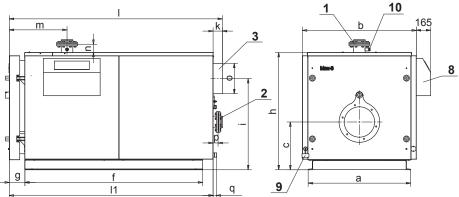
³ Flow resistance boiler in mbar = volume flow (m³/h)² x z-value.

⁴ Excludes weight of burner.



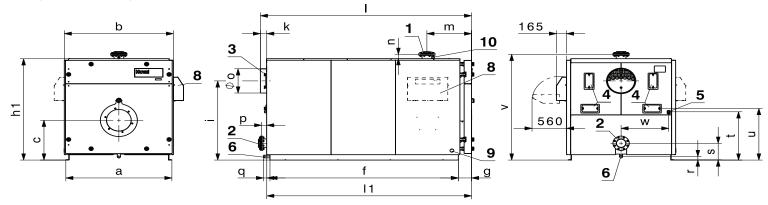
(Dimensions in mm)





Max-3 plus (1500-2700)

(Dimensions in mm)



- 1 Flow
- (420,530)(620,750)(1000-2200) (2700)
- DN 100, PN 6 DN 125, PN 6 DN 150, PN 6 DN 200, PN 6
- 2 Return
- (420,530)(620,750) (1000-2200)

(2700)

- DN 100, PN 6 DN 125, PN 6 DN 150, PN 6 DN 200, PN 6
- 6 Drain R 11/2" Cable routing
 - 8 Control panel

 - Electrical connection
 - Pocket Rp 3/4" with immersion sleeve for boiler temperature sensor

5 Smoke box drain connection R1"

Flue gas outlet Cleaning door

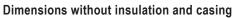
Max-3 plus	а	b	С	f	g	h	h1	i	k	- 1	11	m	n	0	р	q	r
(420,530)	1060	1190	515	1770	181	1230	-	950	104	2178	2074	641	100	299	54	34	175
(620,750)	1180	1310	550	2045	181	1350	-	1050	105	2452	2347	666	95	349	55	35	170
(1000,1250)	1370	1500	635	2330	181	1549	-	1250	107	2739	2632	681	111	349	77	37	175
(1500)	1560	1609	665	2685	212	-	1710	1350	103	3040	2937	722	80	447	83	34	65
(1800)	1720	1769	735	3055	214	-	1868	1460	103	3424	3322	724	80	447	83	52	65
(2200)	1720	1769	735	3355	214	-	1870	1460	101	3724	3623	724	80	447	81	50	65
(2700)	1750	1799	755	3700	212	-	1900	1410	82	4032	3950	722	80	647	82	51	65

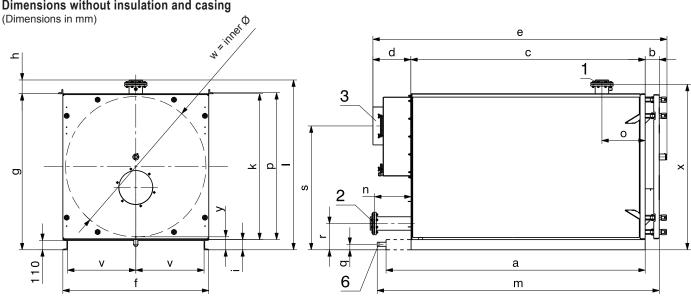
Max-3 plus	s	t	u	V	w
(420,530)	350	595	660	1330	450
(620,750)	550	722	786	1445	475
(1000,1250)	415	620	685	1660	590
(1500)	310	777	842	1790	695
(1800)	310	890	952	1950	773
(2200)	310	890	952	1950	773
(2700)	370	917	982	1980	790

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 page 13.

Dimensions in mm





Max-3 plus	a *	b	С	d	е	f	g	i	k	1	m	n	0	р
(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	$-\mathbf{r}$	s	٧	w	X	у
(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 protudes past the base channel

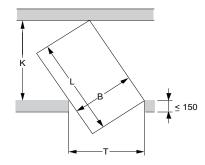
Required minimum width of door and corridor to bring in the boiler

The stated measurements are minimal dimensions

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

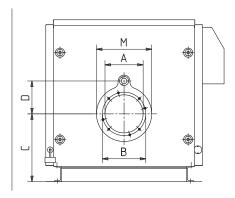
Door width Corridor width Boiler width max. length of boiler

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

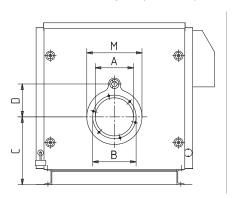


Burner Flange dimensions

Max-3 plus (420,530)

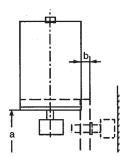


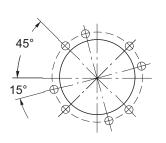
Max-3 plus (620-2700)



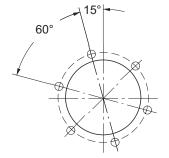
Boiler door openingBoiler door is opening to the right or left (Dimensions in mm).

Excludes burner protrusion



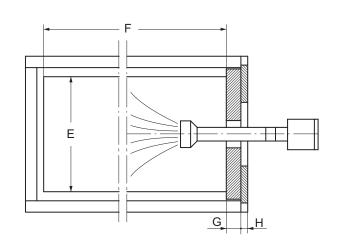


Screw joint flange Max-3 plus (420, 530) 4 x M12 (45°) 4 x M12 (15°)



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

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



Dimensions

(Dimensions in mm)

Max-3 plus	Α	В	С	D	E	F	G	Н	М
(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	655	360	880	2415	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	600x560

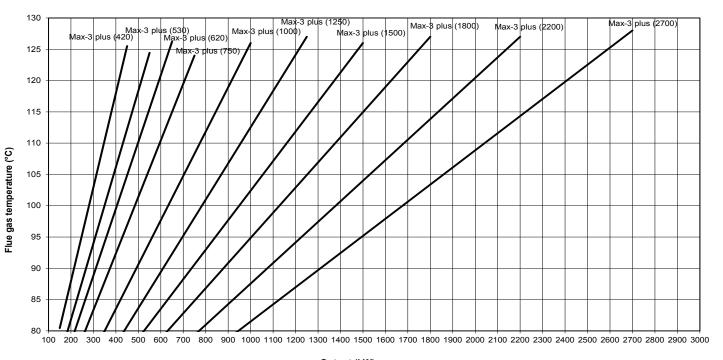
Max-3 plus	а	b
(420)	1060	150
(530)	1060	150
(620)	1180	150
(750)	1180	150
(1000)	1370	150
(1250)	1370	150
(1500)	1520	175
(1800)	1680	175
(2200)	1680	175
(2700)	1680	175

Flue gas temperature and output range

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

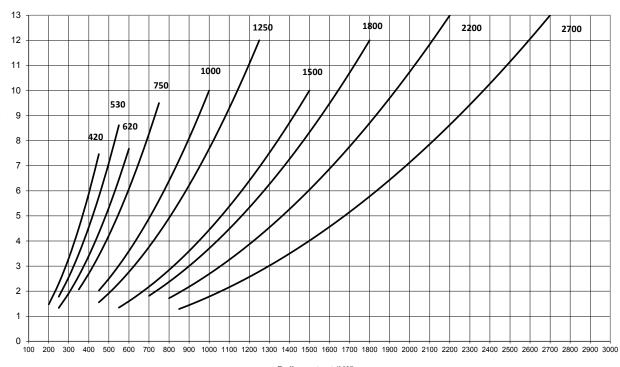
With new installations acidic condensate-proof chimneys should be fitted, or the flue gas temperature must be adjusted higher (min. 160°C).

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).
- Output (kW)
- Operation with heating oil EL, natural gas λ = 1,11 with max. burner output (CO₂ 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 CO₂ 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 λ = 1,11 (CO₂ natural gas = 10,8 %) 500 m above sea level (Tolerance +/- 20%)

Boiler output (kW)

Combustion chamber resistance (mbar)

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 and stainless steel.
- Due to the risk of stress corrosion cracking in the stainless steel component of the boiler, 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 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.

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.

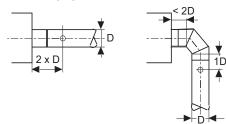
 The total quantity of water used to fill and top up the system during the boiler's life must not exceed a value equivalent to three times the water content of the system.

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 4cm² per 1kW boiler input.
- Minimum free area for the air supply opening at high level is 2cm² per 1kW boiler input.

Chimney/flue gas system Flue gas system

- Flue systems must comply with current British Standard and legislation.
- The flue must be gastight, impervious to moisture, non-corrosive, acid-proof and suitable for flue gas temperatures up to 190°C.
- The connection from the boiler to a header/riser must be connected at an angle of 30-45°.
- If a section of flue is longer than 1m it must be insulated.
- The flue must be designed so that it is not possible for condensate to enter the boiler.
- A flue gas sampling point with an internal diameter of 10-21mm must be fitted. This should extend through any thermal insulation.
- It is recommended that a draught stabiliser is fitted to ensure maximum draught values are not exceeded.
- Flue sample point location:



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.

TC-AF ThermoCondensor

Boiler installations with a TC-AF
 ThermoCondensor require a suitable over-pressure available from the burner to overcome the additional resistance.

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

3 1									
	Total hardness of filling water up to								
[mol/m ³] ¹	<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-		50I/kW	20I/kW	20I/kW				
200 to 600kW	RE-	50l/kW	50I/kW	20I/kW		Always desalinate			
over 600kW	MENT								

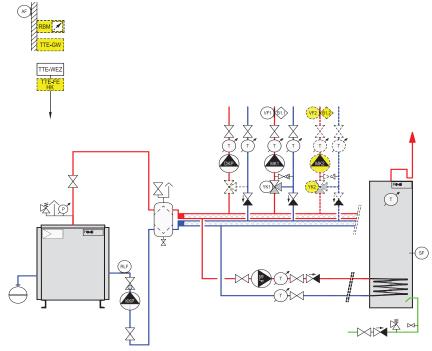
¹ Total of alkaline earths

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

Max-3 plus

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

Hydraulic schematic BEFE010



Important!

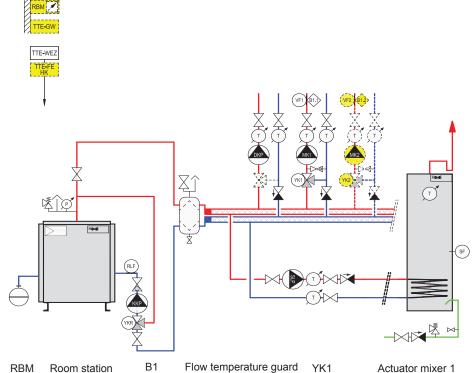
Minimum return temperature must be adhered to.

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.



AF RLF VF1 VF2

SF

Outdoor sensor Return sensor Flow sensor 1 Flow sensor 2 Calorifier heater

sensor

MK1 MK2 SLP DKP ZUP

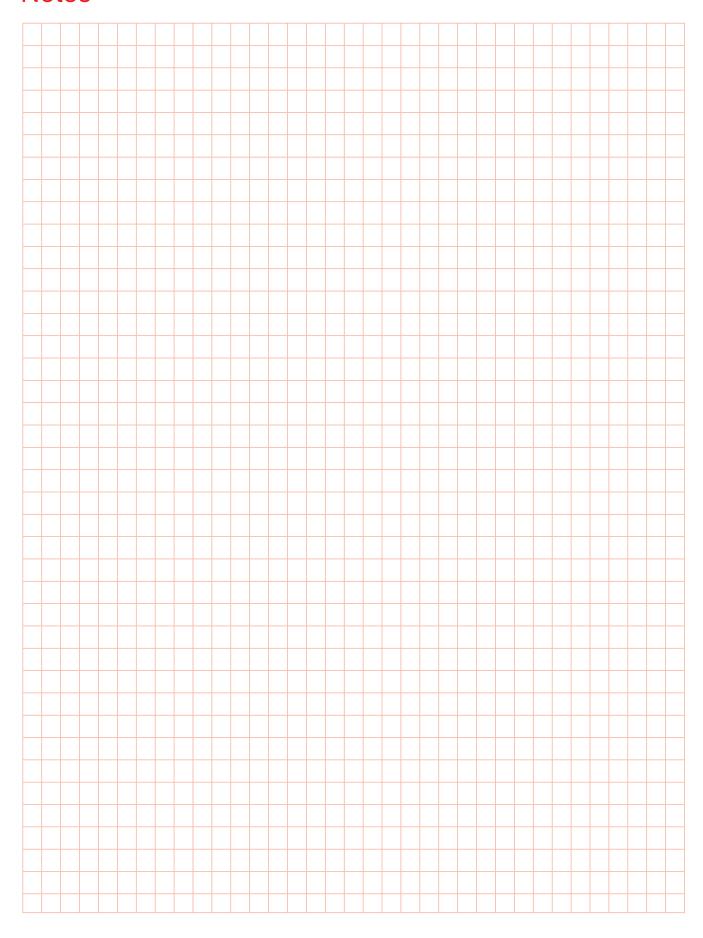
Flow temperature guard (if required) Pump mixing circuit 1 Pump mixing circuit 2 Calorifier loading pump Direct heating circuit Feed pump

YK1 YK2 YKR TTE-GW Actuator mixer 1 Actuator mixer 2 Actuator return mixer

Gateway TTE-WEZ Base module heat generator

TTE-FE HK Extension module

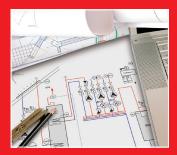
Notes





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