

## ■ Description

### Hoval Max-3 Oil/gas boiler

#### Boiler

- 3-pass steel boiler according to EN 303 part 1 and 2 and EN 304 for firing of Diesel oil, oil L and gas.
- Max-3 (420-1250) complies with the Pressure Equipment Directive 97/23/EG
- Boiler completely welded
- For LowNOx burner with intern flue gas re-circulation
- Insulation at the boiler body 80 mm mineral wool mat
- Boiler completely cased with steel plate, red powder coated
- Flue gas outlet to the rear
- Heating flow connection to the top, heating return connections to the rear, incl. counter flanges, screws and seals

#### Optional

- Control panel with boiler control and regulators in different executions
- Free-standing calorifier see Calorifiers
- Boiler door swivels to the left
- Delivery in single parts and welding on site, time to delivery approx. 8 weeks

#### Delivery

- Boiler, insulation and casing delivered separately packed

#### On site

- Mounting of insulation and casing



#### Model range

Max-3 Type	Output kW
(420)	200-500
(530)	220-610
(620)	240-720
(750)	280-870
(1000)	350-1150
(1250)	480-1450
(1500)	650-1750
(1800)	750-2150
(2200)	920-2500
(2700)	1030-3000

#### Permission Boiler

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 97/23/EG.

#### Control panel TopTronic® T/U3.1

- For operating temperature up to 90 °C
- For mounting on top of boiler  
Hoval Max-3 (420-1250) mounting on top  
Hoval Max-3 (1500-2700) mounting laterally  
on the left or the right
- Integrated control function for:
  - 1 mixing circuit
  - 1 heating circuit without mixing operation
  - domestic hot water loading circuit
- Option to expand the functions by
  - different key modules and/or
  - mounting of an additional heating regulator TopTronic® T/N (see Accessories)
- Main switch "I/O"
- Safety temperature limiter 110 °C
- Fuse 6.3 A
- Trouble indication "Burner"
- Burner running time meter and pulse counter
- Boiler sensor
- Large LCD display
- Rotary push-button

- Button for
  - daytime room temperature
  - night room temperature
  - hot water temperature
  - operating mode selection (holiday, absent, heating operation prolongation, automatic, summer, heating operation continuous - reduced - frost protection)
  - adjusting the heating curves
  - system information
  - emission measurement and manual operation
- Outdoor sensor AF 200
- Flow sensor with plug
- Calorifier sensor with plug
- Plug connection for burner
- Connection available for room stations

#### Delivery

- Control panel separately delivered

#### On site

- Mounting of the control panel at the boiler
- Installation of the control panel for mounting sideways

#### Control panel TopTronic® T/U3.2

- Functions like control panel TopTronic® T/U3.1, but:
- For operating temperature up to 105 °C
- Safety temperature limiter 120 °C

#### Optional

- Safety temperature limiter 130 °C

#### Delivery

- Control panel separately delivered

#### On site

- Mounting of the control panel at the boiler
- Installation of the control panel for mounting sideways

■ **Description**

**Control panel**

**with thermostat T 2.2**

- For systems without TopTronic® regulator.
- For direct 2-stage burner control, requirement starting from external calorifier or heater instruction is possible.
- Main switch "I/O"
- Safety temperature limiter 110 °C
- Selector switch burner load
- Switch summer/winter
- 3 boiler temperature regulators 30-90 °C
  - temperature regulator for base load heating
  - temperature regulator for full load heating
  - temperature regulator for calorifier
- Boiler and burner breakdown lamp
- Plug connection for burner (with cable and plug)

*Optional*

- 2 running time meters integrated
- 2 burner running time meters and pulse counters integrated
- Flue gas thermometer, 4.5 m capillary tube

*Delivery*

- Control panel separately delivered

*On site*

- Mounting of the control panel at the boiler
- Conversion of the boiler control for side mounting

**Control panel**

**with thermostat T 0.2**

- For external control
- For systems without TopTronic® regulator
- For special control function
- Main switch "I/O"
- Safety temperature limiter 120 °C
- 3 boiler temperature regulators 50-105 °C
  - temperature regulator for base load heating
  - temperature regulator for full load heating
  - temperature regulator for calorifier
- without burner plug connection

*Optional*

- 2 running time meters integrated
- 2 burner running time meters and pulse counters integrated
- Flue gas thermometer, 4.5 m capillary tube
- Safety temperature limiter 130 °C

*Delivery*

- Control panel separately delivered

*On site*

- Mounting of the control panel at the boiler
- Conversion of the boiler control for side mounting

## ■ Part No.


**Hoval Max-3**  
**Oil/gas boiler (420-2700)**
**Part No.**
**Boiler**

3-pass boiler made of steel for oil/gas LowNOx firing, without control panel

For operating temperature up to 105 °C

**Execution: complete delivery**

Boiler, insulation and casing separately packed and delivered.

Max - 3 Type	Output kW	Working pressure bar	
(420)	200 - 500	6	8002 655
(530)	220 - 610	6	8002 656
(620)	240 - 720	6	8002 657
(750)	280 - 870	6	8002 658
(1000)	350 - 1150	6	8002 659
(1250)	480 - 1450	6	8002 660
(1500)	650 - 1750	6	7011 420
(1800)	750 - 2150	6	7011 421
(2200)	920 - 2500	6	7011 422
(2700)	1030 - 3000	6	7011 423

**Oil/ gas boiler**  
**Max-3 (420-2700) PGS**  
**without control for mounting on site**
**Execution: delivery in single parts**  
**for mounting on site**

In the Part No. for welding on site are contained:

- welding
- mounting (boiler door, flue gas collector)
- leakage detection under pressure
- priming

In the Part No. for welding on site are not contained:

- bringing the individual parts into the boiler house
  - mounting of insulation and casing
  - drive and spend the night
  - water and electric current at place
- (Mounting on site takes place according to the strict quality standards of the factory assembly)*

Time to delivery approx. 8 weeks


**Blind flange**

made of steel incl. setscrews and gasket to

Max-3 (420,530)

Max-3 (620,750)

Max-3 (1000-2700)

6002 192

6030 026

6002 156


**Intermediate flange drilled to match burner**

made of steel incl. setscrews and gasket to

Max-3 (420,530)

Max-3 (620,750)

Max-3 (1000-2700)

6017 595

6017 593

6017 594



## ■ Part No.

**Control panel with heating regulator  
TopTronic® T to Hoval Max-3**
**Part No.**

**Boiler controller TopTronic® T/U3.1**

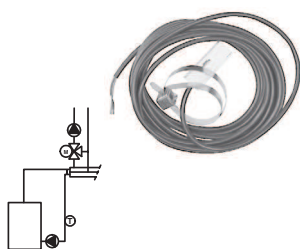
6020 537

Max. operating temperature 90°C  
For mounting on top of boiler  
(sideways, change on site).  
Integrated control function for  
- 1 mixing circuit  
- 1 heating circuit without mixer  
- domestic hot water loading circuit  
incl. outdoor sensor,  
flow sensor and calorifier  
sensor with plug  
Option to expand the functions by  
- different key modules and/or  
- mounting of an additional heating  
regulator TopTronic® T/N  
(see accessories)


**Boiler controller TopTronic® T/U3.2**

6020 538

Max. operating temperature 105°C  
Functions like boiler controller  
TopTronic® T/U3.1  
Delivery:  
Boiler controller separately delivered


**Contact sensor VF204**

2023 998

can be used as flow or return  
flow sensor  
with 4 m cable

For indirect return high attitude.  
Return high attitude through closing of the  
heating circle mixer (main pump necessary)

■ Part No.

**Control panel  
with thermostat**

**Part No.**



**Control panel T 2.2**

- For operating temperature up to 90 °C
- For systems without TopTronic® regulator.
- For direct 2-stage burner control, incl. plug connection for burner requirement starting from external calorifier or heater instruction is possible.
- without burner running time meter and pulse counter
- incl. 2 burner running time meters integrated
- incl. 2 burner running time meters and pulse counters integrated

6015 017

6015 477

6015 478



**Control panel T 0.2**

- For operating temperature up to 105 °C
- For external switching command
- For systems without TopTronic® regulator
- For special control function without burner plug connection
- without burner running time meter and pulse counter
- incl. 2 burner running time meters integrated
- incl. 2 burner running time meters and pulse counters integrated

6015 016

6015 475

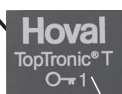
6015 476

**Accessories to control panel  
with thermostat**

**Flue gas thermometer**  
4 m, capillary tube

2411 49

## ■ Part No.

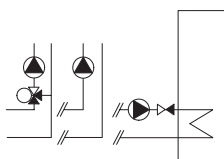

**Accessories to heat regulation system  
TopTronic® T**
**Part No.**
**Key module 1 for Hoval TopTronic® T**

6012 154

for 2nd mixing circuit

Key module consists of:

Function key 1,  
1 flow sensor VF204S with plug,  
2 loose plugs

**Only one key module is possible!**
**System approaches and applications**  
see Hoval CD

**Additional heating regulator set ZN1**

6020 574

for extending functionality and  
implementing further heating circuits  
Consisting of:

**Heating regulator TopTronic® T/N for**

- 1 mixer circuit  
- 1 heating circuit without mixer  
- hot water loading  
Only one key module per regulator  
is possible!

**Flow sensor VF202K**

with 2 m cable and plug.

Cable set

for connecting the auxiliary heating  
regulator TopTronic® T/ N with the  
boiler controller  
Mounting on-site

**Kit BMS module 0-10 V**

6015 195

**(Building management system)**

Consisting of: BMS module and trafo

**Can be installed in the boiler control  
panel!**
**Communication module/  
remote connection see Controls**

**Room station RS-T**

2034 939

for TopTronic® T

effective on one mixing circuit


**Remote control RFF-T**

2022 239

for TopTronic® T

effective on one mixing circuit


**Outdoor sensor AF 200**

2022 995

(may be included in the heat generator  
scope of delivery)

for one mixing circuit or for the mean  
value (per regulator 2 outdoor  
temperature sensors possible)

## ■ Part No.

## Part No.



**Flue gas temperature sensor PT 1000/4**  
L = 2.5 m  
including fixing screws  
(installation on site)

6913 57



**Cable sensor KVT 20/5/6S**  
5 m cable and plug

6012 687



**Contact sensor VF204S**  
can be used as flow or return  
flow sensor  
with 4 m cable and plug

6012 688

**Flow temperature guard**  
for underfloor heating system  
(per heating circuit 1 guard)  
15-95 °C, differential gap 6 K, capillary tube  
max. 700 mm, setting (visible from the outside)  
inside the housing cover.



**Clamp-on thermostat RAK-TW1000.S**  
Thermostat with strap, without cable and plug

242 902



**Immersion thermostat RAK-TW1000.S SB 150**  
Thermostat with pocket ½" - depth of immer-  
sion 150 mm brass nickel-plated

6010 082



**Vibration elements for boiler socket**  
For sound and vibration absorption.  
Made of rubber. Cross section 80/50 mm.

**Delivery**  
4 vibration elements per boiler,  
mounted under the boiler socket

to Max-3 Type	Set of pieces	Length mm	
(420-530)	4	200	6003 739
(620-750)	4	400	6003 741
(1000,1250)	4	500	6003 742
(1500,1800)	4	800	6005 623
(2200,2700)	6	800	6005 624

## Service



## Commissioning



Commissioning by works service or Hoval  
trained authorised serviceman/company is  
condition for warranty.

For commissioning and other services  
please contact your Hoval sales office.

## ■ Technical data

## Max-3

Type		(420)	(530)	(620)	(750)	(1000)	(1250)
• Nominal output at 80/60 °C	kW	500	610	720	870	1150	1450
• Range of output (natural gas: variant 2)	kW	200-500	220-610	240-720	280-870	350-1150	480-1450
• Range of output (diesel oil, variant 1 and natural gas, variant 1)	kW	320-500	350-610	450-720	520-870	680-1150	850-1450
• Burner input maximum	kW	539	662	781	944	1247	1495
• Maximum boiler operation temperature <sup>1</sup>	°C	90	90	90	90	90	90
• Minimum boiler operation temperature	°C	see table operating conditions (below)					
• Minimum boiler return flow temperature	°C	see table operating conditions (below)					
• Minimum flue gas temperature at boiler	°C	see table operating conditions (below)					
• Safety temperature limiter setting (water side) <sup>2</sup>	°C	110	110	110	110	110	110
• Working/test pressure	bar	6/9.6	6/9.6	6/9.6	6/9.6	6/9.6	6/9.6
• Boiler efficiency at full load 80/60 °C (related to net/gross calorific value, diesel oil)	%	92.7/87.5	92.4/87.2	92.4/87.2	92.5/87.3	92.5/87.3	92.5/87.3
• Boiler efficiency at partial load 30 % at return 37 °C (according to EN 303) (related to net/gross calorific value, diesel oil)	%	95.2/89.8	95.3/89.9	94.9/89.5	95.2/89.8	95.3/89.9	95.2/89.8
• Standard efficiency at 75/60 °C (DIN 4702 part 8) (related to net/gross calorific value, diesel oil)	%	94.8/89.5	94.7/89.4	94.3/89.0	94.8/89.4	94.9/89.5	94.8/89.4
• Stand-by loss qB at 70 °C	Watt	1000	1035	1120	1180	1250	1380
• Flue gas resistance at nominal output 180 °C flue gas temperature, 12.5 % CO <sub>2</sub> , 500 m over sea level (tolerance ± 20 %) <sup>3</sup>	mbar	4.9	5.7	5.2	6.5	7.4	8.0
• Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating Oil	kg/h	850	1037	1224	1479	1955	2295
• Flow resistance boiler <sup>3</sup>	z-value	0.022	0.022	0.008	0.008	0.003	0.003
• Water flow resistance at 10 K	mbar	40.4	60.1	30.5	44.5	29.1	40.2
• Water flow resistance at 20 K	mbar	10.1	15.1	7.6	11.1	7.3	10.0
• Water flow volume at 10 K	m³/h	42.8	52.2	61.7	74.5	98.5	115.7
• Water flow volume at 20 K	m³/h	21.4	26.1	30.8	37.2	49.2	57.8
• Boiler water content	litres	552	520	969	938	1528	1478
• Boiler gas volume	m³	0.583	0.602	0.846	0.872	1.350	1.390
• Insulation thickness boiler body	mm	80	80	80	80	80	80
• Weight (incl. casing)	kg	1093	1150	1770	1800	2500	2600
• Weight (without casing)	kg	943	1000	1590	1620	2360	2460
• Combustion chamber dimension Ø inside x length	mm	606/1624	606/1624	684/1899	684/1899	782/2182	782/2182
• Combustion chamber volume	m³	0.466	0.466	0.669	0.669	1.047	1.047
• Dimensions		see Dimensions					
• Maximum depression in flue gas system (boiler connection)	Pa	50	50	50	50	50	50

<sup>1</sup> Limited by the boiler control to 90 °C (U3.1 and T2.2) or to 105 °C (U3.2 and T0.2).

<sup>2</sup> Maximum safety temperature for boiler control U3.1 and T2.2: 110 °C; for U3.2 and T0.2: 120 °C.

<sup>3</sup> Flow resistance boiler in mbar = volume flow (m³/h)² x z

## Possible operating conditions:

Fuel		Diesel oil		Methane H		Oil L
		Variant 1	Variant 2	Variant 1	Variant 2	
min. flue gas temperature	°C	130	110	130	100	130
min. boiler temperature	°C	60	65	65	75	65
min. return temperature	°C	50	55	55	65	55
Return temperature control		yes	yes	yes	yes	yes



## ■ Technical data

### Max-3

Type		(1500)	(1800)	(2200)	(2700)
• Nominal output at 80/60 °C	kW	1750	2150	2500	3000
• Range of output (diesel oil, variant 1 and natural gas, variant 1)	kW	1050-1750	1250-2150	1500-2500	1780-3000
• Range of output (natural gas: variant 2)	kW	650-1750	750-2150	920-2500	1030-3000
• Burner input maximum	kW	1894	2324	2702	3243
• Maximum boiler operation temperature <sup>1</sup>	°C	90	90	90	90
• Minimum boiler operation temperature	°C	see table operating conditions (below)			
• Minimum boiler return flow temperature	°C	see table operating conditions (below)			
• Minimum flue gas temperature at boiler	°C	see table operating conditions (below)			
• Safety temperature limiter setting (water side) <sup>2</sup>	°C	110	110	110	110
• Working/test pressure	bar	6/9.6	6/9.6	6/9.6	6/9.6
• Boiler efficiency at full load 80/60 °C (related to net/gross calorific value, diesel oil)	%	92.4/87.2	92.5/87.3	92.5/87.3	92.5/87.3
• Boiler efficiency at partial load 30 % at return 37 °C (according to EN 303) (related to net/gross calorific value, diesel oil)	%	95.2/89.8	95.3/89.2	95.2/89.2	95.2/89.2
• Standard efficiency at 75/60 °C (DIN 4702 part 8) (related to net/gross calorific value, diesel oil)	%	94.8/89.4	94.9/89.5	94.9/89.5	95/89.6
• Stand-by loss qB at 70 °C	Watt	1850	1950	2100	2300
• Flue gas resistance at nominal output 180 °C flue gas temperature, 12.5 % CO <sub>2</sub> , 500 m over sea level (tolerance ± 20 %)	mbar	7.0	8.8	9.1	8.0
• Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating Oil	kg/h	3031	3723	4329	5195
• Maximum chimney draught	Pa	20	20	20	20
• Flow resistance boiler <sup>3</sup>	z-value	0.022	0.022	0.002	0.002
• Water flow resistance at 10 K	mbar	45	67.9	91.8	132.2
• Water flow resistance at 20 K	mbar	11.3	17.0	23.0	33.1
• Water flow volume at 10 K	m³/h	150.0	184.3	214.3	257.1
• Water flow volume at 20 K	m³/h	75.0	92.1	107.1	128.6
• Boiler water content	litres	2343	2750	3050	3550
• Boiler gas volume	m³	1.956	2.510	2.761	3.037
• Insulation thickness boiler body	mm	80	80	80	80
• Weight (incl. casing)	kg	3566	4888	5017	5589
• Weight (without casing)	kg	3266	4633	4647	5189
• Combustion chamber dimension Ø inside x length	mm	880/2417	976/2605	976/2905	976/3233
• Combustion chamber volume	m³	1.58	2.07	2.30	2.41
• Dimensions		see Dimensions			
• Maximum depression in flue gas system (boiler connection)	Pa	50	50	50	50

<sup>1</sup> Limited by the boiler control to 90 °C (U3.1 and T2.2) or to 105 °C (U3.2 and T0.2).

<sup>2</sup> Maximum safety temperature for boiler control U3.1 and T2.2: 110 °C; for U3.2 and T0.2: 120 °C.

<sup>3</sup> Flow resistance boiler in mbar = volume flow (m³/h)² x z

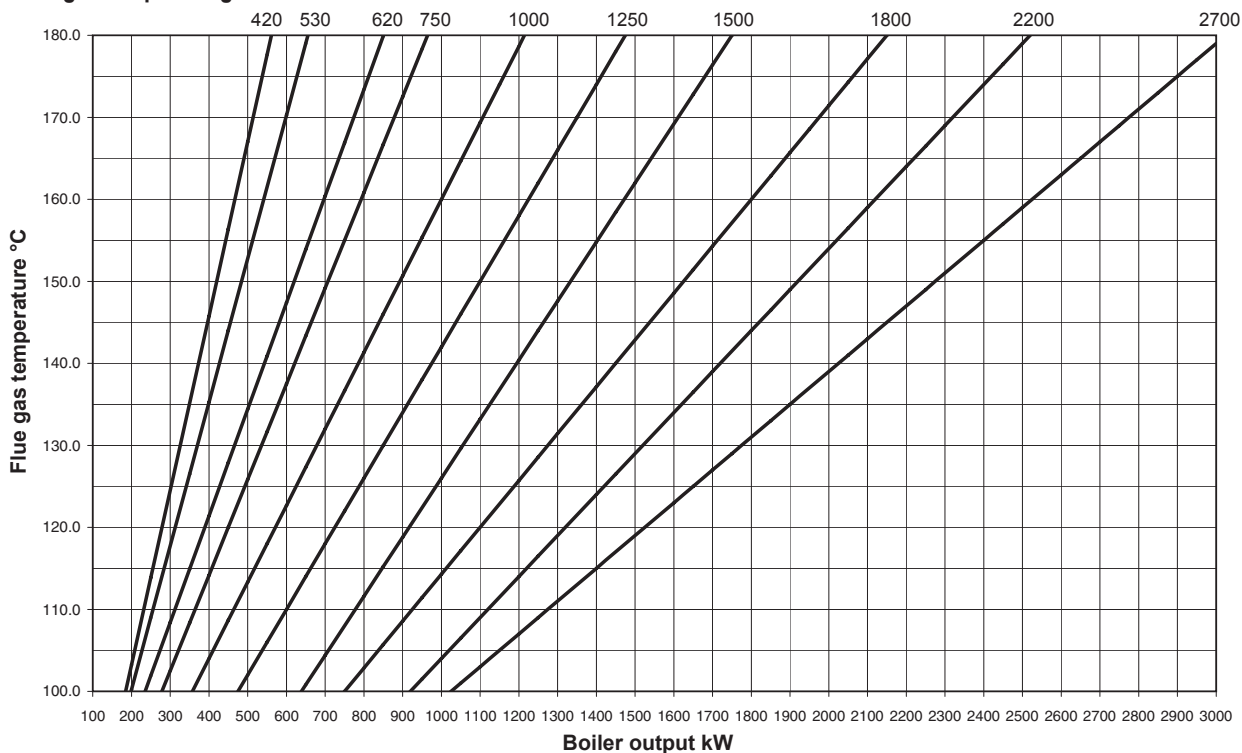
### Possible operating conditions:

Fuel		Diesel oil		Methane H		Oil L
		Variant 1	Variant 2	Variant 1	Variant 2	
min. flue gas temperature	°C	130	110	130	100	130
min. boiler temperature	°C	60	65	65	75	65
min. return temperature	°C	50	55	55	65	55
Return temperature control		yes	yes	yes	yes	yes

## ■ Technical data

### Flue gas output diagrams

#### Flue gas output diagram



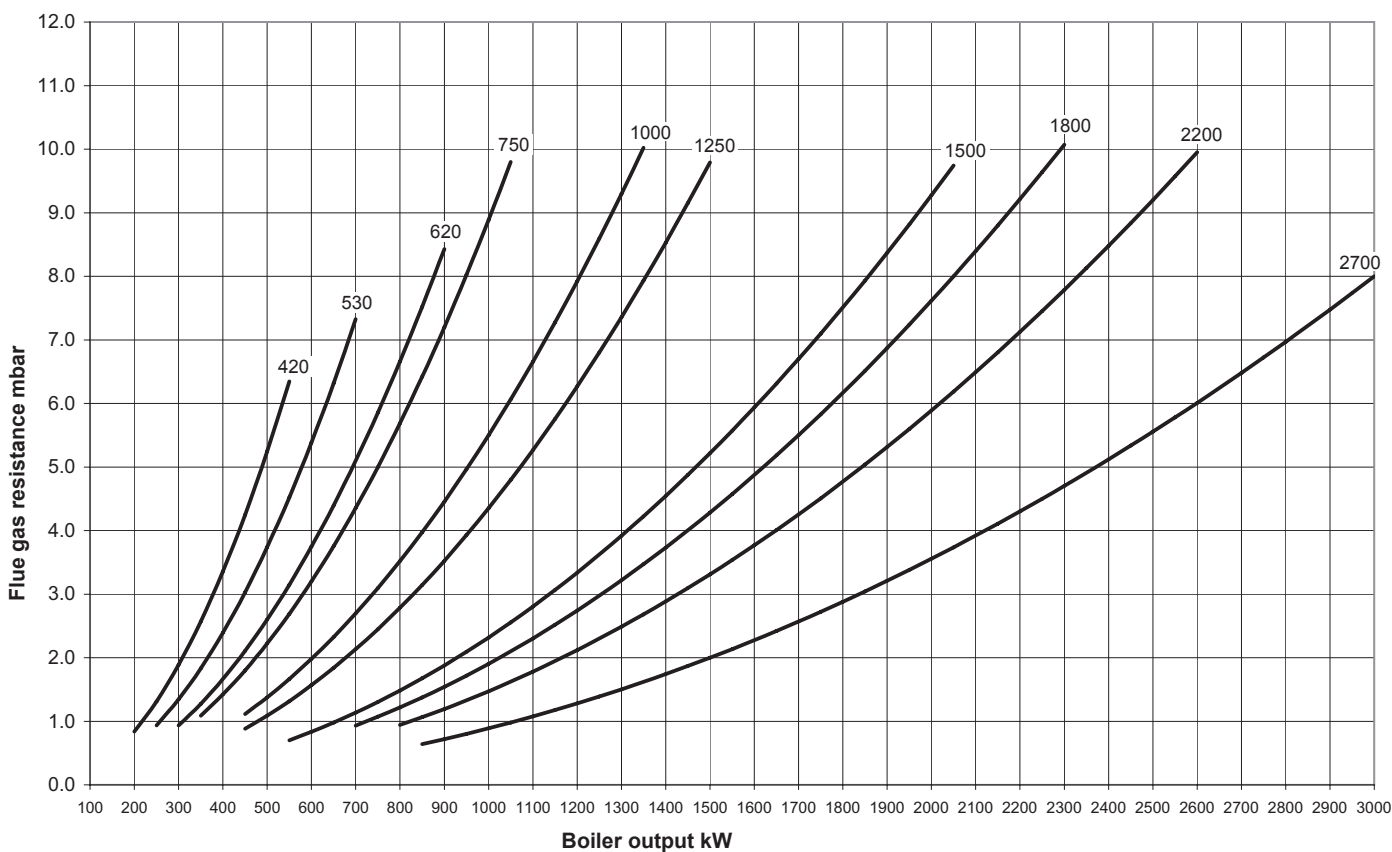
kW = Boiler output

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

- operation with heating oil EL,  $\lambda = 1.22$  with max. burner output (CO<sub>2</sub> heating oil EL = 12.5 %)

- A reduction of the boiler water temperature to -10 K causes a reduction of the flue gas temperature of approx. 6-8 K.  
- A modification of the CO<sub>2</sub> concentration of +/- 1 % causes a modification of the flue gas temperature of approx. +/- 8 K.

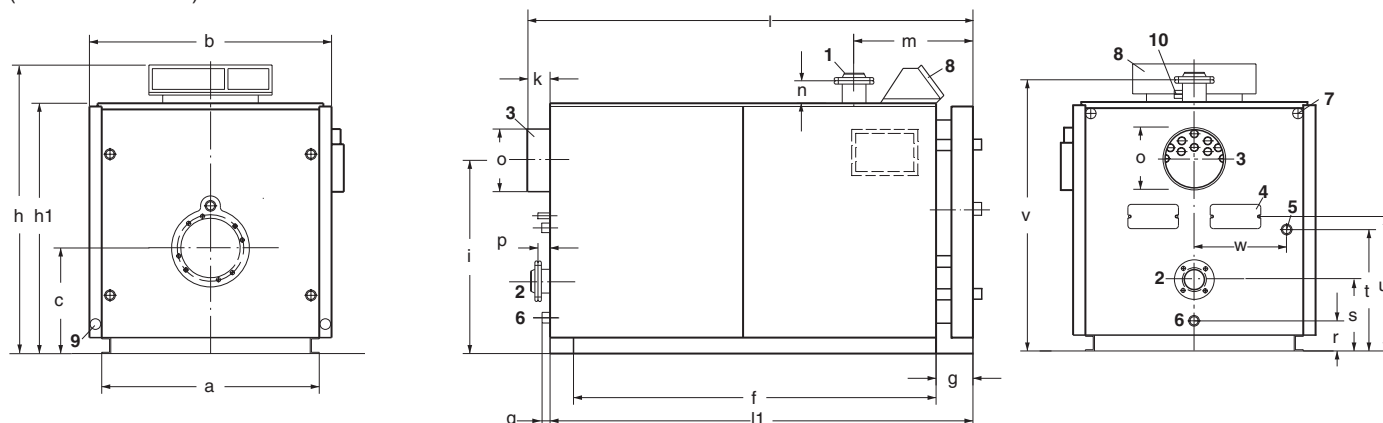
#### Flue gas resistor



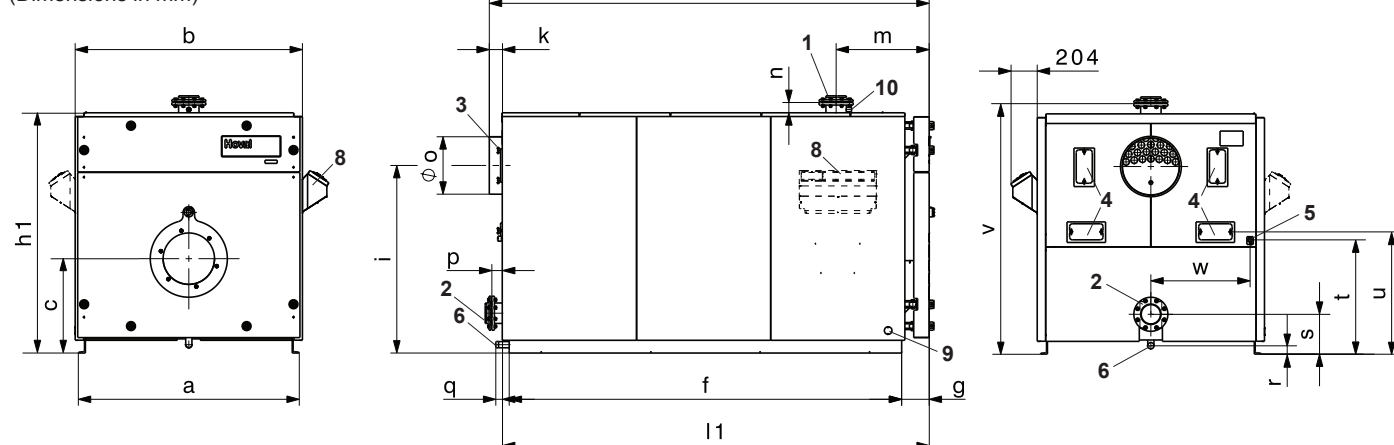
## ■ Dimensions

**Max-3 (420-1250)**

(Dimensions in mm)

**Max-3 (1500-2700)**

(Dimensions in mm)



- |        |             |               |                    |             |               |  |
|--------|-------------|---------------|--------------------|-------------|---------------|--|
| 1 Flow | (420,530)   | DN 100, PN 6  | 2 Return           | (420,530)   | DN 100, PN 6  | 5 Flue gas collector cleaning opening R 1"                           |
|        | (620,750)   | DN 125, PN 6  |                    | (620,750)   | DN 125, PN 6  | 6 Drain R 1½"  |
|        | (1000,1250) | DN 150, PN 6  |                    | (1000,1250) | DN 150, PN 6  | 7 Cable routing  |
|        | (1500-2200) | DN 150, PN 16 |                    | (1500-2200) | DN 150, PN 16 | 8 Control panel  |
|        | (2700)      | DN 200, PN 16 |                    | (2700)      | DN 200, PN 16 | 9 Electrical connection  |
|        |             |               | 3 Flue gas outlet  |             |               | 10 Bushing Rp ¾" with immersion sleeve for boiler temperature sensor |
|        |             |               | 4 Cleaning opening |             |               |  |

Max-3 Type	a	b	c	f	g	h	h1	i	k	l	l1	m	n	Ø o	p	q	r
(420,530)	1060	1190	515	1770	181	1435	1230	950	104	2178	2074	641	100	299	54	34	175
(620,750)	1180	1310	550	2045	181	1555	1350	1050	105	2452	2347	666	95	349	55	35	170
(1000,1250)	1370	1500	635	2330	181	1755	1549	1250	107	2739	2632	681	111	349	77	37	175
(1500)	1560	1610	665	2745	205	-	1700	1350	90	3030	2940	710	90	447	70	55	60
(1800)	1720	1770	735	3115	205	-	1860	1480	70	3400	3330	720	90	447	70	50	65
(2200)	1720	1770	735	3415	205	-	1860	1480	70	3700	3630	720	90	447	70	50	65
(2700)	1750	1800	755	3745	205	-	1890	1410	70	4030	3960	720	90	647	70	50	65

Max-3 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	792	995	1790	665	1850
(1800)	310	845	1046	1950	775	2040
(2200)	310	845	1046	1950	775	2340
(2700)	330	743	946	1980	760	2670

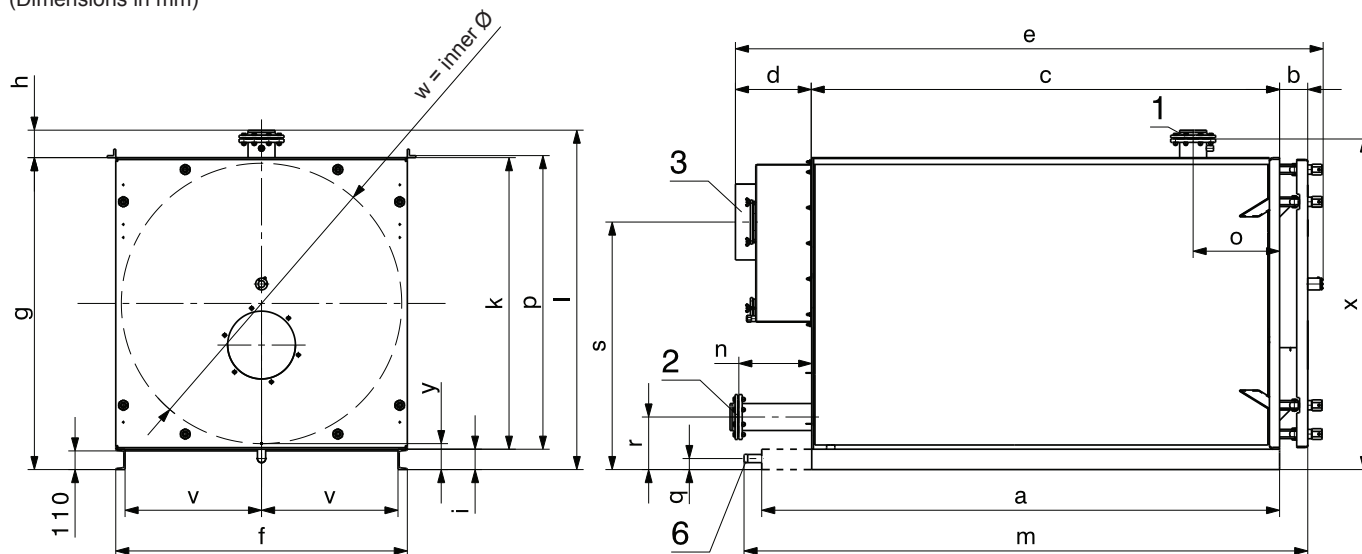
## ■ Dimensions

### Base size

### Dimensions without insulation and casing

Boiler incl. flange, outlet without flue gas collector.

(Dimensions in mm)



1 Flow  
2 Return  
3 Flue gas outlet  
6 Drain

Max-3 Type	a <sup>1</sup>	b	c	d	e	f	g	h	i	k	l	m	n	o	p
(420,530)	1920	150	1770	277	2222	1060	1180	196	120	1060	1376	2077	175	460	1072
(620,750)	2195	150	2045	228	2498	1180	1300	196	120	1180	1496	2353	172	485	1192
(1000,1250)	2480	150	2330	228	2783	1370	1500	187	120	1380	1660	2638	198	500	1392
(1500)	2685	164	2568	260	3078	1560	1680	162	120	1560	1842	2923	240	510	-
(1800)	3055	166	2760	450	3467	1720	1840	162	120	1720	2002	3325	430	510	-
(2200)	3355	166	3060	450	3767	1720	1840	162	120	1720	2002	3625	430	510	-
(2700)	3700	164	3390	430	4075	1750	1870	169	120	1750	2039	3953	430	510	-

Max-3 Type	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	370	1410	820	1684	1980	153

\* Max-3 (1500-2700): socket protrudes

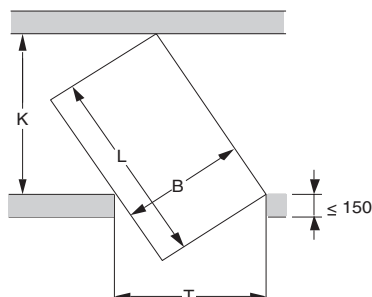
### Required min. width of door and corridor to bring in the boiler

The stated measurements are minimal dimensions

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

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

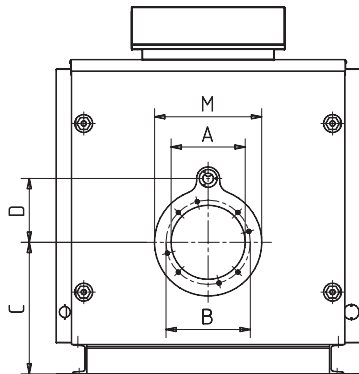
T Door width  
K Corridor width  
B Boiler width  
L Max. boiler length



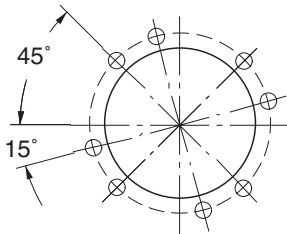
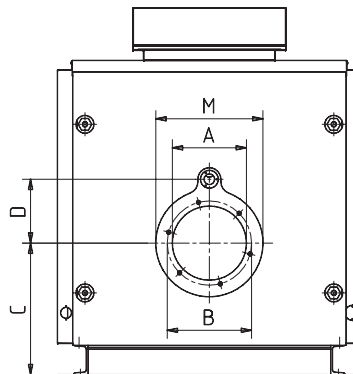
## ■ Dimensions

Furnace dimensions

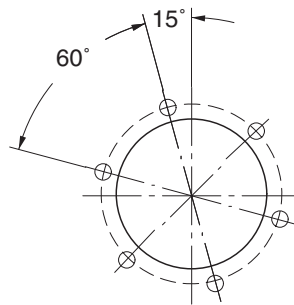
**Max-3 (420,530)**



**Max-3 (620-2700)**

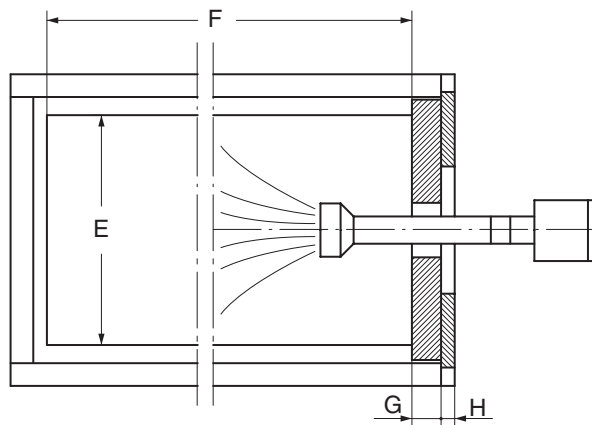


**Screw joint flange  
Max-3 (420, 530)**  
4 x M12 (45°)  
4 x M12 (15°)



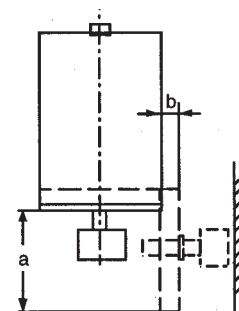
**Screw joint flange  
Max-3 (620, 750)**  
6 x M12 (15°)

**Screw joint flange  
Max-3 (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 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	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  
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

## Engineering

### Standards and guidelines

The following standards and guidelines must be respected:

- technical information and installation manual of the Hoval company.
- hydraulic and control technical control regulations of the Hoval company.
- local building law
- fire protection standards
- DVGW guidelines
- DIN EN 12828 Heating systems in building plans of hot water heating plants.
- DIN EN 12831 Heating plants in buildings
  - procedure for computing the normed heating capacity
- VDE 0100

### Water quality

#### Heating water:

- The European Standard EN 14868 and the Directive VDI 2035 must be observed. In particular, attention must be paid to the following stipulations:
- Hoval boilers and calorifiers are designed for heating plants without significant oxygen intake (plant type I according to EN 14868).
- Plants with
  - **continuous** oxygen intake (e.g. under-floor heating systems without diffusion proof plastic piping) or
  - **intermittent** oxygen intake (e.g. where frequent refilling is necessary)
 must be equipped with separate circuits.
- Treated heating water must be tested at least once yearly. According to the inhibitor manufacturer's instructions, more frequent testing may be necessary.
- A refilling is not necessary if the quality of the heating water in existing installations (e.g. exchange of boiler) conforms to VDI 2035. The Directive VDI 2035 applies equally to the replacement water.
- New and if applicable existing installations must be adequately cleaned and flushed before being recharged! The boiler may only be filled after the heating system has been flushed.
- Parts of the boiler which have contact with water are made of ferrous materials.
- On account of the danger of stress cracking corrosion the chloride, nitrate and sulfate contents of the heating water must not exceed 200 mg/l in total.
- The pH value of the heating water should lie between 8.3 and 9.5 after 6 to 12 weeks of heating operation.

#### Filling and replacement water:

- For a plant using Hoval boilers untreated drinking water is generally best suited as filling and replacement water. However, the quality of the untreated drinking water must at least fulfil the standard set in VDI 2035 or be desalinated and/or be treated with inhibitors. The stipulations of EN 14868 must be observed.
- In order to maintain a high level of boiler efficiency and to avoid overheating of the heating surfaces the values given in the table should not be exceeded (dependent on boiler performance ratings - for multi-boiler plants rating of smallest boiler applies - and on the water content of the plant).

- The total amount of filling and replacement water which is used throughout the total service life of the boiler must not exceed three times the water capacity of the plant.

### Heating system

#### Combustion air

- The combustion air supply must be warranted. The air opening must not be lockable.
- Minimal free cross section for air opening 6.5 cm<sup>2</sup> per 1 kW boiler output.

### Oil burner mounting

- For mounting of the burner an adapter flange may be required depending on the size of the burner flange. The adaptor flange including screws must be delivered by the burner company.
- Length and diameter of the burner pipe should be possible to swivel the boiler door incl. burner by 90°.
- The pipes must be fitted in such a way that the boiler door can be opened completely.
- The connections must be flexible and lead in a sufficient large loop to the burner so that the boiler door can be swung out around 90° to the left or right.
- The space between burner pipe and swivel flange must be isolate. (Delivery by the burner company)
- Boiler installations with ThermoCondensor require from the burner to overcome the resistance of the heat exchanger.

### Electric connection of the burner

- Control voltage 1 x 230 V
- Burner motor 1 x 230 V / 3 x 400 V.
- The burner must be connected to the burner connection plug of the boiler.
- For safety reasons the electrical cable of the burner must be that short that the plug must be removed when swivelling boiler door.

### Sound absorbing

Sound absorption is possible through the following steps:

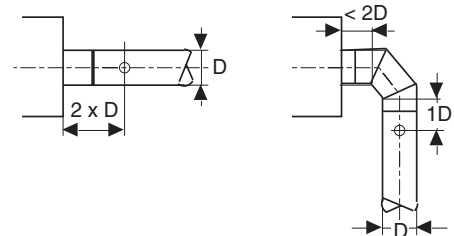
- Heating room walls, ceiling and floor should be very solidly built, a sound absorber should be mounted into the air inlet. Pipe holders and support should be protected by means of anti-vibration sleeves.
- Install sound absorber hood for burner.

- If living rooms are located above or under the boiler room, vibration absorbers have to be mounted to the boiler base. Pipes and flue gas tube must be connected flexibly with compensators.
- Pumps have to be connected with compensators to the pipes.
- For damping of flame noise it is possible to install a silencer into the flue gas tube (space should be foreseen for later installation).

### Chimney/flue gas system

#### Flue gas pipe

- The flue gas tube between boiler and chimney must be connected with an angle 30-45° to the chimney.
- If the flue gas tube is longer than 1 m, it must be insulated.



- The flue gas tube must be designed that no condensate water can get into the boiler.
- A closeable flue gas measuring socket with an inner diameter of 10-21 mm must be foreseen. The socket has to be led over the thermal insulation.

### Chimney

- The flue gas system must be humidity-insensitive and acid-proof and admitted for flue gas temperatures up to > 160 °C.
- For existing chimney installation the restoration must be carried out according to the instructions of the chimney constructor.
- Calculation of the profile of the chimney according to DIN 4705.
- It is recommendable to use a secondary air valve for chimney draft limiting.

### Sanitary installation

- The service water temperature must correspond to the local regulations.
- The safety valve may be adjusted on max. 8 bar.

### Regulations of the calorifier

- See Calorifiers

### Maximum filling quantity according to VDI 2035

Carbonate 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
Conductance <sup>2</sup>	<20	100.0	200.0	300.0	400.0	500.0	600.0	>600
Boiler size of the individual boiler								
maximum filling quantity without desalination								
200 to 600 kW		50 l/kW	50 l/kW	20 l/kW	always desalinate			
over 600 kW								

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

<sup>2</sup> If the conductance in µS/cm exceeds the tabular value an analysis of the water is necessary.

## ■ Engineering

### Required chimney diameter

Basics: Smooth chimneys  
made of stainless steel,  
flue gas tube  $\leq 5$  m,  $\Sigma \zeta = 2.2$ ,

Flue gas tube and chimney insulated.  
Height above sea level  $\leq 1000$  m,  
outdoor temperature  $\leq 30$  °C.

Max-3	Type (420)		Type (530)		Type (620)		Type (750)	
m	Flue gas tube Ø mm	Chimney Ø mm	Flue gas tube Ø mm	Chimney Ø mm	Flue gas tube Ø mm	Chimney Ø mm	Flue gas tube Ø mm	Chimney Ø mm
25	300	300	300	300	300	300	350	350
20	300	300	300	300	300	300	350	350
15	300	300	300	300	350	300	350	350
10	300	300	350	300	350	350	400	350

m = chimney height (m)

## ■ Mounting on site

### Max-3 (420-1500)

If the local situation does not permit bringing in the whole boiler, the possibility of the place assembly exists.

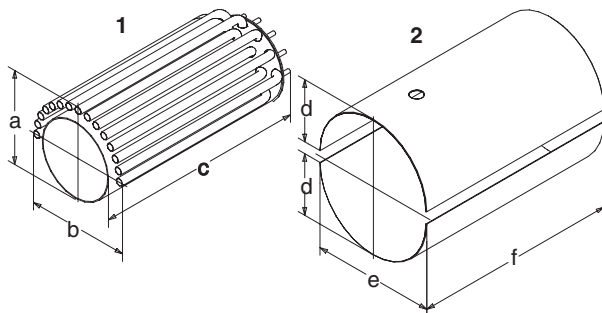
- The element welding on site incl. pressure test are to be coactive to obtain from Hoval.

Time to delivery approx. 8 weeks

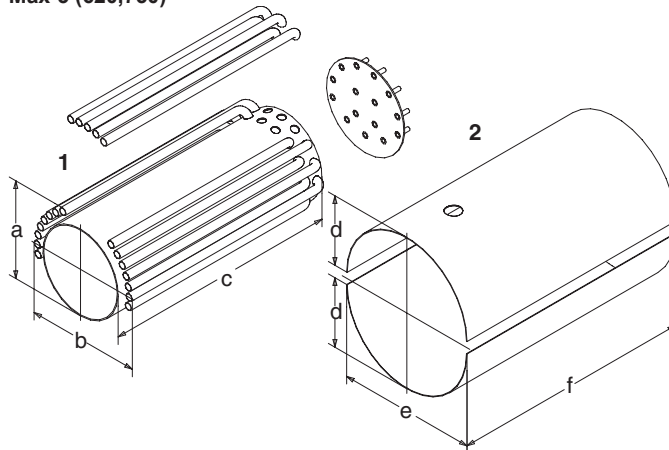


## Dimensions and weights of the single parts

### Max-3 (420,530)



### Max-3 (620,750)



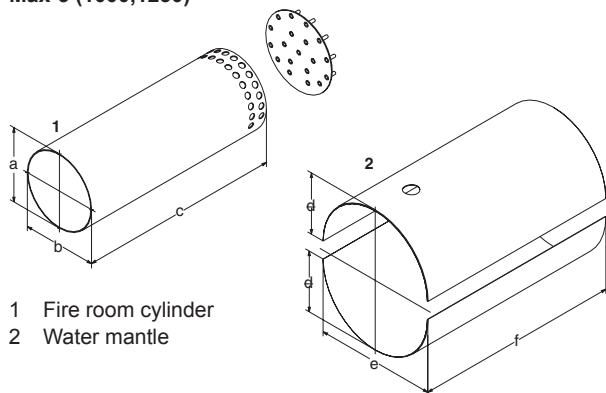


## Engineering

Mounting on site

### Dimensions and weights of the single parts

#### Max-3 (1000,1250)



- 1 Fire room cylinder  
2 Water mantle

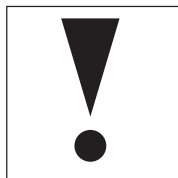
#### Combustion chamber 1

Max-3 Type	a	b	c	Weight kg
(420,530)	730	835	1725	325
(620,750)	745	915	2000	410
(1000,1250)	800	800	2180	375

#### Water mantle - half shell 2

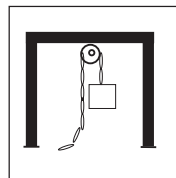
Max-3 Type	d	e	f	Weight kg
(420,530)	500	1000	1665	105
(620,750)	560	1120	1940	135
(1000,1250)	655	1310	2225	215

### Planning hints



#### Important preparations

- Old boiler must be dismantled and removed.
- The heating room, if necessary with boiler base, must be available with beginning of work.



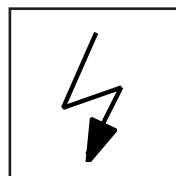
#### Assembly aids

If no concrete cover is present, at which a chain course with Hilti pegs can be installed, an appropriate scaffold for loads up to 1000 kg must be present.



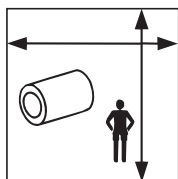
#### Boiler material

- The boiler material is delivered by Hoval (in single parts) and must be brought in on site.
- If bringing in the boiler parts does not take place immediately after unloading, the parts are to be stored weather-protected.



#### Power connection

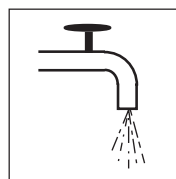
A power connection for the welding machine with a 5-pin plug socket, 3 x 400 V must be present.



#### Heating room preparation

##### Required space

In the heating room sufficient space for the assembly of the boiler must be available (see space requirement below)



#### Water connection

In the heating room a water connection (3/4") with fresh water for filling and squeezing off the welded boiler has to be present.

### Required space for mounting and welding in the boiler room

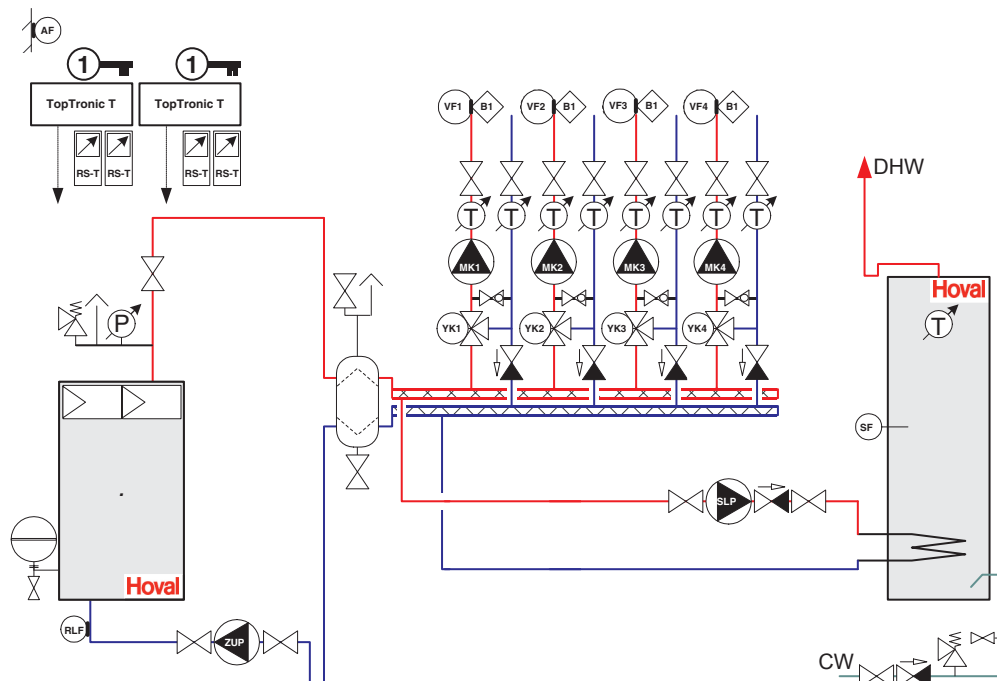
#### Min. room dimensions in mm

	(420)	(530)	(620)	(750)	(1000)	(1250)
Length	3700	3700	4500	4500	5000	5000
Width	2200	2200	2500	2500	3500	3500
Height	2500	2500	3000	3000	3200	3200

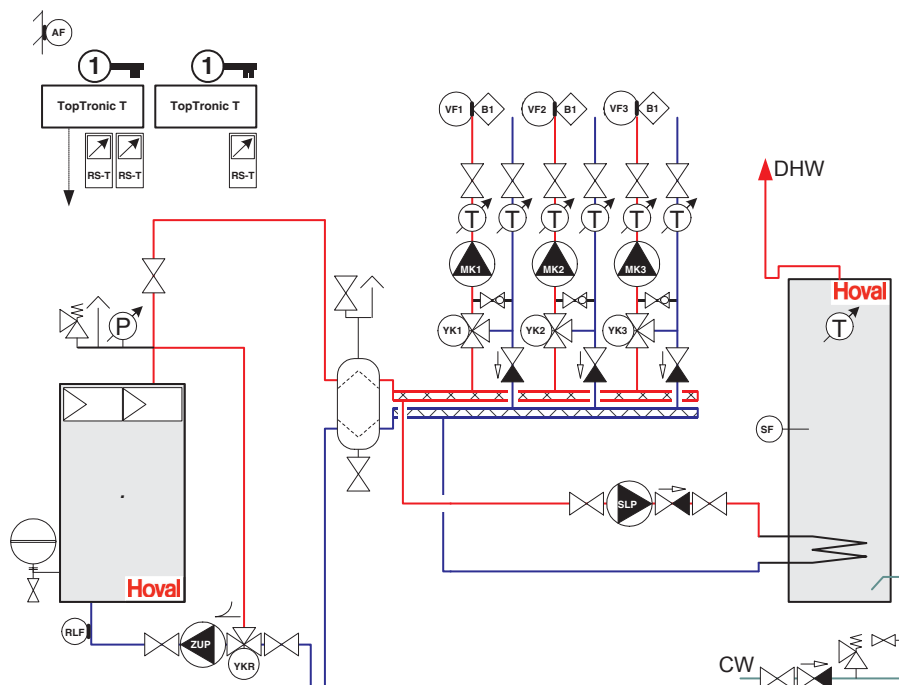


## Examples

### Hydraulic principle schematic Max-3 with heating regulator TopTronic® T Hydraulic schematic BBDT050



### Hydraulic principle schematic Max-3 with heating regulator TopTronic® T Hydraulic schematic BBDT070



#### Notice:

- This hydraulic schematic is a principle schematic. It does not contain all details for installation. The installation must be done according to local conditions, dimensioning and regulations.
- For underfloor heating, a flow temperature monitor must be built-in.
- Shut-off devices to the safety valve (pressurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

RS-T Room station  
AF Outdoor sensor  
RLF Return sensor  
VF1 Flow sensor 1  
VF2 Flow sensor 2  
VF3 Flow sensor 3  
VF4 Flow sensor 4  
SF Calorifier heater sensor

B1 Flow temperature guard (if required)  
MK1 Pump mixing circuit 1  
MK2 Pump mixing circuit 2  
MK3 Pump mixing circuit 3  
MK4 Pump mixing circuit 4  
SLP Calorifier loading pump  
ZUP Feed pump

YK1 Actuator mixer 1  
YK2 Actuator mixer 2  
YK3 Actuator mixer 3  
YK4 Actuator mixer 4  
YKR Actuator return mixer  
CW Cold Water  
DHW Domestic Hot Water