



**OIL / GAS (Heat recovery)**

**Hoval**

Responsibility for energy and environment

**Complete high efficient system solutions  
for domestic, commercial and industrial applications.**

**Oil condensing boiler**  
for all heating oil grades



**Hoval MultiJet®**

**12-25 kW**

■ Description	3
■ Part No.	4
■ Technical data	16
■ Dimensions	17
■ Space requirements	19
■ Engineering	20
■ Examples	23



**Hoval UltraOil®**

**16-80 kW**

■ Description	27
■ Part No.	29
■ Technical data	47
■ Dimensions	50
■ Space requirements	53
■ Engineering	55
■ Examples	58



**Hoval UltraOil®**

**110-300 kW**

■ Description	63
■ Part No.	65
■ Technical data	72
■ Dimensions	74
■ Engineering	78
■ Examples	81





**Hoval UltraOil®**

**320-600 kW**

■ Description	83
■ Part No.	85
■ Technical data	93
■ Dimensions	94
■ Space requirements	95
■ Engineering	96
■ Examples	99

Up to 400 kW, now only condensing units are allowed to be placed on the market in the EU member states according to Regulation (EU) No. 813/2013. This also affects replacement heat generators.

			Page
<b>Oil/gas boilers</b> (heat value/gas condensation)		<b>Hoval Max-3</b>	<b>500-3000 kW</b>
		<ul style="list-style-type: none"><li>■ Description 101</li><li>■ Part No. 103</li><li>■ Technical data 109<ul style="list-style-type: none"><li>Flue gas output diagrams 111</li></ul></li><li>■ Dimensions 112<ul style="list-style-type: none"><li>Base size 113</li><li>Furnace dimensions 114</li></ul></li><li>■ Engineering 115<ul style="list-style-type: none"><li>Mounting on site 117</li></ul></li><li>■ Examples 119</li></ul>	
<hr/>			
		<b>Hoval Max-3 plus</b>	<b>420-2700 kW</b>
		<ul style="list-style-type: none"><li>■ Description 121</li><li>■ Part No. 123</li><li>■ Technical data 129<ul style="list-style-type: none"><li>Flue gas output diagrams 131</li></ul></li><li>■ Dimensions 132<ul style="list-style-type: none"><li>Base size 133</li><li>Furnace dimensions 134</li></ul></li><li>■ Engineering 135<ul style="list-style-type: none"><li>Mounting on site 137</li></ul></li><li>■ Examples 139</li></ul>	
<hr/>			
<b>Standard terms and conditions of delivery</b>			<b>141</b>

## Description

### Hoval MultiJet® Oil condensing boiler

#### Boiler

- Oil condensing special boiler according to EN 303 part 1 and 2, EN 15034 and EN 15035
- For firing of standard diesel oil and low-sulphur heating oil EL, (intermixture of up to 10 % FAME (EN 14213) is possible)
- Maximal flue gas condensation through special jet-insets and 2-stage operation for MultiJet® (16,20,25); MultiJet® (12) 2nd stage as start stage
- No lower delimitation of the boiler water temperature and the boiler return temperature
- No minimal water circulation necessary
- High class stainless steel design resistant against sulphuric acid of the flue gas and condensate carrying parts
- Design with neutralisation box
- Boiler door:
  - MultiJet® (12,16) opening to the top, swivel-mounted to the left or to the front
  - MultiJet® (20,25) opening to the top, swivel-mounted to the right (standard delivery from the factory) or to the left (changing on site of the customer)
- Insulation at the boiler body with mineral wool mat and special fabric:
  - MultiJet® (12,16) 50 mm
  - MultiJet® (20,25) 80 mm
- Boiler completely cased with steel plate, red powder coated
- Flue outlet:
  - MultiJet® (12,16) to the top
  - MultiJet® (20,25) backwards to the top
- Flue gas sound absorber:
  - MultiJet® (12,16) integrated
  - MultiJet® (20,25) see Accessories
- Heating connections right and left side for:
  - flow
  - return, high temperature
  - return, low temperature
- Sound absorbing/thermal insulation hood
- Flue gas temperature monitoring integrated
- TopTronic® E controller installed

#### TopTronic® E controller

##### Control panel

- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

##### TopTronic® E control module

- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

#### Model range

	MultiJet® type	Heat output 40/30 °C kW
<b>A</b>	(12) <sup>2)</sup>	12
<b>A</b>	(16) <sup>1)</sup>	12-16
<b>A</b>	(20) <sup>1)</sup>	14-20
<b>A</b>	(25) <sup>1)</sup>	16-25

- <sup>1)</sup> Energy efficiency class of the compound system with control
- <sup>2)</sup> Energy efficiency class of the compound system with control and room control module (room sensor)

#### TopTronic® E basic module heat generator (TTE-WEZ)

- Control functions integrated for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set

#### Options for TopTronic® E controller

- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting or
  - module expansion universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

#### Number of modules that can be additionally installed in the heat generator:

- 1 module expansion and 1 controller module **or**
- 2 controller modules

The supplementary plug set must be ordered in order to use expanded controller functions.

#### Oil automatic function device OFA

- Control function integrated for
  - flue gas sensor for safety shut-off
  - 0-10V output for connecting a modulating main pump (incl. delta T-control with low consumption)



#### Permissions boilers

CE product ID No.

MultiJet® (12-25) CE-0036-0368/05

- Standard plug connection for 2-stage burner 1 x 230 V
- Variable input for plant-specific functions (heat generator block, return sensor, info sensor etc.)
- Variable output for plant-specific functions (thermostat function, operating message, etc.)

#### Further information about the TopTronic® E see "Controls"

#### Oil burner to MultiJet® (12-25)

- Fully automatic 2-stage pressure jet burner (blue flame burner)
- With motorised air damper
- With oil pre-heating
- Flame monitoring with flicker detector (IRD)
- Oil burner tested by Hoval for ≤ 1000 m above sea level. 1.2 % output reduction per 100 m higher level

#### Optional

- Free-standing calorifier, see Calorifiers
- Flue gas systems

#### Delivery

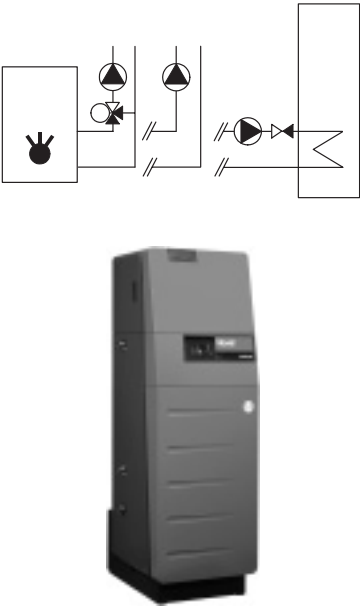
- MultiJet® (12-25): boiler incl. TopTronic® E control, control panel, sound absorbing hood and boiler socket completely cased. Oil burner and possibly neutralisation box are separately packed and delivered.

#### Heating armature groups and wall distributors

see "Various system components"



■ Part No.



**Oil condensing boiler  
Hoval MultiJet®**

**Part No.**

Oil condensing boiler with built-in Hoval TopTronic® E control

- Control functions integrated for
- 1 heating circuit with mixer
  - 1 heating circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Can be optionally expanded 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)

Incl. sensor, flue temperature monitoring, 2-stage oil burner, sound attenuation cowl and fire protection switch. Design with/without neutraliser box.

*Delivery*  
MultiJet® (12-25): boiler incl. TopTronic® E control, control panel, sound attenuation cowl and fully cased boiler base. Oil burner and possibly neutraliser box are supplied separately packaged.

**Oil condensing boiler with TopTronic® E  
incl. neutraliser box**

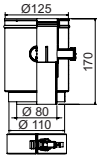
MultiJet® Type	Oil burner type	Heat output 40/30 °C kW	
<b>A</b> (12) <sup>2)</sup>	Blue burner	12	7013 588
<b>A</b> (16) <sup>1)</sup>	Blue burner	12-16	7013 589
<b>A</b> (20) <sup>1)</sup>	Blue burner	14-20	7013 590
<b>A</b> (25) <sup>1)</sup>	Blue burner	16-25	7013 591

For installation of neutralization, it is necessary to comply with the local regulations.

- <sup>1)</sup> **Energy efficiency class of the compound system with control**  
<sup>2)</sup> **Energy efficiency class of the compound system with control and room control module (room sensor)**

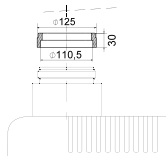
## ■ Part No.

## Part No.


**Boiler connection piece**

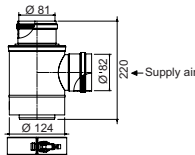
for MultiJet® (12,16)  
C80/110 -> C80/125PP  
with measure opening  
for flue gas and supply air  
At Hoval LAS flue pipe systems included  
in the scope of delivery.

2009 694


**Adapter ring for LAS boiler connection piece**

for MultiJet® (12,16)  
C80/110 -> C80/125  
to reduce construction height  
Attention:  
T-piece with measure opening  
necessary  
Order LAS flue gas system as separate  
pieces!

5015 274


**Separating piece C80/125 -> 2xE80PP**

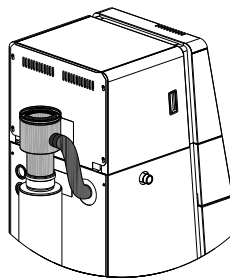
for ambient air independent operation  
for separate conduction of flue gas and  
combustion air.

2010 174


**Connection set for ambient air independent operation without sound absorber**

for UltraOil® (16-35),  
UltraGas® (15-50), MultiJet® (20,25)  
Consisting of:  
corrugated pipe Ø 50 mm for  
combustion air supply to burner.  
Concentric boiler connection piece  
E80 -> C80/125PP for flue gas  
and supply air.  
Necessary if no Hoval  
LAS flue gas system is used.

6027 510


**Flue gas sound absorber**

for MultiJet® (20,25),  
MultiJet® LSP (12-20), UltraOil® (16-25)  
to reduce the flue gas side sound  
emissions.  
Connection on both sides E80  
sound absorbing approx. 11 dB(A)  
flue gas resistance 12 Pa (at 25 kW)  
Total length 810 mm  
external Ø 160 mm  
Mounting position: vertical up to 45°

6017 246


**Special cleaning brush**

stainless steel brush with nylon  
bristles for a careful cleaning  
of the stainless steel heating  
surfaces D 189 x 120/1030

2015 202

## ■ Part No.

## Accessories

## Part No.



**Boiler socket**  
for MultiJet® (12,16)  
to elevate the condensate drainage  
made of steel  
height 150 mm  
anthracite painted

6025 417

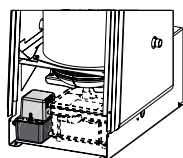


**Boiler socket**  
for MultiJet® (20,25),  
UltraOil® (16-35), UltraGas® (15-50)  
to elevate the condensate drainage  
made of steel  
height 150 mm  
anthracite painted

6025 418

### Condensate drainage for Hoval MultiJet® (12-25)

**With neutralisation**, for condensate drainage  
into higher situated drain pipe



**Condensate pump**  
for transporting condensation water  
into a higher drainage duct.  
Including connection line,  
completely wired,  
cable and plug for connection  
to the boiler controller  
max. transport height: 3.5 m  
Delivery rate up to 294 l/h  
combinable with neutralisation box  
can be mounted in boiler socket

6034 771



**Neutralisation granulate**  
for neutralisation box  
Refill set volume 3 kg  
Life time of one filling:  
approx. 2-4 years; depending on amount  
of condensate

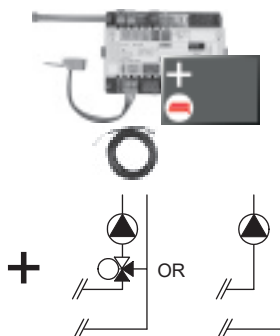
2028 906



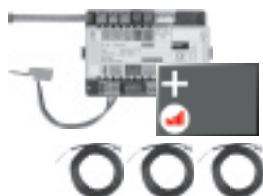
**Active carbon for neutralisation box**  
Refill Carboscreen  
operating life of one filling  
approx. 10 years

2029 801

■ Part No.



**Notice**  
The supplementary plug set may have to be ordered to implement functions differing from the standard!



**Notice**  
The flow rate sensor set must be ordered as well.



**Notice**  
Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

**TopTronic® E module expansions**  
for TopTronic® E basic module heat generator

**Part No.**

**TopTronic® E module expansion heating circuit TTE-FE HK**

6034 576

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories  
1 x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ**

6037 062

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

in each case incl. energy balancing

incl. fitting accessories  
3 x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Flow rate sensor sets**

Plastic housing

Size	Connection	Flow rate l/min	
DN 8	G ¾"	0.9-15	6038 526
DN 10	G ¾"	1.8-32	6038 507
DN 15	G 1"	3.5-50	6038 508
DN 20	G 1¼"	5-85	6038 509
DN 25	G 1½"	9-150	6038 510

**Flow rate sensor sets**

Brass housing

Size	Connection	Flow rate l/min	
DN 10	G 1"	2-40	6042 949
DN 32	G 1½"	14-240	6042 950

**TopTronic® E module expansion Universal TTE-FE UNI**

6034 575

Expansion to the inputs and outputs of a controller module (basic module heat generator, heating circuit/domestic hot water module, solar module, buffer module) for implementing various functions

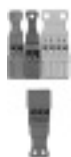
incl. fitting accessories

Can be installed in:  
Boiler control, wall housing, control panel

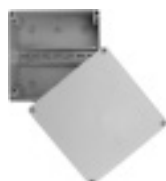
**Further information**

see "Controls" - "Hoval TopTronic® E module expansions" chapter

## ■ Part No.

**HovalConnect available from summer 2019**

Up to that point, TopTronic® E online is delivered.

**Accessories for TopTronic® E****Part No.****Supplementary plug set**

for basic module heat generator (TTE-WEZ)  
for controller modules and module expansion TTE-FE  
HK

6034 499  
6034 503

**TopTronic® E controller modules**

TTE-HK/WW TopTronic® E heating circuit/  
hot water module  
TTE-SOL TopTronic® E solar module  
TTE-PS TopTronic® E buffer module  
TTE-MWA TopTronic® E measuring module

6034 571  
6037 058  
6037 057  
6034 574

**TopTronic® E room control modules**

TTE-RBM TopTronic® E room control modules  
easy white  
comfort white  
comfort black

6037 071  
6037 069  
6037 070

**Enhanced language package TopTronic® E**

one SD card required per control module  
Consisting of the following languages:  
HU, CS, SL, RO, PL, TR, ES, HR,  
SR, JA, DA

6039 253

**HovalConnect**

HovalConnect domestic starter LAN  
HovalConnect domestic starter WLAN  
HovalConnect commercial starter LAN  
HovalConnect commercial starter WLAN  
SMS remote control unit  
System component SMS remote control unit

6049 496  
6049 498  
6049 495  
6049 497  
6018 867  
6022 797

**TopTronic® E interface modules**

GLT module 0-10 V  
HovalConnect domestic starter Modbus  
HovalConnect domestic starter KNX  
HovalConnect commercial starter Modbus  
HovalConnect commercial starter KNX

6034 578  
6049 501  
6049 593  
6049 500  
6049 502

**TopTronic® E wall casing**

WG-190 Wall casing small  
WG-360 Wall casing medium  
WG-360 BM Wall casing medium with  
control module cut-out  
WG-510 Wall casing large  
WG-510 BM Wall casing large with  
control module cut-out

6035 563  
6035 564  
6035 565  
6035 566  
6038 533

**TopTronic® E sensors**

AF/2P/K Outdoor sensor  
TF/2P/5/6T Immersion sensor, L = 5.0 m  
ALF/2P/4/T Contact sensor, L = 4.0 m  
TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m

2055 889  
2055 888  
2056 775  
2056 776

**System housing**

System housing 182 mm  
System housing 254 mm

6038 551  
6038 552

Bivalent switch

2061 826

**Further information**  
see "Controls"



■ Part No.

Part No.



**Flow temperature guard**

for underfloor heating system (1 guard per heating circuit) 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

*Kit Clamp-on thermostat RAK-TW1000.S*

Thermostat with strap, enclosed cable (4 m) and plug

6033 745

*Immersion thermostat RAK-TW1000.S SB 150*

Thermostat with pocket ½" - depth of immersion 150 mm, brass nickel-plated

6010 082



**CO monitor**

For safety shut-off of the boiler on leakage of carbon monoxide  
incl. connection cable

6043 277

## ■ Part No.

	Boiler connection sets	Part No.
	<b>Connection set AS25-S/NT/HT</b> for mounting a heating regulating armature HA25 for MultiJet® (12,16), UltraOil® (16,20), UltraGas® (15,27) Rigid flow pipe and flexible return pipe Suitable for left or right connection Low/high temperature Connection set completely insulated For mounting a heating regulating armature HA20 an adapter set DN 20 - DN 25 is required.	6017 055
	<b>Connection set AS25-S2/NT/HT</b> for mounting a heating regulating armature HA25 for MultiJet® (20,25), UltraOil® (25,35) Rigid flow pipe and flexible return pipe Suitable for left or right connection Low/high temperature Connection set completely insulated For mounting a heating regulating armature HA20 an adapter set DN 20 - DN 25 is required.	6024 985
	<b>Mounting kit AS-HA</b> for MultiJet® (20,25) If an armature group is mounted on both sides of the boiler, this kit has to be ordered in order to allow a complete swinging out of the boiler door.	6027 233
	<b>Connection set AS 25-LG</b> for mounting a Compact charging group LG-2 for MultiJet® (12-25), UltraOil® (16-35), UltraGas® (15-27) Suitable for left or right connection Low-temperature return Connection set completely insulated made of flexible pipes	6034 818
	<b>Holding plate</b> for the installation of a loading group LG25-2/unmixed HA group HA25-2 Suited to Hoval boiler connection set AS25 Dimension between axes A = 125 mm, installation height H = 60 mm	2022 446

## ■ Part No.


**Heating armature groups**
**Part No.**
**Heating armature group HA-3BM-R**

with 3-way motor mixer and heat-insulating box.  
Installation right (flow left)

HA group/pump	Speed control	EEI
	   	≤

**DN 20 (¾")**

HA20-3BM-R/HSP 4	•	•	0.20	6043 993
HA20-3BM-R/HSP 6	•	•	0.20	6043 994
HA20-3BM-R/SPS-S 7	•	•	0.20	6049 541
HA20-3BM-R/SPS-S 8	•	•	0.20	6049 542

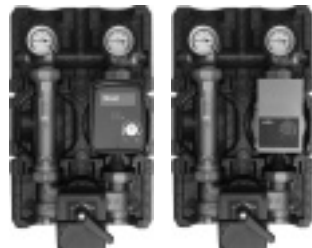
**DN 25 (1")**

HA25-3BM-R/HSP 6	•	•	0.20	6046 609
HA25-3BM-R/SPS-S 7	•	•	0.20	6049 545
HA25-3BM-R/SPS-S 8	•	•	0.20	6049 546
HA25-3BM-R/SPS-I 8 PM1	•	•	0.23	6046 612
HA25-3BM-R		without pump		6046 642

**Pumps for HA25-3BM-R**

see "Circulating pumps".

Pump installation dimensions 1½" x 180 mm


**Heating armature group HA-3BM-L**

with 3-way motor mixer and heat-insulating box.  
Installation left (flow right)

HA group/pump	Speed control	EEI
	   	≤

**DN 20 (¾")**

HA20-3BM-L/HSP 4	•	•	0.20	6043 999
HA20-3BM-L/HSP 6	•	•	0.20	6044 000
HA20-3BM-L/SPS-S 7	•	•	0.20	6049 543
HA20-3BM-L/SPS-S 8	•	•	0.20	6049 544

**DN 25 (1")**





HA25-3BM-L/HSP 6	•	•	0.20	6046 621
HA25-3BM-L/SPS-S 7	•	•	0.20	6049 547
HA25-3BM-L/SPS-S 8	•	•	0.20	6049 548
HA25-3BM-L/SPS-I 8 PM1	•	•	0.23	6046 624
HA25-3BM-L		without pump		6046 644

**Pumps for HA25-3BM-L**

see "Circulating pumps".

Pump installation dimensions 1½" x 180 mm

**Speed control legend**

	Δp-v	Variable differential pressure
	ENF	Vent function 10 min.
	PWM1 or PM1	PWM control signal heating
	Δp-c	Constant differential pressure

## ■ Part No.



## Heating armature groups

## Part No.

**Loading group LG-2**
**Heating armature group HA-2**

For the connection of a side calorifier or as heating circuit without mixer, with heat-insulating box. Installation right (flow left).

Charging/HA group/pump	Speed control	EEI
	   	≤

**DN 20 (¾")**

LG/HA20-2/HSP 4	•	•	0.20	6044 023
LG/HA20-2/HSP 6	•	•	0.20	6044 024
LG/HA20-2/SPS-S 7	•	•	0.20	6040 906
LG/HA20-2/SPS-S 8	•	•	0.20	6040 907

**DN 25 (1")**

LG/HA25-2/HSP 6	•	•	0.20	6046 633
LG/HA25-2/SPS-S 7	•	•	0.20	6049 553
LG/HA25-2/SPS-S 8	•	•	0.20	6049 554
LG/HA25-2/SPS-I 8 PM1	•	•	0.23	6046 636
LG/HA25-2		without pump		6046 646

**Pumps for LG/HA25-2**

see "Circulating pumps".

Pump installation dimensions 1½" x 180 mm


**Compact loading group LG-2**





With heat-insulating box for the direct installation on the CombiVal with 1"-nozzle, in the feed line or on the boiler.

Charging group/pump	Speed control	EEI
	   	≤

**DN 25 (1")**

LG 25-Compact/HSP 4	•	•	0.20	6044 029
LG 25-Compact/HSP 6	•	•	0.20	6044 030
LG 25-Compact/SPS-S 7	•	•	0.20	6049 556

**Speed control legend**

	Δp-v	Variable differential pressure
	ENF	Vent function 10 min.
	PWM1 or PM1	PWM control signal heating
	Δp-c	Constant differential pressure

## ■ Part No.



**Bypass valve DN 20 (1/2")**  
for the installation in a HA group DN 20  
Pressure range 0.1-0.6 bar

## Part No.

6013 684



**Bypass valve DN 25 (1")**  
for installation on a HA group DN 25  
Pressure range 0.1 - 0.6 bar

6046 875



**Adapter set DN 20-DN 25**  
for the installation of the HA group  
DN 20 to a wall distributor DN 25 or  
a connection set DN 25.  
Installation height 120 mm

6013 693

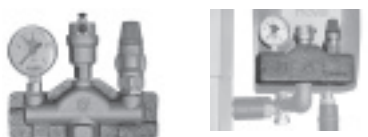


**Adapter set DN32-DN25**  
for the installation of the HA group  
DN32 to a connection set DN25.

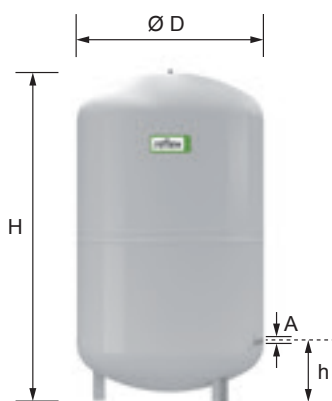
6007 191



## ■ Part No.



Installation example



## Accessories

**Wall bracket**

for the installation of a Hoval armature group on the wall.

Type	Dim. between centre lines mm	Connection		Wall distance mm
		Top	Bottom	
DN 20	90	Rp 1"	R 1"	70,85,100
DN 25	125	Rp 1½"	R 1"	87-162
DN 32	125	Rp 2"	R 1½"	142,167

## Part No.

6019 209

6019 210

6025 295

**Safety set SG15-1"**

Suitable up to max. 50 kW  
complete with safety valve (3 bar)  
Pressure gauge and automatic air vent  
with cut off valve  
Connection: 1" internal thread

641 184

**Pressure expansion tank  
Reflex NG 35-100**

Vessel with feet. Permitted operating pressure  
6 bar. Permitted operating temperature of ves-  
sel/diaphragm 120 °C/70 °C.

Reflex Type	Ø D mm	H mm	h mm	A
NG 35	354	460	130	R ¾"
NG 50	409	493	175	R ¾"
NG 80	480	565	166	R 1"
NG 100	480	670	166	R 1"

242 792

2026 088

2026 089

2026 090

**Further pressure expansion tanks**  
see "Various system components"**Vibration elements for boiler socket**

4 pieces of 100 mm each  
Height unstressed approx. 50 mm,  
width 80 mm

If vibration elements for boiler socket  
are used then all connections (incl.  
flue gas pipe) must be connected  
flexibly with sound absorbing  
compensators.

6003 737

**Oil filter**

with automatic air vent TOC Duo  
for operation in one pipe systems  
with return flow feed  
Incl. wall mounting set and  
shut-off valve

Connections:  
tank side internal thread R ¾",  
burner side external thread R ¾"  
with internal cone for pipe connection  
Operating temperature: max. 40 °C  
Ambient temperature: max. 60 °C  
Nozzle output: max. 120 l/h Diesel oil  
Filter inset made of sinter plastic:  
Fineness 50-75 µm  
Usage of the filter: < 40 kW

2004 128

**Filter inset made of sinter plastic Siku**

Fineness: 50-75 µm  
Output range: up to 40 kW

2005 275

## ■ Part No.



**Clamping ring screw joint KVS/6  
for TOC Duo**  
made of brass for oil pipe Ø 6 mm

Part No.

560 724



**Clamping ring screw joint KVS/8  
for TOC Duo**  
made of brass for oil pipe Ø 8 mm

560 725



**Clamping ring screw joint KVS/10  
for TOC Duo**  
made of brass for oil pipe Ø 10 mm

2010 185



**Clamping ring screw joint KVS/12  
for TOC Duo**  
made of brass  
for oil pipe Ø 12 mm

2010 186

### Accessories bio heating oil mix B10



**Heat oil filter**  
with automatic air vent  
for use in single-line systems with  
return connection  
Switching valve for multiple filtering  
negative pressure gauge,  
support, fitting accessories and  
shut-off valve  
Connections:  
tank-side internal thread G 3/8"  
burner-side external thread G 3/8" with  
internal cone for hose connection  
Operating temperature: max. 60 °C  
Ambient temperature: max. 60 °C  
Nozzle power: max. 100 l/h  
Siku sieve Optimum  
Fineness grade 50 µm

6047 955



**Filter inset made from cellulose**  
Fineness 5-20 µm  
Output range < 30 kW

2030 196



### 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

Type		(12)	(16)	(20)	(25)
• Nominal output 80/60 °C	kW	11.1	15.6	19.2	24.2
• Nominal output 40/30 °C	kW	12.0	16.5	20.0	25.0
• Range of output 80/60 °C	1st/2nd stage kW	11.1	11.1/15.6	13.6/19.2	15.2/24.2
• Range of output 40/30 °C	1st/2nd stage kW	12.0	11.8/16.5	14.4/20.0	16.0/25.5
• Heat input	1st/2nd stage kW	11.3	11.3/15.9	13.8/19.5	15.4/24.6
• Dimensions		see Dimensions			
• Boiler working temperature max.	°C	90	90	90	90
• Boiler working temperature min.			no min. limit		
• Return flow temperature min.			no min. limit		
• Flue gas temperature min. at the boiler			no min. limit		
• Safety temperature limiter setting (water side)	°C	110	110	110	110
• Working / test pressure		3.0/4.5	3.0/4.5	3.0/4.5	3.0/4.5
• Boiler efficiency at 80/60 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	98.3/92.7	98.0/92.5	98.3/92.7	98.3/92.7
• Boiler efficiency at 40/30 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	104.0/98.1	103.5/97.6	103.5/97.6	103.5/97.6
• Boiler efficiency at 30 % partial load (EN 303) (net calorific value NCV / gross calorific value GCV)	%	104.5/98.6	104.5/98.6	104.5/98.6	104.5/98.6
• Stand-by deficiency qB at 70 °C	Watt	148	148	194	201
• Energy efficiency class					
- without control	ns %	87	90	91	91
- with control	ns %	89	92	93	93
- with control and room sensor	ns %	91	94	95	95
• Combustion gas resistance, 12.5 % CO <sub>2</sub> , 500 m above sea, level (tolerance +/- 20 %)	mbar	1.0	2.0	0.7	0.9
• Flow resistance boiler <sup>1)</sup>	z-value	4.5	4.5	3.4	3.4
• Water resistance at 10 K	mbar	4.5	9.0	10.2	16.2
• Water resistance at 20 K	mbar	1.1	2.2	2.5	4.0
• Water flow volume at 10 K	m³/h	1.01	1.41	1.73	2.18
• Water flow volume at 20 K	m³/h	0.50	0.71	0.86	1.09
• Boiler water capacity	litres	35	35	50	58
• Boiler gas volume	m³	0.024	0.024	0.076	0.088
• Insulation thickness boiler body	mm	50	50	80	80
• Weight (incl. casing, sound absorbing hood, burner)	kg	117	117	155	165
• Weight of transport	kg	105	105	137	152
• Electrical power consumption min./max.	Watt	45/123	53/128	59/149	66/176
• Standby	Watt	6	6	6	6
• Type of protection <sup>2)</sup>	IP	20	20	20	20
• Acoustic power level incl. sound absorber hood					
Ambient air dependent					
- Heating noise (EN 15036 part 1)	dB(A)	62	67	63	65
Ambient air independent					
- Heating noise (EN 15036 part 1)	dB(A)	51	57	52	56
- Aspiration noise is radiated from the mouth (DIN 45835)	dB(A)	60	66	66	66
- Aspiration / exhaust noise - LAS - is radiated from the mouth (DIN 45835) <sup>3)</sup>	dB(A)	61	72	71	74
Ambient air dependent and ambient air independent					
- Exhaust noise in the pipe (EN 15036 part 2) <sup>3)</sup>	dB(A)	78	80	85	87
- Flue gas noise radiated from the mouth (DIN 45635 Part 47) <sup>3)</sup>	dB(A)	56	58	70	73
• Condensate rate (heating oil EL) at 40/30 °C	l/h	0.8	1.07	1.26	1.75
• pH-value of the condensate	ca.	3.2	3.2	3.2	3.2
• Construction type (according to EN 15035)		C53, C63			
• Flue gas system					
Temperature class		T120	T120	T120	T120
Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating oil EL	kg/h	18.2	24.3	31.0	38.9
Flue gas temperature at nominal output 80/60 °C	°C	65	85	85	85
Maximum supply pressure for supply air and flue gas line	Pa	30	30	50	50
Maximum draught/underpressure at flue gas outlet	Pa	-20	-20	-20	-20
• Combustion chamber dimensions Ø inside x length	mm	189x310	189x310	295x408	295x420
• Combustion chamber volume	m³	0.0087	0.0087	0.027	0.028

<sup>1)</sup> Flow resistance boiler in mbar = Volume flow (m³/h)² x z factor

<sup>2)</sup> Indication relates to protection against contact with dangerous components

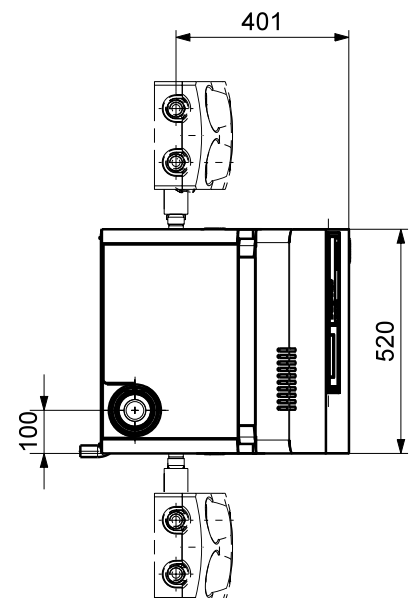
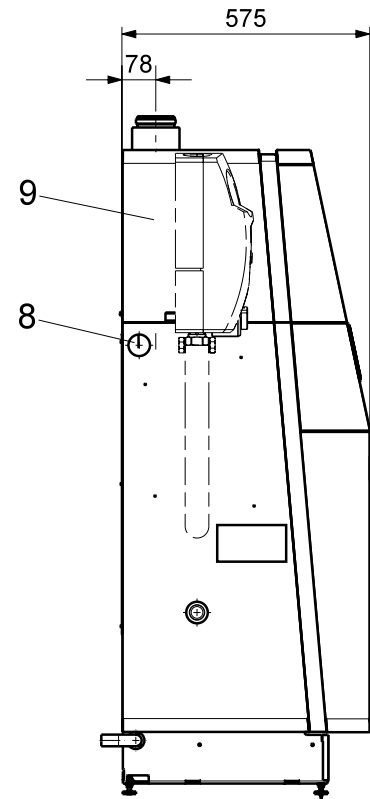
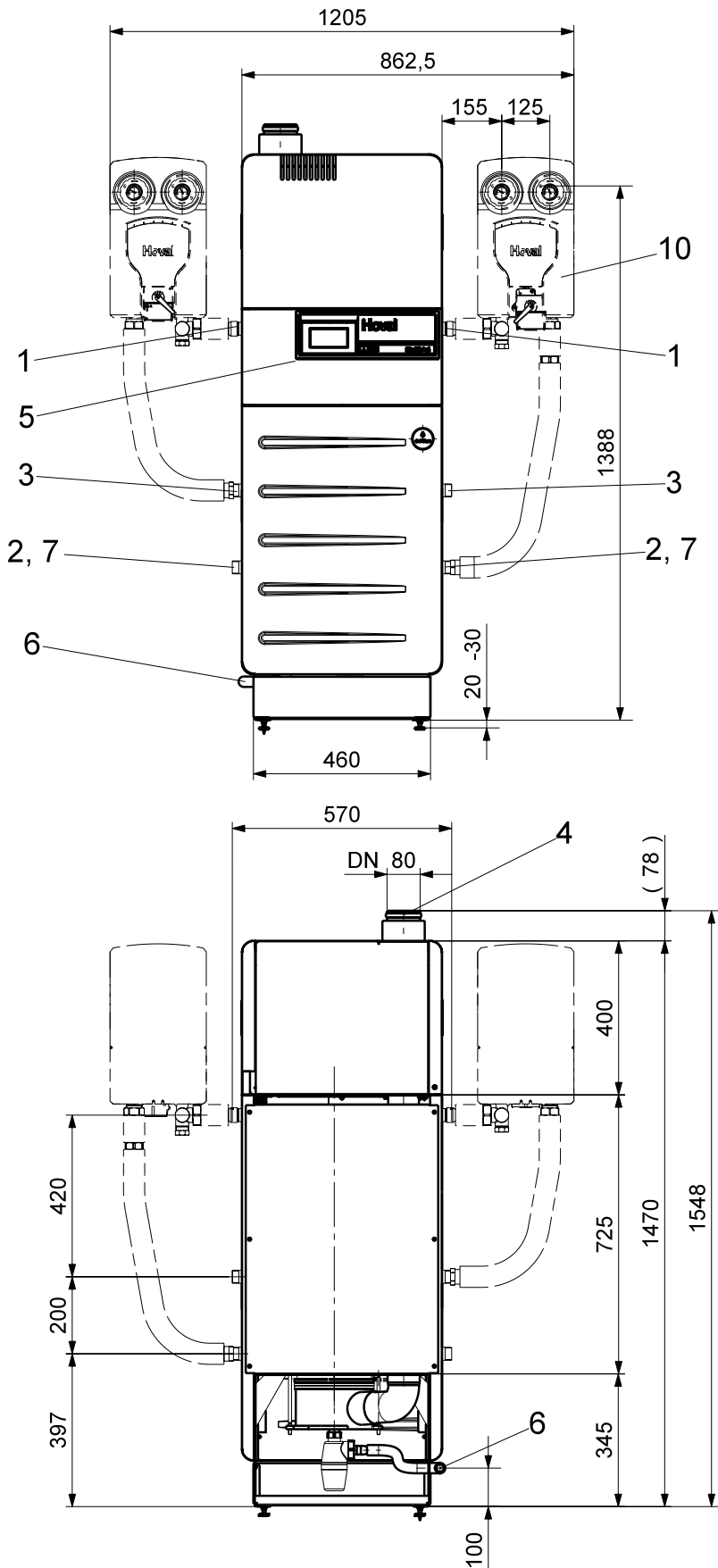
<sup>3)</sup> MultiJet® (12,16): Sound absorber integrated  
MultiJet® (20,25): Data without sound absorber. Reduction by installation of a sound absorber possible.

## Heating armature group

Flow resistance MultiJet® (12-25) with heating armature group  
HA-25-3BM-R/L (with mixing) z = 34.5  
HA25-2 (without mixing) z = 27.5

## ■ Dimensions

### MultiJet® (12,16) with heating armature group HA 25 (Dimensions in mm)

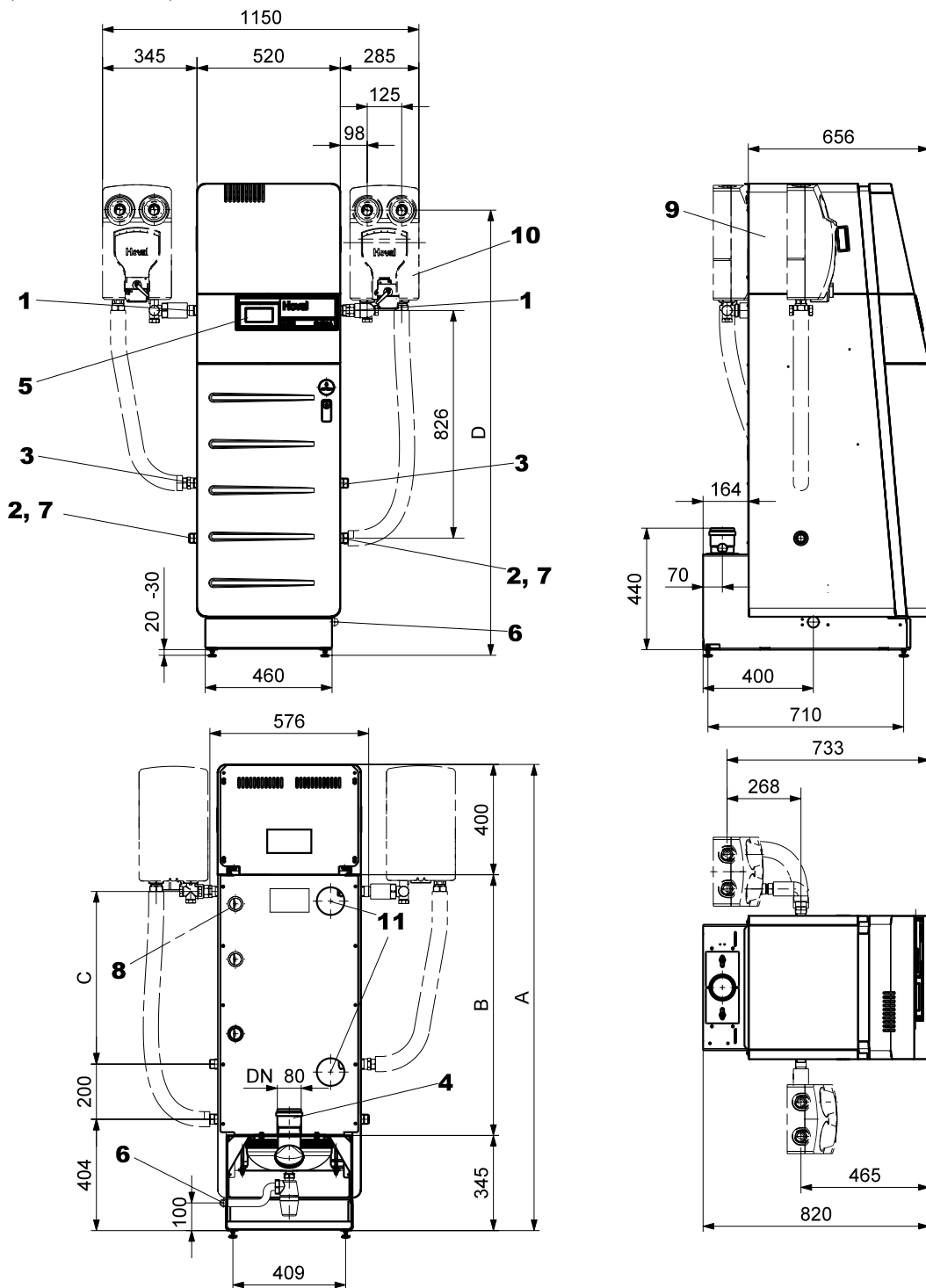


- 1 Flow heating/safety flow R 1"
- 2 Low temperature return R 1"
- 3 High temperature return R 1"
- 4 LAS flue gas/supply air connection C80/110
- 5 Control panel
- 6 Condensate drain (left or right)  
incl. syphon (DN 25) and 2 m PVC  
passage tube Ø inside 19 x 4 mm
- 7 Drain
- 8 Electric cable entry point
- 9 Absorber hood
- 10 Heating armature group  
or loading group (option)

### ■ Dimensions

### MultiJet® (20,25) with heating armature group HA25

(Dimensions in mm)



- If armature groups are connected on both sides of the boiler the fitting set AS-HA must be ordered, so that a complete swivelling of the boiler door is possible.
- Standard delivery with boiler door opening to the top, swivel-mounted to the right.
- Change to the left is possible on site of the customer.

- 1 Flow heating/safety flow R 1"
- 2 Low temperature return R 1"
- 3 High temperature return R 1"
- 4 Flue gas outlet DN 80
- 5 Control panel
- 6 Condensate drain (left or right) incl. syphon (DN 25) and  
2 m PVC passage tube Ø inside 19 x 4 mm
- 7 Drain
- 8 Electric cable entry point
- 9 Absorber hood
- 10 Heating armature group  
or loading group (option)
- 11 Feed-through combustion air hose

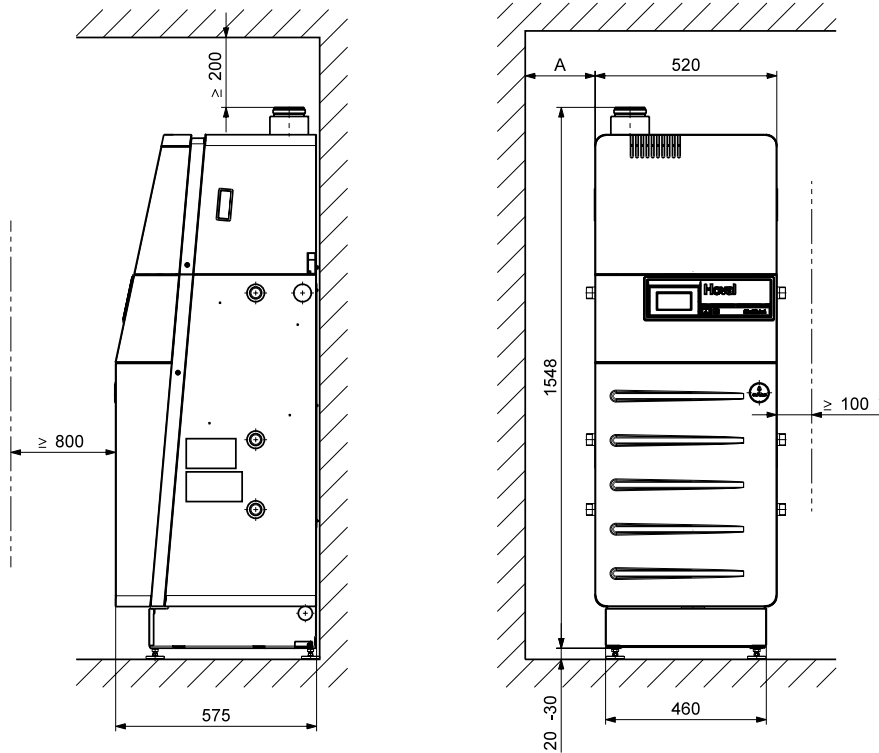
Type	A	B	C	D
MultiJet <sup>®</sup> (20)	1690	945	626	1603
MultiJet <sup>®</sup> (25)	1840	1095	776	1753



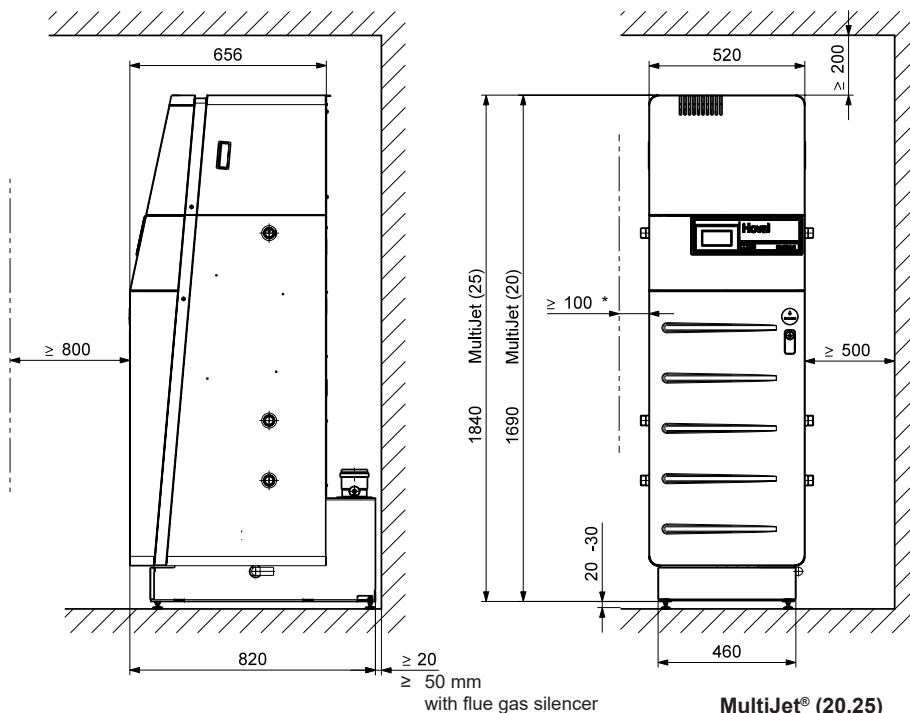
## ■ Dimensions

### Space requirements

#### Space requirements MultiJet® (12,16)



#### Space requirements MultiJet® (20,25)



#### MultiJet® (12,16)

A = minimal 100 mm \*

Burner service position in the front - boiler cleaning from the right

A = optimal 300 mm \*

- Burner service position left - boiler cleaning from the front
- Boiler can be placed on the right side directly against the wall however, a minimum gap of 100 mm is required.

\* without armature group,  
500 mm with armature group

#### MultiJet® (20,25)

- Door of the boiler inclusive burner must be able to be swung out 90°. Standard design right swivelling. The conversion from right to left is later possible (change on site).
- The minimum wall distance of 500 mm must be kept on the left side, if the boiler door swivels to the left.

**Notice:** The burner standardisation edge connection must be installed opposite the swivelling direction.

- The cleaning opening must be well accessible.
- Boiler rear side must be accessible.

\* without armature group,  
500 mm with armature group

## ■ Engineering

### Standards and guidelines

The following standard and guidelines must be respected:

- technical information and installation manual of Hoval
- hydraulic and technical control regulations of Hoval
- local building law
- fire protection standard
- 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.
- 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. underfloor 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 need to be adequately cleaned and flushed before being filled. The boiler may only be filled after the heating system has been flushed!
- Parts of the boiler/calorifier which have contact with water are made of ferrous materials and stainless steel.
- On account of the danger of stress cracking corrosion in the stainless steel section of the boiler the chloride, nitrate and sulphate contents of the heating water must not exceed 50 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 domestic water is generally best suited as heating medium, i.e. as filling and replacement water. However, the quality of the untreated domestic water must fulfil the standard set in VDI 2035. Should the mains water available not be suited for use then it must 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).
- If frost protection agent is being used, please contact the Hoval company to ask for the separate engineering sheet.
- 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.

### Frost protection agent

See separate engineering sheet "Use of frost protection agent".

### Combustion air supply

The combustion air supply must be guaranteed. The air vent must not be blocked. Where the air supply is fed directly to the boiler (air-exhaust system) the connecting piece for combustion air supply must be used. It is very important to ensure that the combustion air is free from halogen compounds. These are present, for example, in spray cans, varnishes, glues, solvents and cleansing agents.

#### Ambient air independent operation with separate combustion air duct to boiler:

- 0.8 cm<sup>2</sup> per 1 kW boiler capacity. The loss of pressure in the combustion air duct must be taken into account when determining the size of the flue gas system.
- In the MultiJet®, ventilation of the installation room must be guaranteed for operation independent from the room air.

#### Ambient air dependent operation:

- The minimum free cross-section for the combustion air can be assumed simplified as follows (nominal output relevant!).
- A ventilation outlet of at least 1 x 150 cm<sup>2</sup> or 2 x 75 cm<sup>2</sup> cross-section and in addition 2 cm<sup>2</sup> for each kW above 50 kW of boiler capacity is necessary.

### Oil burner mounting

- The burner connection plug must be mounted opposite of the burner door hinges.
- It should be possible to swivel the boiler door incl. burner by 90°.
- The space between burner and boiler door must be insulated by the additionally delivered insulation material.

### Electric connection of the burner

- Electric supply 1 x 230 V, 50 Hz, 10 A.
- The burner must be connected to the burner connection plug of the boiler.
- For safety reasons the electric cable of the burner must be that short that the plug must be removed when swivelling boiler door.

### Sound absorption

Sound absorption is possible through the following steps:

- Walls, ceilings 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.
- 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 flexible 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)

**Table 1:** Maximum filling quantity without/with demineralisation

	Carbonate hardness of the 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
<b>Size of single boiler</b>	<b>maximum filling quantity without demineralisation</b>							
up to 50 kW	NO REQUIREMENT							20 l/kW

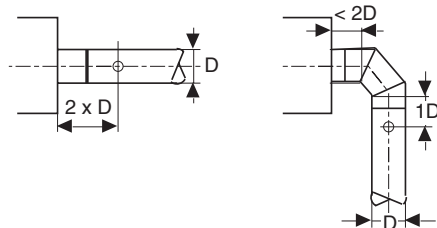
<sup>1</sup> Sum of alkaline earths

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

## ■ Engineering

### Flue gas system

- The flue gas system must be made by an examined and certified flue gas line.
- The flue gas line must be certified gas-tight, humidity-insensitively, corrosion and acid-proof as well as for flue gas temperatures up to 120 °C.
- The flue gas system must be suitable for the operation with over-pressure.
- The flue gas lines must be secured against unwanted loosening of the plug connections.
- The flue gas line is to be laid with upward gradient, so that the resulting condensate of the flue gas system flows back into the boiler so that before deriving into drains it can be neutralised.
- When using flue gas lines made from plastic, a flue gas safety temperature limiter is prescribed.  
Built in the MultiJet® (12-25) already.
- Computation of the fire-place cross section on basis of DIN 4705.
- In the connection pipe has to be integrated a closable flue gas measurement nozzle with circular inner diameter of 10-21 mm.  
The socket has to be led over the thermal insulation.



### Fuel oil quality

The Hoval MultiJet® can be operated with the following fuel oil qualities:

- Diesel oil sulphur content:  
max. 1000 ppm (0.1 % by weight)  
Nitrogen content: undefined
- Low sulphur fuel oil sulphur content:  
max. 50 ppm (0.005 % by weight)
- Heating oil EL sulphur-free sulphur content:  
max. 10 ppm (0.001 % by weight)

In addition to the engineering guidelines for the MultiJet®, the following additional notes apply for biological heating oil mix B10:

### Special project planning notes for heating systems with biological heating oil mix B10

Biological heating oil mix B10 is composed of heating oil EL low-sulphur with the addition of max. 10% FAME.

### Oil filters

Only oil filters suitable for biological heating oil are allowed to be used. Filter elements made from copper, brass or plastics not compatible with biological heating oil are not suitable. See accessories in the Part No. section for suitable oil filters.

### Maintenance

It is essential for the filter to be renewed after the first heating season.

### Sound level

The acoustic **power** level value is independent of local and special circumstances.

The acoustic **pressure** level is dependent on the installation conditions and can e.g. be 10 to 15 dB(A) lower than the acoustic **power** level at a distance of 1 m.

### Condensate drain

A boiler base is integrated in the MultiJet® for condensate collection and drainage.

- According to local regulations
- The condensate derivative must be made back by a pipeline that is free of backlog and by a siphon (built in the MultiJet® already).
- The boiler can be placed additionally on a special boiler base. Thus a condensate discharge height of 280 mm is reached.
- Suitable materials for the condensate derivative:
  - stoneware pipes
  - pipes from PVC
  - pipes made from polyethylene (PE)
  - pipes from ABS or ASP
- The commercial system operator must inform the sewer operator if the exhaust condensate is discharged into the sewer system.

### Installation instructions

Please observe the installation instructions supplied with every boiler.

## Engineering

### Piping mounting

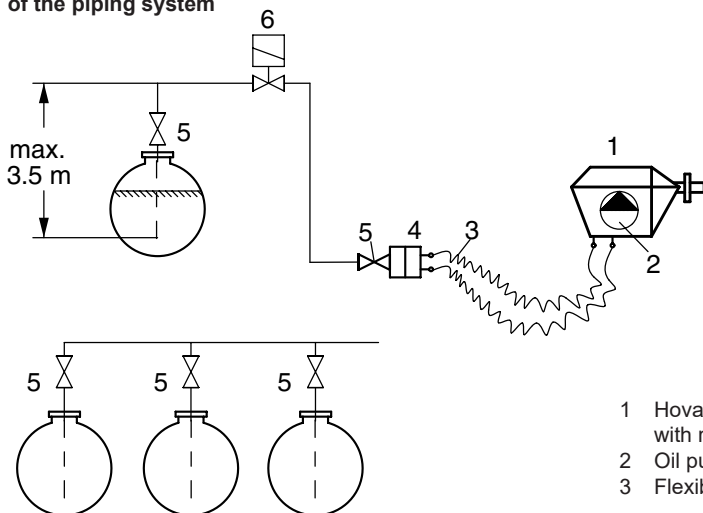
- Hoval MultiJet® can only be used for a single pipe system. Max. suction height without pump 3.5 m, maximum length of pipe system 30 m.
- The pipes must be fitted in such a way that the boiler door can be opened completely.
- At the end of the fixed piping a shut-off valve must be installed (by "TOC Duo" filter already included).
- We recommend the installation of an automatic heating oil deaerator in front of the burner to safeguard a trouble-free operation.
- One pipe heating oil filter**  
A one pipe heating oil filter with return connection and inset for MultiJet® (12-25) mesh size 50-75 µm (e.g. sintered plastic) must be installed in front of the burner piping on the height of the oil pump.

### Automatic heating oil deaerator with integrated filter

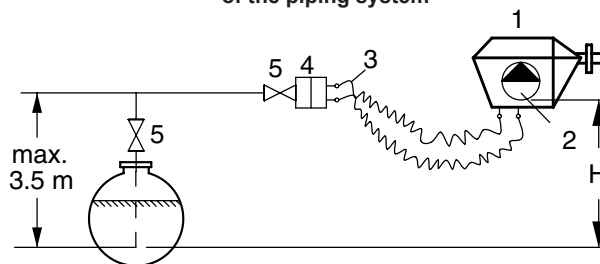
- When connected an automatic heating oil deaerator with filter in front of the burner, the deaerator must be fitted approx. 100 mm above the oil pump.
- The same specifications apply to the use of this filter as above to one pipe heating oil filter.
- The highest point of the piping should be max. 3.5 m above the tank suction pipe.
- Product pipelines must be installed in such a way that no liquid can emerge independently (rise) from the tank.

- If the highest oil level in the tank is higher than the lowest point of the piping, a solenoid valve must be installed at the highest point of the system as close at the oil tank as possible.
- In the case of plants with several oil-fired boilers, the oil supply to the boilers must be ensured in all operating states, e.g. provide an independent connection line to the oil tank for each boiler.

### Max. oil level higher than the lowest point of the piping system



### Max. oil level lower as the lowest point of the piping system



- 1 Hoval-burner for 1-line connection with return flow
- 2 Oil pump
- 3 Flexible hoses of the burner

- 4 Fuel filter with return connection Sinter plastic inset 25-75 µm
- 5 Shut-off valve
- 6 Solenoid valve

H = Suction height [m]

### Single pipe system

Pipe Ø inside 4 mm, max. pipe length in m

Suction height H in m	MultiJet®			
	(12)	(16)	(20)	(25)
0	30	30	30	30
1	30	30	30	30
2	30	30	28	23
3	20	20	16	13

This pipe dimensioning table renders orienting values for: fuel oil EL or intermixture of fuel oil EL with max. 10 % FAME (bio fuel oil), oil temperature > 10 °C (inner tank) up to 700 m over sea level, 1 filter, 1 valve, 6 arcs/bows 90° (40 mbar).

### Pipe systems that are oversized can lead to operational disturbance!

For this reason, in case of boiler exchange the pipe dimensioning table must be observed!

### Expansion tank/expansion

- Ideally, the pressure expansion tank should be connected to the heating system as described in our example applications, with a removable or sealable actuation device. This means that it is not necessary to drain the entire system in order to carry out work.

### Safety valve

- A safety valve an automatic air vent must be installed in the safety flow

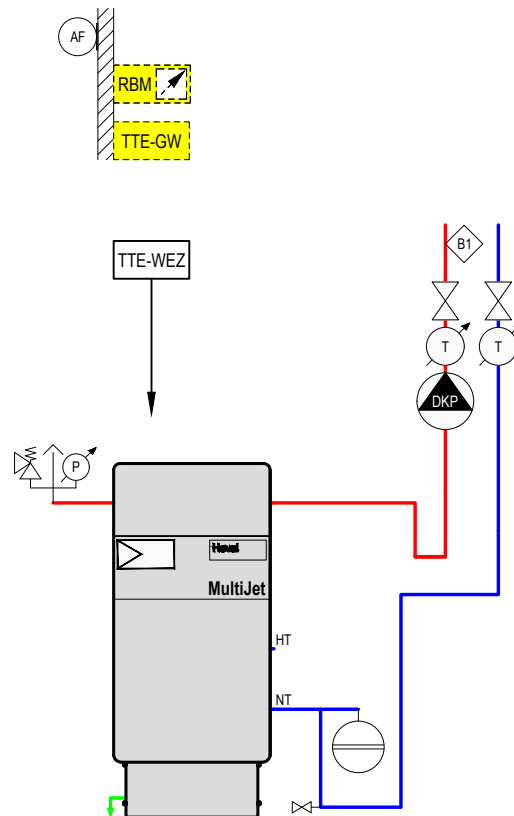
## ■ Examples

### MultiJet® (12-25)

Oil condensing boiler with

- 1 direct circuit

Hydraulic schematic BEAE005



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
B1	Flow temperature guard (if required)
AF	Outdoor sensor
DKP	Pump for heating circuit without mixer
<i>Option</i>	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway



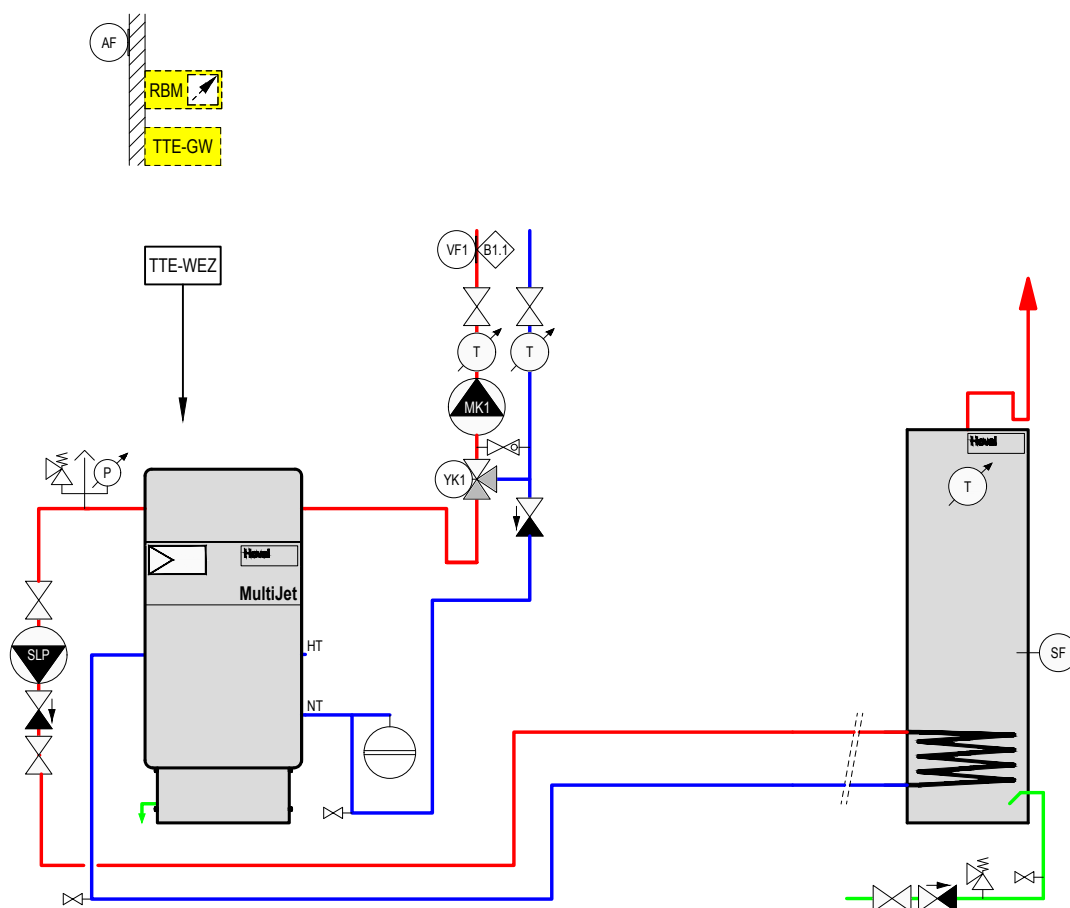
## ■ Examples

### MultiJet® (12-25)

Oil condensing boiler with

- calorifier
- 1 mixed circuit

Hydraulic schematic BEAE020



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SLP	Calorifier charging pump

#### Option

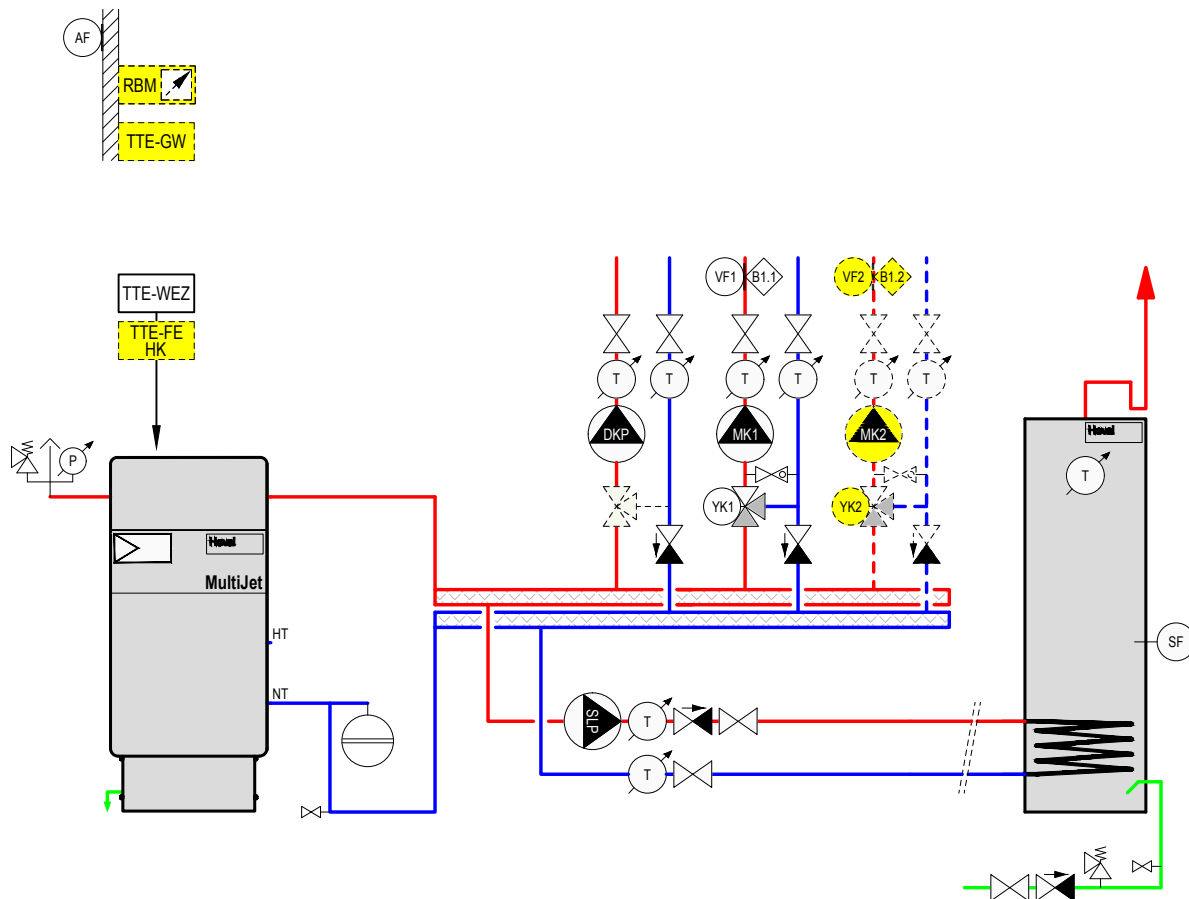
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

## ■ Examples

**MultiJet® (12-25)**

Oil condensing boiler with

- calorifier
- 1 direct circuit and 1-... mixer circuit(s)

**Hydraulic schematic BEAE030****Notice:**

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
DKP	Pump for heating circuit without mixer
SLP	Calorifier charging pump

**Option**

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2



## Description

### Hoval UltraOil® (16-80)

#### Oil-fired condensing boiler for ecological heating oil EL low-sulphur

##### Boiler

- Oil condensing boiler according to EN 303 part 1 and 2; EN 15034 and EN 15035 (only for UltraOil® (16-50))
- For burning **ecological heating oil EL low-sulphur (sulphur content < 50 ppm) acc. to standard SN 181160.2 Intermixture of up to 10 % FAME (EN 14213) is possible.**
- Boiler made of steel with condensation design
- Components that come into contact with flue gas and condensate are made from high-alloyed stainless steel
- Maximum flue gas condensation by heating surfaces made of **aluFer®** composite pipe and 2-stage operation
- Flue gas side: aluminium
- Water side: stainless steel
- No lower delimitation of the boiler water temperature and the boiler return temperature
- No minimal water circulation necessary
- Boiler door
- UltraOil® (16-50): top, to the left
- UltraOil® (65,80): top, backwards
- Insulation at the boiler body: 80 mm mineral wool mat and glass fabric
- UltraOil® (16-50): Boiler completely cased with steel plate, red powder coated
- UltraOil® (65,80): casing made of steel sheet, red powder coated, delivered separately packed
- Flue outlet
- UltraOil® (16-35,65,80) backwards to the top
- UltraOil® (50) to the top
- Flue gas sound absorber:
- UltraOil® (50) integrated
- UltraOil® (16-35,65,80) see Accessories
- Heating connections for:
  - flow
  - return - high temperature
  - return - low temperature
- UltraOil® (16-50) on the left and right side
- UltraOil® (65,80) backwards
- Sound absorbing/thermal insulation hood
- Flue gas temperature monitoring
- UltraOil® (16-50): integrated
- UltraOil® (65,80): included in the scope of delivery
- Cleaning scraper included in the scope of delivery
- TopTronic® E controller installed

##### TopTronic® E controller

##### Control panel

- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

##### TopTronic® E control module

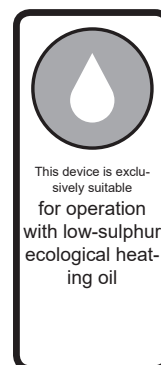
- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules



Hoval UltraOil® (16-50)



Hoval UltraOil® (65,80)



##### Model range

UltraOil® type	Output 40/30 °C kW
<b>A</b> (16)	12-16
<b>A</b> (20)	14-20
<b>A</b> (25)	16-25
<b>A</b> (35)	22-35
<b>A</b> (50) <sup>1</sup>	30-50
<b>A</b> (65) <sup>1</sup>	41-65
(80)	52-80

<sup>1</sup> incl. room control module (room sensor) **A+**

Energy efficiency class of the compound system with control

- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

##### TopTronic® E basic module heat generator (TTE-WEZ)

- Control functions integrated for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set

##### Options for TopTronic® E controller

- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting or
  - module expansion universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

##### Permissions boilers

UltraOil® (16-80)  
VKF certificate 16994  
CE product ID No. CE 0036 0379/06

##### Number of modules that can be additionally installed in the heat generator:

- 1 module expansion and 1 controller module **or**
- 2 controller modules

The supplementary plug set must be ordered in order to use expanded controller functions.

##### Oil automatic function device OFA

- Control function integrated for
  - flue gas sensor for safety shut-off
  - 0-10V output for connecting a modulating main pump (incl. delta T-control with low consumption)
  - Standard plug connection for 2-stage burner 1x 230 V
  - Variable input for plant-specific functions (heat generator block, return sensor, info sensor etc.)
  - Variable output for plant-specific functions (thermostat function, operating message, etc.)

**Further information about the TopTronic® E**  
see "Controls"

### ■ Description

#### *Oil burner to UltraOil® (16-80)*

- Fully automatic 2-stage pressure jet burner (blue flame burner)
- With motorised air damper
- With oil pre-heating
- Oil burner tested by Hoval for  $\leq 1000$  m above sea level. 1.2 % output reduction per 100 m higher level

#### **Heating armature groups and wall distributors**

see "Various system components"

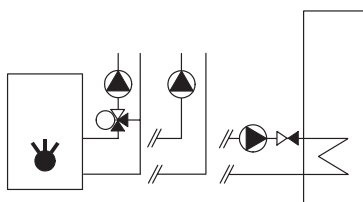
#### *Optional*

- Free-standing calorifiers, see Calorifiers
- Flue gas systems
- Version with/without neutralisation

#### *Delivery*

- UltraOil® (16-50): boiler incl. TopTronic® E control, control panel and sound absorbing hood completely cased. Oil burner is delivered separately packed.
- UltraOil® (65,80): boiler incl. TopTronic® E control, control panel, casing with thermal insulation and oil burner are delivered separately packed.

■ Part No.



Hoval UltraOil® (16-50)



Hoval UltraOil® (65,80)

**Oil condensing boiler**  
**Hoval UltraOil®**

Part No.

Oil condensing boiler with built-in Hoval TopTronic® E control

Control functions integrated for

- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- bivalent and cascade management
- Can be optionally expanded 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)

Incl. sensor, flue temperature monitoring, 2-stage oil burner, sound attenuation cowl and fire protection switch.

**Delivery**

- UltraOil® (16-50): boiler incl. TopTronic® E control, control panel and sound absorbing hood completely cased. Oil burner is delivered separately packed.
- UltraOil® (65,80): boiler incl. TopTronic® E control, control panel, casing with thermal insulation and oil burner are delivered separately packed.

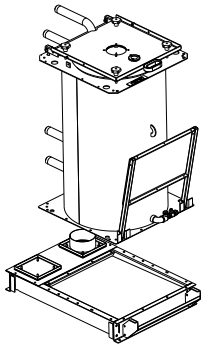
For burning **heating oil EL low-sulphur or sulphur-free** with sulphur content <50 ppm. Admixture of up to 10 % FAME is possible.

UltraOil® Type	Heat output 40/30 °C kW	
<b>A</b> (16)	12-16	7014 889
<b>A</b> (20)	14-20	7014 890
<b>A</b> (25)	16-25	7014 891
<b>A</b> (35)	22-35	7014 892
<b>A</b> (50) <sup>1</sup>	30-50	7014 893
<b>A</b> (65) <sup>1</sup>	41-65	7014 894
<b>A</b> (80)	52-80	7014 895

<sup>1</sup> incl. room control module (room sensor) **A+**

**Energy efficiency class of the compound system with control**

■ Part No.



Oil condensing boiler  
Hoval UltraOil®  
(delivery in separate parts)

Part No.

Oil condensing boiler with built-in Hoval TopTronic® E control for **delivery in separate parts**.

The flue gas collector is loosely screwed onto the boiler and can be removed on site to facilitate installation. Assembled on-site by the installer.

UltraOil® type	Output 40/30 °C kW
(65) <sup>1</sup>	41-65
(80)	52-80

7016 804  
7016 805

<sup>1</sup> incl. room control module (room sensor) **A+**

Energy efficiency class of the compound system with control

■ Part No.

Accessories

Part No.



Accessories necessary  
for air independent operation

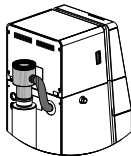
**Connection set for ambient air  
independent operation without  
sound absorber**  
for UltraOil® (16-35),  
UltraGas® (15-50), MultiJet® (20,25)  
Consisting of:  
corrugated pipe Ø 50 mm for  
combustion air supply to burner.  
Concentric boiler connection piece  
E80 -> C80/125PP for flue gas  
and supply air.  
Necessary if no Hoval  
LAS flue gas system is used.

6027 510



**Connection set for ambient air  
independent operation**  
for MultiJet® (20,25) and  
UltraOil® (16-25) with silencer and  
MultiJet® LSP (12-20) without silencer  
suitable for supply air/flue gas piping  
C80/125 PP  
Consisting of:  
corrugated pipe Ø 50 mm  
for combustion air supply to burner  
Concentric boiler connection piece  
E80->C80/125PP for flue gas and  
supply air.

6017 143

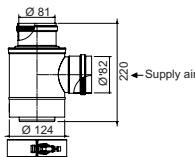


**Connection set  
for room air independent operation  
in combination with silencer**  
for Hoval UltraOil® (35)  
Consists of:  
Corrugated pipe Ø 50 mm for  
combustion air supply to burner  
Concentric boiler connection piece  
E100 -> C100/150 PP for flue gas  
and supply air

6024 898

For air independent operation with separate  
combustion air duct (not concentric).

for Hoval UltraOil® (16-35)

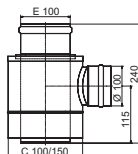


**Separating piece C80/125 -> 2xE80PP**  
for ambient air independent operation  
for separate conduction of flue gas and  
combustion air.

2010 174



## ■ Part No.

**Accessories****Part No.****Separating piece C100/150 -> 2xE100PP**

2015 244

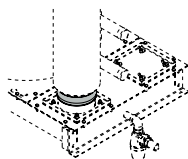
for UltraOil® (35,50),  
TopGas® classic (35-120),  
UltraGas® (50-100)  
for separate conduction of flue gas and  
combustion air (LAS-system)  
Recommendation:  
If the air inlet at the facade is near a  
noise sensitive place (window of  
bedroom, terrace etc.), we recommend  
to use a sound absorber at the  
direct combustion air inlet.

For air dependent operation with separate  
combustion air duct (not concentric).

**Horizontal flue gas connection E100PP**

6016 933

for UltraOil® (50), UltraGas® (70,100)  
for the conversion of the vertical  
flue gas connection (series delivery)  
to a horizontal to rear routed  
flue gas connection.

**Connection seal**

2029 956

for UltraGas® (125,150),  
UltraOil® (65,80)  
with clamping flanges Ø 150 mm  
(e.g. in connection with the Hoval  
flue gas sound absorber)  
on Hoval flue gas line systems already  
included in the scope of delivery

**Flue gas sound absorber**

to reduce the flue gas side sound emissions.  
Mounting position: vertical up to 45°

for Hoval UltraOil®	Connection
type	on both sides

(16-25)	E80	6017 246
(35)	E100 (incl. transition E80-E100)	6031 571
(50)	integrated	
(65,80)	E150	6017 245

For further details, see Technical data

**Boiler socket**

6025 418

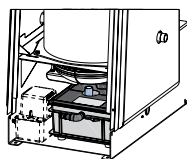
for MultiJet® (20,25),  
UltraOil® (16-35), UltraGas® (15-50)  
to elevate the condensate drainage  
made of steel  
height 150 mm  
anthracite painted

## ■ Part No.

**Condensate drainage for  
Hoval UltraOil® (16-35)**
**Part No.**


**Condensate pump**  
for transporting condensation water  
into a higher drainage duct.  
Including connection line,  
completely wired,  
cable and plug for connection  
to the boiler controller  
max. transport height: 3.5 m  
Delivery rate up to 294 l/h  
combinable with neutralisation box  
can be mounted in boiler socket

6034 771



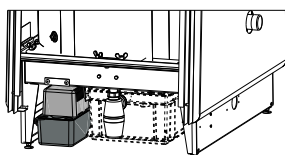
**Neutralisation box**  
for transporting condensation water into  
a lower lying drainage duct  
incl. condensate neutralisation  
incl. neutralisation granulate 3 kg  
combinable with condensate pump  
can be mounted in boiler socket

6024 764



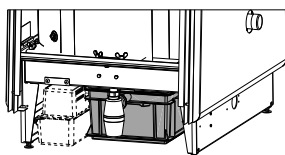
**Neutralisation granulate**  
for neutralisation box  
Refill set volume 3 kg  
Life time of one filling:  
approx. 2-4 years; depending on amount  
of condensate

2028 906

**Condensate drainage for  
Hoval UltraOil® (50)**


**Condensate pump**  
for UltraGas® (70,100), UltraOil® (50)  
for transporting condensation water  
into a higher drainage duct  
Including connection line  
completely wired  
cable and plug for connection  
to the boiler controller  
Max. transport height: 3.5 m  
combinable with neutralisation box  
can be mounted in boiler socket

6034 772



**Neutralisation box**  
for UltraOil® 50, UltraGas® (70,100)  
for transporting condensation water into  
a lower lying drainage duct incl.  
neutralisation granulate 6 kg.  
Combinable with condensate pump;  
can be mounted in boiler socket

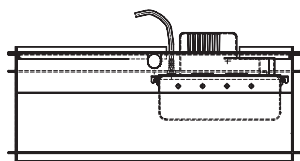
6012 553



**Neutralisation granulate**  
for neutralisation box  
Refill set volume 3 kg  
Life time of one filling:  
approx. 2-4 years; depending on amount  
of condensate

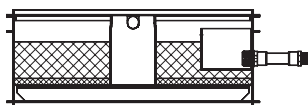
2028 906

## ■ Part No.

**Condensate drainage for  
Hoval UltraOil® (65,80)**
**Part No.**

**Condensate box KB 22**

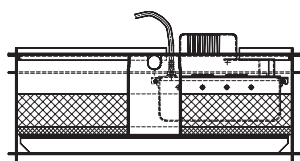
6033 767

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)  
For condensate drainage into higher  
situated drain pipe with delivery pump.  
Max. delivery height 3.5 m, from  
1200 kW two delivery pumps necessary.  
Delivery rate 120 l/h  
incl. liquid level switch, silicone hose  
9/13 mm, 4 m long, electrical cable  
1.5 m with plug  
Use one box per boiler.


**Neutralisation box KB 23**

6001 917

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)  
Condensate drainage into lower situated  
drain pipe without condensate  
delivery pump  
with neutralisation  
12 kg neutralisation granulate  
Placed under the boiler  
Use one box per boiler.


**Neutralisation box KB 24**

6033 764

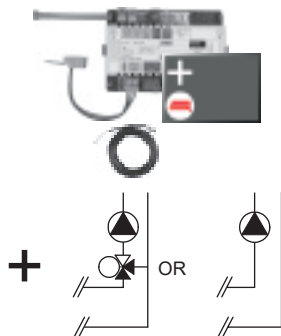
for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)  
for transporting condensation water into  
a higher lying drainage duct,  
max. delivery height 3.5 m, from  
1200 kW two delivery pumps necessary.  
Delivery rate 120 l/h  
incl. liquid level switch, silicone hose  
9/13 mm, 4 m long, electrical cable  
1.5 m with plug  
12 kg granulate  
Use one box per boiler.


**Neutralisation granulate**

2028 906

for neutralisation box  
Refill set volume 3 kg  
Life time of one filling:  
approx. 2-4 years; depending on amount  
of condensate

■ Part No.



**Notice**

The supplementary plug set may have to be ordered to implement functions differing from the standard!

**TopTronic® E module expansions**  
for TopTronic® E basic module heat generator

**Part No.**

**TopTronic® E module expansion heating circuit TTE-FE HK**

6034 576

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories  
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ**

6037 062

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating/cooling circuit w/o mixer or
- 1 heating/cooling circuit with mixer

in each case incl. energy balancing

incl. fitting accessories  
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Notice**

The flow rate sensor set must be ordered as well.



**Flow rate sensor sets**

Plastic housing

Size	Connection	Flow rate l/min	
DN 8	G ¾"	0.9-15	6038 526
DN 10	G ¾"	1.8-32	6038 507
DN 15	G 1"	3.5-50	6038 508
DN 20	G 1¼"	5-85	6038 509
DN 25	G 1½"	9-150	6038 510

Brass housing

Size	Connection	Flow rate l/min	
DN 10	G 1"	2-40	6042 949
DN 32	G 1½"	14-240	6042 950



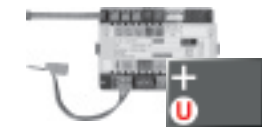
**TopTronic® E module expansion Universal TTE-FE UNI**

6034 575

Expansion to the inputs and outputs of a controller module (basic module heat generator, heating circuit/domestic hot water module, solar module, buffer module) for implementing various functions

incl. fitting accessories

Can be installed in:  
Boiler control, wall housing, control panel



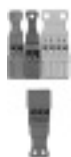
**Notice**

Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

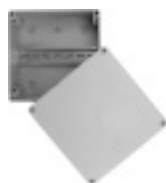
**Further information**

see "Controls" - "Hoval TopTronic® E module expansions" chapter

## ■ Part No.


**HovalConnect available from summer 2019**

Up to that point, TopTronic® E online is delivered.


**Accessories for TopTronic® E**
**Part No.**
**Supplementary plug set**

for basic module heat generator (TTE-WEZ)  
for controller modules and module expansion TTE-FE  
HK

6034 499  
6034 503

**TopTronic® E controller modules**

TTE-HK/WW TopTronic® E heating circuit/  
hot water module  
TTE-SOL TopTronic® E solar module  
TTE-PS TopTronic® E buffer module  
TTE-MWA TopTronic® E measuring module

6034 571  
6037 058  
6037 057  
6034 574

**TopTronic® E room control modules**

TTE-RBM TopTronic® E room control modules  
easy white  
comfort white  
comfort black

6037 071  
6037 069  
6037 070

**Enhanced language package TopTronic® E**

one SD card required per control module  
Consisting of the following languages:  
HU, CS, SL, RO, PL, TR, ES, HR,  
SR, JA, DA

6039 253

**HovalConnect**

HovalConnect domestic starter LAN  
HovalConnect domestic starter WLAN  
HovalConnect commercial starter LAN  
HovalConnect commercial starter WLAN  
SMS remote control unit  
System component SMS remote control unit

6049 496  
6049 498  
6049 495  
6049 497  
6018 867  
6022 797

**TopTronic® E interface modules**

GLT module 0-10 V  
HovalConnect domestic starter Modbus  
HovalConnect domestic starter KNX  
HovalConnect commercial starter Modbus  
HovalConnect commercial starter KNX

6034 578  
6049 501  
6049 593  
6049 500  
6049 502

**TopTronic® E wall casing**

WG-190 Wall casing small  
WG-360 Wall casing medium  
WG-360 BM Wall casing medium with  
control module cut-out  
WG-510 Wall casing large  
WG-510 BM Wall casing large with  
control module cut-out

6035 563  
6035 564  
6035 565  
6035 566  
6038 533

**TopTronic® E sensors**

AF/2P/K Outdoor sensor  
TF/2P/5/6T Immersion sensor, L = 5.0 m  
ALF/2P/4/T Contact sensor, L = 4.0 m  
TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m

2055 889  
2055 888  
2056 775  
2056 776

**System housing**

System housing 182 mm  
System housing 254 mm

6038 551  
6038 552

Bivalent switch

2061 826

**Further information**  
see "Controls"

## ■ Part No.

## Part No.


**Flow temperature guard**

for underfloor heating system (1 guard per heating circuit) 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*

242 902

Thermostat with strap, without cable and plug

*Kit Clamp-on thermostat RAK-TW1000.S*

6033 745

Thermostat with strap, enclosed cable (4 m) and plug

*Immersion thermostat RAK-TW1000.S SB 150*

6010 082

Thermostat with pocket ½" - depth of immersion 150 mm, brass nickel-plated


**CO monitor**

For safety shut-off of the boiler on leakage of carbon monoxide  
incl. connection cable

6043 277

## ■ Part No.

**Boiler connection sets****Part No.**

for mounting a heating armature group to the boiler Hoval UltraOil® (16-50).  
Suitable for left or right connection.  
Low/high temperature version

*Delivery*

- Connection set in assembly units, completely packed.

**Connection set AS25-S/NT/HT**

6017 055

for mounting a heating regulating armature HA25 for MultiJet® (12,16), UltraOil® (16,20), UltraGas® (15,27)  
Rigid flow pipe and flexible return pipe  
Suitable for left or right connection  
Low/high temperature  
Connection set completely insulated  
For mounting a heating regulating armature HA20 an adapter set DN 20 - DN 25 is required.

**Connection set AS25-S2/NT/HT**

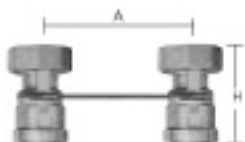
6024 985

for mounting a heating regulating armature HA25 for MultiJet® (20,25), UltraOil® (25,35)  
Rigid flow pipe and flexible return pipe  
Suitable for left or right connection  
Low/high temperature  
Connection set completely insulated  
For mounting a heating regulating armature HA20 an adapter set DN 20 - DN 25 is required.

**Connection set AS 25-LG**

6034 818

for mounting a Compact charging group LG-2 for MultiJet® (12-25), UltraOil® (16-35), UltraGas® (15-27)  
Suitable for left or right connection  
Low-temperature return  
Connection set completely insulated  
made of flexible pipes

**Holding plate**

2022 446

for the installation of a loading group LG25-2/unmixed HA group HA25-2  
Suited to Hoval boiler connection set AS25  
Dimension between axes A = 125 mm, installation height H = 60 mm

## ■ Part No.

## Part No.


**Connection set AS32-S/NT/HT**

6024 455

for mounting a heating regulating armature HA32 for UltraOil® (35)  
Rigid flow pipe and flexible return pipe  
Suitable for left or right connection  
Low/high temperature  
Fastening material incl.  
Reduction set 1¼" ET - 1" IT for boiler connection  
Connection set completely insulated  
For mounting a heating regulating armature HA25 an adapter set DN 25 - DN 32 is required.


**Connection set AS40-S/NT/HT**

6014 848

for mounting a heating regulating armature HA40 for UltraOil® (50), UltraGas® (70,100)  
Rigid flow pipe and flexible return pipe with screw flange R 1½"  
Suitable for left or right connection  
Low/high temperature  
Connection set completely insulated  
For mounting a heating regulating armature HA32 an adapter set DN 32 - DN 40 is required.


**Adapter set DN 20-DN 25**

6013 693

for the installation of the HA group DN 20 to a wall distributor DN 25 or a connection set DN 25.  
Installation height 120 mm


**Adapter set DN32-DN25**

6007 191

for the installation of the HA group DN32 to a connection set DN25.


**Adapter fitting DN32-DN40**

6014 863

for the installation of the HA group DN32 to a wall distributor DN40 or a connection set AS40-S/NT/ HT.



## ■ Part No.



## Heating armature groups

## Part No.

**Heating armature group HA-3BM-R**

with 3-way motor mixer and heat-insulating box.

Installation right (flow left)

HA group/pump

Speed control EEI  
    ≤

**DN 20 (¾")**

HA20-3BM-R/HSP 4	•	•	•	0.20	6043 993
HA20-3BM-R/HSP 6	•	•	•	0.20	6043 994
HA20-3BM-R/SPS-S 7	•	•	•	0.20	6049 541
HA20-3BM-R/SPS-S 8	•	•	•	0.20	6049 542

**DN 25 (1")**

HA25-3BM-R/HSP 6	•	•	•	0.20	6046 609
HA25-3BM-R/SPS-S 7	•	•	•	0.20	6049 545
HA25-3BM-R/SPS-S 8	•	•	•	0.20	6049 546
HA25-3BM-R/SPS-I 8 PM1	•	•	•	0.23	6046 612
HA25-3BM-R				without pump	6046 642

**Pumps for HA25-3BM-R**

see "Circulating pumps".

Pump installation dimensions 1½" x 180 mm

**DN 32 (1¼")**

HA32-3BM-R/SPS-S 7	•	•	•	0.20	6049 549
HA32-3BM-R/SPS-S 8	•	•	•	0.20	6049 550
HA32-3BM-R/SPS-I 8 PM1	•	•	•	0.23	6046 618
HA32-3BM-R/SPS-I 12 PM1	•	•	•	0.23	6046 619
HA32-3BM-R				without pump	6046 643

**Pumps for HA32-3BM-R**

see "Circulating pumps".

Pump installation dimensions 2" x 180 mm

**DN 40 (1½")**





HA40-3M-R/SPS-I 8 PM1	•	•	•	0.23	6040 903
HA40-3M-R/SPS-I 12 PM1	•	•	•	0.23	6040 904
HA40-3M-R				without pump	6014 867

**Pumps for HA40-3M**

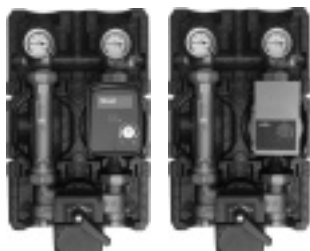
see "Circulating pumps".

Pump installation dimensions DN40/PN6 x 250 mm

**Speed control legend**

	Δp-v	Variable differential pressure
	ENF	Vent function 10 min.
	PWM1 or PM1	PWM control signal heating
	Δp-c	Constant differential pressure

## ■ Part No.


**Heating armature groups**
**Part No.**
**Heating armature group HA-3BM-L**

with 3-way motor mixer and heat-insulating box.

Installation left (flow right)

HA group/pump      Speed control      EEI  
**DN 20 (¾")**

HA20-3BM-L/HSP 4	•	•	0.20	6043 999
HA20-3BM-L/HSP 6	•	•	0.20	6044 000
HA20-3BM-L/SPS-S 7	•	•	0.20	6049 543
HA20-3BM-L/SPS-S 8	•	•	0.20	6049 544

**DN 25 (1")**

HA25-3BM-L/HSP 6	•	•	0.20	6046 621
HA25-3BM-L/SPS-S 7	•	•	0.20	6049 547
HA25-3BM-L/SPS-S 8	•	•	0.20	6049 548
HA25-3BM-L/SPS-I 8 PM1	•	•	0.23	6046 624
HA25-3BM-L		without pump		6046 644

**Pumps for HA25-3BM-L**

see "Circulating pumps".

Pump installation dimensions 1½" x 180 mm

**DN 32 (1¼")**

HA32-3BM-L/SPS-S 7	•	•	0.20	6049 551
HA32-3BM-L/SPS-S 8	•	•	0.20	6049 552
HA32-3BM-L/SPS-I 8 PM1	•	•	0.23	6046 630
HA32-3BM-L/SPS-I 12 PM1	•	•	0.23	6046 631
HA32-3BM-L		without pump		6046 645

**Pumps for HA32-3BM-L**

see "Circulating pumps".

Pump installation dimensions 2" x 180 mm

**Speed control legend**

	Δp-v	Variable differential pressure
	ENF	Vent function 10 min.
	PWM1 or PM1	PWM control signal heating
	Δp-c	Constant differential pressure

## ■ Part No.


**Heating armature groups**
**Part No.**
**Loading group LG-2**
**Heating armature group HA-2**

For the connection of a side calorifier or as heating circuit without mixer, with heat-insulating box. Installation right (flow left).

Charging/HA group/pump	Speed control	EEI
	   	≤

**DN 20 (¾")**

LG/HA20-2/HSP 4	•	•	0.20	6044 023
LG/HA20-2/HSP 6	•	•	0.20	6044 024
LG/HA20-2/SPS-S 7	•	•	0.20	6040 906
LG/HA20-2/SPS-S 8	•	•	0.20	6040 907

**DN 25 (1")**

LG/HA25-2/HSP 6	•	•	0.20	6046 633
LG/HA25-2/SPS-S 7	•	•	0.20	6049 553
LG/HA25-2/SPS-S 8	•	•	0.20	6049 554
LG/HA25-2/SPS-I 8 PM1	•	•	0.23	6046 636
LG/HA25-2		without pump		6046 646

**Pumps for LG/HA25-2**

see "Circulating pumps".

Pump installation dimensions 1½" x 180 mm

**DN 32 (1¼")**

LG/HA32-2/SPS-S 8	•	•	0.21	6049 555
LG/HA32-2/SPS-I 8 PM1	•	•	0.23	6046 641
LG/HA32-2		without pump		6046 647

**Pumps for LG/ HA32-2**

see "Circulating pumps".

Pump installation dimensions 2" x 180 mm


**Compact loading group LG-2**





With heat-insulating box for the direct installation on the CombiVal with 1"-nozzle, in the feed line or on the boiler.

Charging group/pump	Speed control	EEI
	   	≤

**DN 25 (1")**

LG 25-Compact/HSP 4	•	•	0.20	6044 029
LG 25-Compact/HSP 6	•	•	0.20	6044 030
LG 25-Compact/SPS-S 7	•	•	0.20	6049 556

**Speed control legend**

	Δp-v	Variable differential pressure
	ENF	Vent function 10 min.
	PWM1 or PM1	PWM control signal heating
	Δp-c	Constant differential pressure

## ■ Part No.

## Part No.

**Wall bracket**

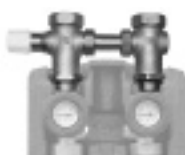
for the installation of a Hoval armature group on the wall.

Type	Dim. between centre lines mm	Connection		Wall dist. mm
		Top	Bottom	
DN 20	90	Rp 1"	R 1"	70,85,100
DN 25	125	Rp 1½"	R 1"	87-162
DN 32	125	Rp 2"	R 1½"	142,167

6019 209

6019 210

6025 295

**Bypass valve DN 20 (½")**

for the installation in a HA group DN 20  
Pressure range 0.1-0.6 bar

6013 684

**Bypass valve DN 25 (1")**

for installation on a HA group DN 25  
Pressure range 0.1 - 0.6 bar

6046 875

**Bypass valve DN 32 (1¼")**

for the installation in a HA group DN 32  
Setting range 0.6-1.5 bar  
Max. flow rate: 1.5 m³/h  
with self-sealing screw connection for  
mounting between flow and return  
ball valve

6014 849

**Actuator NR230-20B**

for three-way valve B3G460  
2-wire control  
Operating voltage 230 V/50 Hz  
Torque 10 Nm  
Actuation time 140 s  
manual/automatic positioning  
reversible scale for  
position indicator 0...10.  
Complete with installation material.

245 209

**Actuator NR230-20S**

for three-way valve B3G460  
with limit switch  
2-wire control  
Operating voltage 230 V/50 Hz  
Torque 10 Nm  
Actuation time 140 s  
manual/automatic positioning  
reversible scale for  
position indicator 0...10

245 212

## ■ Part No.



## Accessories

## Part No.

**Three-way tap B3G460, PN10 with internal thread connection, brass**

for manual operation or with actuator NR..., housing, cover, shaft and segment made of brass, maintenance-free O-ring seal. Left and right-hand installation possible. Operating pressure 10 bar. Max. operating temperature + 110 °C.

Type	DN	Screw connection	kvs	Operating pressure bar
B3G460	15	Rp ½"	2.5	10
B3G460	20	Rp ¾"	6.0	10
B3G460	25	Rp 1"	12.0	10
B3G460	32	Rp 1¼"	18.0	10

2039 167  
2039 168  
2039 169  
2039 170



Installation example



Installation example

**Safety set SG15-1"**

Suitable up to max. 50 kW complete with safety valve (3 bar) Pressure gauge and automatic air vent with cut off valve Connection: 1" internal thread

641 184

**Safety set SG20-1"**

Range of application to 100 kW complete with safety valve (3 bar) Pressure gauge and autom. aspirator with shut-off valve. Connection: DN20 1" internal thread

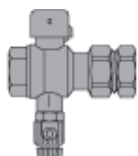
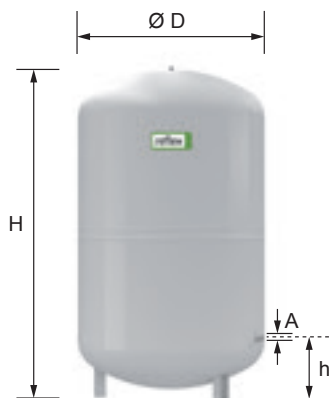
6014 390

**Reflex NG 35-100**

Vessel with feet. Permitted operating pressure 6 bar. Permitted operating temperature of vessel/diaphragm 120 °C/70 °C.

Reflex Type	Ø D mm	H mm	h mm	A
NG 35	354	460	130	R ¾"
NG 50	409	493	175	R ¾"
NG 80	480	565	166	R 1"
NG 100	480	670	166	R 1"

242 792  
2026 088  
2026 089  
2026 090



Chamber connection side

**Quick connection SU R 1" x 1"**

for diaphragm-type expansion chambers in closed heating and cooling water plants. With shut-off valve against unintended closing (check ball) and drain according to DIN 4751 Part 2 tested by TÜV Connection R 1" PN10/120 °C

242 772

**Vibration elements for boiler socket**

4 pieces of 100 mm each Height unstressed approx. 50 mm, width 80 mm If vibration elements for boiler socket are used then all connections (incl. flue gas pipe) must be connected flexibly with sound absorbing compensators.

6003 737



## ■ Part No.

## Part No.


**Oil filter**

with automatic air vent TOC Duo  
for operation in one pipe systems  
with return flow feed  
Incl. wall mounting set and  
shut-off valve  
Connections:  
tank side internal thread R 3/8",  
burner side external thread R 3/8"  
with internal cone for pipe connection  
Operating temperature: max. 40 °C  
Ambient temperature: max. 60 °C  
Nozzle output: max. 120 l/h Diesel oil  
Filter inset made of sinter plastic:  
Fineness 50-75 µm  
Usage of the filter: < 40 kW

2004 128


**Filter inset made of sinter plastic Siku**

Fineness: 50-75 µm  
Output range: up to 40 kW

2005 275


**Oil filter**

with automatic air vent TOC Duo  
for operation in one pipe systems  
with return flow feed  
Incl. wall mounting set and  
shut-off valve  
Connections:  
tank side internal thread R 3/8",  
burner side external thread R 3/8"  
with internal cone for pipe connection  
Operating temperature: max. 40 °C  
Ambient temperature: max. 60 °C  
Nozzle output: max. 120 l/h Diesel oil  
Filter inset made of sinter plastic:  
Fineness 100-150 µm  
Usage of the filter: < 40 kW

6012 935


**Filter inset made of sinter plastic Siku**

Fineness: 100-150 µm  
Output range: up to 40 kW

2005 276


**Clamping ring screw joint KVS/6  
for TOC Duo**

made of brass for oil pipe Ø 6 mm

560 724


**Clamping ring screw joint KVS/8  
for TOC Duo**

made of brass for oil pipe Ø 8 mm

560 725


**Clamping ring screw joint KVS/10  
for TOC Duo**

made of brass for oil pipe Ø 10 mm

2010 185


**Clamping ring screw joint KVS/12  
for TOC Duo**

made of brass  
for oil pipe Ø 12 mm

2010 186

## ■ Part No.


**Accessories bio heating oil mix B10**
**Part No.**
**Heat oil filter**

6047 955

with automatic air vent  
for use in single-line systems with  
return connection  
Switching valve for multiple filtering  
negative pressure gauge,  
support, fitting accessories and  
shut-off valve  
Connections:  
tank-side internal thread G 3/8"  
burner-side external thread G 3/8" with  
internal cone for hose connection  
Operating temperature: max. 60 °C  
Ambient temperature: max. 60 °C  
Nozzle power: max. 100 l/h  
Siku sieve Optimum  
Fineness grade 50 µm


**Filter inset made from cellulose**

2030 196

Fineness 5-20 µm  
Output range < 30 kW


**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

## Hoval UltraOil® (16-25)

Type		(16)	(20)	(25)
• Nominal output 80/60 °C	kW	15	19	24
• Nominal output 40/30 °C	kW	16	20	25
• Range of output 80/60 °C	kW	11 - 15	14 - 19	15 - 24
• Range of output 40/30 °C	kW	12 - 16	14 - 20	16 - 25
• Heat input	kW	11.3 - 15.5	13.8 - 19.5	15.4 - 24.5
• Dimensions		Space requirements		
• Boiler working temperature max.	°C	90	90	90
• Boiler working temperature min.	°C		no min. limit	
• Return flow temperature min.	°C		no min. limit	
• Flue gas temperature min. at the boiler	°C		no min. limit	
• Safety temperature limiter setting (water side)	°C	110	110	110
• Working / test pressure	bar	3.0 / 4.5	3.0 / 4.5	3.0 / 4.5
• Operating/test pressure		3.0/4.5	3.0/4.5	3.0/4.5
• Boiler efficiency at 80/60 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	98.3/92.7	98.5/92.9	98.2/92.6
• Boiler efficiency at 40/30 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	103.5/97.6	103.9/98.0	103.8/97.9
• Boiler efficiency at 30 % partial load (EN 303) (net calorific value NCV / gross calorific value GCV)	%	103.9/98.0	104.2/98.3	104.1/98.2
• Stand-by deficiency qB at 70 °C	Watt	220	230	240
• Energy efficiency class				
without control	ηs	%	92	92
with control	ηs	%	94	94
with control and room sensor	ηs	%	96	96
• Combustion gas resistance. 12.5 % CO <sub>2</sub> , 500 m above sea level (tolerance +/- 20 %)	mbar	0.30	0.29	0.29
• Flow resistance boiler <sup>1</sup>	z value	3.5	3.5	3.5
• Water resistance	mbar	6.6	10.6	16.6
	at 10 K	1.7	2.6	4.2
• Water flow volume	m³/h	1.38	1.74	2.18
	at 20 K	0.69	0.87	1.09
• Boiler water capacity	litres	66	63	68
• Boiler gas volume	m³	0.034	0.035	0.046
• Insulation thickness boiler body	mm	80	80	80
• Weight (incl. casing, burner)	kg	140	145	157
• Weight of transport	kg	134	139	151
• Electrical power consumption min./max.	Watt	55/125	62/147	69/175
• Standby	Watt	6	6	6
• Type of protection <sup>2</sup>	IP	20	20	20
• Acoustic power level incl. sound absorber hood				
Ambient air dependent				
- Heating noise (EN 15036 part 1)	dB(A)	61	62	66
Ambient air independent				
- Heating noise (EN 15036 part 1)	dB(A)	53	54	57
- Aspiration noise is radiated from the mouth (DIN 45835)	dB(A)	60	62	66
- Aspiration /exhaust noise - LAS - is radiated from the mouth (DIN 45835) <sup>3</sup>	dB(A)	70	73	77
Ambient air dependent and ambient air independent				
- Exhaust noise in the pipe (EN 15036 part 2) <sup>3</sup>	dB(A)	83	86	88
- Exhaust noise is radiated from the mouth (DIN 45635 part 47) <sup>3</sup>	dB(A)	69	71	75
• Condensate rate (heating oil EL) at 40/30 °C	l/h	1.07	1.31	1.65
• pH-value of the condensate	ca.	3.2	3.2	3.2
• Construction type (according to EN 15035)		C53, C63		
• Flue gas system				
Temperature class		T120	T120	T120
Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating oil EL	kg/h	24	31	38
Flue gas temperature at nominal output 80/60 °C	°C	75	75	75
Maximum supply pressure for supply air and flue gas line	Pa	50	50	50
Maximum draught/underpressure at flue gas outlet	Pa	-20	-20	-20
• Combustion chamber dimensions Ø inside x length	mm	294 x 403	294 x 403	294 x 543
• Combustion chamber volume	m³	0.027	0.027	0.037

<sup>1</sup> Flow resistance boiler in mbar = Volume flow (m³/h)² x z factor<sup>2</sup> Indication relates to protection against contact with dangerous components<sup>3</sup> UltraOil® (50): Sound absorber integrated

UltraOil® (16.20.25.35.65.80): Data without sound absorber. Reduction by installation of a sound absorber possible



## ■ Technical data

## Hoval UltraOil® (35-80)

Type		(35)	(50)	(65)	(80)
• Nominal output 80/60 °C	kW	33	48	62	77
• Nominal output 40/30 °C	kW	35	50	65	80
• Range of output 80/60 °C	kW	21 - 33	28 - 48	38 - 62	48 - 77
• Range of output 40/30 °C	kW	22 - 35	30 - 50	41 - 65	52 - 80
• Heat input	kW	20.9 - 33.8	28.4 - 48.4	39 - 63	50 - 78.0
• Dimensions		Space requirements			
• Boiler working temperature max.	°C	90	90	90	90
• Boiler working temperature min.	°C		no min. limit		
• Return flow temperature min.	°C		no min. limit		
• Flue gas temperature min. at the boiler	°C		no min. limit		
• Safety temperature limiter setting (water side)	°C	110	110	110	110
• Working / test pressure	bar	3.0 / 4.5	3.0 / 4.5	3.0 / 4.5	3.0 / 4.5
• Boiler efficiency at 80/60 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	98.5/92.9	98.7/93.1	98.5/92.9	98.4/92.6
• Boiler efficiency at 40/30 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	103.6/97.7	103.5/97.6	103.5/97.6	103.2/97.4
• Boiler efficiency at 30 % partial load (EN 303) (net calorific value NCV / gross calorific value GCV)	%	104.2/98.3	104.7/98.8	104.5/98.6	104.2/98.3
• Stand-by deficiency qB at 70 °C	Watt	250	290	480	480
• Energy efficiency class					
without control	ηs	%	92	94	94
with control	ηs	%	94	96	96
with control and room sensor	ηs	%	96	98	98
• Combustion gas resistance. 12.5 % CO <sub>2</sub> , 500 m above sea level (tolerance +/- 20 %)	mbar	0.30	0.75	0.18	0.26
• Flow resistance boiler <sup>1</sup>	z value	3.4	1.50	1.50	1.50
• Water resistance	mbar	30.6	27.7	46.9	71.4
	at 10 K				
	at 20 K				
• Water flow volume	m <sup>3</sup> /h	3.00	4.29	5.6	6.9
	at 10 K				
	at 20 K				
• Boiler water capacity	litres	65	115	135	135
• Boiler gas volume	m <sup>3</sup>	0.076	0.13	0.18	0.18
• Insulation thickness boiler body	mm	80	50	80	80
• Weight (incl. casing, burner)	kg	164	276	360	360
• Weight of transport	kg	158	261	317	317
• Electrical power consumption min./max.	Watt	80/215	99/253	109/262	123/262
• Standby	Watt	6	6	6	6
• Type of protection <sup>2</sup>	IP	20	20	20	20
• Acoustic power level incl. sound absorber hood					
Ambient air dependent					
- Heating noise (EN 15036 part 1)	dB(A)	63	71	69	65
Ambient air independent					
- Heating noise (EN 15036 part 1)	dB(A)	60	67	-	-
- Aspiration noise is radiated from the mouth (DIN 45835)	dB(A)	62	66	-	-
- Aspiration /exhaust noise - LAS - is radiated from the mouth (DIN 45835) <sup>3</sup>	dB(A)	79	-	-	-
Ambient air dependent and ambient air independent					
- Exhaust noise in the pipe (EN 15036 part 2) <sup>3</sup>	dB(A)	93	85	91	95
- Exhaust noise is radiated from the mouth (DIN 45635 part 47) <sup>3</sup>	dB(A)	76	68	75	76
• Condensate rate (heating oil EL) at 40/30 °C	l/h	2.28	3.52	4.0	5.0
• pH-value of the condensate	ca.	3.2	3.2	3.2	3.2
• Construction type (according to EN 15035)		C53, C63		-	-
• Flue gas system					
Temperature class		T120	T120	T120	T120
Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating oil EL	kg/h	53	76	102	126
Flue gas temperature at nominal output 80/60 °C	°C	75	75	73	75
Maximum supply pressure for supply air and flue gas line	Pa	40	50	50	50
Maximum draught/underpressure at flue gas outlet	Pa	-20	-20	-20	-20
• Combustion chamber dimensions Ø inside x length	mm	294 x 543	425 x 551	524 x 600	524 x 600
• Combustion chamber volume	m <sup>3</sup>	0.037	0.0781	0.129	0.129

<sup>1</sup> Flow resistance boiler in mbar = Volume flow (m<sup>3</sup>/h)<sup>2</sup> x z factor<sup>2</sup> Indication relates to protection against contact with dangerous components<sup>3</sup> UltraOil® (50): Sound absorber integrated

UltraOil® (16,20,25,35,65,80): Data without sound absorber. Reduction by installation of a sound absorber possible

## ■ Technical data

Oil burner	for UltraOil®	(16)	(20)	(25)	(35)	(50)	(65)	(80)
• Oil burner	Type	Blue flame burner	Blue flame burner	Blue flame burner	Blue flame burner	Blue flame burner	Blue flame burner	Blue flame burner
• Operating mode		1st/2nd stage	1st/2nd stage	1st/2nd stage	1st/2nd stage	1st/2nd stage	1st/2nd stage	1st/2nd stage
• Heat input range	kW	11.3 15.5	13.8 19.5	15.4 24.5	20.9 33.8	28.4 48.0	43 63	51 78
• Oil flow rate	kg/h	0.95 1.34	1.16 1.64	1.3 2.07	1.76 2.85	2.38 4.06	3.6 5.3	5.0 6.5

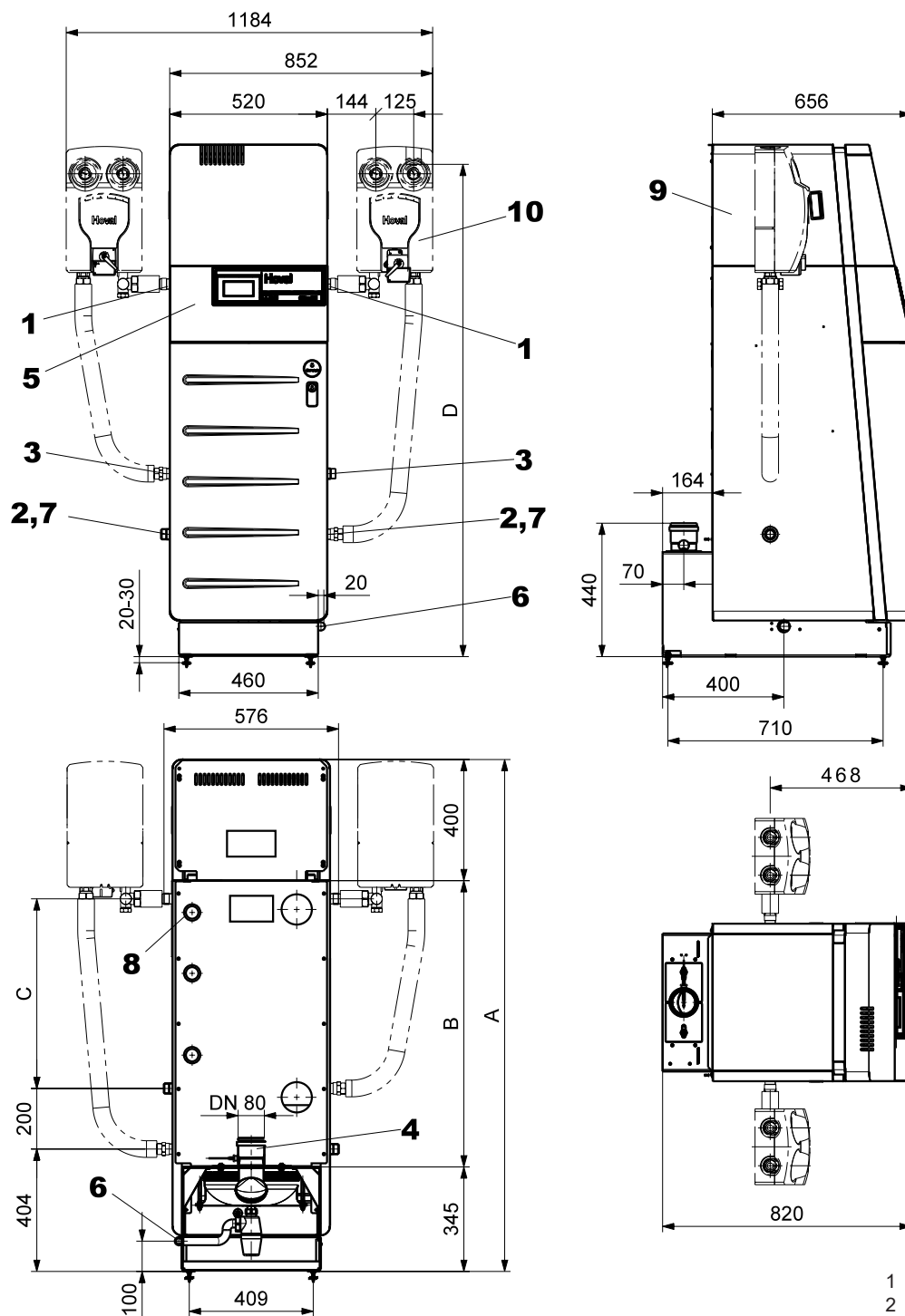
## Flue gas silencer

for Hoval UltraOil® type	Connection on both sides	Overall length mm	Outer diameter mm	Attenuation dB (A)	Resistance Pa	Output kW
(16-25)	E80	810	160	11	12	25
(35)	E100	810	180	13	10	35
(50)			integrated			
(65)	E150	910	200	8	20	65
(80)	E150	910	200	8	30	80

## ■ Dimensions

### Hoval UltraOil® (16-35)

(Dimensions in mm)



- 1 Flow heating/safety flow R 1"
- 2 Low-temperature return R 1"
- 3 High-temperature return R 1"
- 4 Flue gas outlet DN 80
- 5 Control panel
- 6 Condensate drain (left or right) incl. siphon (DN 25) and 2 m PVC passage tube Ø inside 19 x 4 mm
- 7 Drain
- 8 Electric cable entry point
- 9 Absorber hood
- 10 Heating armature group or loading group (option)

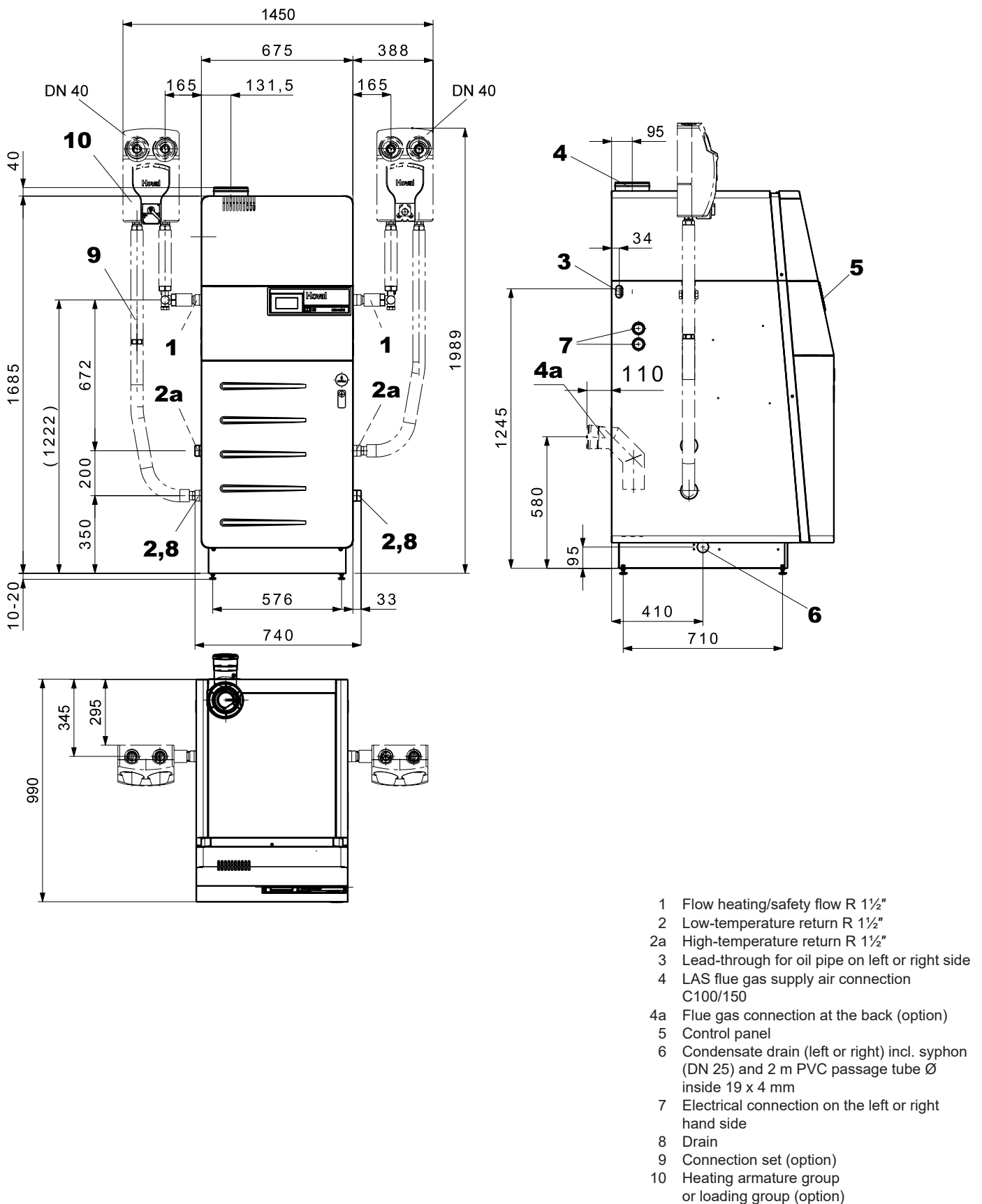
Type	A	B	C	D
UltraOil® (16,20)	1550	805	486	1485
UltraOil® (25,35)	1690	945	626	1625

**Space requirements**  
see separate page

### ■ Dimensions

## UltraOil® (50)

(Dimensions in mm)

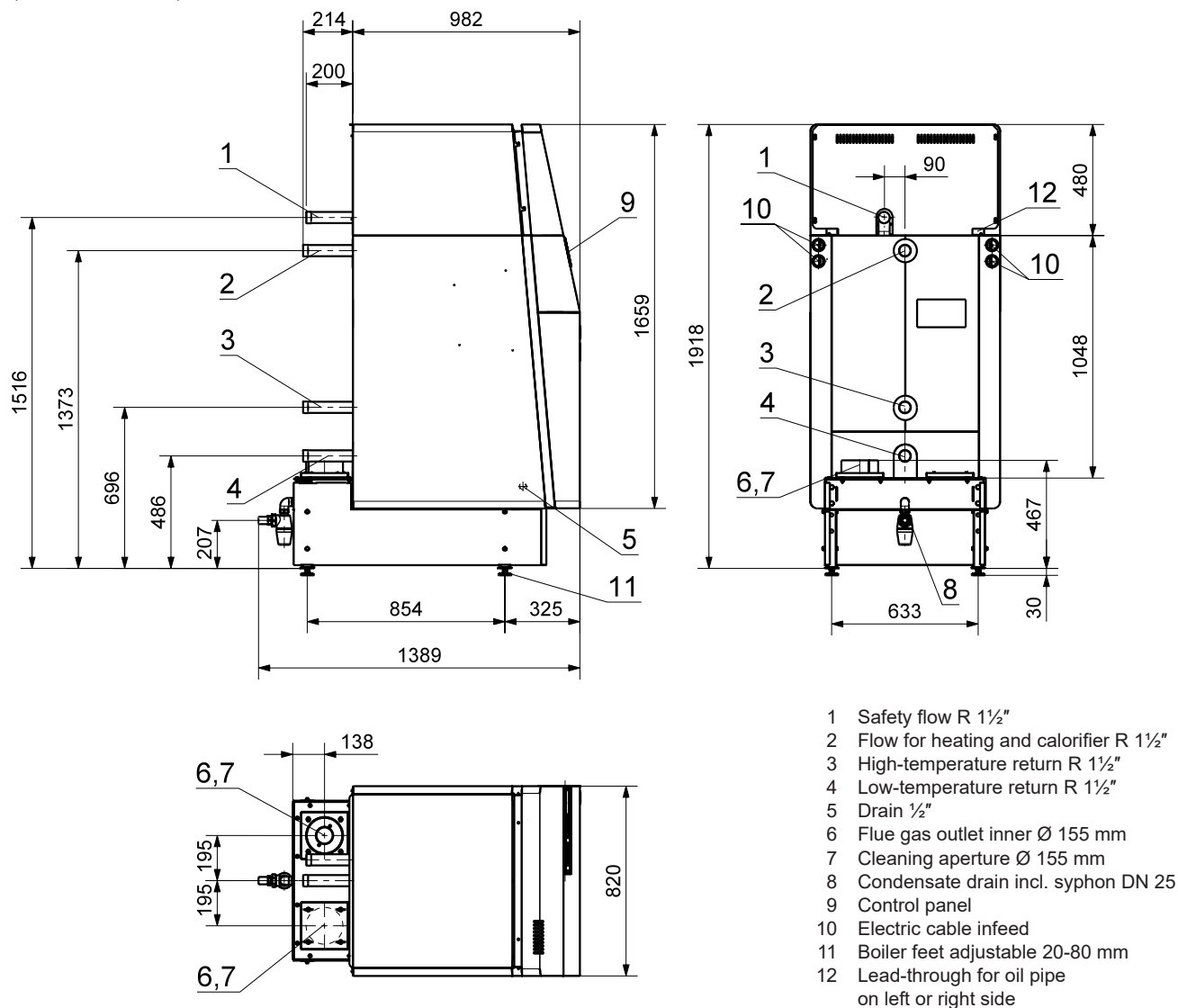


**Space requirements**  
see separate page

## ■ Dimensions

### UltraOil® (65,80)

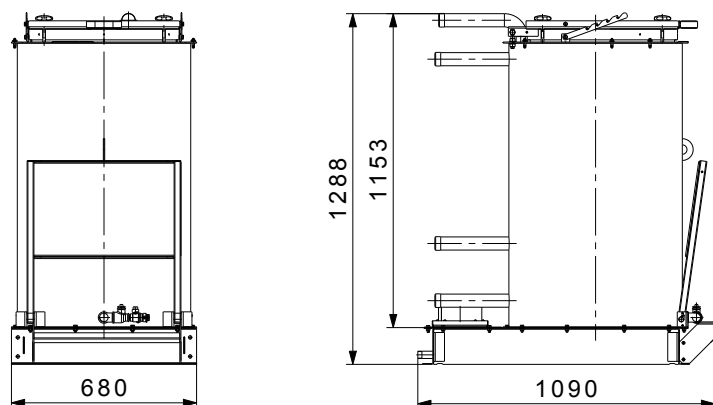
(Dimensions in mm)



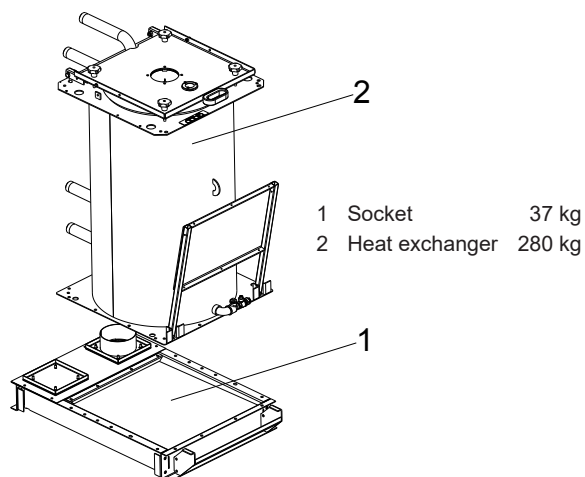
**Space requirements**  
see separate page

### Overall unit dimensions UltraOil® (65,80)

(Dimensions in mm)



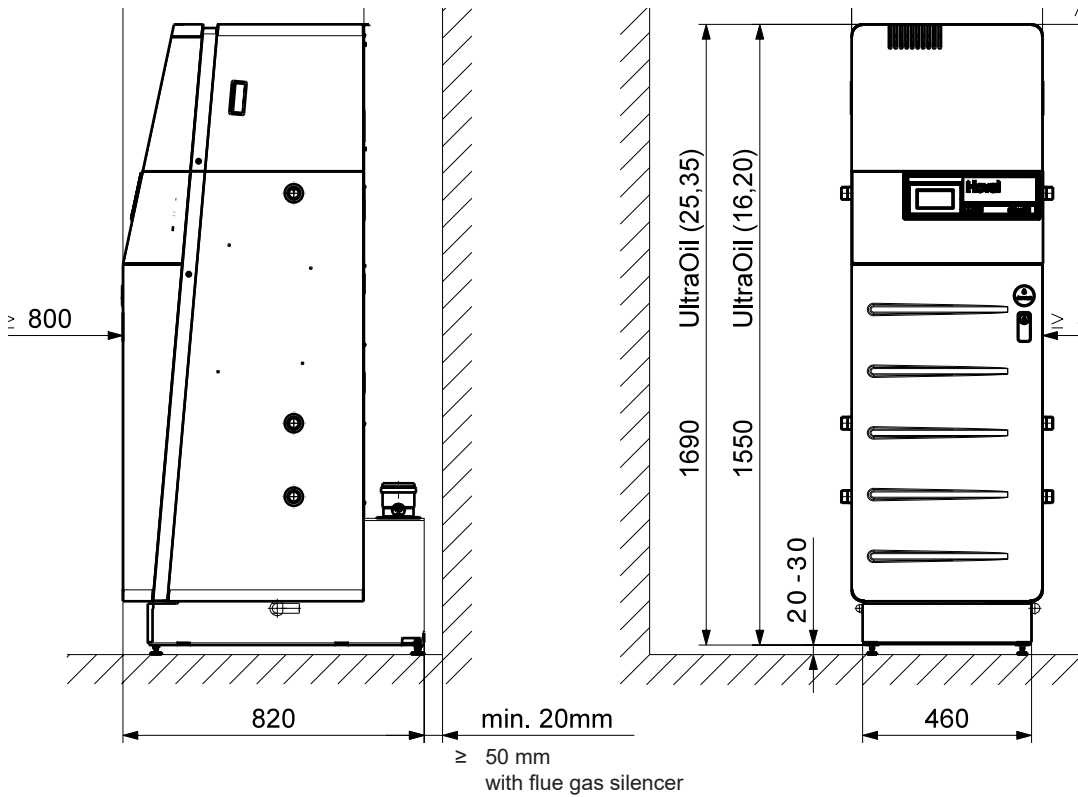
### Weights for transporting in UltraOil® (65,80) with partial load



## ■ Dimensions

### Space requirements

#### Hoval UltraOil® (16-35)



Boiler door incl. burner swivels upwards and to the left or to the front

**A** = minimum 150 mm \*

- Burner service position in the front - boiler cleaning from the right

**A** = optimum 300 mm \*

- Burner service position left - boiler cleaning from the front
- A minimum gap of 160 mm is required to the right of the boiler

\* without armature group

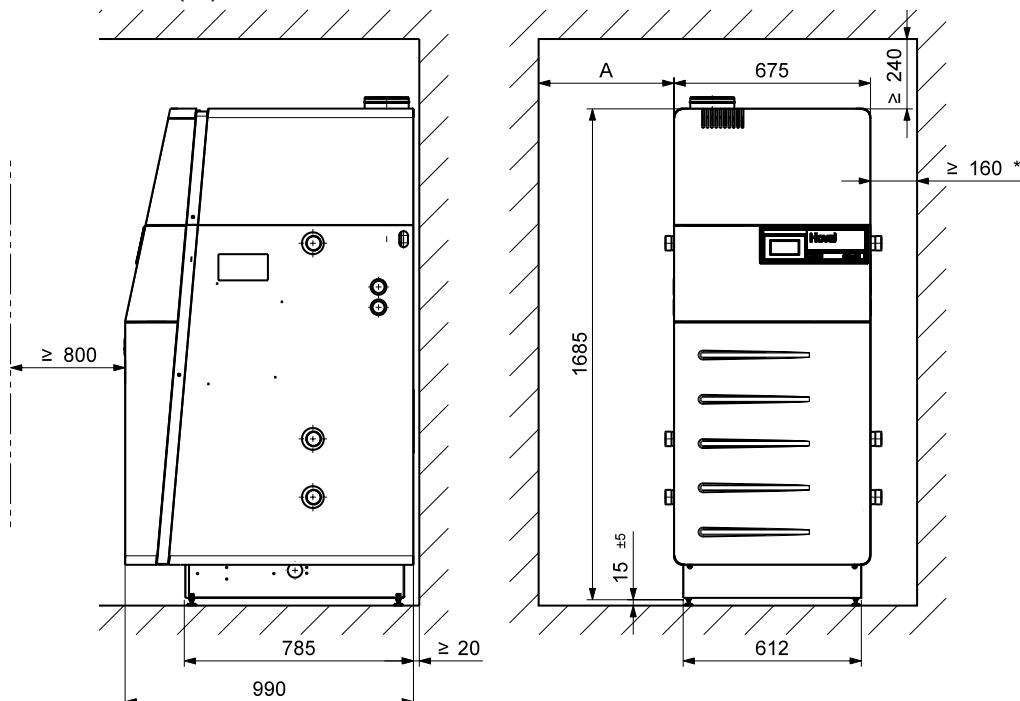
**500 mm** with armature group

- The cleaning aperture must be easily accessible.
- Boiler rear side must be accessible.

## ■ Dimensions

### Space requirements

#### Hoval UltraOil® (50)



Boiler door incl. burner swivels upwards and to the left or to the front

A = minimum 150 mm \*

- Burner service position in the front - boiler cleaning from the right

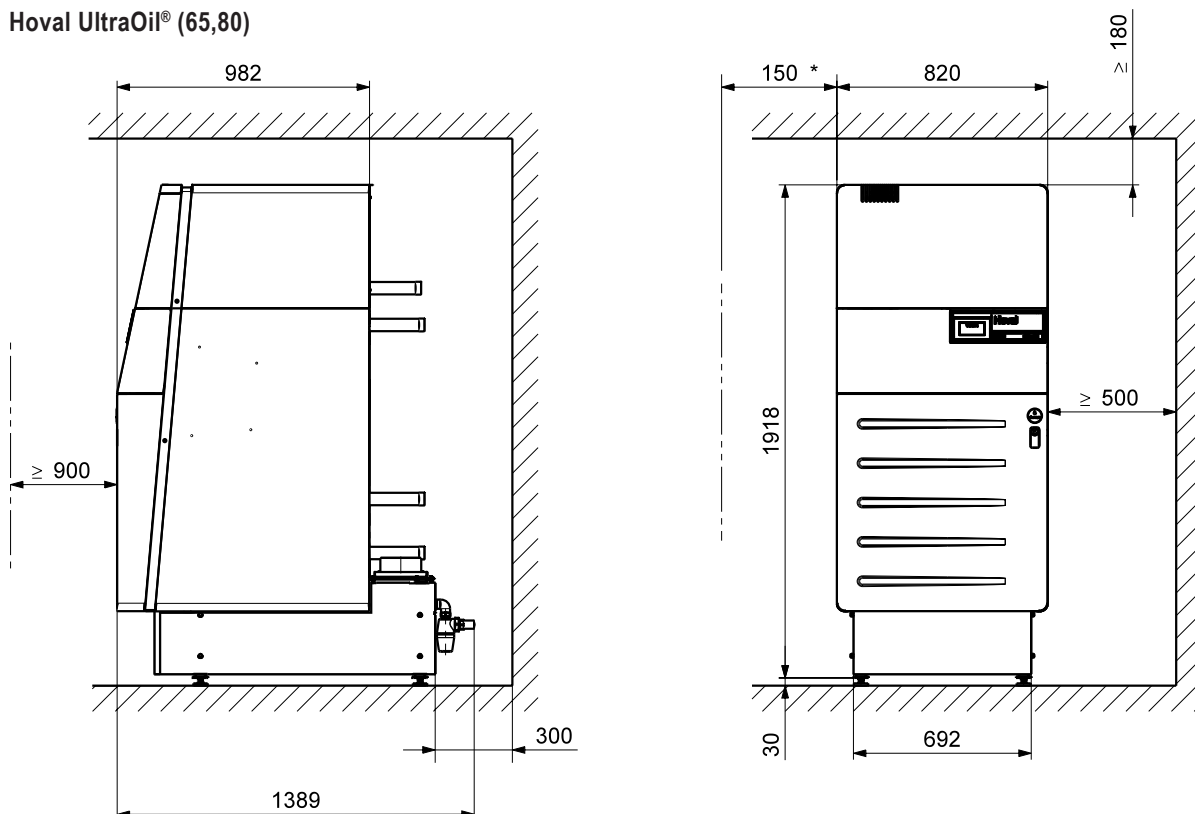
A = optimum 300 mm \*

- Burner service position left - boiler cleaning from the front

\* without armature group

**500 mm** with armature group

#### Hoval UltraOil® (65,80)



- It must be possible to swing open the hinged door of the boiler with the burner upward and rearward.

- Boiler rear side must be accessible.

\* The cleaning aperture must be easily accessible. As a result, a minimum distance of 500 mm must be maintained on the cleaning opening side.

## ■ Engineering

### Standards and guidelines

The following standard and guidelines must be respected:

- technical information and installation instructions from Hoval
- hydraulic and technical control regulations of Hoval
- local building law
- fire protection standard
- 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.**
- 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. underfloor 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.
- On existing systems (for example if the boiler is replaced), where the quality of the existing heating water meets the requirements of VDI 2035, re-filling of the system is not recommended. The requirements of VDI 2035 also apply to replacement water.
- New and if applicable existing installations need to be adequately cleaned and flushed before being filled. The boiler may only be filled after the heating system has been flushed!
- Parts of the boiler/calorifier which have contact with water are made of ferrous materials and stainless steel.
- On account of the danger of stress cracking corrosion in the stainless steel section of the boiler the chloride, nitrate and sulphate contents of the heating water must not exceed 50 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

- As a rule, untreated domestic water is best suited as filling and replacement water for a system with Hoval boilers. However, the quality of the untreated mains water must still meet the requirements of VDI 2035 or be demineralised and/or treated with inhibitors. The requirements of EN 14868 must be met in this context.
- To maintain high boiler efficiency and prevent overheating of the heating surfaces, the values in Table 1 should not be exceeded, taking into consideration the boiler output (smallest individual boiler in multi-boiler plants) and the water content.
- The total quantity of filling and replacement water added to the boiler over its service life must not be higher than three times the system water content.

#### Frost protection agent

The planning sheet "Use of antifreeze" is available from your Hoval contact person.

#### Combustion air

The combustion air supply must be guaranteed. Ensure that the air intake can not be closed or blocked. The connection for direct combustion air supply must be used for direct combustion air supply to the boiler (LAS system). It is very important to ensure that the combustion air is free from halogen compounds. These are present, for example, in spray cans, varnishes, glues, solvents and cleansing agents.

#### Room air-independent operation with separate combustion air duct to the boiler:

- 0.8 cm<sup>2</sup> per 1 kW boiler capacity. The pressure loss in the combustion air duct must be taken into account when sizing the flue gas system.
- In the UltraOil®, ventilation of the installation room must be guaranteed for operation independent from the room air.

#### Ambient air dependent operation:

- Minimum free cross-section for the air opening can be assumed as follows by way of simplification. Nominal heat output is the determining factor!
- A minimum free cross-section of once 150 cm<sup>2</sup> or twice 75 cm<sup>2</sup> and an additional 2 cm<sup>2</sup> for each kW boiler capacity in excess of 50 kW is required for the air opening into the outside air.

#### Oil burner mounting

- The standard burner plug connection must be positioned in the opposite direction to the swivelling direction of the boiler door.
- The space between the combustion pipe and the boiler door must be filled with the insulation material supplied.

#### Electric connection of the burner

- Mains connection 1 x 230 V, 50 Hz, 10 A
- The burner must be connected to the standard plug connection of the boiler.
- The burner cable must be shortened so that the plug-in connection has to be parted to swing out the burner.

#### Sound absorption

Sound absorption is possible through the following steps:

- Make boiler room walls, ceiling and floor as thick as possible, install a silencer in the intake air opening, provide carriers and brackets for the pipes with noise insulation.
- If there are living areas above or below the boiler room, install rubber vibration dampers under the base rails of the boiler.
- Connect circulating pumps to the piping network using expansion joints.
- To dampen the flame noise in the chimney, silencers can be installed in the connection tube (possibly leave space for later installation).

**Table 1:** Maximum filling quantity without/with demineralisation

	Total hardness of the 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
<b>Size of single boiler</b>	<b>maximum filling quantity without demineralisation</b>							
up to 50 kW	NO REQUIREMENT							20 l/kW
50 to 200 kW		50 l/kW	20 l/kW	20 l/kW	always demineralise			

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

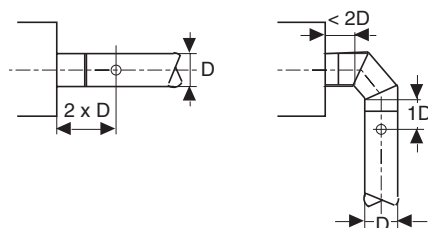
<sup>2</sup> If the conductance in µS/cm exceeds the tabular value an analysis of the water is necessary



## ■ Engineering

**Flue gas system**

- The flue gas system must be made by an examined and certified flue gas line.
- The flue gas line must be certified gas-tight, humidity-insensitively, corrosion and acid-proof as well as for flue gas temperatures up to 120 °C.
- The flue gas system must be suitable for the operation with over-pressure.
- The flue gas lines must be secured against unwanted loosening of the plug connections.
- The flue gas line is to be laid with upward gradient, so that the resulting condensate of the flue gas system flows back into the boiler so that before deriving into drains it can be neutralised.
- When using flue gas lines made from plastic, a flue gas safety temperature limiter is prescribed.  
Built in the UltraOil® (16-80) already.
- In the connection pipe has to be integrated a closable flue gas measurement nozzle with circular inner diameter of 10-21 mm. The socket has to be led over the thermal insulation.

**Dimensioning flue gas line****Sound power**

The sound power level is independent of local and spatial influences.

The sound **pressure** level depends on installation conditions and can, for example, be 10 to 15 dB(A) lower than the sound **power** level at a distance of 1 m.

**Recommendation:**

If the air inlet at the facade is near a noise sensitive place (window of bedroom, terrace etc.), we recommend to use a sound absorber at the direct combustion air inlet.

**Condensate drain**

A boiler base is integrated in the UltraOil® for condensate collection and drainage.

- in accordance with local regulations.
- The condensate discharge must be carried out without backpressure and via siphon (already installed in the UltraOil®).
- The boiler can additionally be placed on a special boiler base.
- This achieves a condensate discharge height of 280 mm.
- Suitable materials for condensate drain:
  - Stoneware pipes
  - Pipes made from PVC
  - Pipes made from polyethylene (PE)
  - Pipes made from ABS or ASA
- The commercial system operator must inform the sewer operator if the exhaust gas condensate is discharged into the sewer system.

**Installation instructions**

Please observe the installation instructions supplied with every boiler.

**Heating system renovation notice**

If an existing oil heating installation is replaced by Hoval UltraOil®, the following instructions regarding the oil tank and its refilling must be observed:

- The Hoval UltraOil® is only allowed to be operated with heating oil EL low-sulphur with sulphur content < 50 ppm (< 0.005 %).
- It is recommended for the oil tank to be cleaned before refilling it.
- A residual amount of heating oil EL in the oil tank may be mixed with heating oil EL low-sulphur, provided that the residual amount does not exceed the following values of the total content.
  - Residual quantity of heating oil EL (sulphur content: 2000 ppm or 0.2 %) max. 3 % of tank volume
  - Residual quantity of heating oil EL (sulphur content: 1000 ppm or 0.1 %) max. 5 % of tank volume
  - Residual quantity of ecological heating oil EL (sulphur content: 500 ppm or 0.05 %) max. 10 % of tank volume
- In order to reach the permissible mixture ratio with heating oil EL low-sulphur taking account of the residual amount of heating oil in the oil tank, a 100 % tank filling is necessary.

**Special project planning notices for heating systems with biological heating oil mix B10**

Biological heating oil mix B10 is composed of heating oil EL low-sulphur with the addition of max. 10 % FAME.

**Oil filters**

Only oil filters suitable for biological heating oil are allowed to be used. Filter elements made from copper, brass or plastics not compatible with biological heating oil are not suitable. See accessories in the price section for suitable oil filters.

**Maintenance**

It is essential for the filter to be renewed after the first heating season.

## ■ Engineering

### Oil line installation

- The Hoval UltraOil® is only allowed to be connected to 1-section oil lines. Max. suction height without intermediate pump 3.5 m, maximum line length 30 m.
- The lines must be positioned so that the boiler door can still be fully opened.
- A shut-off element must be installed before the flexible oil lines at the end of the rigid oil line (already installed in the "TOC Duo").
- An automatic heating oil fan is recommended in front of the burner to ensure trouble-free operation.

#### • One pipe heating oil filter

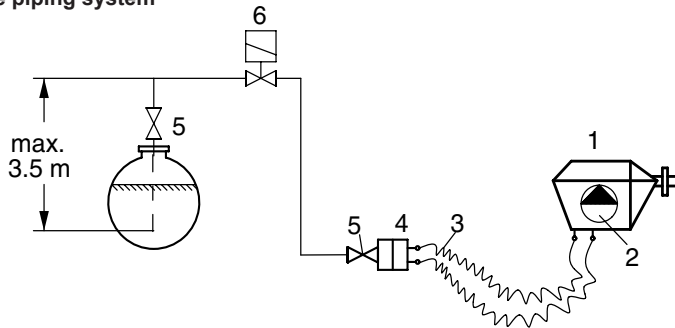
In front of the burner, a one pipe heating oil filter with return flow supply and an insert for the UltraOil® (16-80) with a mesh width of 50-75 µm (e.g.: sintered plastic) must be used at the level of the oil pump.

#### • Automatic heating oil deaerator with integrated filter

- When connecting an automatic heating oil deaerator with filter in front of the burner, the deaerator must be fitted approx. 100 mm above the oil pump. The use of these filters should comply with the specifications as for one pipe heating oil filters.
- The highest point of the piping should be max. 3.5 m above the tank suction pipe.
- Product pipelines must be installed in such a way that no liquid can emerge independently (rise) from the tank.

- If the highest point of the oil level in the oil tank is higher than the lowest point in the removal line, it is necessary to install a solenoid valve at the highest point in the oil line as close as possible to the oil tank.
- In the case of plants with several oil-fired boilers, the oil supply to the boilers must be ensured in all operating states, e.g. provide an independent connection line to the oil tank for each boiler.

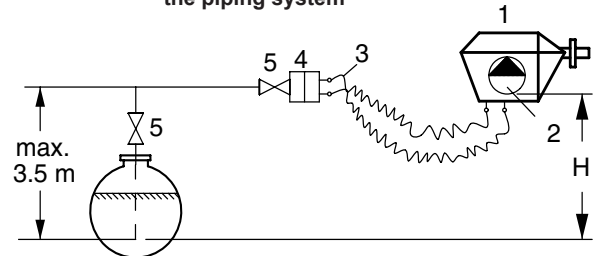
### Max. oil level higher than the lowest point of the piping system



- Hoval-burner for 1-line connection with return flow
- Oil pump
- Oil hoses on the burner

- Fine filter with return feed. Filter element with cellulose, fineness 20 µm for heating oil EL low-sulphur with up to 10 % FAME, output 10 to 30 kW  
Sintered plastic insert 25-75 µm for heating oil EL low-sulphur 10 to 40 kW.  
> 40 kW with nickel strainer insert 100-150 µm..

### Max. oil level lower than the lowest point of the piping system



- Shut-off valve
  - Solenoid valve
- H = Suction height [m]

### One pipe oil lines

Line diameter Ø inside 4 mm, max. permissible line length in m

Suction height H in m	UltraOil®						
	(16)	(20)	(25)	(35)	(50)	(65)	(80)
<b>0</b>	30	30	30	30	20	14	12
<b>1</b>	30	30	30	23	15	11	9
<b>2</b>	30	29	23	16	10	8	6
<b>3</b>	20	16	13	9	6	-	-

This line sizing table provides indicative values for:

Low-sulphur heating oil EL or low-sulphur mixed heating oil EL with max. 10 % FAME (bio heating oil) content, oil temperature > 10 °C (indoor tank) up to 700 m above sea level, 1 filter, 1 valve, 6 elbows 90° (40 mbar).

For the project planning and sizing of suction installations for heating oil extra light and pipes made of copper or plastic pipes, please refer to the relevant literature; this also contains conversion calculations for oil temperature, viscosity, additional resistance values, influence of altitude above 700 m above sea level, etc.

### Pipe systems that are oversized can lead to operational disturbance!

For this reason, in case of boiler exchange the pipe dimensioning table must be observed!

### Expansion tank/expansion

- Ideally, the pressure expansion tank should be connected to the heating system as described in our example applications, with a removable or sealable actuation device. This means that it is not necessary to drain the entire system in order to carry out work.

### Safety valve

- A safety valve and an automatic air vent must be installed in the safety flow

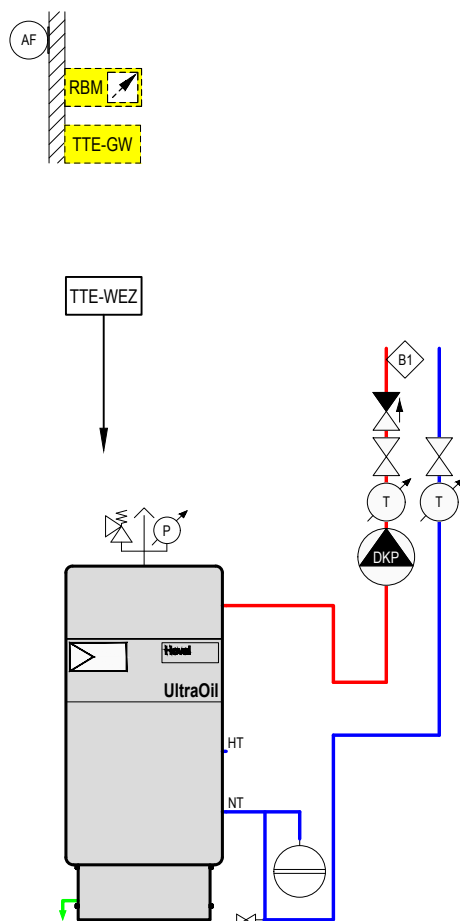
### ■ Examples

## UltraOil® (16-80)

Oil condensing boiler with

- 1 direct circuit

**Hydraulic schematic BEBE005**



**Notice:**

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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 be safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

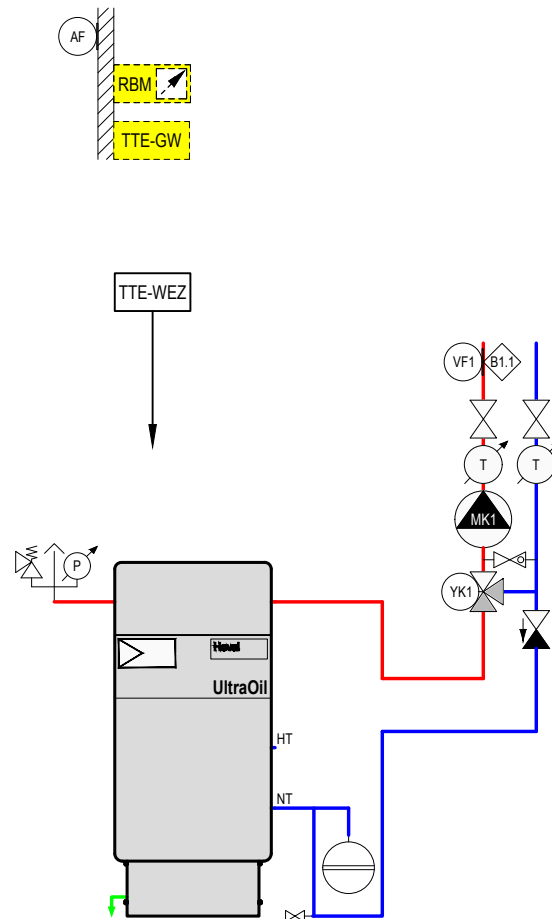
TTE-WEZ	TopTronic® E basic module heat generator (installed)
B1	Flow temperature guard (if required)
AF	Outdoor sensor
DKP	Pump for heating circuit without mixer
Option	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

## ■ Examples

**UltraOil® (16-80)**

Oil condensing boiler with

- 1 mixer circuit

**Hydraulic schematic BEBE010****Notice:**

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor

**Option**

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

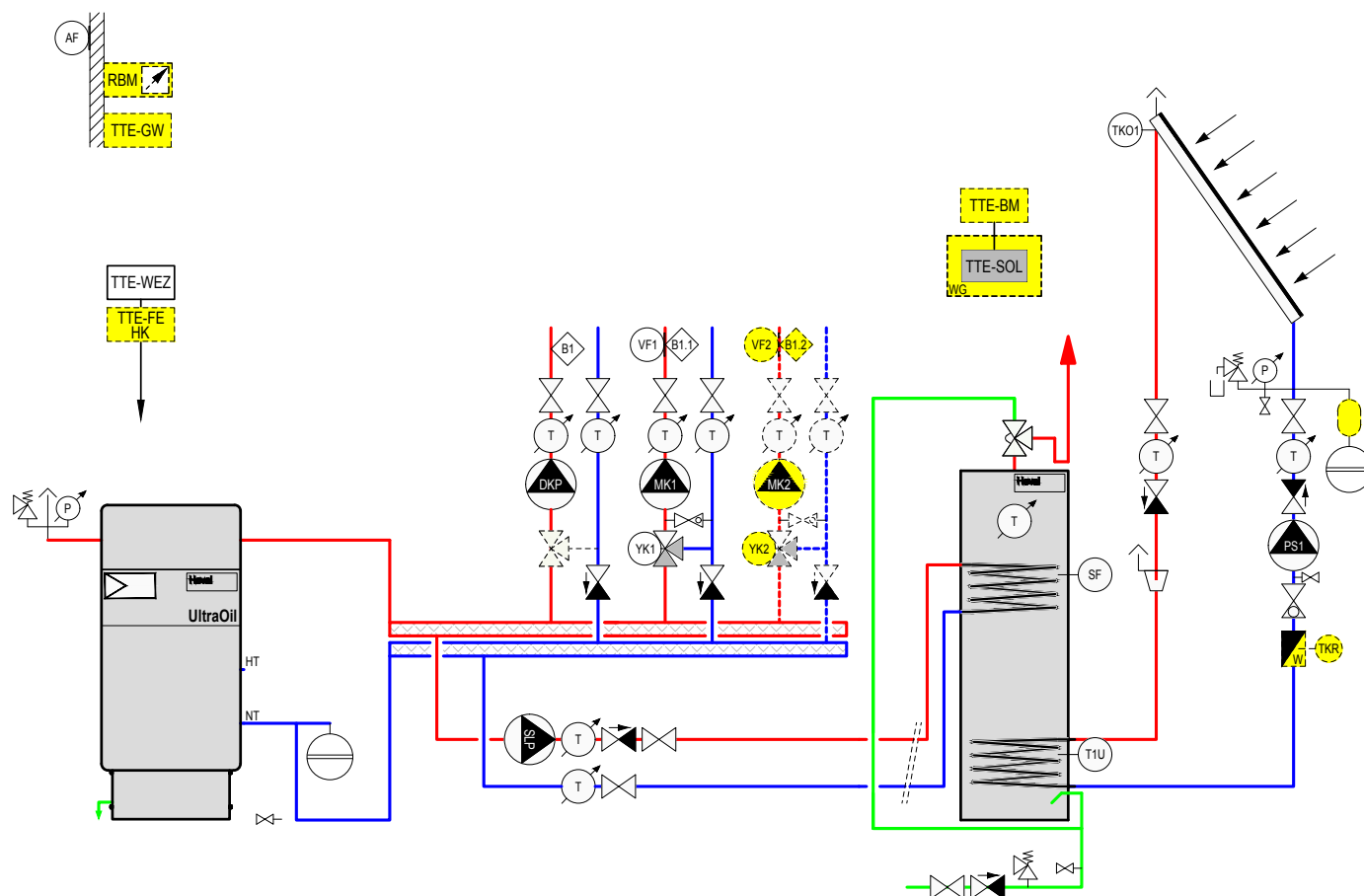
## Examples

### UltraOil® (16-80)

Oil condensing boiler with

- calorifier
- 1 direct circuit and 1-... mixer circuit(s)
- solar collectors

Hydraulic schematic BEBE030/BAAE020



TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1	Flow temperature guard (if required)
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
TKR	Return sensor
TKO1	Collector sensor
T1U	Storage tank sensor
PS1	Solar circuit pump
SLP	Calorifier charging pump

#### Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-SOL	TopTronic® E solar module
WG	Wall casing

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

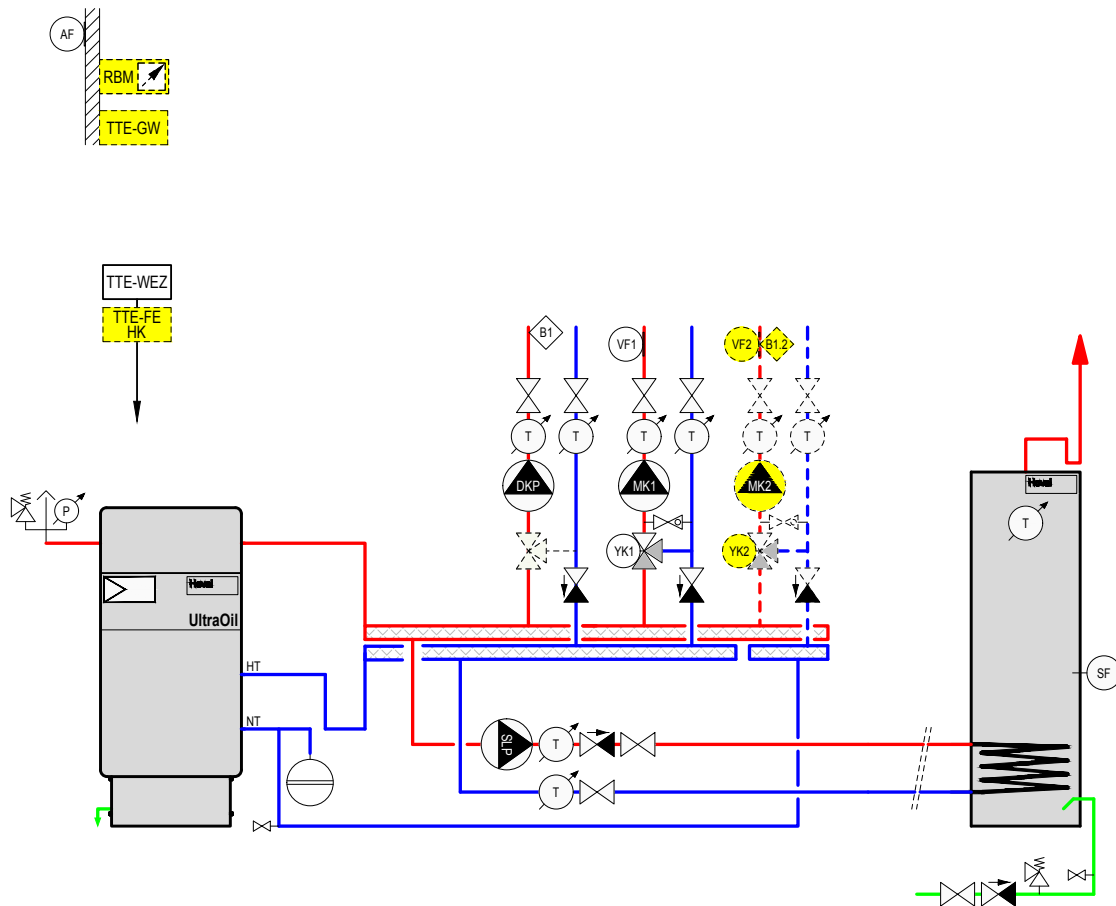
## Examples

### UltraOil® (16-80)

Oil condensing boiler with

- calorifier
- 1 direct circuit and 1-... mixer circuit(s)

Hydraulic schematic BEBE050



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1	Flow temperature guard (if required)
DKP	Pump for heating circuit without mixer
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SLP	Calorifier charging pump

#### Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2



## ■ Description

### Hoval UltraOil® (110-300)

#### Oil-fired condensing boiler for ecological heating oil EL low-sulphur

##### Boiler

- Oil condensing boiler according to EN 303 part 1 and 2 and EN 15034
- For burning **ecological heating oil EL low-sulphur (sulphur content < 50 ppm) acc. to standard SN 181160-2.**
- Boiler made of steel with condensation design
- Components that come into contact with flue gas and condensate are made from high-alloyed stainless steel
- Maximum flue gas condensation by heating surfaces made of aluFer® composite pipe; Flue gas side: aluminium Water side: stainless steel
- No lower delimitation of the boiler water temperature and the boiler return temperature
- No minimal water circulation necessary
- Boiler door swivelling to the front right, swivelling to the left by conversion on the system
- Insulation at the boiler body: 80 mm mineral wool mat and glass fabric
- Casing made of steel sheet, red powder coated, delivered separately packed
- Flue outlet backwards
- Heating connections at top incl. counter-flange, bolts and seals for:
  - flow
  - return - high temperature
  - return - low temperature
- Sound absorbing/thermal insulation hood
- Water pressure sensor:
  - Fulfills the function of a minimum and maximum pressure limiter
  - Replacement for the water shortage protection
- Flue gas temperature monitoring (installation on site)
- Cleaning set comprising scraper and implement holder (included in the scope of delivery)
- TopTronic® E controller installed

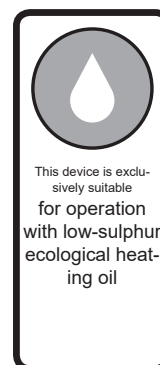
##### TopTronic® E controller

##### Control panel

- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

##### TopTronic® E control module

- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)



##### Model range

UltraOil® type	Output 40/30 °C kW
(110)	83-110
(130)	104-130
(160)	119-160
(200)	155-200
(250)	189-250
(300)	227-300

##### TopTronic® E basic module heat generator (TTE-WEZ)

- Control functions integrated for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set

##### Options for TopTronic® E controller

- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting or
  - module expansion universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

##### Number of modules that can be additionally installed in the heat generator:

- 1 module expansion and 1 controller module **or**
- 2 controller modules

The supplementary plug set must be ordered in order to use expanded controller functions.

##### Permissions boilers

UltraOil® (110-300) CE product ID No.	CE 0036 0379/06
--	-----------------

##### Oil automatic function device OFA

- Control function integrated for
  - flue gas sensor for safety shut-off
  - 0-10V output for connecting a modulating main pump (incl. delta T-control with low consumption)
  - Standard plug connection for 2-stage burner 1x 230 V
  - Variable input for plant-specific functions (heat generator block, return sensor, info sensor etc.)
  - Variable output for plant-specific functions (thermostat function, operating message, etc.)

##### Further information about the TopTronic® E see "Controls"

##### Oil burner to UltraOil® (110-300)

- Fully automatic 2-stage pressure atomizer burner (blue burner)
- Air termination flap
- Fan follow-on time
- Completely wired up with 7+4-pin standard plug connection 1 x 230 V
- The oil burner is checked at the factory according to factory setting ≤ 1000 m above sea level. Higher altitudes result in a power reduction of 1.2 % per 100 m



### ■ Description

#### *Optional*

- Free-standing calorifier, see Calorifiers
- Flue gas systems
- Installation transport set for conditions of restricted access

#### *Delivery*

- Boiler, casing with thermal insulation, oil burner and TopTronic® E controller are separately packed and delivered.

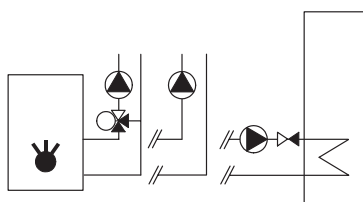
#### *On site*

- Installation of thermal insulation, casing, control panel and burner

#### **Heating armature groups and wall distributors**

see "Various system components"

■ Part No.



**Oil condensing boiler Hoval UltraOil®**

Part No.

Oil condensing boiler with built-in Hoval TopTronic® E control

Control functions integrated for

- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- bivalent and cascade management
- Can be optionally expanded 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)

Incl. sensor, flue gas temperature monitoring, 2-stage oil burner and sound absorbing hood.

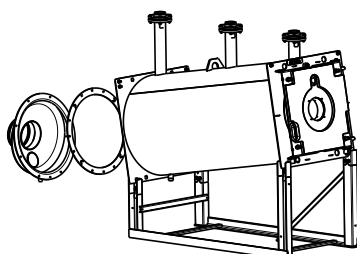
*Delivery*

Boiler, casing with thermal insulation, front casing panel, oil burner and TopTronic® E control are delivered separately packed.

For burning **ecological heating oil EL low-sulphur (sulphur content < 50 ppm) acc. to standard SN 181160-2.**

UltraOil® type	Output 40/30 °C kW	
(110)	83-110	7014 811
(130)	104-130	7014 812
(160)	119-160	7014 813
(200)	155-200	7014 814
(250)	189-250	7014 816
(300)	227-300	7014 817

**Oil condensing boiler  
Hoval UltraOil®  
(delivery in separate parts)**

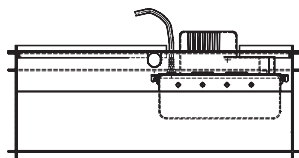


Oil condensing boiler with built-in Hoval TopTronic® E control for **delivery in separate parts.**

The flue gas collector is loosely screwed onto the boiler and can be removed on site to facilitate installation. Assembled on-site by the installer.

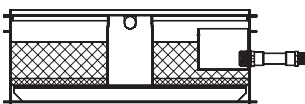
UltraOil® type	Output 40/30 °C kW	
(110)	83-110	7014 872
(130)	104-130	7014 873
(160)	119-160	7014 874
(200)	155-200	7014 875
(250)	189-250	7014 876
(300)	227-300	7014 877

## ■ Part No.


**Condensate line**
**Part No.**
**Condensate box KB 22**

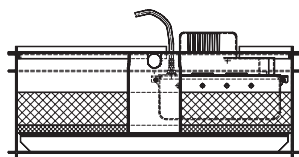
6033 767

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)

For condensate drainage into higher  
situated drain pipe with delivery pump.  
Max. delivery height 3.5 m, from  
1200 kW two delivery pumps necessary.  
Delivery rate 120 l/h  
incl. liquid level switch, silicone hose  
9/13 mm, 4 m long, electrical cable  
1.5 m with plug  
Use one box per boiler.

**Neutralisation box KB 23**

6001 917

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)

Condensate drainage into lower situated  
drain pipe without condensate  
delivery pump  
with neutralisation  
12 kg neutralisation granulate  
Placed under the boiler  
Use one box per boiler.

**Neutralisation box KB 24**

6033 764

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)

for transporting condensation water into  
a higher lying drainage duct,  
max. delivery height 3.5 m, from  
1200 kW two delivery pumps necessary.  
Delivery rate 120 l/h  
incl. liquid level switch, silicone hose  
9/13 mm, 4 m long, electrical cable  
1.5 m with plug  
12 kg granulate  
Use one box per boiler.

**Neutralisation granulate**

2028 906

for neutralisation box  
Refill set volume 3 kg  
Life time of one filling:  
approx. 2-4 years; depending on amount  
of condensate

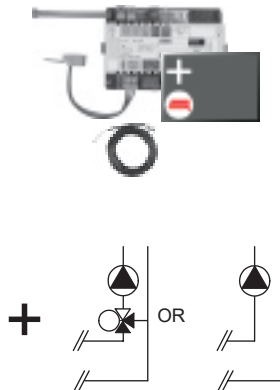
**Accessories**

**Boiler connection sleeve**

2053 217

for UltraOil® (250,300)  
for flue gas lines Ø 250 mm  
of stainless steel  
with EPDM damping insert.  
Reduces the transmission of  
solid-borne noise.

## ■ Part No.


**TopTronic® E module expansions**  
for TopTronic® E basic module heat generator

**Part No.**
**TopTronic® E module expansion heating circuit TTE-FE HK**

6034 576

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

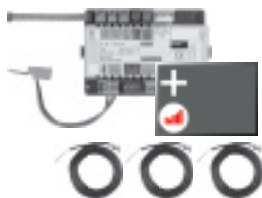
- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories  
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Notice**

The supplementary plug set may have to be ordered to implement functions differing from the standard!


**TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ**

6037 062

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

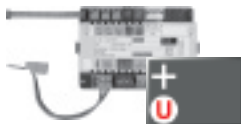
- 1 heating/cooling circuit w/o mixer or
  - 1 heating/cooling circuit with mixer
- in each case incl. energy balancing

incl. fitting accessories  
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Notice**

Suitable flow rate sensors (pulse sensors) must be provided on site.


**TopTronic® E module expansion Universal TTE-FE UNI**

6034 575

Expansion to the inputs and outputs of a controller module (basic module heat generator, heating circuit/domestic hot water module, solar module, buffer module) for implementing various functions

incl. fitting accessories

Can be installed in:  
Boiler control, wall housing, control panel

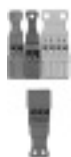
**Further information**

see "Controls" - "Hoval TopTronic® E module expansions" chapter

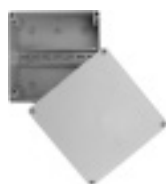
**Notice**

Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

## ■ Part No.


**HovalConnect available from summer 2019**

Up to that point, TopTronic® E online is delivered.


**Accessories for TopTronic® E**
**Part No.**
**Supplementary plug set**

for basic module heat generator (TTE-WEZ)  
for controller modules and module expansion TTE-FE  
HK

6034 499  
6034 503

**TopTronic® E controller modules**

TTE-HK/WW TopTronic® E heating circuit/  
hot water module  
TTE-SOL TopTronic® E solar module  
TTE-PS TopTronic® E buffer module  
TTE-MWA TopTronic® E measuring module

6034 571  
6037 058  
6037 057  
6034 574

**TopTronic® E room control modules**

TTE-RBM TopTronic® E room control modules  
easy white  
comfort white  
comfort black

6037 071  
6037 069  
6037 070

**Enhanced language package TopTronic® E**

one SD card required per control module  
Consisting of the following languages:  
HU, CS, SL, RO, PL, TR, ES, HR,  
SR, JA, DA

6039 253

**HovalConnect**

HovalConnect domestic starter LAN  
HovalConnect domestic starter WLAN  
HovalConnect commercial starter LAN  
HovalConnect commercial starter WLAN  
SMS remote control unit  
System component SMS remote control unit

6049 496  
6049 498  
6049 495  
6049 497  
6018 867  
6022 797

**TopTronic® E interface modules**

GLT module 0-10 V  
HovalConnect domestic starter Modbus  
HovalConnect domestic starter KNX  
HovalConnect commercial starter Modbus  
HovalConnect commercial starter KNX

6034 578  
6049 501  
6049 593  
6049 500  
6049 502

**TopTronic® E wall casing**

WG-190 Wall casing small  
WG-360 Wall casing medium  
WG-360 BM Wall casing medium with  
control module cut-out  
WG-510 Wall casing large  
WG-510 BM Wall casing large with  
control module cut-out

6035 563  
6035 564  
6035 565  
6035 566  
6038 533

**TopTronic® E sensors**

AF/2P/K Outdoor sensor  
TF/2P/5/6T Immersion sensor, L = 5.0 m  
ALF/2P/4/T Contact sensor, L = 4.0 m  
TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m

2055 889  
2055 888  
2056 775  
2056 776

**System housing**

System housing 182 mm  
System housing 254 mm

6038 551  
6038 552

Bivalent switch

2061 826

**Further information**  
see "Controls"

■ Part No.



Part No.

**Flow temperature guard**  
for underfloor heating system (1 guard per heating circuit) 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* 242 902  
Thermostat with strap, without cable and plug

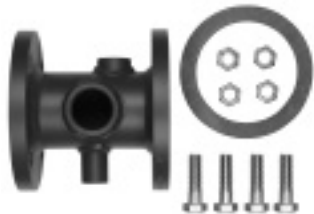
*Kit Clamp-on thermostat RAK-TW1000.S* 6033 745  
Thermostat with strap, enclosed cable (4 m) and plug

*Immersion thermostat RAK-TW1000.S SB 150* 6010 082  
Thermostat with pocket ½" - depth of immersion 150 mm, brass nickel-plated

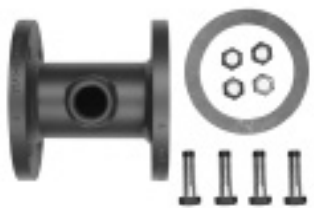
## ■ Part No.

	Accessories	Part No.
	<b>Vibration elements for boiler socket</b> 4 pieces of 100 mm each Height unstressed approx. 50 mm, width 80 mm If vibration elements for boiler socket are used then all connections (incl. flue gas pipe) must be connected flexibly with sound absorbing compensators.	6003 737
	<b>Oil meter VZO 4K</b> with filter Screw connection Ø 6-1/8" On-site installation	6004 224
	<b>Oil meter VZO 4K</b> with filter Screw connection Ø 8-1/8" On-site installation	6003 163
	<b>Automatic oil/air separator</b> with "Tigerloop Combi" shut-off valve Tank-side connection: female thread R 1/4" Pipe connection Ø external 6 or 8 mm Burner-side connection: male thread R 3/8" with inner cone for hose connection Filter element SiKu 50-75 µm	2023 618
	<b>Heating oil filter, 1-strand</b> with return feed OVENTROP type 3/8" AG Sinter/plastic filter insert 50-75 µm On-site installation	2005 877
	<b>Carrying set</b> for UltraOil® (250,300), (500D-600D) for vertical transport in tight places Consists of: Wooden pallet with spacer and screw connection. See dimensions for details	6027 693
	<b>Carrying set</b> for UltraOil® (110-200), (320D-400D) for vertical transport in tight places Consists of: Wooden pallet with spacer and screw connection. See dimensions for details	6023 293

■ Part No.



Fitting pipe flow



Fitting pipe return

Part No.

**Fitting pipes for flow and return**  
for installation on the flow or high and low-temperature return of the Hoval UltraOil®.  
With screws, nuts and seal for connecting a

- safety valve 1¼"
- additional safety temperature limiter and a maximum pressure limiter on the flow and
- an expansion tank on the return

Dimension	Fitting UltraOil®	Connection	
DN 65	(110-300)	Flow	6032 993
DN 65	(110-300)	Return	6023 108



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

### Hoval UltraOil® (110-160)

Type		(110)	(130)	(160)
• Nominal output 80/60 °C		105	124	152
• Nominal output 40/30 °C		110	130	160
• Range of output 80/60 °C	kW	78 - 105.0	99 - 124.0	114 - 152.0
• Range of output 40/30 °C	kW	83 - 110.0	104 - 130.0	119 - 160.0
• Heat input	kW	80 - 105.8	100 - 125.2	115 - 154.0
• Dimensions		Space requirements		
• Boiler working temperature max.	°C	90	90	90
• Boiler working temperature min.	°C		no min. limit	
• Return flow temperature min.	°C		no min. limit	
• Flue gas temperature min. at the boiler	°C		no min. limit	
• Safety temperature limiter setting (water side)	°C	110	110	110
• Working / test pressure	bar	5.0 / 7.5	5.0 / 7.5	5.0 / 7.5
• Boiler efficiency at 80/60 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	99.1 / 93.5	99.0 / 93.4	98.7 / 93.1
• Boiler efficiency at 40/30 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	104.1 / 98.2	104.1 / 98.2	103.9 / 98.0
• Boiler efficiency at 30 % partial load (EN 303) (net calorific value NCV / gross calorific value GCV)	%	105.0 / 99.1	104.8 / 98.9	104.5 / 98.6
• Stand-by deficiency qB at 70 °C	Watt	500	500	500
• Combustion gas resistance, 12.5 % CO <sub>2</sub> , 500 m above sea, level (Tolerance +/- 20 %)	mbar	0.24	0.34	0.45
• Flow resistance boiler <sup>1</sup>	z value	0.1	0.1	0.1
• Water resistance at 10 K	mbar	8.9	12.4	18.8
• Water resistance at 20 K	mbar	2.2	3.1	4.7
• Water flow volume at 10 K	m <sup>3</sup> /h	9.4	11.1	13.7
• Water flow volume at 20 K	m <sup>3</sup> /h	4.7	5.6	6.9
• Boiler water capacity	litres	340	340	340
• Boiler gas volume	m <sup>3</sup>	0.247	0.247	0.247
• Insulation thickness boiler body	mm	80	80	80
• Weight (incl. casing, burner)	kg	420	420	420
• Weight of transport	kg	370	370	370
• Electrical power consumption (during operation) min./max.	Watt	140/360	152/550	167/550
• Standby	Watt	6	6	6
• Acoustic power level incl. sound absorber hood				
Ambient air dependent				
- Heating noise (EN 15036 part 1)	dB(A)	65	67	67
Ambient air dependent				
- Exhaust noise in the pipe (EN 15036 part 2)	dB(A)	86	89	92
- Exhaust noise is radiated from the mouth (DIN 45635 part 47)	dB(A)	75	76	78
• Condensate rate (heating oil EL) at 40/30 °C	l/h	7,8	8,7	10,8
• pH-value of the condensate	ca.	3,2	3,2	3,2
• Flue gas system				
Temperature class		T120	T120	T120
Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating oil EL	kg/h	163.6	193.0	252.0
Flue gas temperature at nominal output 80/60 °C	°C	68	70	75
Maximum supply pressure for supply air and flue gas line	Pa	80	80	80
Maximum draught/underpressure at flue gas outlet	Pa	-20	-20	-20
• Combustion chamber dimensions Ø inside x length	mm	Ø524 x 800	Ø524 x 800	Ø524 x 800
• Combustion chamber volume	m <sup>3</sup>	0.172	0.172	0.172

<sup>1</sup> Flow resistance boiler in mbar = Volume flow (m<sup>3</sup>/h)<sup>2</sup> x z factor

## ■ Technical data

### Hoval UltraOil® (200-300)

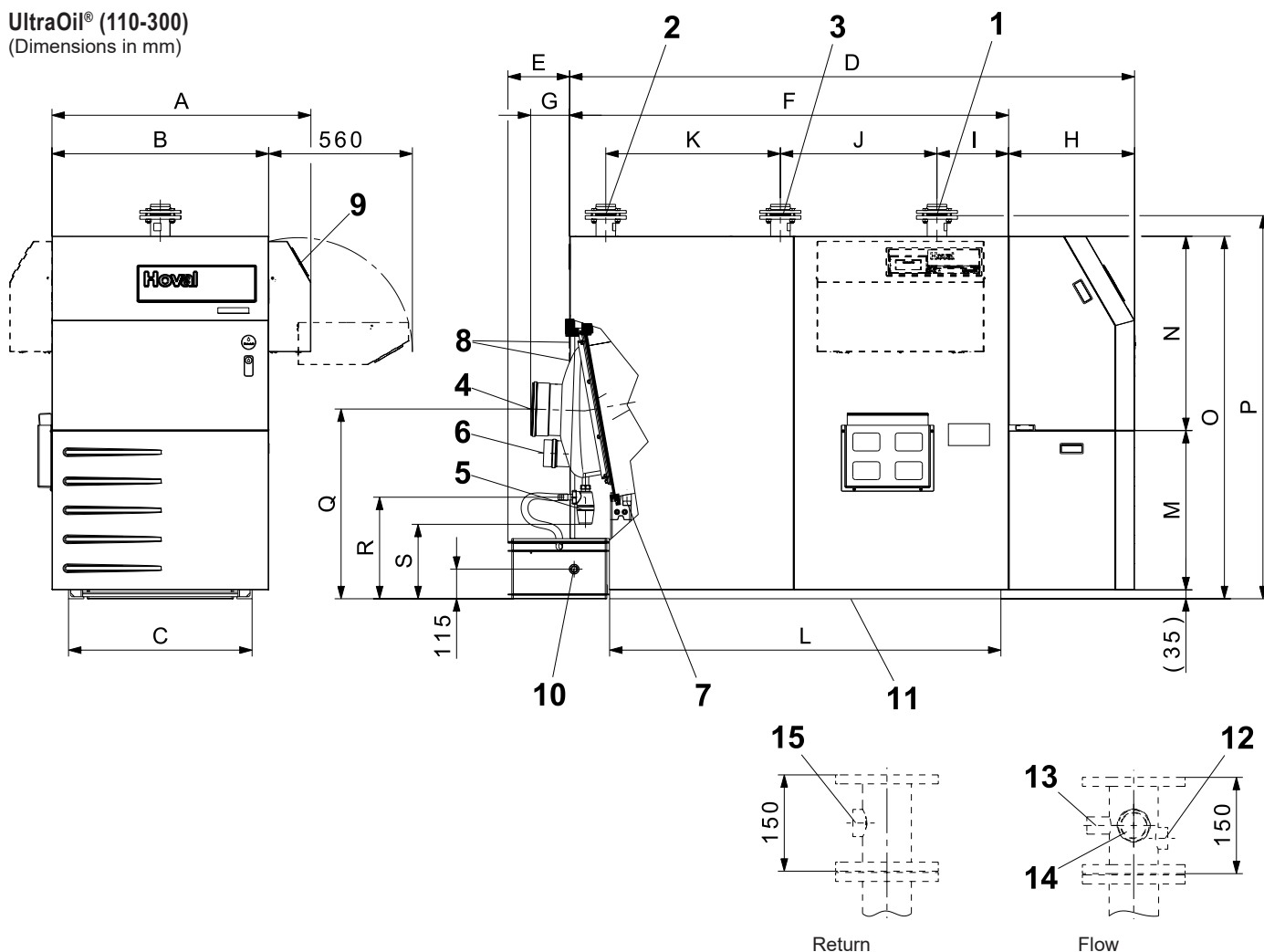
Type		(200)	(250)	(300)
• Nominal output 80/60 °C		190	238	286
• Nominal output 40/30 °C		200	250	300
• Range of output 80/60 °C	kW	133 - 190	180 - 238	215 - 286
• Range of output 40/30 °C	kW	140 - 200	189 - 250	227 - 300
• Heat input	kW	150 - 194	182 - 241	218 - 290
• Dimensions		Space requirements		
• Boiler working temperature max.	°C	90	90	90
• Boiler working temperature min.	°C		no min. limit	
• Return flow temperature min.	°C		no min. limit	
• Flue gas temperature min. at the boiler	°C		no min. limit	
• Safety temperature limiter setting (water side)	°C	110	110	110
• Working / test pressure	bar	5.0 / 7.5	5.0 / 7.5	5.0 / 7.5
• Boiler efficiency at 80/60 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	98.2 / 92.6	99.0 / 93.4	98.8 / 93.2
• Boiler efficiency at 40/30 °C in full-load operation (net calorific value NCV / gross calorific value GCV)	%	103.4 / 97.5	104.1 / 98.2	103.9 / 98.0
• Boiler efficiency at 30 % partial load (EN 303) (net calorific value NCV / gross calorific value GCV)	%	104.0 / 98.1	104.9 / 99.0	104.6 / 98.7
• Stand-by deficiency qB at 70 °C	Watt	520	600	600
• Combustion gas resistance, 12.5 % CO <sub>2</sub> , 500 m above sea, level (Tolerance +/- 20 %)	mbar	0.67	0.50	0.80
• Flow resistance boiler <sup>1</sup>	z value	0.1	0.1	0.1
• Water resistance at 10 K	mbar	29.4	46.1	66.3
• Water resistance at 20 K	mbar	7.3	11.5	16.6
• Water flow volume at 10 K	m <sup>3</sup> /h	17.1	21.5	25.8
• Water flow volume at 20 K	m <sup>3</sup> /h	8.6	10.7	12.9
• Boiler water capacity	litres	360	295	295
• Boiler gas volume	m <sup>3</sup>	0.290	0.440	0.440
• Insulation thickness boiler body	mm	80	80	80
• Weight (incl. casing, burner)	kg	450	634	634
• Weight of transport	kg	390	534	534
• Electrical power consumption (during operation) min./max.	Watt	186/500	207/830	226/830
• Standby	Watt	6	6	6
• Acoustic power level incl. sound absorber hood				
Ambient air dependent				
- Heating noise (EN 15036 part 1)	dB(A)	67	74	75
Ambient air dependent				
- Exhaust noise in the pipe (EN 15036 part 2)	dB(A)	93	87	89
- Exhaust noise is radiated from the mouth (DIN 45635 part 47)	dB(A)	82	75	79
• Condensate rate (heating oil EL) at 40/30 °C	l/h	13,5	16,8	20,2
• pH-value of the condensate	ca.	3,2	3,2	3,2
• Flue gas system				
Temperature class		T120	T120	T120
Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating oil EL kg/h		315.0	393.7	472.5
Flue gas temperature at nominal output 80/60 °C	°C	80	67	71
Maximum supply pressure for supply air and flue gas line	Pa	50	50	50
Maximum draught/underpressure at flue gas outlet	Pa	-20	-20	-20
• Combustion chamber dimensions Ø inside x length	mm	Ø524 x 1000	Ø624 x 1100	Ø624 x 1100
• Combustion chamber volume	m <sup>3</sup>	0.215	0.336	0.336

<sup>1</sup> Flow resistance boiler in mbar = Volume flow (m<sup>3</sup>/h)<sup>2</sup> x z factor

## ■ Dimensions

### UltraOil® (110-300)

(Dimensions in mm)



UltraOil® (110-200)

UltraOil® (250,300)

- 1 Flow heating/safety flow
- 2 Low temperature return
- 3 High temperature return
- 4 Flue gas outlet (plastic)
- 5 Siphon and 2 m PVC passage
- 6 Cleaning aperture
- 7 Drain
- 8 Electrical connection, optionally left or right
- 9 Boiler controller, optionally left or right
- 10 Condensate drain, optionally left or right
- 11 Plinth rail
- 12 Maximum pressure limiter
- 13 Safety temperature limiter
- 14 Safety valve connection
- 15 Expansion

DN 65/PN 6  
DN 65/PN 6  
DN 65/PN 6

D200  
DN 25  
D19x3  
D100  
R 1"

R ¾"

Rp ¾"  
Rp ½"  
Rp 1¼"  
Rp 1"

DN 65/PN 6  
DN 65/PN 6  
DN 65/PN 6

Ø252/258  
DN 25  
D19x3  
D100  
R 1"

R ¾"

Rp ¾"  
Rp ½"  
Rp 1¼"  
Rp 1"

	A	B	C	D	E	F	G	H	I	J
UltraOil® (110-160)	1009	844	715	2200	243	1710	153	490	280	610
UltraOil® (200)	1009	844	715	2408	238	1918	137	490	277	800
UltraOil® (250,300)	1064	899	770	2706	228	2018	135	690	292	888
	K	L	M	N	O	P	Q	R	S	
UltraOil® (110-160)	680	1524	619	756	1412	1492	740	395	290	
UltraOil® (200)	690	1722	619	756	1412	1492	701	356	251	
UltraOil® (250,300)	690	1820	650	797	1483	1602	710	335	230	

## ■ Dimensions

### UltraOil® (110-300)

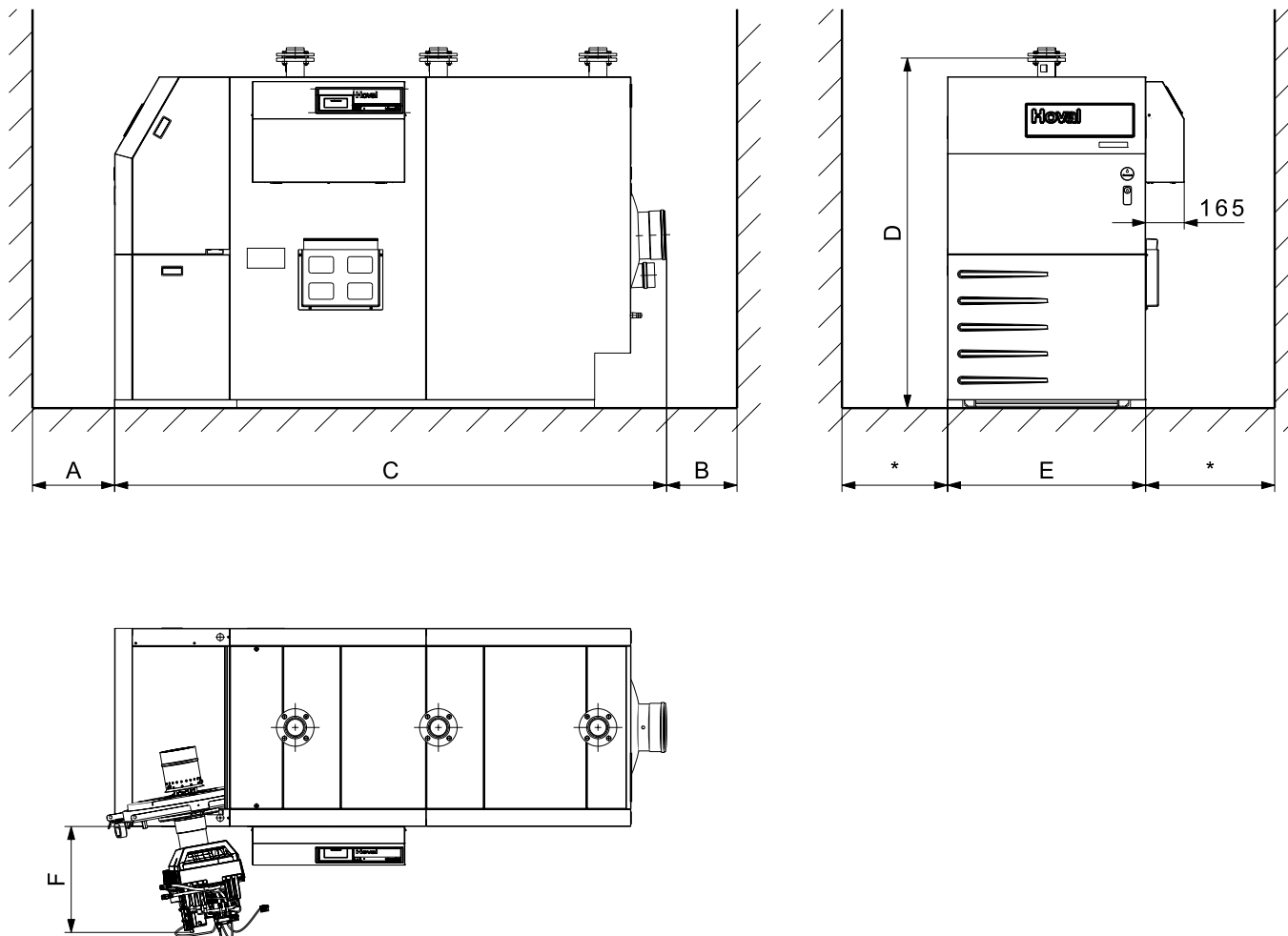
(Dimensions in mm)

#### Space requirements

for fitting the side casing 400 mm.

The boiler can then be pushed to a position 100 mm away from the wall.

Allow space for vibration absorber if necessary (see Accessories).



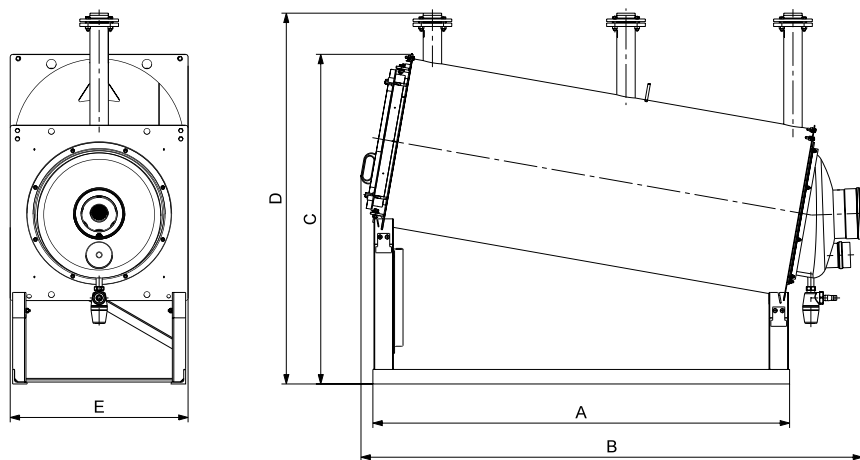
\* Important: there must be 700 mm space on the left or right of the boiler so that the boiler door can be swivelled out with the burner.

Type	A	B	C	D	E	F
UltraOil® (110-160)	560	360	2353	1492	845	450
UltraOil® (200)	560	360	2545	1492	845	450
UltraOil® (250,300)	700	480	2841	1602	900	550

## ■ Dimensions

### Dimensions without thermal insulation and casing

(Dimensions in mm)



	A	B	C	D	E
UltraOil® (110-160)	1524	1882	1362	1533	735
UltraOil® (200)	1722	2073	1362	1533	735
UltraOil® (250,300)	1820	2174	1434	1642	790

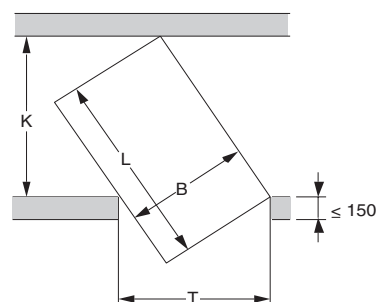
### Required minimum width of door and corridor for bringing in the boiler

The following values are the calculated minimum values

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

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

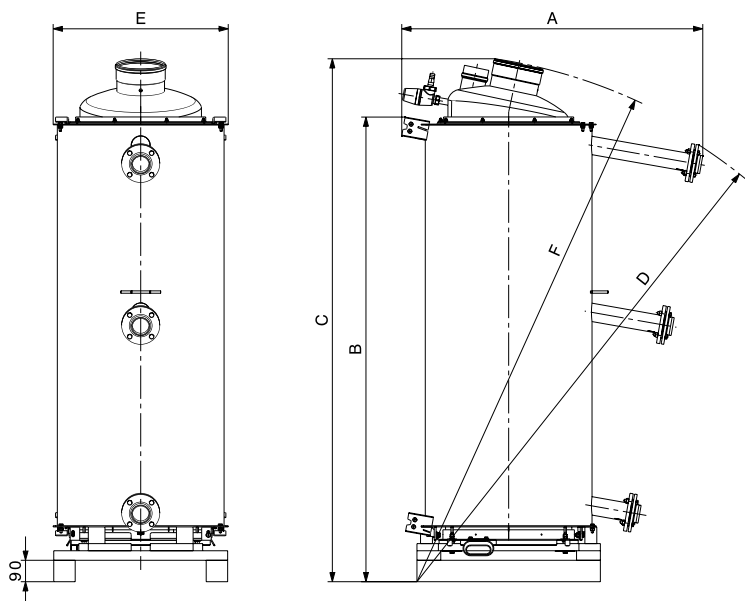
T Door width  
K Corridor width  
B Boiler width  
L Maximum boiler length



### Vertical installation in case of space problems

#### Dimensions without thermal insulation and casing

(Dimensions in mm)



	A	B	C	D	E	F
UltraOil® (110-160)	1230	1751	2000	2002	735	2027
UltraOil® (200)	1264	1951	2195	2182	735	2220
UltraOil® (250,300)	1372	2050	2299	2304	790	2317

## ■ Dimensions

### Neutralisation setup for UltraOil® (110-300) (Dimensions in mm)

#### Neutralisation box type KB 23

##### Use

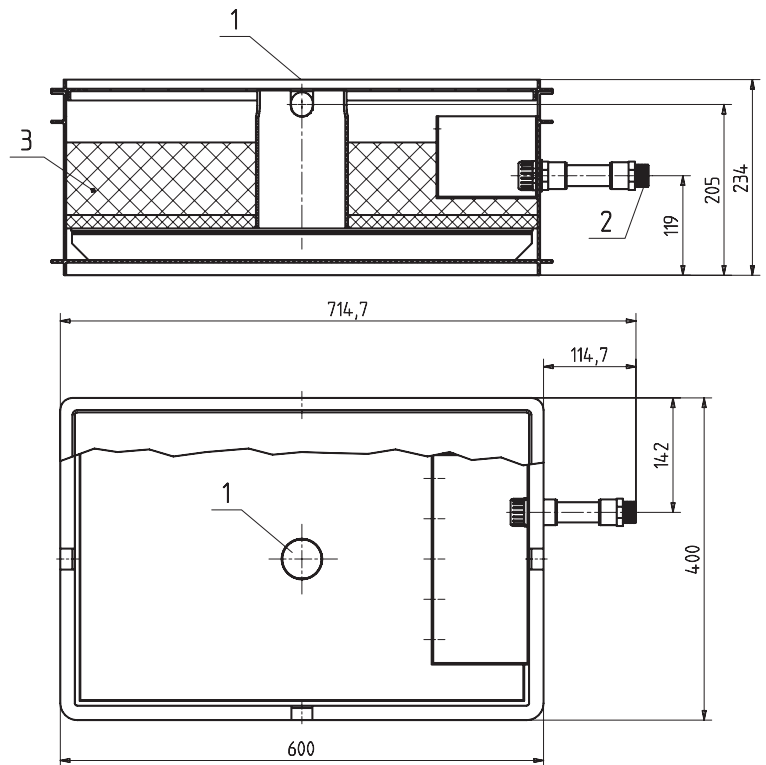
- Condensate discharge into lower drainage duct
- With condensate neutralisation
- Placed under or next to the boiler

##### Design

- Collecting tank with neutralisation unit
- 12 kg neutralisation granulate
- Connection line from boiler (siphon) to Neutrabox, if the installation location is underneath the boiler

##### On-site:

- With installation next to the boiler, connection lines from boiler (siphon) to the neutralisation box
- Discharge line from the Neutrabox



- 1 Condensate inlet from the boiler
- 2 Exit R 3/4"
- 3 Condensate tank with 12 kg granulate

#### Neutralisation box with pump type KB 24

##### Use:

- Condensate discharge into higher drainage duct
- With condensate pump, delivery head 3.5 m
- With condensate neutralisation, 12 kg granulate
- Placed under or next to the boiler.

##### Design

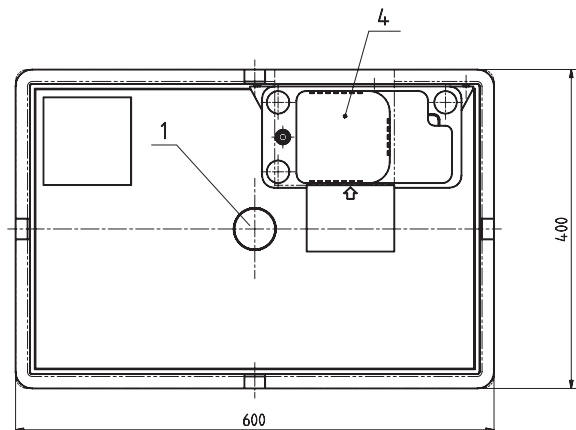
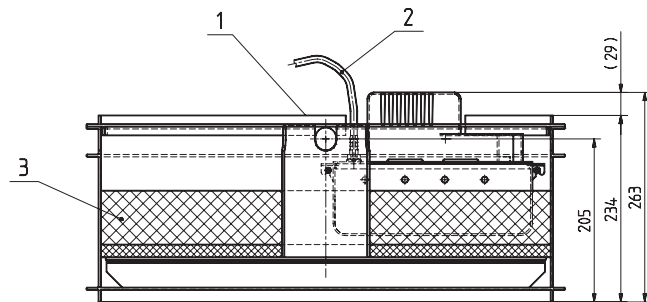
- Collecting tank with feed pump and neutralisation unit
- 12 kg neutralisation granulate
- Delivery head of the pump max. 3.5 m (2 dm³/min.)
- Silicone hose Ø 9/13 mm, length 4 m
- Electrical cable length 1.5 m with plug for connecting to boiler electrical panel if installation location is below boiler
- Plastic connection line Ø 25 mm, from boiler (siphon) to Neutrabox, if the installation location is underneath the boiler.

##### On-site:

- Discharge duct, if silicone hose too short.

For installation next to the boiler:

- Connection lines from boiler (siphon) to the neutralisation box
- Electrical connection from feed pump to electrical panel if supplied cable is too short.



- 1 Condensate inlet from the boiler
- 2 Outlet from pump, silicone hose Ø 9/13 mm, length 4 m
- 3 Condensate tank with 12 kg granulate (KB 24)
- 4 Condensate pump

#### Condensate box with pump type KB 22

##### Use:

- Condensate discharge into higher drainage duct
- With condensate pump, delivery height 3.5 m
- Placed under or next to the boiler.

##### Design

Design as for KB 24, but **without** neutralisation granulate.

## ■ Engineering

### Standards and guidelines

The following standard and guidelines must be respected:

- technical information and installation manual of Hoval
- hydraulic and technical control regulations of Hoval
- local building law
- fire protection standard
- 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.**
- 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. underfloor 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.
- On existing systems (for example if the boiler is replaced), where the quality of the existing heating water meets the requirements of VDI 2035, re-filling of the system is not recommended. The requirements of VDI 2035 also apply to replacement water.
- New and if applicable existing installations need to be adequately cleaned and flushed before being filled. The boiler may only be filled after the heating system has been flushed!
- Parts of the boiler/calorifier which have contact with water are made of ferrous materials and stainless steel.
- On account of the danger of stress cracking corrosion in the stainless steel section of the boiler the chloride, nitrate and sulphate contents of the heating water must not exceed 50 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:

- As a rule, untreated domestic water is best suited as filling and replacement water for a system with Hoval boilers. However, the quality of the untreated mains water must still meet the requirements of VDI 2035 or be demineralised and/or treated with inhibitors. The requirements of EN 14868 must be met in this context.
- To maintain high boiler efficiency and prevent overheating of the heating surfaces, the values in Table 1 should not be exceeded, taking into consideration the boiler output (smallest individual boiler in multi-boiler plants) and the water content.
- The total quantity of filling and replacement water added to the boiler over its service life must not be higher than three times the system water content.

#### Frost protection agent

The planning sheet "Use of antifreeze" is available from your Hoval contact person.

#### Combustion air

The combustion air supply must be guaranteed. Ensure that the air intake can not be closed or blocked. It is very important to ensure that the combustion air is free from halogen compounds. These are present, for example, in spray cans, varnishes, glues, solvents and cleansing agents.

#### Ambient air dependent operation:

- Minimum free cross-section for the air opening can be assumed as follows by way of simplification. Nominal heat output is the determining factor!
- A minimum free cross-section of once 150 cm<sup>2</sup> or twice 75 cm<sup>2</sup> and an additional 2 cm<sup>2</sup> for each kW boiler capacity in excess of 50 kW is required for the air opening into the outside air.

### Oil burner mounting

- The standard burner plug connection must be positioned in the opposite direction to the swivelling direction of the boiler door.
- The space between the combustion pipe and the boiler door must be filled with the insulation material supplied.

#### Electric connection of the burner

- Mains connection 1 x 230 V, 50 Hz, 10 A
- The burner must be connected to the standard plug connection of the boiler.
- The burner cable must be shortened so that the plug-in connection has to be parted to swing out the burner.

### Sound absorption

Sound absorption is possible through the following steps:

- Make boiler room walls, ceiling and floor as thick as possible, install a silencer in the intake air opening, provide carriers and brackets for the pipes with noise insulation.
- If there are living areas above or below the boiler room, install rubber vibration dampers under the base rails of the boiler.
- Connect circulating pumps to the piping network using expansion joints.
- To dampen the flame noise in the chimney, silencers can be installed in the connection tube (possibly leave space for later installation).

**Table 1:** Maximum filling quantity without/with demineralisation

	Total hardness of the filling water up to ...							
[mol/m <sup>3</sup> ] 1	<0.1	0.5	1	1.5	2	2.5	3	>3
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
<b>Size of single boiler</b>	<b>maximum filling quantity without demineralisation</b>							
50 to 200 kW	NO REQUIREMENT	50 l/kW	20 l/kW	20 l/kW	always demineralise			
200 to 300 kW		50 l/kW	50 l/kW	20 l/kW				

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

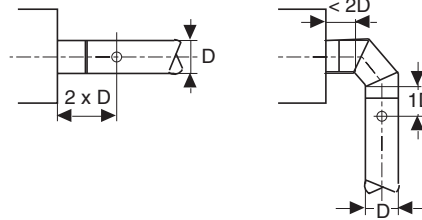
<sup>2</sup> If the conductance in µS/cm exceeds the tabular value an analysis of the water is necessary

## ■ Engineering

**Flue gas system**

- The flue gas system must be made by an examined and certified flue gas line.
- The flue gas line must be certified gas-tight, humidity-insensitively, corrosion and acid-proof as well as for flue gas temperatures up to 120 °C.
- The flue gas system must be suitable for the operation with over-pressure.
- The flue gas lines must be secured against unwanted loosening of the plug connections.
- The flue gas line is to be laid with upward gradient, so that the resulting condensate of the flue gas system flows back into the boiler so that before deriving into drains it can be neutralised.
- When using flue gas lines made of plastic a flue gas safety temperature limiter must be inserted (included in the boiler scope of delivery).

- In the connection pipe has to be integrated a closable flue gas measurement nozzle with circular inner diameter of 10-21 mm. The socket has to be led over the thermal insulation.

**Connecting pipes**

Horizontal connecting pipes must be installed with an inclination of at least 50 mm per metre of their length installed in the direction of the boiler to allow free return of condensation water towards the boiler. The whole flue gas system must be installed so that condensate can never collect at any point.

**Maximum flue gas pipe lengths according to examples**  
**Chimney connection and flue gas pipe in chimney stack**
**Flue gas pipe dimensions**

Boiler		Smooth-walled flue gas line	90° bends <sup>1)</sup> (flue gas + supply air)			
Type	Flue gas dim.		1	2	3	4 <sup>2)</sup>
UltraOil®	int.	Designation	Total pipe length in m (flue gas + supply air)			
		DN				
(110)	200	130 <sup>3)</sup>	22	21	19	18
(110)	200	150 <sup>3)</sup>	40	40	40	40
(130)	200		30	30	30	30
(160)	200		23	21	19	17
(110)	200	200 <sup>4)</sup>	50	50	50	50
(130)	200		50	50	50	50
(160)	200		50	50	50	50
(200)	200		38	36	34	32
(250)	250	250	50	50	50	-
(300)	250	250	50	50	50	-

<sup>1)</sup> Two 45° bends should be used instead of a 90° bend

<sup>2)</sup> If there are 4 bends or more, the delivery pressure for the supply air/flue gas line must be reduced by 30 % for the calculation and an exact design of the flue gas line is necessary.

<sup>3)</sup> Flue gas pipe systems DN 130, DN 150:

A 90° bend or a reduction is not permitted directly after the flue gas connection of the boiler. From the flue gas connection to the first bend or reduction, the flue gas pipe must be configured in the same dimension as the flue gas connection over a length of at least 0.5 m.

<sup>4)</sup> Flue gas pipe system DN 200:

The vertical length of the flue gas pipe system DN 200 must not exceed 25 m due to the weight load on the support arch.

**Notices**

- The data contained in the table represents guide values at maximum output. An exact calculation for the flue gas line must be made on site.
- The diameters given in the dimensioning tables must not be undershot.



## Engineering

### Sound power

The sound power level is independent of local and spatial influences.

The sound **pressure** level depends on installation conditions and can, for example, be 10 to 15 dB(A) lower than the sound **power** level at a distance of 1 m.

#### Recommendation:

If the air inlet at the facade is near a noise sensitive place (window of bedroom, terrace etc.), we recommend to use a sound absorber at the direct combustion air inlet.

### Condensate drain

- A permit for discharge of the flue gas condensate into the sewage system must be obtained from the relevant authority.
- The condensate from the flue gas system can be discharged via the boiler. A condensate trap is no longer needed in the flue gas duct system.
- A siphon must be installed on the condensate drain of the oil-fired condensing boiler (included in the boiler scope of delivery).
- Suitable materials for condensate drain:
  - Stoneware pipes
  - Pipes made from PVC
  - Pipes made from polyethylene (PE)
  - Pipes made from ABS or ASA
- The commercial system operator must inform the sewer operator if the exhaust gas condensate is discharged into the sewer system.

### Installation instructions

Please observe the installation instructions supplied with every boiler.

### Heating system renovation notice

If an existing oil heating installation is replaced by Hoval UltraOil®, the following instructions regarding the oil tank and its refilling must be observed:

- The Hoval UltraOil® is only allowed to be operated with heating oil EL low-sulphur with sulphur content < 50 ppm (< 0.005 %).
- It is recommended to clean the oil tank before refilling it.
- A residual amount of heating oil EL in the oil tank may be mixed with heating oil EL low-sulphur, provided that the residual amount does not exceed the following values of the total content.

- Residual quantity of heating oil EL (sulphur content: 2000 ppm or 0.2 %) max. 3 % of tank volume
- Residual amount heating oil EL (sulphur content: 1000 ppm or 0.1 %) max. 5 % of tank volume
- Residual amount eco heating oil EL (sulphur content: 500 ppm or 0.05 %) max. 10 % of tank volume
- In order to reach the permissible mixture ratio with heating oil EL low-sulphur taking account of the residual amount of heating oil in the oil tank, a 100 % tank filling is necessary.

### Oil line installation

- The Hoval UltraOil® is only allowed to be connected to 1-section oil lines. Max. suction height without intermediate pump 3.5 m, maximum line length 30 m.
- The lines must be positioned so that the boiler door can still be fully opened.
- A shut-off element must be installed before the flexible oil lines at the end of the rigid oil line (already installed in the "Oventrop filter").
- A single line fine filter with return feed must be installed before the burner (e.g. "Oventrop" type).
- The highest point on the oil line is allowed to be max. 3.5 m above the tank suction line.
- Product pipelines must be installed in such a way that no liquid can emerge independently (rise) from the container.
- If the highest point of the oil level in the oil tank is higher than the lowest point in the removal line, it is necessary to install a solenoid valve at the highest point in the oil line as close as possible to the oil tank.
- In the case of plants with several oil-fired boilers, the oil supply to the boilers must be ensured in all operating states, e.g. provide an independent connection line to the oil tank for each boiler.

### One pipe oil lines

Line diameter Ø inside 6 mm, max. permissible line length in m

Suction height H in m	UltraOil® (110)	(130)	(160)	(200)	(250)	(300)
0	30	30	30	26	21	17
1	30	30	26	20	15	12
2	28	25	18	14	10	8

This line sizing table provides indicative values for:

Low-sulphur heating oil EL or low-sulphur mixed heating oil EL with max. 10 % FAME (bio heating oil) content, oil temperature > 10 °C (indoor tank) up to 700 m above sea level, 1 filter, 1 valve, 6 elbows 90° (40 mbar).

### Pipe systems that are oversized can lead to operational disturbance!

For this reason, in case of boiler exchange the pipe dimensioning table must be observed!

### Expansion tank/expansion

- Ideally, the pressure expansion tank should be connected to the heating system as described in our example applications, with a removable or sealable actuation device. This means that it is not necessary to drain the entire system in order to carry out work.

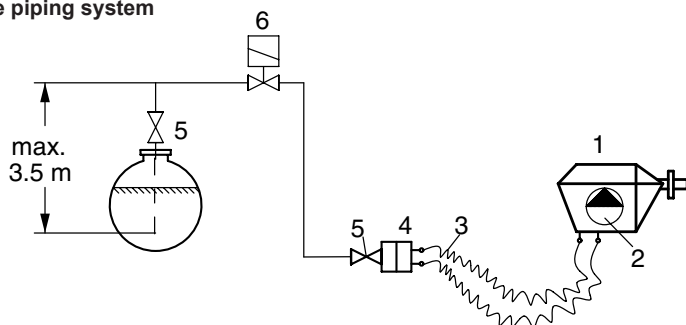
### Safety valve

- A safety valve and an automatic air vent must be installed in the safety flow.

### Plants with one return

- In plants with one return, the return must always be connected to the low-temperature return of the boiler. An air vent must be fitted on the high-temperature return.

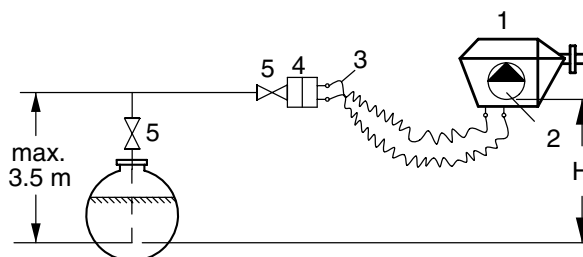
### Max. oil level higher than the lowest point of the piping system



- Hoval-burner for 1-line connection with return flow
- Oil pump

- Oil hoses on the burner
- Fine filter with return feed with sintered plastic insert 50-75 µm

### Max. oil level lower than the lowest point of the piping system



- Shut-off valve
- Solenoid valve
- H = Suction height [m]

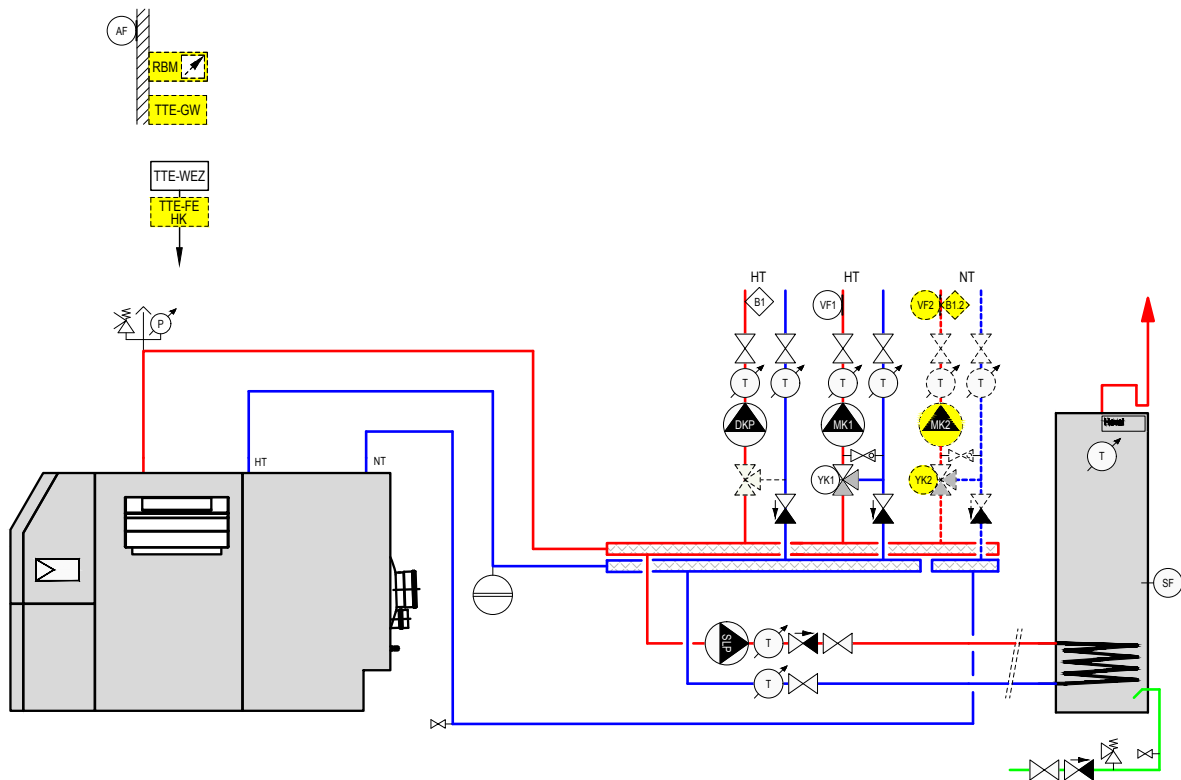
## ■ Examples

### UltraOil® (110-300)

Oil condensing boiler with

- calorifier
- 1 direct circuit and 1-... mixer circuit(s)  
(HT/LT separation)

Hydraulic schematic BECE030



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
SLP	Calorifier sensor

#### Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

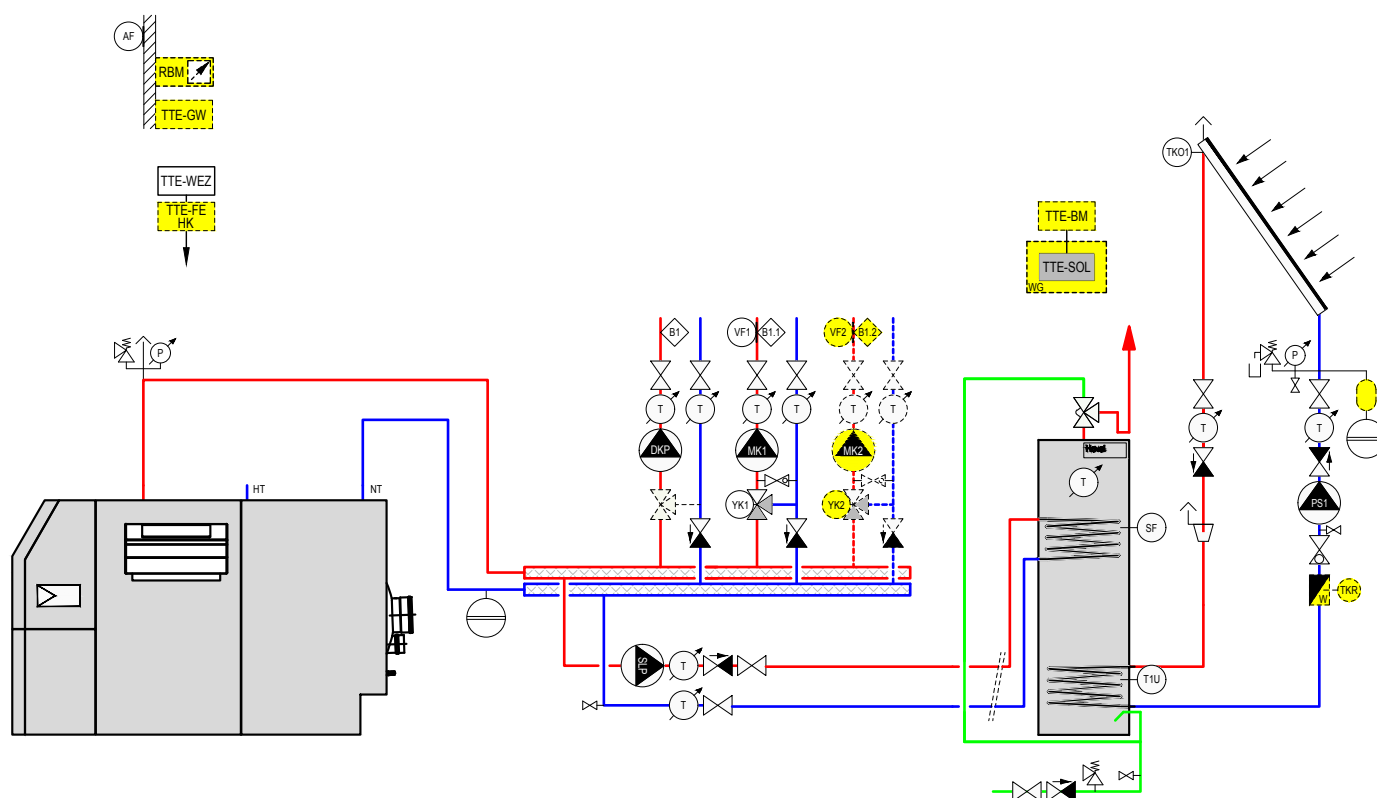
## Examples

### UltraOil® (110-300)

Oil condensing boiler with

- calorifier
- 1 direct circuit and 1-... mixer circuit(s)
- solar collectors

#### Hydraulic schematic BECE040



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
TTE-SOL	TopTronic® E solar module
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
TKR	Return sensor
TKO	Collector sensor
T1U	Storage tank sensor
DKP	Pump for heating circuit without mixer
PS1	Solar circuit pump
SLP	Calorifier charging pump

#### Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-SOL	TopTronic® E solar module
TTE-BM	TopTronic® E control module

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

## Description

### Hoval UltraOil® (320D-600D) Oil-fired condensing boiler for ecological heating oil EL low-sulphur

#### Boiler

- Oil condensing boiler according to EN 303 part 1 and 2 and EN 15034. Double boiler consisting of two single boilers (UltraOil® 160, 200, 250, 300 kW)
- For burning **ecological heating oil EL low-sulphur (sulphur content < 50 ppm) acc. to standard SN 181160-2.**
- Boiler made of steel with condensation design
- Components that come into contact with flue gas and condensate are made from high-alloyed stainless steel  
Maximum flue gas condensation by heating surfaces made of aluFer® composite pipe;  
Flue gas side: aluminium  
Water side: stainless steel
- No lower delimitation of the boiler water temperature and the boiler return temperature
- No minimal water circulation necessary
- Boiler door swivelling to the front right, swivelling to the left by conversion on the system
- Insulation at the boiler body: 80 mm mineral wool mat and glass fabric
- Casing made of steel sheet, red powder coated, delivered separately packed
- Flue outlet at the back upwards
- Heating connections at top incl. counter-flange, bolts and seals for:
  - flow
  - return - high temperature
  - return - low temperature
- Sound absorbing/thermal insulation hood
- Water pressure sensor:
  - Fulfills the function of a minimum and maximum pressure limiter
  - Replacement for the water shortage
- Flue gas temperature monitoring (installation on site)
- Cleaning set comprising scraper and implement holder (included in the scope of delivery)
- Each individual boiler is supplied with a Hoval TopTronic® E control

#### TopTronic® E controller

##### Control panel

- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

##### TopTronic® E control module

- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)



#### Model range

UltraOil® type	Output 40/30 °C kW
(320D)	119-320
(400D)	155-400
(500D)	189-500
(600D)	227-600

#### Permissions boilers

UltraOil® (320D-600D)  
CE product ID No. CE 0036 0379/06

#### TopTronic® E basic module heat generator (TTE-WEZ)

- Control functions integrated for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set

#### Options for TopTronic® E controller

- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting or
  - module expansion universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

#### Number of modules that can be additionally installed in the heat generator (per single boiler):

- 1 module expansion and 1 controller module **or**
- 2 controller modules

The supplementary plug set must be ordered in order to use expanded controller functions.

#### Oil automatic function device OFA

- Control function integrated for
  - flue gas sensor for safety shut-off
  - 0-10V output for connecting a modulating main pump (incl. delta T-control with low consumption)
  - Standard plug connection for 2-stage burner 1x 230 V
  - Variable input for plant-specific functions (heat generator block, return sensor, info sensor etc.)
  - Variable output for plant-specific functions (thermostat function, operating message, etc.)

#### Further information about the TopTronic® E see "Controls"

#### Oil burner

- Fully automatic 2-stage pressure atomizer burner (blue burner)
- Air termination flap
- Fan follow-on time
- Completely wired up with 7+4-pin standard plug connection 1 x 230 V
- The oil burner is checked at the factory according to factory setting ≤ 1000 m above sea level. Higher altitudes result in a power reduction of 1.2 % per 100 m

### ■ Description

#### *Optional*

- Free-standing calorifier, see Calorifiers
- Flue gas systems
- Installation transport set for conditions of restricted access

#### *Delivery*

- 2 boilers, casing with thermal insulation, front casing panel, oil burner and 2 TopTronic® E controls are delivered separately packed.

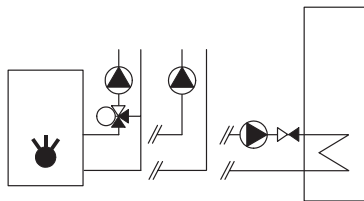
#### *On site*

- Installation of thermal insulation, casing, boiler control panel
- Installation of the flue gas connection line with the flue gas flap
- Installation of the hydraulic connection set (option)

#### **Heating armature groups and wall distributors**

see "Various system components"

■ Part No.



**Oil condensing boiler Hoval UltraOil®**

**Part No.**

Double boiler consisting of two individual boilers (UltraGas® 125-1000 kW), each with a built-in Hoval TopTronic® E control

- Control functions integrated for
- 1 heating circuit with mixer
  - 1 heating circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Can be optionally expanded 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)

Incl. sensor, flue gas temperature monitoring, 2-stage oil burner and sound absorbing hood.

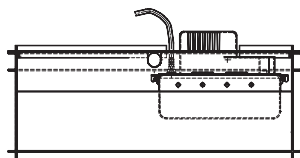
**Delivery**  
2 boilers, casing with thermal insulation, front casing panel, 2 oil burners, 2 TopTronic® E controls and flue gas connection line are delivered separately packed.

Operation with low-sulphur heating oil EL (sulphur content < 50 ppm) acc. to DIN 51603.

UltraOil® type	Output 40/30 °C kW	
(320D)	119-320	7014 818
(400D)	155-400	7014 859
(500D)	189-500	7014 860
(600D)	227-600	7014 861

**UltraOil® (320D-600D) delivery in separate parts on request**

## ■ Part No.


**Condensate line (per boiler)**
**Part No.**
**Condensate box KB 22**

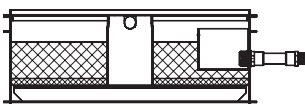
6033 767

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)

For condensate drainage into higher  
situated drain pipe with delivery pump.  
Max. delivery height 3.5 m, from  
1200 kW two delivery pumps necessary.  
Delivery rate 120 l/h

incl. liquid level switch, silicone hose  
9/13 mm, 4 m long, electrical cable  
1.5 m with plug

Use one box per boiler.


**Neutralisation box KB 23**

6001 917

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)

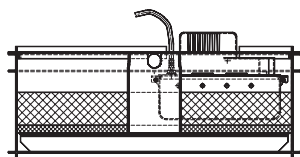
Condensate drainage into lower situated  
drain pipe without condensate  
delivery pump

with neutralisation

12 kg neutralisation granulate

Placed under the boiler

Use one box per boiler.


**Neutralisation box KB 24**

6033 764

for UltraGas® (125-1150), (250D-2300D),  
UltraOil® (65-300), (320D-600D)

for transporting condensation water into  
a higher lying drainage duct,  
max. delivery height 3.5 m, from  
1200 kW two delivery pumps necessary.  
Delivery rate 120 l/h

incl. liquid level switch, silicone hose  
9/13 mm, 4 m long, electrical cable  
1.5 m with plug

12 kg granulate

Use one box per boiler.


**Neutralisation granulate**

2028 906

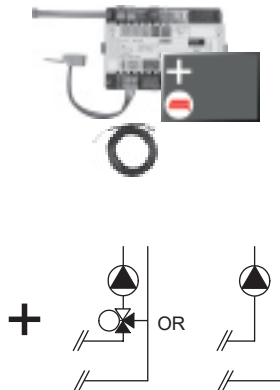
for neutralisation box

Refill set volume 3 kg

Life time of one filling:

approx. 2-4 years; depending on amount  
of condensate

## ■ Part No.


**TopTronic® E module expansions**  
for TopTronic® E basic module heat generator

Part No.

**TopTronic® E module expansion heating circuit TTE-FE HK**

6034 576

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

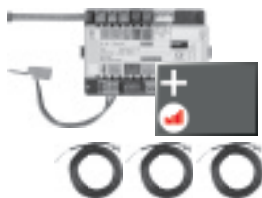
- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories  
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Notice**

The supplementary plug set may have to be ordered to implement functions differing from the standard!


**TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ**

6037 062

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating/cooling circuit w/o mixer or
  - 1 heating/cooling circuit with mixer
- in each case incl. energy balancing

incl. fitting accessories  
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Notice**

Suitable flow rate sensors (pulse sensors) must be provided on site.


**TopTronic® E module expansion Universal TTE-FE UNI**

6034 575

Expansion to the inputs and outputs of a controller module (basic module heat generator, heating circuit/domestic hot water module, solar module, buffer module) for implementing various functions

incl. fitting accessories

Can be installed in:  
Boiler control, wall housing, control panel

**Further information**

see "Controls" - "Hoval TopTronic® E module expansions" chapter

**Notice**

Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

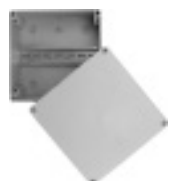


## ■ Part No.



**HovalConnect available from summer 2019**

Up to that point, TopTronic® E online is delivered.



## Accessories for TopTronic® E

## Part No.

### Supplementary plug set

for basic module heat generator (TTE-WEZ)  
for controller modules and module expansion TTE-FE  
HK

6034 499  
6034 503

### TopTronic® E controller modules

TTE-HK/WW TopTronic® E heating circuit/  
hot water module  
TTE-SOL TopTronic® E solar module  
TTE-PS TopTronic® E buffer module  
TTE-MWA TopTronic® E measuring module

6034 571  
6037 058  
6037 057  
6034 574

### TopTronic® E room control modules

TTE-RBM TopTronic® E room control modules  
easy white  
comfort white  
comfort black

6037 071  
6037 069  
6037 070

### Enhanced language package TopTronic® E

one SD card required per control module  
Consisting of the following languages:  
HU, CS, SL, RO, PL, TR, ES, HR,  
SR, JA, DA

6039 253

### HovalConnect

HovalConnect domestic starter LAN  
HovalConnect domestic starter WLAN  
HovalConnect commercial starter LAN  
HovalConnect commercial starter WLAN  
SMS remote control unit  
System component SMS remote control unit

6049 496  
6049 498  
6049 495  
6049 497  
6018 867  
6022 797

### TopTronic® E interface modules

GLT module 0-10 V  
HovalConnect domestic starter Modbus  
HovalConnect domestic starter KNX  
HovalConnect commercial starter Modbus  
HovalConnect commercial starter KNX

6034 578  
6049 501  
6049 593  
6049 500  
6049 502

### TopTronic® E wall casing

WG-190 Wall casing small  
WG-360 Wall casing medium  
WG-360 BM Wall casing medium with  
control module cut-out  
WG-510 Wall casing large  
WG-510 BM Wall casing large with  
control module cut-out

6035 563  
6035 564  
6035 565  
6035 566  
6038 533

### TopTronic® E sensors

AF/2P/K Outdoor sensor  
TF/2P/5/6T Immersion sensor, L = 5.0 m  
ALF/2P/4/T Contact sensor, L = 4.0 m  
TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m

2055 889  
2055 888  
2056 775  
2056 776

### System housing

System housing 182 mm  
System housing 254 mm

6038 551  
6038 552

Bivalent switch

2061 826

**Further information**  
see "Controls"

■ Part No.



**Flow temperature guard**

for underfloor heating system (1 guard per heating circuit) 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

*Kit Clamp-on thermostat RAK-TW1000.S*

Thermostat with strap, enclosed cable (4 m) and plug

6033 745

*Immersion thermostat RAK-TW1000.S SB 150*

Thermostat with pocket ½" - depth of immersion 150 mm, brass nickel-plated

6010 082

## ■ Part No.

**Accessories****Part No.****Vibration elements for boiler socket**

6003 737

4 pieces of 100 mm each  
Height unstressed approx. 50 mm,  
width 80 mm

If vibration elements for boiler socket  
are used then all connections (incl.  
flue gas pipe) must be connected  
flexibly with sound absorbing  
compensators.

**Sound absorbing boiler base elements  
for one boiler****Oil meter VZO 4K**

6004 224

with filter  
Screw connection Ø 6-1/8"  
On-site installation

**Oil meter VZO 4K**

6003 163

with filter  
Screw connection Ø 8-1/8"  
On-site installation

**Automatic oil/air separator**

2023 618

with "Tigerloop Combi" shut-off valve  
Tank-side connection: female thread R 1/4"  
Pipe connection Ø external 6 or 8 mm  
Burner-side connection: male thread  
R 3/8" with inner cone  
for hose connection  
Filter element SiKu 50-75 µm

**Heating oil filter, 1-strand**

2005 877

with return feed  
OVENTROP type 3/8" AG  
Sinter/plastic filter insert 50-75 µm  
On-site installation

**Carrying set**

6023 293

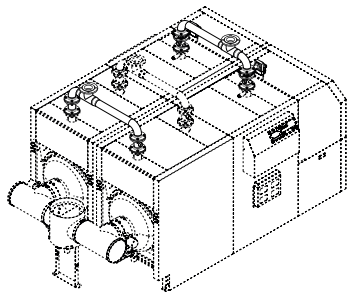
for UltraOil® (110-200), (320D-400D)  
for vertical transport in  
tight places  
Consists of:  
Wooden pallet with spacer  
and screw connection.  
See dimensions for details

**Carrying set**

6027 693

for UltraOil® (250,300), (500D-600D)  
for vertical transport in  
tight places  
Consists of:  
Wooden pallet with spacer  
and screw connection.  
See dimensions for details

■ Part No.



Hydraulic connection

Part No.

Double boiler

**Flow/return DN 65 / PN 6**

for UltraOil® (320D-600D)  
Hydraulic connection set for double boiler incl.  
motor shut-off flap valves.  
Fitting pipe must also be ordered with the  
hydraulic connection set (flow/return).

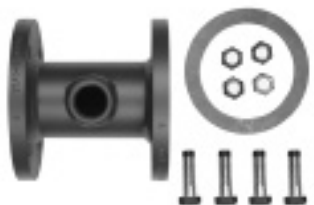
6038 472



Fitting pipe flow

**Fitting pipes for flow and return**

for installation on the flow or high and low-  
temperature return of the Hoval UltraOil®.  
With screws, nuts and seal for connecting a  
- safety valve 1¼"  
- additional safety temperature limiter and a  
maximum pressure limiter on the flow and  
- an expansion tank on the return



Fitting pipe return

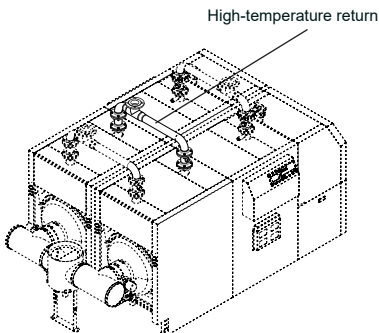
Dimension	Fitting UltraOil®	Connection
DN 65*	(320D-600D)	Flow
DN 65*	(320D-600D)	Return

6032 993  
6023 108

\* 2 pieces necessary.

**Further details**

see Dimensions single boiler  
UltraOil® (160-300)



**High-temperature return DN 65 / PN 6**

for UltraOil® (320D-600D)  
Pipe connection set for double boiler  
(e.g. for return of calorifier charging).

6001 926



**Hydraulic shut-off flaps PN 16**

for UltraOil® (320D-600D)  
for direct mounting in flow and/or return. As  
option if no flow/return set will be ordered.  
Complete with cabling.  
1 piece DN 65  
Two pieces per double boiler necessary!

6002 660

■ Part No.



Service

Part No.

**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

### Hoval UltraOil® (320D-600D)

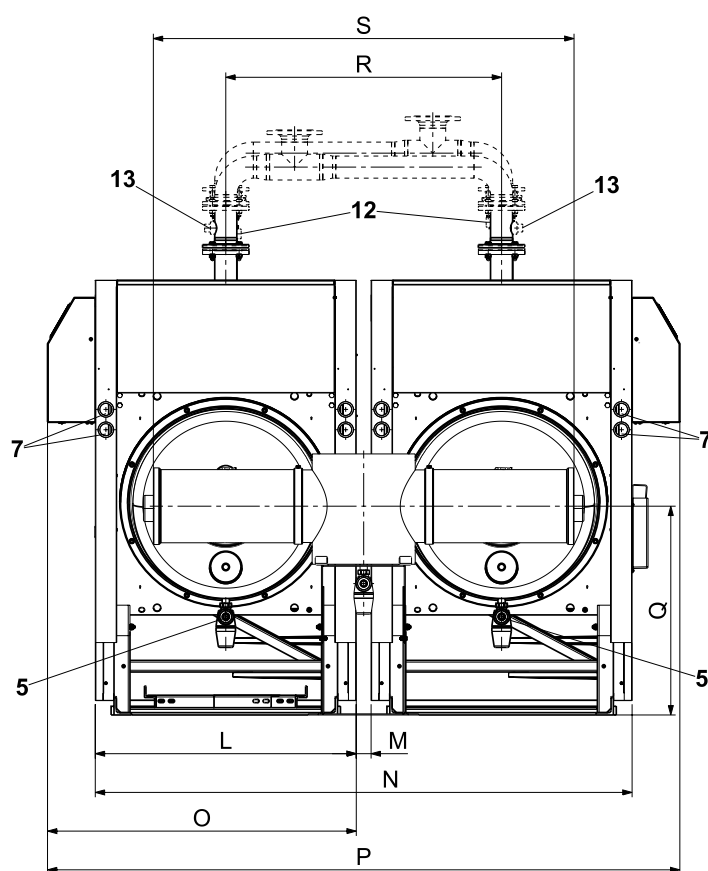
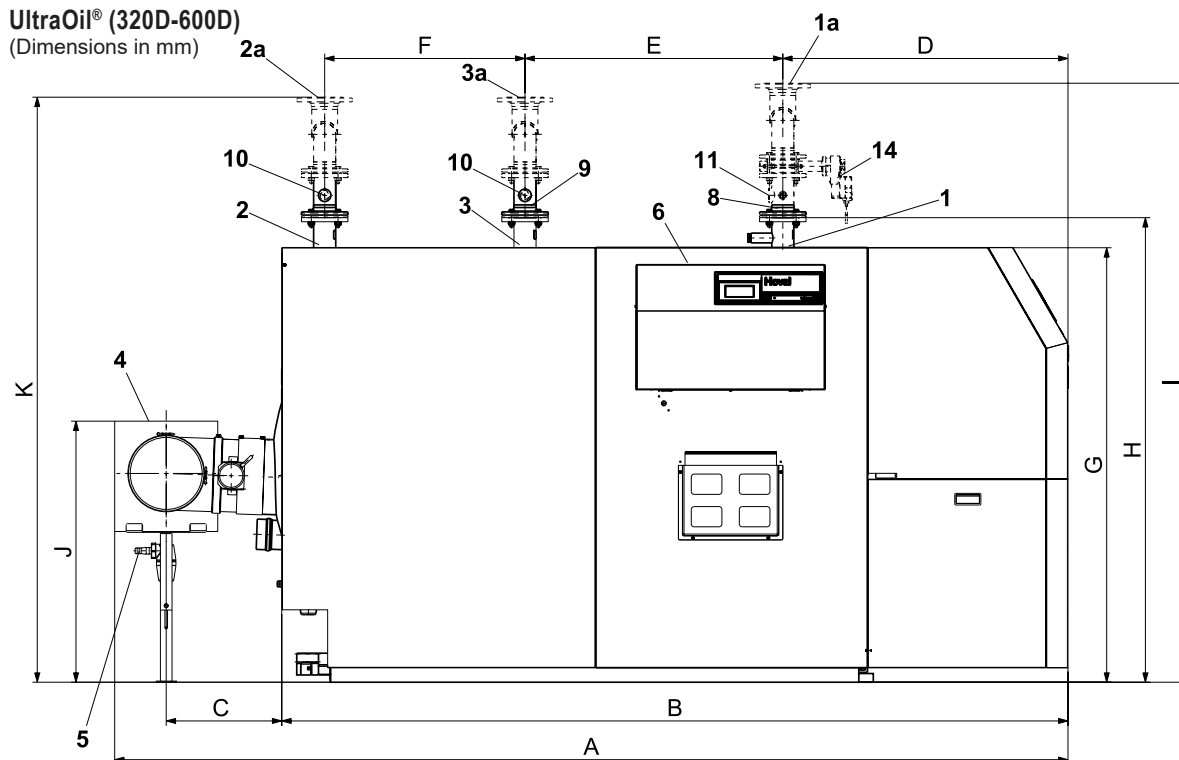
Type		(320D)	(400D)	(500D)	(600D)
• Nominal output 80/60 °C		304	380	476	572
• Nominal output 40/30 °C		320	400	500	600
• Range of output 80/60 °C	kW	114 - 304	147 - 380	180 - 476	215 - 572
• Range of output 40/30 °C	kW	119 - 320	155 - 400	189 - 500	227 - 600
• Heat input	kW	115.0 - 309.0	150.0 - 388.0	182.0 - 482.0	218.0 - 580.0
• Dimensions		Space requirements			
• Boiler working temperature max.	°C	90	90	90	90
• Boiler working temperature min.	°C		no min. limit		
• Return flow temperature min.	°C		no min. limit		
• Flue gas temperature min. at the boiler	°C		no min. limit		
• Safety temperature limiter setting (water side)	°C	110	110	110	110
• Working / test pressure	bar	5.0/7.5	5.0/7.5	5.0/7.5	5.0/7.5
• Boiler efficiency at 80/60 °C in full-load operation (net calorific value NCV / gross calorific value GCV)		98.7/93.1	98.2/92.6	99.0/93.4	98.6/93.0
• Boiler efficiency at 40/30 °C in full-load operation (net calorific value NCV / gross calorific value GCV)		103.9/98.0	103.4/97.5	104.1/98.2	103.9/98.0
• Boiler efficiency at 30 % partial load (EN 303) (net calorific value NCV / gross calorific value GCV)		104.5/98.6	104.0/98.1	104.9/99.0	104.6/98.7
• Stand-by deficiency qB at 70 °C	Watt	1000	1040	1200	1200
• Combustion gas resistance. 12.5 % CO <sub>2</sub> . 500 m above sea level (Tolerance +/- 20 %)	mbar	0.45	0.67	0.49	0.61
• Flow resistance boiler <sup>1</sup>	z value	0.1	0.1	0.1	0.1
• Water resistance (per boiler) at 10 K	mbar	75.2	117.6	183.7	264.5
• Water resistance (per boiler) at 20 K	mbar	18.8	29.4	45.9	66.1
• Water flow volume (per boiler) at 10 K	m³/h	27.4	34.3	42.9	51.4
• Water flow volume (per boiler) at 20 K	m³/h	13.7	17.1	21.4	25.7
• Boiler water capacity	litres	680	720	590	590
• Gas volume (per boiler)	m³	0.347	0.290	0.440	0.440
• Insulation thickness boiler body	mm	80	80	80	80
• Weight (incl. casing, burner)	kg	840	900	1268	1268
• Weight of transport	kg	740	780	1068	1068
• Electrical power consumption (during operation) min./max.	Watt	233/740	260/1100	289/1660	315/1660
• Standby	Watt	6	6	6	6
• Acoustic power level incl. sound absorber hood					
Ambient air dependent					
- Heating noise (EN 15036 part 1) <sup>2</sup>	dB(A)	72	73	79	78
Ambient air dependent					
- Exhaust noise in the pipe (EN 15036 part 2) <sup>2</sup>	dB(A)	90	90	89	88
- Exhaust noise is radiated from the mouth (DIN 45635 part 47)	dB(A)	-	-	-	-
• Condensate rate (heating oil EL) at 40/30 °C	l/h	21.6	27.0	20.2	20.2
• pH-value of the condensate	ca.	3.2	3.2	3.2	3.2
• Flue gas system					
Temperature class		T120	T120	T120	T120
Flue gas mass flow at nominal output 12.5 % CO <sub>2</sub> heating oil EL	kg/h	504.0	730.0	784.0	945.0
Flue gas temperature at nominal output 80/60 °C	°C	75	80	67	70
Maximum supply pressure for supply air and flue gas line	Pa	40	25	25	25
Maximum draught/underpressure at flue gas outlet	Pa	-20	-20	-20	-20
• Combustion chamber dimensions Ø inside x length	mm	Ø524 x 800	Ø524 x 1000	Ø624 x 1100	Ø624 x 1100
• Combustion chamber volume	m³	0.173	0.216	0.336	0.336

<sup>1</sup> Flow resistance boiler in mbar = Volume flow (m³/h)² x z factor

<sup>2</sup> Acoustic values with nominal output of both boilers

## ■ Dimensions

### UltraOil® (320D-600D) (Dimensions in mm)



- 1 Flow/safety flow
- 1a Flow connection set (option)
- 2 Low-temperature return
- 2a Low-temperature return connection set (option)
- 3 High-temperature return
- 3a High-temperature return connection set (option)
- 4 Flue gas outlet (320D,400D)
- 4 Flue gas outlet (500D,600D)
- 5 Condensate drain/siphon
- 6 Control panel
- 7 Electrical connection on the left or right hand side
- 8 Fitting pipe flow (option)
- 9 Fitting pipe return (option)
- 10 Expansion
- 11 Safety valve connection
- 12 Maximum pressure limiter
- 13 Safety temperature limiter
- 14 Motor shut-off flap valve

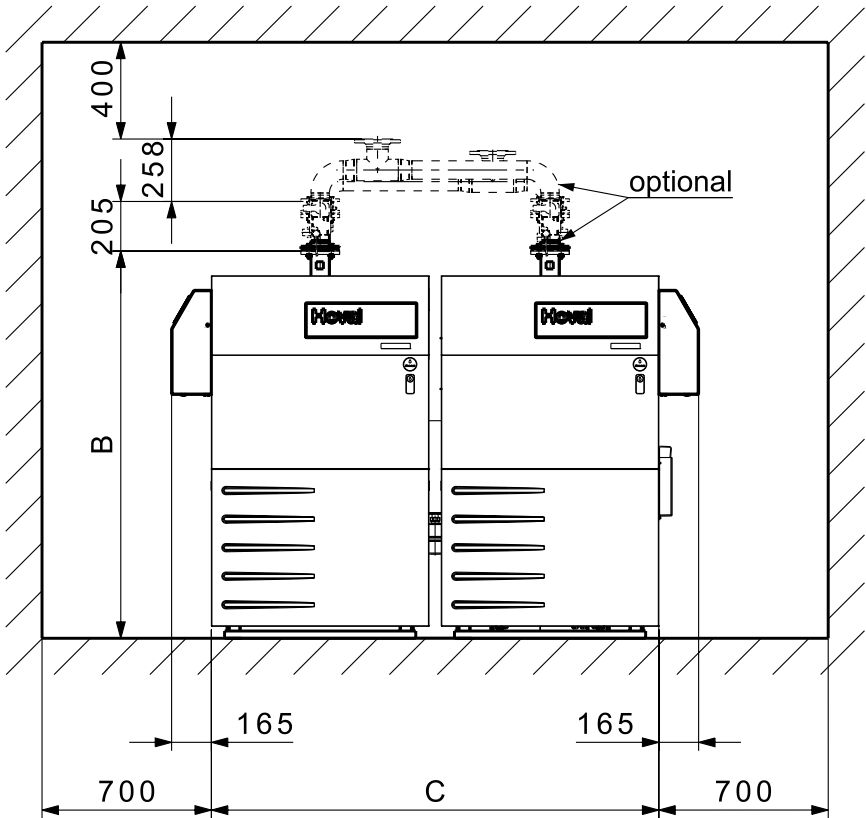
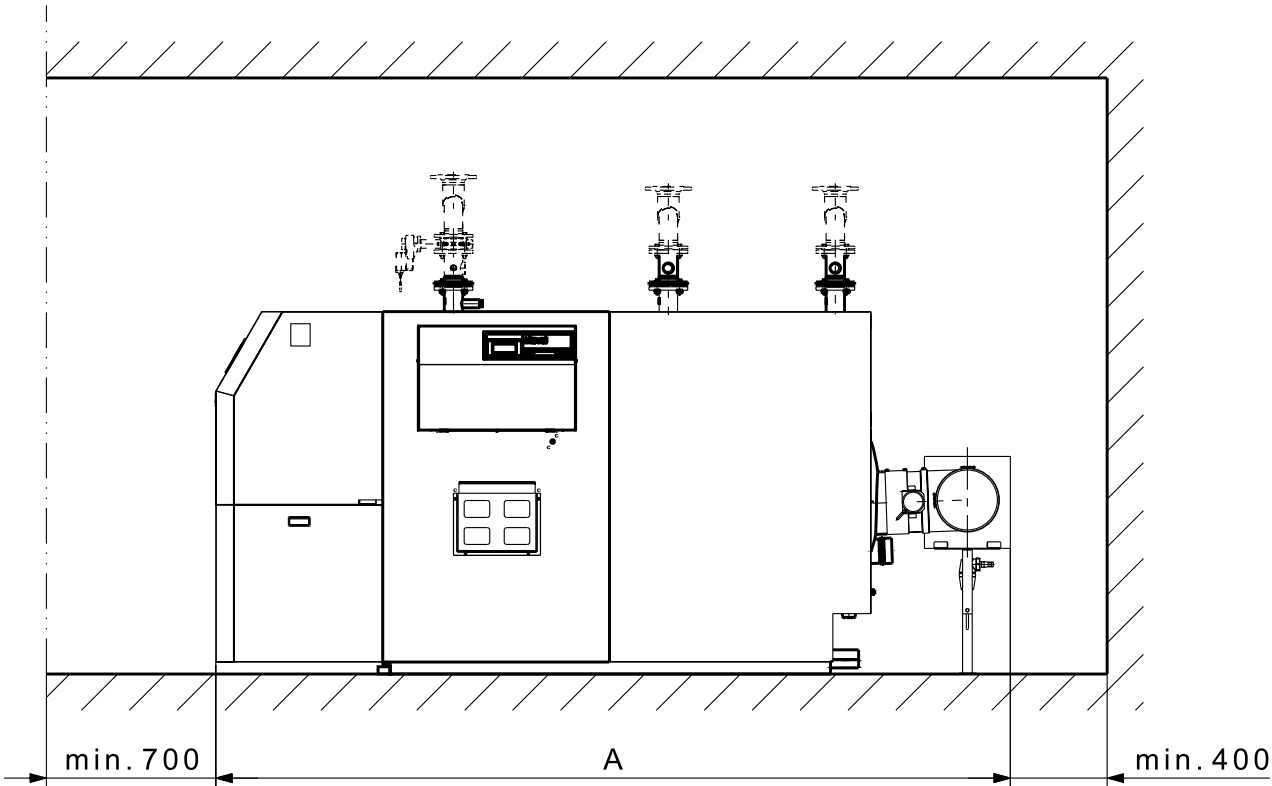
DN 65/PN 6  
DN 80/PN 6  
DN 65/PN 6  
DN 80/PN 6  
DN 65/PN 6  
DN 80/PN 6  
Ø305/315  
Ø350/352  
DN 25

Rp 1"  
Rp 1 1/4"  
Rp 3/4"  
Rp 1/2"

UltraOil® type	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
(320D)	2709	2200	252	770	610	680	1412	1492	1955	889	1907	844	106	1794	1009	2123	709	950	1305
(400D)	2901	2408	236	767	800	690	1412	1492	1955	889	1907	844	106	1794	1009	2123	709	950	1305
(500D, 600D)	3284	2708	398	982	888	690	1483	1600	2063	899	2015	899	51	1849	1064	2278	719	950	1449

■ Dimensions  
Space requirements

UltraOil® (320D-600D)  
(Dimensions in mm)



UltraOil® type	A	B	C
(320D)	2709	1492	1794
(400D)	2901	1492	1794
(500D, 600D)	3284	1600	1849

**Detailed dimensions and dimensions for installation**  
see single boiler UltraOil® (160-300)

**Dimensions neutralisation unit**  
see single boiler UltraOil® (160-300)



## ■ Engineering

### Standards and guidelines

The following standard and guidelines must be respected:

- technical information and installation manual of Hoval
- hydraulic and technical control regulations of Hoval
- local building law
- fire protection standard
- 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.**
- 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. underfloor 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.
- On existing systems (for example if the boiler is replaced), where the quality of the existing heating water meets the requirements of VDI 2035, re-filling of the system is not recommended. The requirements of VDI 2035 also apply to replacement water.
- New and if applicable existing installations need to be adequately cleaned and flushed before being filled. The boiler may only be filled after the heating system has been flushed!

- Parts of the boiler/calorifier which have contact with water are made of ferrous materials and stainless steel.
- On account of the danger of stress cracking corrosion in the stainless steel section of the boiler the chloride, nitrate and sulphate contents of the heating water must not exceed 50 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:

- As a rule, untreated domestic water is best suited as filling and replacement water for a system with Hoval boilers. However, the quality of the untreated mains water must still meet the requirements of VDI 2035 or be demineralised and/or treated with inhibitors. The requirements of EN 14868 must be met in this context.
- To maintain high boiler efficiency and prevent overheating of the heating surfaces, the values in Table 1 should not be exceeded, taking into consideration the boiler output (smallest individual boiler in multi-boiler plants) and the water content.
- The total quantity of filling and replacement water added to the boiler over its service life must not be higher than three times the system water content.

#### Frost protection agent

The planning sheet "Use of antifreeze" is available from your Hoval contact person.

#### Combustion air

The combustion air supply must be guaranteed. Ensure that the air intake can not be closed or blocked. It is very important to ensure that the combustion air is free from halogen compounds. These are present, for example, in spray cans, varnishes, glues, solvents and cleansing agents.

#### Ambient air dependent operation:

- Minimum free cross-section for the air opening can be assumed as follows by way of simplification. Nominal heat output is the determining factor!
- A minimum free cross-section of once 150 cm<sup>2</sup> or twice 75 cm<sup>2</sup> and an additional 2 cm<sup>2</sup> for each kW boiler capacity in excess of 50 kW is required for the air opening into the outside air.

#### Oil burner mounting

- The standard burner plug connection must be positioned in the opposite direction to the swivelling direction of the boiler door.
- The space between the combustion pipe and the boiler door must be filled with the insulation material supplied.

#### Electric connection of the burner

- Mains connection 1 x 230 V, 50 Hz, 10 A
- The burner must be connected to the standard plug connection of the boiler.
- The burner cable must be shortened so that the plug-in connection has to be parted to swing out the burner.

#### Sound absorption

Sound absorption is possible through the following steps:

- Make boiler room walls, ceiling and floor as thick as possible, install a silencer in the intake air opening, provide carriers and brackets for the pipes with noise insulation.
- If there are living areas above or below the boiler room, install rubber vibration dampers under the base rails of the boiler.
- Connect circulating pumps to the piping network using expansion joints.
- To dampen the flame noise in the chimney, silencers can be installed in the connection tube (possibly leave space for later installation).

**Table 1:** Maximum filling quantity without/with demineralisation

	Total hardness of the filling water up to ...							
[mol/m <sup>3</sup> ] 1	<0,1	0.5	1	1.5	2	2,5	3	>3
°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 2	<20	100.0	200.0	300.0	400.0	500.0	600.0	>600
<b>Size of single boiler</b>	<b>maximum filling quantity without demineralisation</b>							
50 to 200 kW	NO REQUIREMENT	50 l/kW	20 l/kW	20 l/kW	always demineralise			
200 to 300 kW		50 l/kW	50 l/kW	20 l/kW				

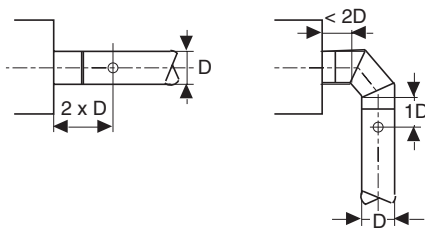
<sup>1</sup> Sum of alkaline earths

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

## ■ Engineering

### Flue gas system

- The flue gas system must be made by an examined and certified flue gas line.
- The flue gas line must be certified gas-tight, humidity-insensitively, corrosion and acid-proof as well as for flue gas temperatures up to 120 °C.
- The flue gas system must be suitable for the operation with over-pressure.
- The flue gas lines must be secured against unwanted loosening of the plug connections.
- The flue gas line is to be laid with upward gradient, so that the resulting condensate of the flue gas system flows back into the boiler so that before deriving into drains it can be neutralised.
- When using flue gas lines made of plastic a flue gas safety temperature limiter must be inserted (included in the boiler scope of delivery).
- In the connection pipe has to be integrated a closable flue gas measurement nozzle with circular inner diameter of 10-21 mm. The socket has to be led over the thermal insulation.



### Flue gas pipe dimensions

#### Table with bases for calculation

- Calculation based on max. 1000 m above sea level.

- The first 2 m of the flue gas line must be configured with the same dimension as the flue gas connector, after which the size of the flue gas system can be selected according to the table below.

#### Connecting pipes

Horizontal connecting pipes must be installed with an inclination of at least 50 mm per metre of their length installed in the direction of the boiler to allow free return of condensation water towards the boiler. The whole flue gas system must be installed so that condensate can never collect at any point.

Type	Boiler Flue gas dim.	Smooth-walled flue gas line Designation DN	90° bends <sup>1)</sup> (flue gas + supply air) Total pipe length in m (flue gas + supply air)		
			1	2	3
UltraOil®	int.				
(320D)	305	300	50	50	50
(400D)	305	300	50	50	50
(500D)	350	350	50	50	50
(600D)	350	350	50	50	50

<sup>1</sup> Two 45° bends should be used instead of a 90° bend

Notice: The data contained in the table "flue gas line dimensions" represents guide values. An exact calculation for the flue gas line must be made on site.

With total pipe lengths exceeding 50 m, a separate calculation is necessary.

## Engineering

### Sound power

The sound power level is independent of local and spatial influences.

The sound **pressure** level depends on installation conditions and can, for example, be 10 to 15 dB(A) lower than the sound **power** level at a distance of 1 m.

#### Recommendation:

If the air inlet at the facade is near a noise sensitive place (window of bedroom, terrace etc.), we recommend to use a sound absorber at the direct combustion air inlet.

### Condensate drain

- A permit for discharge of the flue gas condensate into the sewage system must be obtained from the relevant authority.
- The condensate from the flue gas system can be discharged via the boiler. A condensate trap is no longer needed in the flue gas duct system.
- A siphon must be installed on the condensate drain of the oil-fired condensing boiler (included in the boiler scope of delivery).
- Suitable materials for condensate drain:
  - Stoneware pipes
  - Pipes made from PVC
  - Pipes made from polyethylene (PE)
  - Pipes made from ABS or ASA
- The commercial system operator must inform the sewer operator if the exhaust gas condensate is discharged into the sewer system.

### Installation instructions

Please observe the installation instructions supplied with every boiler.

### Heating system renovation notice

If an existing oil heating installation is replaced by Hoval UltraOil®, the following instructions regarding the oil tank and its refilling must be observed:

- The Hoval UltraOil® is only allowed to be operated with heating oil EL low-sulphur with sulphur content < 50 ppm (< 0.005 %).
- It is recommended to clean the oil tank before refilling it.
- A residual amount of heating oil EL in the oil tank may be mixed with heating oil EL low-sulphur, provided that the residual amount does not exceed the following values of the total content.

- Residual quantity of heating oil EL (sulphur content: 2000 ppm or 0.2 %) max. 3 % of tank volume  
Residual amount heating oil EL (sulphur content: 1000 ppm or 0.1 %) max. 5 % of tank volume  
Residual amount eco heating oil EL (sulphur content: 500 ppm or 0.05 %) max. 10 % of tank volume
- In order to reach the permissible mixture ratio with heating oil EL low-sulphur taking account of the residual amount of heating oil in the oil tank, a 100 % tank filling is necessary.

### Oil line installation

- The Hoval UltraOil® is only allowed to be connected to 1-section oil lines. Max. suction height without intermediate pump 3.5 m, maximum line length 30 m.
- The lines must be positioned so that the boiler door can still be fully opened.
- A shut-off element must be installed before the flexible oil lines at the end of the rigid oil line (already installed in the "Oventrop filter").
- A single line fine filter with return feed must be installed before the burner (e.g. "Oventrop" type).
- The highest point on the oil line is allowed to be max. 3.5 m above the tank suction line.
- Product pipelines must be installed in such a way that no liquid can emerge independently (rise) from the container.
- If the highest point of the oil level in the oil tank is higher than the lowest point in the removal line, it is necessary to install a solenoid valve at the highest point in the oil line as close as possible to the oil tank.
- In the case of plants with several oil-fired boilers, the oil supply to the boilers must be ensured in all operating states, e.g. provide an independent connection line to the oil tank for each boiler.

### One pipe oil lines

Line diameter Ø inside 6 mm, max. permissible line length in m

Suction height H in m	UltraOil®					
	(110)	(130)	(160)	(200)	(250)	(300)
0	30	30	30	26	21	17
1	30	30	26	20	15	12
2	28	25	18	14	10	8

This line sizing table provides indicative values for:

Low-sulphur heating oil EL or low-sulphur mixed heating oil EL with max. 10 % FAME (bio heating oil) content, oil temperature > 10 °C (indoor tank) up to 700 m above sea level, 1 filter, 1 valve, 6 elbows 90° (40 mbar).

### Pipe systems that are oversized can lead to operational disturbance!

For this reason, in case of boiler exchange the pipe dimensioning table must be observed!

### Expansion tank/expansion

- Ideally, the pressure expansion tank should be connected to the heating system as described in our example applications, with a removable or sealable actuation device. This means that it is not necessary to drain the entire system in order to carry out work.

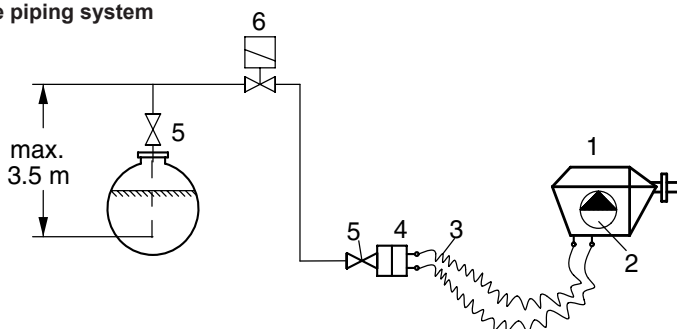
### Safety valve

- A safety valve and an automatic air vent must be installed in the safety flow.

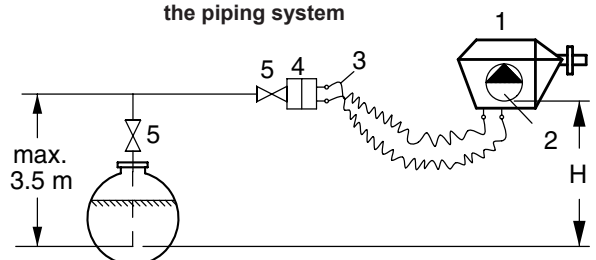
### Plants with one return

- In plants with one return, the return must always be connected to the low-temperature return of the boiler. An air vent must be fitted on the high-temperature return.

### Max. oil level higher than the lowest point of the piping system



### Max. oil level lower than the lowest point of the piping system



- Hoval-burner for 1-line connection with return flow
- Oil pump

- Oil hoses on the burner
- Fine filter with return feed with nickel strainer insert 100-150 µm

- Shut-off valve
  - Solenoid valve
- H = Suction height [m]

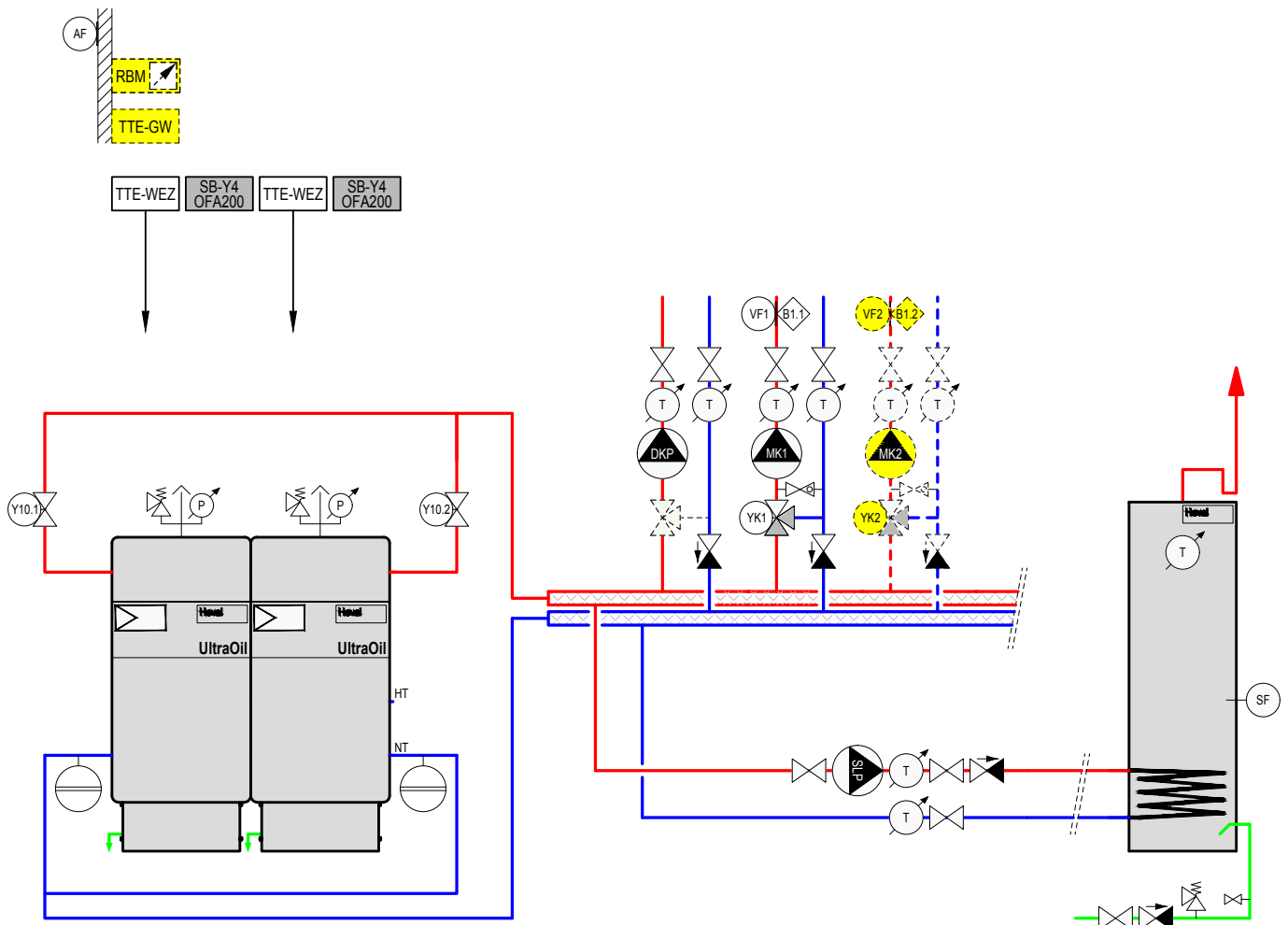
## ■ Examples

### UltraOil® (320D-600D)

Oil condensing boiler with

- calorifier
- 2 mixer circuits
- option GLT (0-10V module)

Hydraulic schematic KAE010



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
SB-Y4 OFA200	System module Y4
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
SF	Calorifier sensor
Y10.1	Shut-off device 1 or zone valve (single-wire control)
Y10.2	Shut-off device 2 or zone valve (single-wire control)
SLP	Calorifier charging pump
DKP	Pump for heating circuit without mixer

<i>Option</i>	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-GLT	GLT module 0-10 V
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)



## ■ 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 2014/68/CE
- Boiler completely welded
- For LowNOx burner with intern flue gas recirculation
- 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*

- Boiler control panel with boiler control and heating control in various versions
  - Boiler control
    - with TopTronic® E control
    - with thermostat T 2.2
    - with thermostat T 0.2
- 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, thermal 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)	480-1350
(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

#### **Pressure Equipment Directive 2014/68/CE**

## Description

### Boiler controller with TopTronic® E/E13.4 control

- Maximum operating temperature 90 °C

#### TopTronic® E controller

##### Control panel

- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

#### TopTronic® E control module

- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

#### TopTronic® E basic module heat generator (TTE-WEZ)

- Control functions integrated for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
  - bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set

The supplementary plug set must be ordered in order to use expanded controller functions.

#### Options for TopTronic® E controller

- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting or
  - module expansion universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

#### Number of modules that can be additionally installed in the electrical box:

- 1 module expansion and 2 controller modules **or**
- 1 controller module and 2 module expansions **or**
- 3 controller modules

#### Notice

Max. 1 module expansion can be connected to the basic module heat generator (TTE-WEZ)!

### Further information about the TopTronic® E see "Controls"

#### Oil automatic function device OFA

- Control function integrated for
  - flue gas sensor for safety shut-off
  - 0-10V output for connecting a modulating main pump (incl. delta T-control with low consumption)
  - Standard plug connection for 2-stage burner 1x 230 V
  - Variable input for plant-specific functions (heat generator block, return sensor, info sensor etc.)
  - Variable output for plant-specific functions (thermostat function, operating message, etc.)

#### Delivery

- Boiler control panel separately delivered

#### On site

- Mounting of the control panel at the boiler left or right side

### Boiler controller with TopTronic® E/E13.5 control

- Maximum operating temperature 105 °C

- Configuration as TopTronic® E/E13.4 but:
- safety temperature limiter 120 °C

#### Delivery

- Boiler controller separately delivered

#### On site

- Mounting of the control panel at the boiler left or right side

### 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 left or right side

### 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 left or right side

## ■ Part No.


**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, thermal insulation and casing delivered separately packed.

Max-3 Type	Output kW	Working pressure bar	
(420)	200-500	6	7013 765
(530)	220-610	6	7013 766
(620)	240-720	6	7013 773
(750)	280-870	6	7013 774
(1000)	350-1150	6	7013 781
(1250)	480-1350	6	7013 782
(1500)	650-1750	6	7013 536
(1800)	750-2150	6	7013 537
(2200)	920-2500	6	7013 538
(2700)	1030-3000	6	7013 620


**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 thermostat

Part No.



Control panel T 2.2

- Operating temperature max. 90 °C
- For systems without TopTronic® E controller.
- 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
- For mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order.

6015 017

6015 477

6015 478



Control panel T 0.2

- Operating temperature max. 105 °C
- For external switching command
- For systems without TopTronic® E controller.
- 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
- For mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order.

6015 016

6015 475

6015 476

Accessories to control panel  
with thermostat

Flue gas thermometer  
4 m, capillary tube

241 149

## ■ Part No.


**Boiler controller  
with TopTronic® E control**
**Part No.**
**Boiler controller TopTronic® E/E13.4**

6040 236

for mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order. Maximum operating temperature 90 °C

Control functions integrated for

- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- bivalent and cascade management
- Can be optionally expanded 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
- oil automatic function device OFA-200
- safety temperature limiter
- burner cable cpl. 2-stage, L = 5.0 m
- 1x outdoor sensor AF/2P/K
- immersion sensor TF/2P/5/6T/S1, L = 5.0 m with plug
- contact sensor ALF/2P/4/T/S1, L = 4.0 m with plug

**Notice**

The electrical connection for each external burner must be clarified separately.


**Boiler controller TopTronic® E/E13.5**

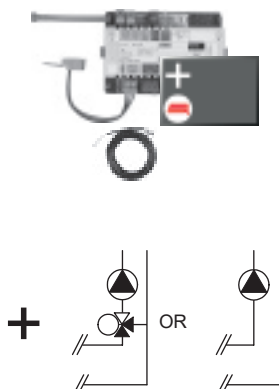
6040 237

for mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order. Maximum operating temperature 105 °C Configuration as boiler controller TopTronic® E/E13.4

**Notice**

The electrical connection for each external burner must be clarified separately.

## ■ Part No.


**TopTronic® E module expansions**  
for TopTronic® E basic module heat generator

**Part No.**
**TopTronic® E module expansion heating circuit TTE-FE HK**

6034 576

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

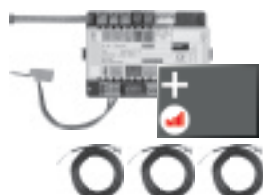
- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories  
1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Notice**

The supplementary plug set may have to be ordered to implement functions differing from the standard!


**TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ**

6037 062

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating/cooling circuit w/o mixer or
  - 1 heating/cooling circuit with mixer
- in each case incl. energy balancing

incl. fitting accessories  
3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
Boiler control, wall housing, control panel

**Notice**

Suitable flow rate sensors (pulse sensors) must be provided on site.


**TopTronic® E module expansion Universal TTE-FE UNI**

6034 575

Expansion to the inputs and outputs of a controller module (basic module heat generator, heating circuit/domestic hot water module, solar module, buffer module) for implementing various functions

incl. fitting accessories

Can be installed in:  
Boiler control, wall housing, control panel

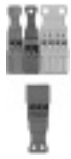
**Further information**

see "Controls" - "Hoval TopTronic® E module expansions" chapter

**Notice**

Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

## ■ Part No.

**HovalConnect available from summer 2019**

Up to that point, TopTronic® E online is delivered.

**Accessories for TopTronic® E****Part No.****Supplementary plug set**

for basic module heat generator (TTE-WEZ)  
for controller modules and module expansion TTE-FE  
HK

6034 499

6034 503

**TopTronic® E controller modules**

TTE-HK/WW TopTronic® E heating circuit/  
hot water module

6034 571

TTE-SOL TopTronic® E solar module

6037 058

TTE-PS TopTronic® E buffer module

6037 057

TTE-MWA TopTronic® E measuring module

6034 574

**TopTronic® E room control modules**

TTE-RBM TopTronic® E room control modules

easy white

6037 071

comfort white

6037 069

comfort black

6037 070

**Enhanced language package TopTronic® E**

6039 253

one SD card required per control module

Consisting of the following languages:

HU, CS, SL, RO, PL, TR, ES, HR,

SR, JA, DA

**HovalConnect**

HovalConnect domestic starter LAN

6049 496

HovalConnect domestic starter WLAN

6049 498

HovalConnect commercial starter LAN

6049 495

HovalConnect commercial starter WLAN

6049 497

SMS remote control unit

6018 867

System component SMS remote control unit

6022 797

**TopTronic® E interface modules**

GLT module 0-10 V

6034 578

HovalConnect domestic starter Modbus

6049 501

HovalConnect domestic starter KNX

6049 593

HovalConnect commercial starter Modbus

6049 500

HovalConnect commercial starter KNX

6049 502

**TopTronic® E wall casing**

WG-190 Wall casing small

6035 563

WG-360 Wall casing medium

6035 564

WG-360 BM Wall casing medium with  
control module cut-out

6035 565

WG-510 Wall casing large

6035 566

WG-510 BM Wall casing large with  
control module cut-out

6038 533

**TopTronic® E sensors**

AF/2P/K Outdoor sensor

2055 889

TF/2P/5/6T Immersion sensor, L = 5.0 m

2055 888

ALF/2P/4/T Contact sensor, L = 4.0 m

2056 775

TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m

2056 776

**System housing**

System housing 182 mm

6038 551

System housing 254 mm

6038 552

Bivalent switch

2061 826

**Further information**  
see "Controls"

■ Part No.



Accessories

Part No.

**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	1350
• Range of output (natural gas: variant 2)	kW	200-500	220-610	240-720	280-870	350-1150	480-1350
• Range of output (diesel oil, variant 1 and natural gas, variant 1)	kW	320-500	350-610	450-720	520-870	680-1150	850-1350
• Burner input max.	kW	539	662	781	944	1247	1459
• Boiler working temperature max. <sup>1</sup>	°C	90	90	90	90	90	90
• Boiler working temperature min.	°C	see table operating conditions (below)					
• Return flow temperature min.	°C	see table operating conditions (below)					
• Flue gas temperature min. at the 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 80/60 °C in full-load operation (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	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 30 % partial load (EN 303) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	95.2/89.8	95.3/89.9	94.9/89.5	95.2/89.8	95.3/89.9	95.2/89.8
• Nominal efficiency at 75/60 °C (DIN 4702-8) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	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 %)	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	m <sup>3</sup> /h	42.8	52.2	61.7	74.5	98.5	115.7
• Water flow volume at 20 K	m <sup>3</sup> /h	21.4	26.1	30.8	37.2	49.2	57.9
• Boiler water content	litres	552	520	969	938	1528	1478
• Boiler gas volume	m <sup>3</sup>	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	m <sup>3</sup>	0.466	0.466	0.669	0.669	1.047	1.047
• Dimensions		see Dimensions					
• Draught/underpressure at flue gas outlet max.	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> Limited by the boiler controller E13.4 TopTronic® E and T 2.2 to 90 °C or by E13.5 TopTronic® E and T 0.2 to 105 °C.

<sup>3</sup> Max. safety temperature for boiler controller E13.4 TopTronic® E and T 2.2: 110 °C or E13.5 TopTronic® E and T 0.2: 120 °C.

### Possible operating conditions:

Fuel		Diesel oil		Natural gas H, low-sulphur diesel oil		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 max.	kW	1894	2324	2702	3243
• Boiler working temperature max. <sup>1</sup>	°C	90	90	90	90
• Boiler working temperature min.	°C		see table operating conditions (below)		
• Return flow temperature min.	°C		see table operating conditions (below)		
• Flue gas temperature min. at the 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 80/60 °C in full-load operation (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	92.4/87.2	92.5/87.3	92.5/87.3	92.5/87.3
• Boiler efficiency at 30 % partial load (EN 303) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	95.2/89.8	95.3/89.2	95.2/89.2	95.2/89.2
• Nominal efficiency at 75/60 °C (DIN 4702-8) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	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			
• Draught/underpressure at flue gas outlet max.	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> Limited by the boiler controller E13.4 TopTronic® E and T 2.2 to 90 °C or by E13.5 TopTronic® E and T 0.2 to 105 °C.

<sup>3</sup> Max. safety temperature for boiler controller E13.4 TopTronic® E and T 2.2: 110 °C or E13.5 TopTronic® E and T 0.2: 120 °C.

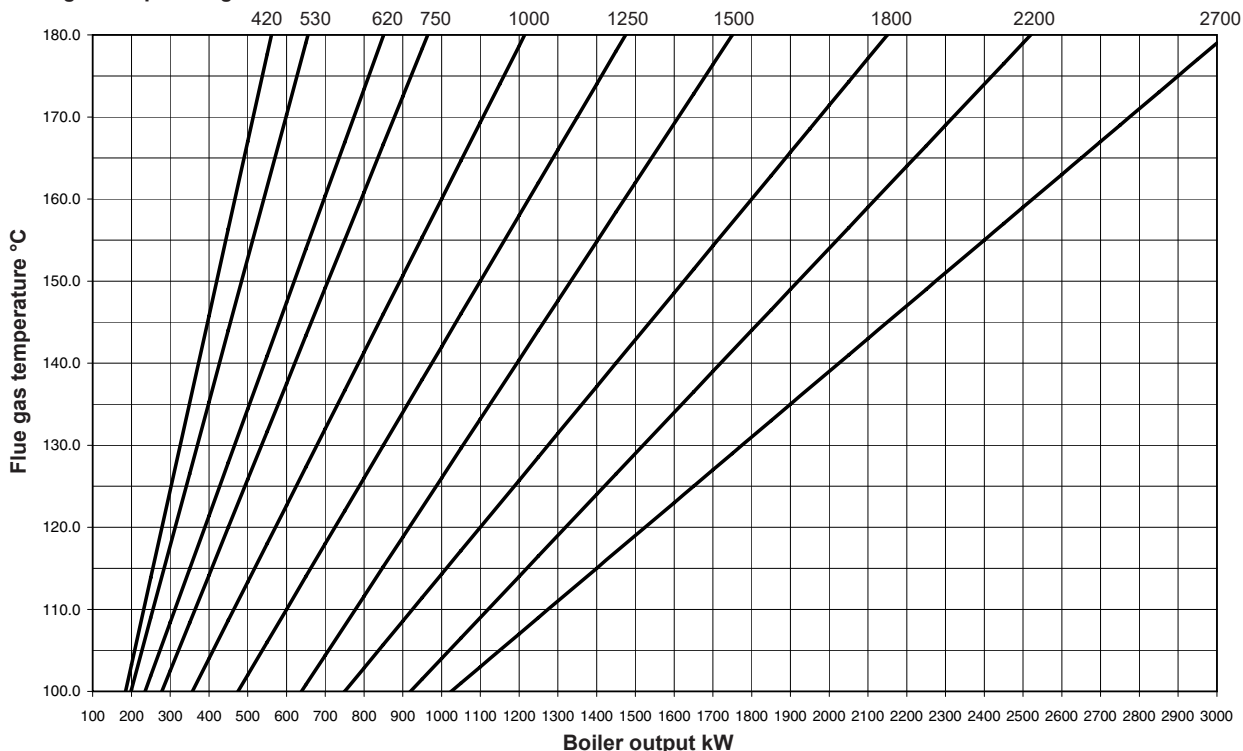
### Possible operating conditions:

Fuel		Diesel oil		Natural gas H, low-sulphur diesel oil		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



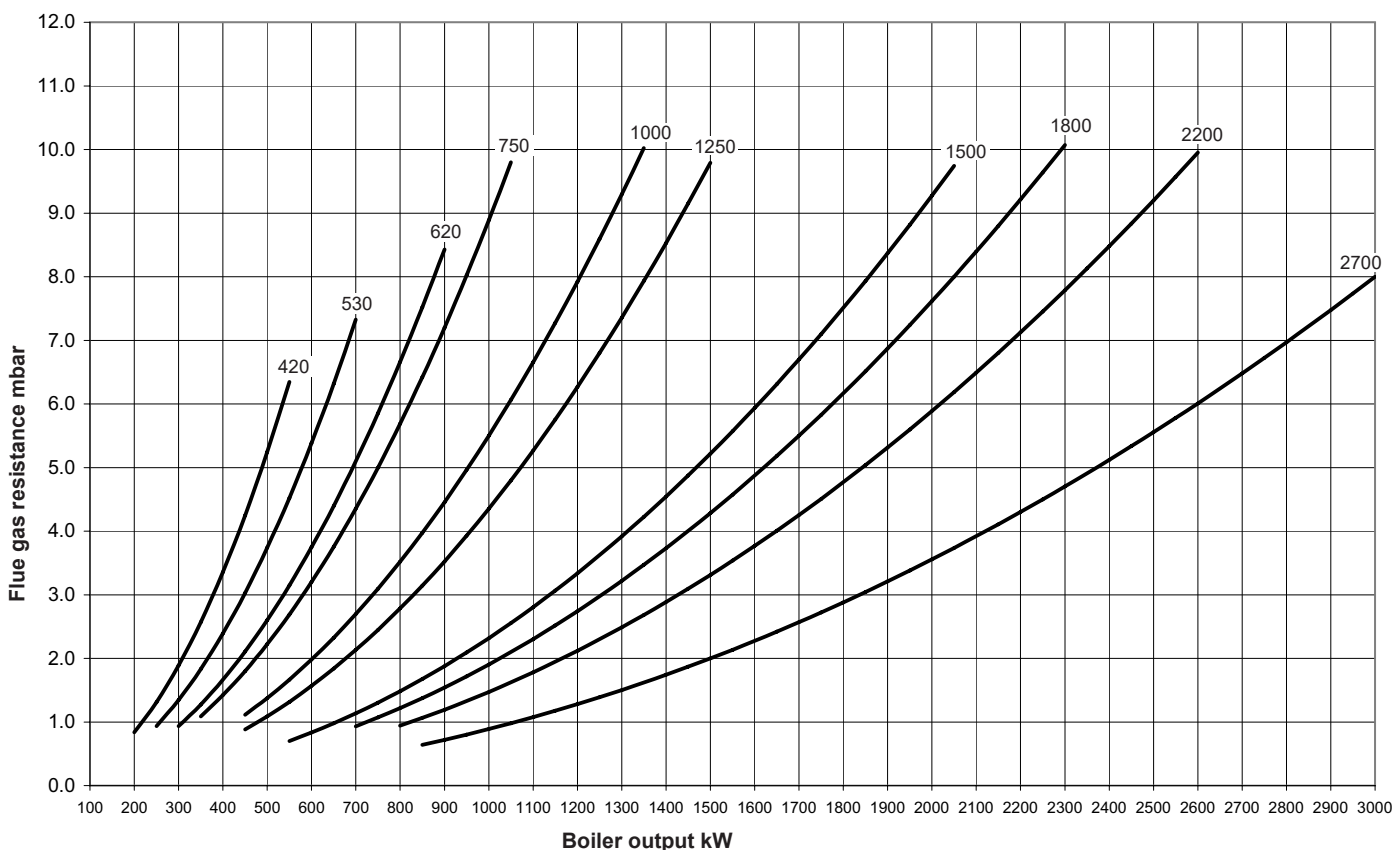
kW = Boiler output

°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 %)

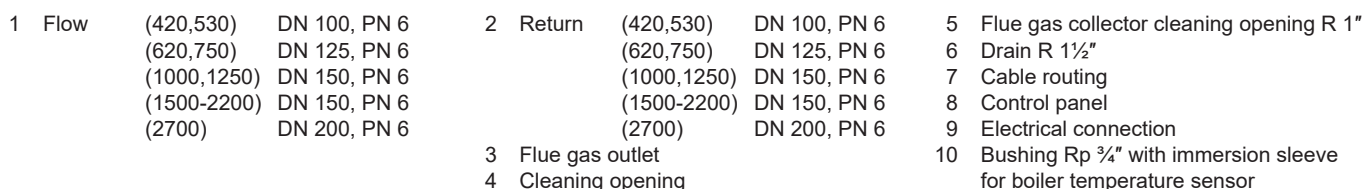
- A reduction of the boiler water temperature to -10 K causes a reduction of the flue gas temperature of approx. 6-8 K.  
- A modification of the CO<sub>2</sub> concentration of +/- 1 % causes a modification of the flue gas temperature of approx. +/- 8 K.

#### Flue gas resistor





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



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	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

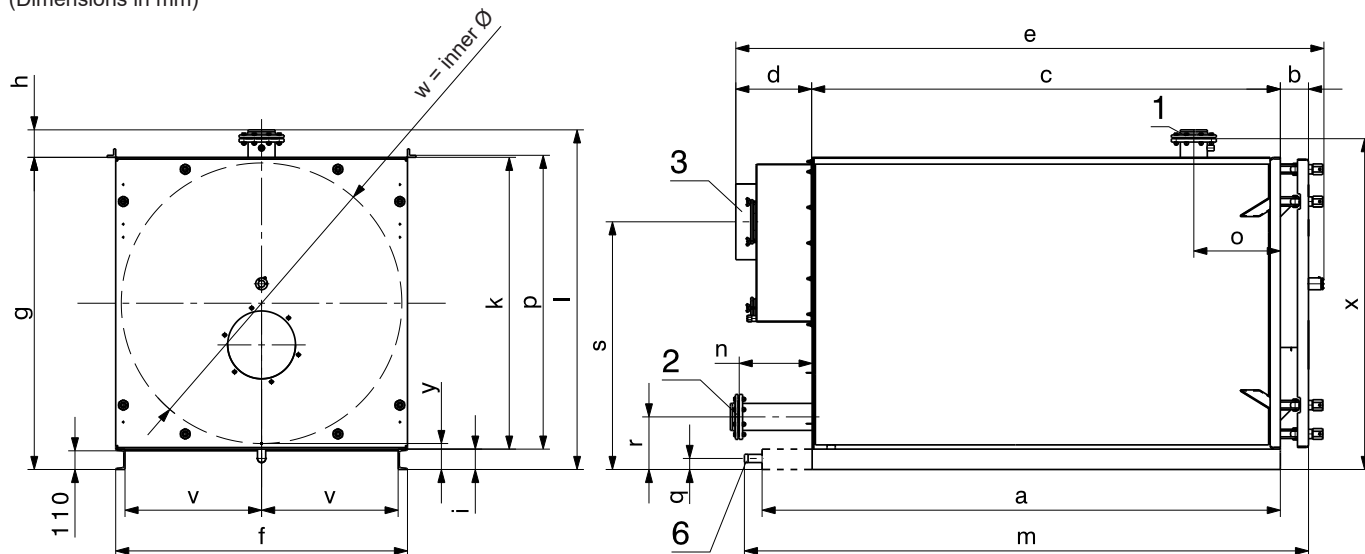
## ■ Dimensions

### Base size

### Dimensions without insulation and casing

Boiler incl. flange, outlet without flue gas collector.

(Dimensions in mm)



- 1 Flow 3 Flue gas outlet  
2 Return 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

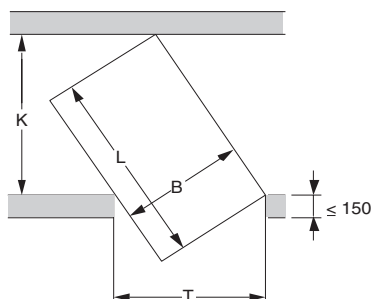
### Required min. width of door and corridor to bring in the boiler

The stated measurements are minimal dimensions

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

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

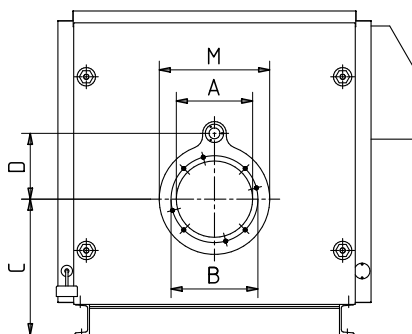
- T Door width  
K Corridor width  
B Boiler width  
L Max. boiler length



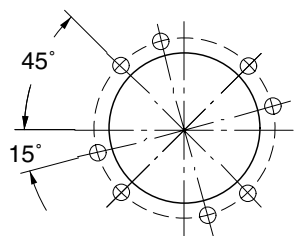
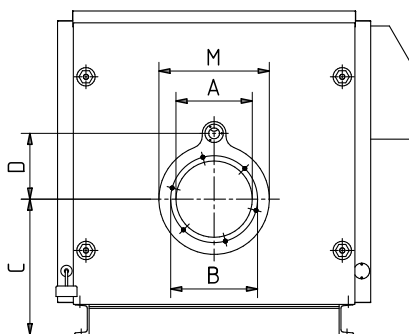
## ■ Dimensions

Furnace dimensions

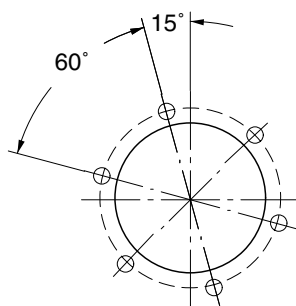
Max-3 (420,530)



Max-3 (620-2700)

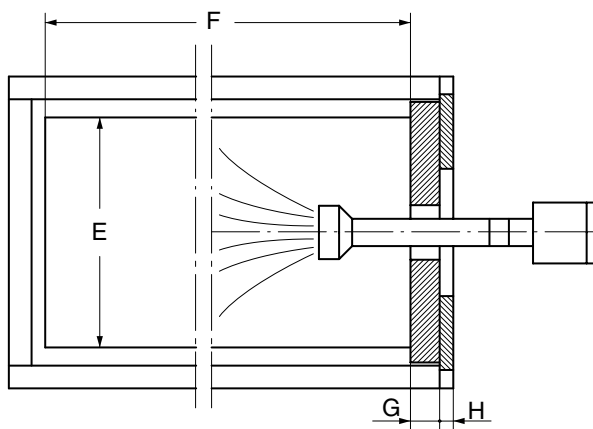


**Screw joint flange**  
Max-3 (420, 530)  
4 x M12 (45°)  
4 x M12 (15°)



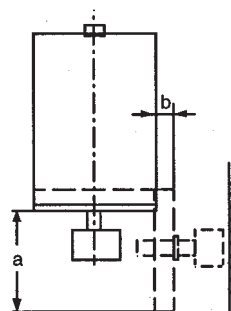
**Screw joint flange**  
Max-3 (620, 750)  
6 x M12 (15°)

**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	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 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
- 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.
- 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. underfloor 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 recommended 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 domestic water is generally best suited as filling and replacement water. However, the quality of the untreated domestic 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.

### Combustion air supply

The combustion air supply must be warranted. The air opening must not be lockable. It is very important to ensure that the combustion air is free from halogen compounds. These are present, for example, in spray cans, varnishes, glues, solvents and cleansing agents.

#### Room air dependent operation:

- Minimum free cross-section for the air opening can be assumed as follows by way of simplification. Nominal heat output is the determining factor!
- A minimum free cross-section of once 150 cm<sup>2</sup> or twice 75 cm<sup>2</sup> and an additional 2 cm<sup>2</sup> for each kW boiler capacity in excess of 50 kW is required for the air opening into the outside air.

### 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.
- Circulating 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).

### Measures for sound reduction

Make sure right from the planning phase that bedrooms are not situated in the immediate vicinity of the sound source (heating room, chimney).

A reduction of the radiated burner air sound level in the heating room (reduction of the burner noises) of up to approx. 12 dB can be achieved encapsulating the burner (sound absorbing hood).

A significant part of the noise development in the combustion chamber and in the secondary heating surfaces is radiated as airborne noise via the flue gas line.

In addition, depending on dimensioning of the chimney and intersection, resonance effects caused by the vibration of the combustion noises (amplification) can occur.

These noises can be reduced on the one hand by measures on the burner side, such as modification of the flame geometry, the atomisation characteristic or the fuel throughput.

On the other hand, flue gas silencers achieve an important noise reduction.

These silencers must usually be adapted to low frequencies of 60-250 Hz.

Flue gas silencers work based on the principle of sound absorption.

The kinetic energy of the flue gases is consumed due to friction, which means a draughting requirement increase in the flue gas line is necessary. This must be taken into account when dimensioning the burner.

The connection piece from the boiler to the flue gas silencer must be gas-tight as the draught and pressure zero points lie behind the flue gas silencer.

The space required of approx. 1 m for retrofitting of a flue gas silencer should be provided during planning.

Note also that secondary air devices are installed only behind a flue gas silencer.

### Maximum filling quantity without/with demineralisation

	Carbonate hardness of filling water up to...							
[mol/m³] 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
Conductance ²	<20	100.0   200.0		300.0	400.0	500.0	600.0	>600
<b>Boiler size of the individual boiler</b>	<b>maximum filling quantity without desalination</b>							
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

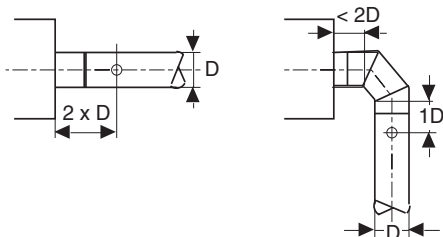
### Installation instructions

Please observe the installation instructions supplied with every boiler.

### Chimney/flue gas system

#### Flue gas line

- 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.

### Expansion tank/expansion

- Ideally, the pressure expansion tank should be connected to the heating system as described in our example applications, with a removable or sealable actuation device. This means that it is not necessary to drain the entire system in order to carry out work.

#### Safety valve

- A safety valve and an automatic air vent must be installed in the safety flow.

■ Engineering

**Required chimney diameter**

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

Flue gas line 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 line Ø mm	Chimney Ø mm	Flue gas line Ø mm	Chimney Ø mm	Flue gas line Ø mm	Chimney Ø mm	Flue gas line 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 (420-1250)**

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

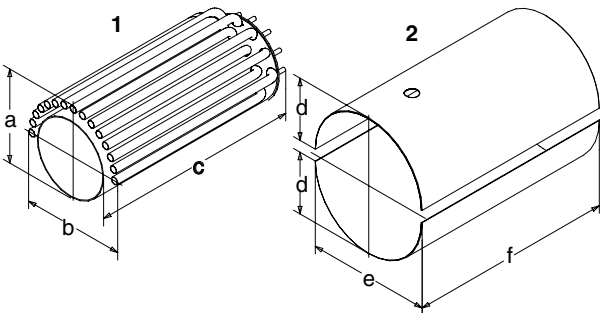
- The element welding on site incl. pressure  
test are to be coactive to obtain from Hoval.

Time to delivery approx. 8 weeks

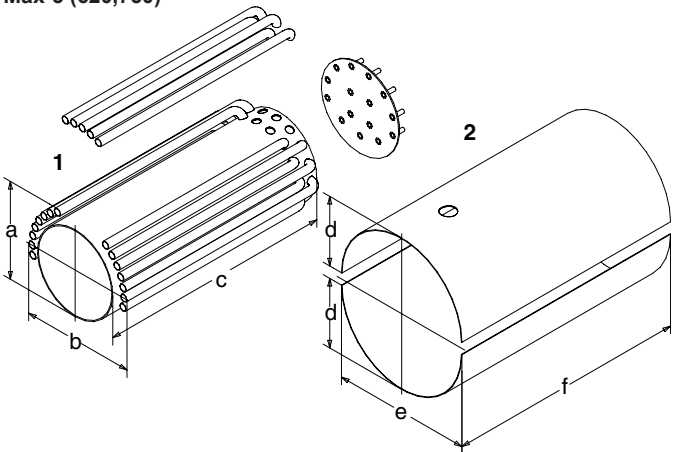


**Dimensions and weights of the single parts**

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



**Max-3 (620,750)**

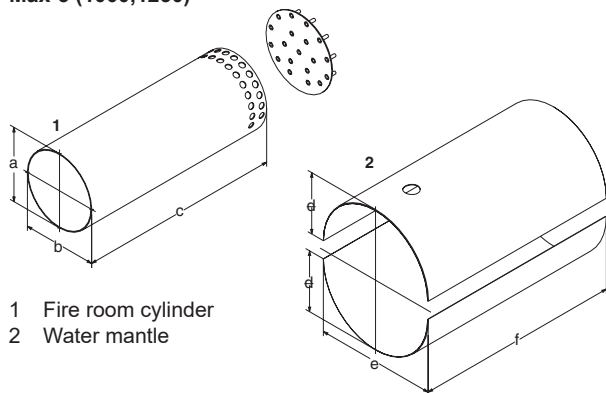


## Engineering

Mounting on site

### Dimensions and weights of the single parts

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



- 1 Fire room cylinder  
2 Water mantle

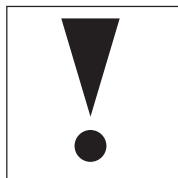
#### Combustion chamber 1

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

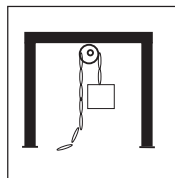
Max-3 Type	d	e	f	Weight kg
(420,530)	500	1000	1665	105
(620,750)	560	1120	1940	135
(1000,1250)	655	1310	2225	215

### 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.



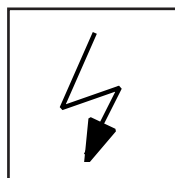
#### Assembly aids

If no concrete cover is present, at which a chain course with Hilti pegs can be installed, an appropriate scaffold for loads up to 2500 kg must be present.



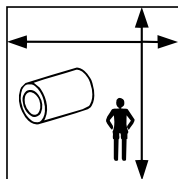
#### Boiler material

- 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

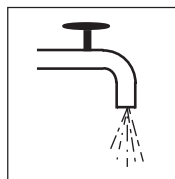
A power connection for the welding machine with a 5-pin plug socket, 3 x 400 V must be present.



#### 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

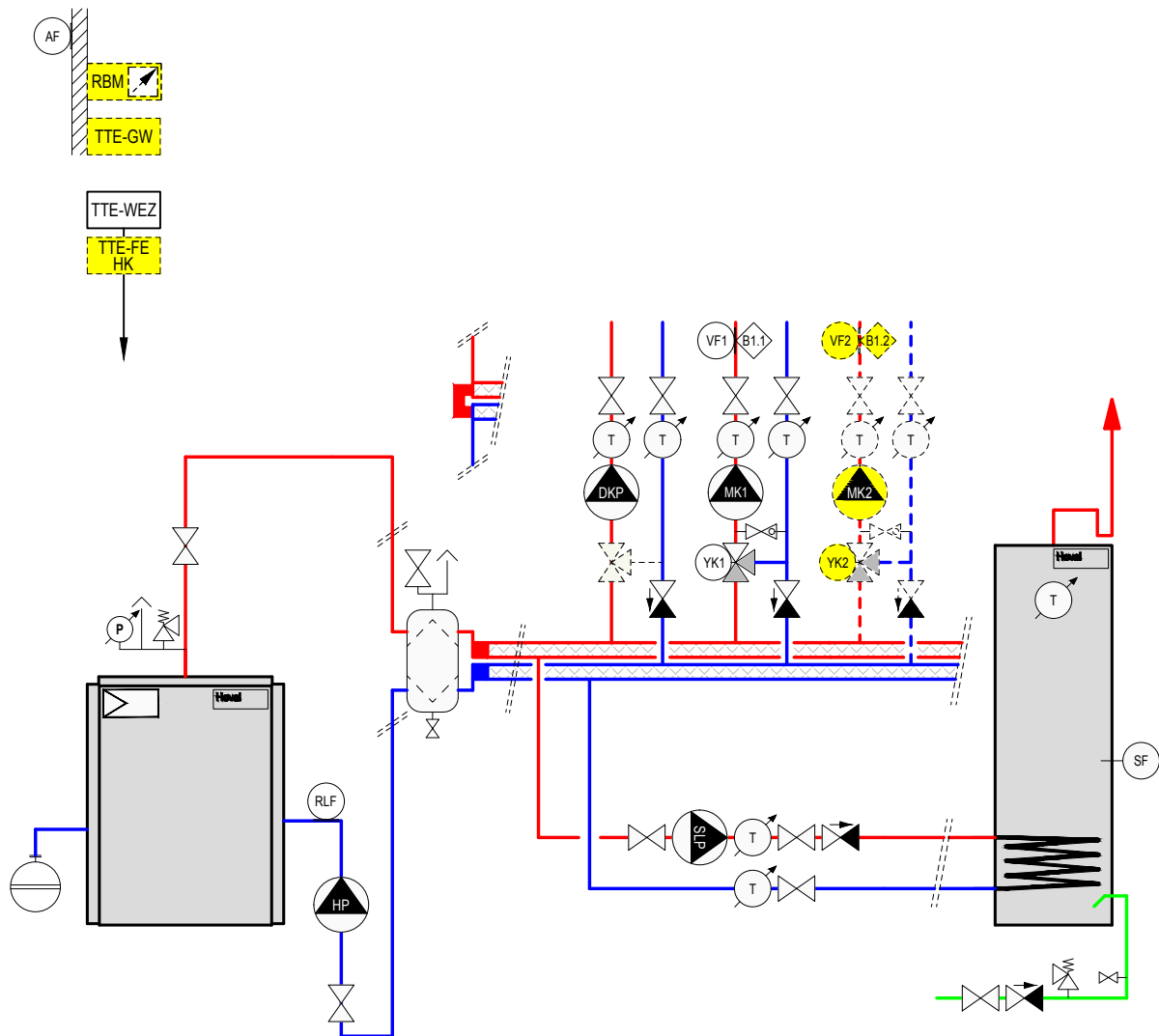
## Examples

### Max-3 (420-2700)

Oil/gas boiler with

- main pump
- return temperature control (effective on mixer circuit)
- hydraulic switch
- calorifier
- 1 direct circuit and 1-... mixer circuit(s)

#### Hydraulic schematic BEFE010



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
DKP	Pump for heating circuit without mixer
RLF	Return sensor
SLP	Calorifier charging pump
HP	Main pump

#### Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2



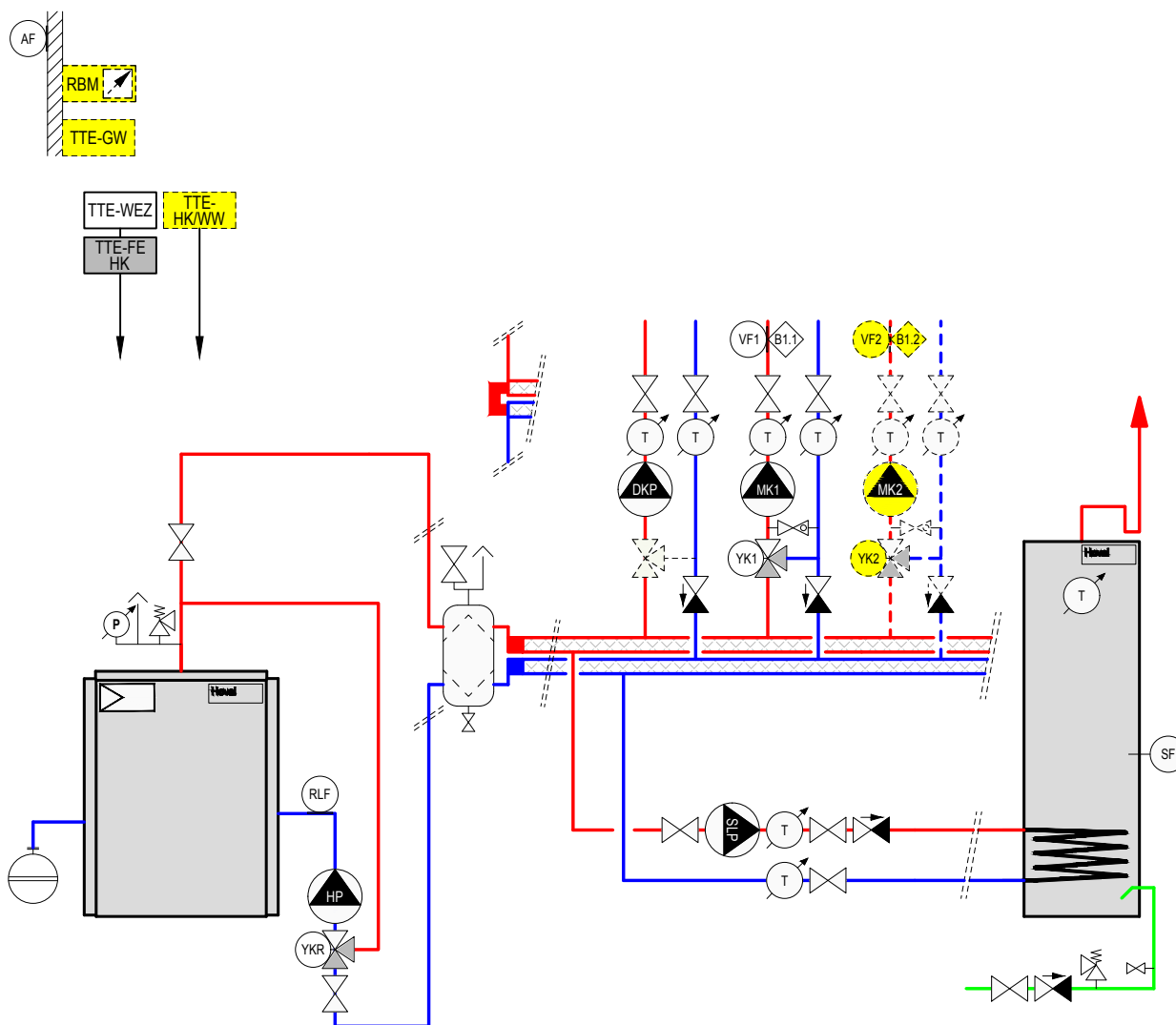
## Examples

### Max-3 (420-2700)

Oil/gas boiler with

- main pump
- return temperature control (continuous)
- hydraulic switch
- calorifier
- 1 direct circuit and 1-... mixer circuit(s)

Hydraulic schematic BEFE020



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
YKR	Actuator return mixer
SF	Calorifier sensor
RLF	Return sensor
DKP	Pump for heating circuit without mixer
SLP	Calorifier charging pump
KKP	Boiler circuit pump

#### Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-HK/WW	TopTronic® E heating circuit/DHW module

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

## ■ Description

### Hoval Max-3 plus Oil/gas boiler

#### *Boiler*

- High-efficiency 3-pass boiler according to EN 14394 for firing of heating oil EL and gas.
- Max-3 plus (420-2700) complies with the Pressure Equipment Directive 2014/68/CE
- 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*

- Boiler control panel with boiler control and heating control in various versions
  - Boiler control
    - with TopTronic® E control
    - with thermostat T 2.2
    - with thermostat T 0.2
- Free-standing calorifier see Calorifiers
- Boiler door swivels to the left
- Delivery in single parts and welding on site (Max-3 plus (420-1250)), time to delivery approx. 8 weeks

#### *Delivery*

- Boiler, thermal insulation and casing delivered separately packed

#### *On site*

- Mounting of insulation and casing



#### **Model range**

Max-3 plus Type	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

**Permission Boiler  
Directive on appliances burning  
gaseous fuels 90/396/EG**  
Max-3 plus (420-2700):  
CE product ID No. CE-0085BL0015  
**Pressure Equipment Directive  
2014/68/CE**

## ■ Description

### Boiler controller with TopTronic® E/E13.4 control

- Maximum operating temperature 90 °C

#### TopTronic® E controller

##### Control panel

- Colour touchscreen 4.3 inch
- Heat generator blocking switch for interrupting operation
- Fault signalling lamp

##### TopTronic® E control module

- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

#### TopTronic® E basic module heat generator (TTE-WEZ)

- Control functions integrated for
  - 1 heating/cooling circuit with mixer
  - 1 heating/cooling circuit without mixer
  - 1 hot water loading circuit
- bivalent and cascade management
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Rast-5 basic plug set

The supplementary plug set must be ordered in order to use expanded controller functions.

#### Options for TopTronic® E controller

- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat accounting or
  - module expansion universal
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module

#### Number of modules that can be additionally installed in the electrical box:

- 1 module expansion and 2 controller modules  
**or**
- 1 controller module and 2 module expansions  
**or**
- 3 controller modules

#### Notice

Max. 1 module expansion can be connected to the basic module heat generator (TTE-WEZ)!

### Further information about the TopTronic® E see "Controls"

#### Oil automatic function device OFA

- Control function integrated for
  - flue gas sensor for safety shut-off
  - 0-10V output for connecting a modulating main pump (incl. delta T-control with low consumption)
  - Standard plug connection for 2-stage burner 1x 230 V
  - Variable input for plant-specific functions (heat generator block, return sensor, info sensor etc.)
  - Variable output for plant-specific functions (thermostat function, operating message, etc.)

#### Delivery

- Boiler control panel separately delivered

#### On site

- Mounting of the control panel at the boiler left or right side

### Boiler controller with TopTronic® E/E13.5 control

- Maximum operating temperature 105 °C

- Configuration as TopTronic® E/E13.4 but:
- safety temperature limiter 120 °C

#### Delivery

- Boiler controller separately delivered

#### On site

- Mounting of the control panel at the boiler left or right side

### Control panel with thermostat T 2.2

- For systems without TopTronic® controller.
- 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 left or right side

### Control panel with thermostat T 0.2

- For external control
- For systems without TopTronic® controller
- 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 left or right side

## ■ Part No.


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

High-efficiency 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, thermal insulation and casing delivered separately packed.

Max-3 plus Type	Output kW	Working pressure bar	
(420)	147-420	6	7013 783
(530)	185-530	6	7013 784
(620)	217-620	6	7013 785
(750)	263-750	6	7013 786
(1000)	350-1000	6	7013 787
(1250)	437-1250	6	7013 788
(1500)	525-1500	6	7013 626
(1800)	630-1800	6	7013 627
(2200)	770-2200	6	7013 628
(2700)	945-2700	6	7013 659

The minimum boiler operating temperature and the minimum boiler return temperature must imperatively be observed (see technical data).  
A constant return temperature control must be provided!

The condensate trap must imperatively be mounted on the flue gas outlet of the boiler!


**Blind flange made**

made of steel incl. setscrews and gasket to  
Max-3 plus (420,530)  
Max-3 plus (620,750)  
Max-3 plus (1000-2700)

6002 192  
6030 026  
6002 156


**Intermediate flange drilled to match burner**

made of steel incl. setscrews and gasket to  
Max-3 plus (420,530)  
Max-3 plus (620,750)  
Max-3 plus (1000-2700)

6017 595  
6017 593  
6017 594

## ■ Part No.

**Control panel  
with thermostat****Part No.****Control panel T 2.2**

- Operating temperature max. 90 °C
- For systems without TopTronic® E controller.
- 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
- For mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order.

6015 017

6015 477

6015 478

**Control panel T 0.2**

- Operating temperature max. 105 °C
- For external switching command
- For systems without TopTronic® E controller.
- 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
- For mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order.

6015 016

6015 475

6015 476

**Accessories to control panel  
with thermostat**

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

241 149

## ■ Part No.


**Boiler controller  
with TopTronic® E control**
**Part No.****Boiler controller TopTronic® E/E13.4**

6040 236

for mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order. Maximum operating temperature 90 °C

Control functions integrated for

- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- bivalent and cascade management
- Can be optionally expanded 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
- oil automatic function device OFA-200
- safety temperature limiter
- burner cable cpl. 2-stage, L = 5.0 m
- 1x outdoor sensor AF/2P/K
- immersion sensor TF/2P/5/6T/S1, L = 5.0 m with plug
- contact sensor ALF/2P/4/T/S1, L = 4.0 m with plug

**Notice**

The electrical connection for each external burner must be clarified separately.

**Boiler controller TopTronic® E/E13.5**

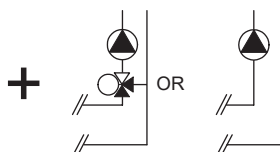
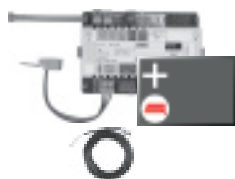
6040 237

for mounting on heat generator side right (standard) or left (configuration on request). Specify mounting variant in purchase order. Maximum operating temperature 105 °C Configuration as boiler controller TopTronic® E/E13.4

**Notice**

The electrical connection for each external burner must be clarified separately.

## ■ Part No.


**TopTronic® E module expansions**  
 for TopTronic® E basic module heat generator
**Part No.**
**TopTronic® E module expansion heating circuit TTE-FE HK**

6034 576

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

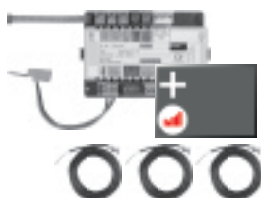
- 1 heating circuit without mixer or
- 1 heating circuit with mixer

incl. fitting accessories  
 1x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
 Boiler control, wall housing, control panel

**Notice**

The supplementary plug set may have to be ordered to implement functions differing from the standard!


**TopTronic® E module expansion heating circuit incl. energy balancing TTE-FE HK-EBZ**

6037 062

Expansion to the inputs and outputs of the basic module heat generator or the heating circuit/domestic hot water module for implementing the following functions:

- 1 heating/cooling circuit w/o mixer or
  - 1 heating/cooling circuit with mixer
- in each case incl. energy balancing

incl. fitting accessories  
 3x contact sensor ALF/2P/4/T L = 4.0 m

Can be installed in:  
 Boiler control, wall housing, control panel

**Notice**

Suitable flow rate sensors (pulse sensors) must be provided on site.


**TopTronic® E module expansion Universal TTE-FE UNI**

6034 575

Expansion to the inputs and outputs of a controller module (basic module heat generator, heating circuit/domestic hot water module, solar module, buffer module) for implementing various functions

incl. fitting accessories

Can be installed in:  
 Boiler control, wall housing, control panel

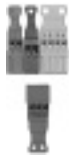
**Further information**

see "Controls" - "Hoval TopTronic® E module expansions" chapter

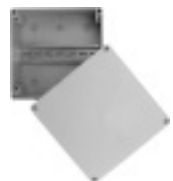
**Notice**

Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

## ■ Part No.


**HovalConnect available from summer 2019**

Up to that point, TopTronic® E online is delivered.


**Accessories for TopTronic® E**
**Part No.**
**Supplementary plug set**

for basic module heat generator (TTE-WEZ)  
for controller modules and module expansion TTE-FE  
HK

6034 499

6034 503

**TopTronic® E controller modules**

TTE-HK/WW TopTronic® E heating circuit/  
hot water module

6034 571

TTE-SOL TopTronic® E solar module

6037 058

TTE-PS TopTronic® E buffer module

6037 057

TTE-MWA TopTronic® E measuring module

6034 574

**TopTronic® E room control modules**

TTE-RBM TopTronic® E room control modules  
easy white  
comfort white  
comfort black

6037 071

6037 069

6037 070

**Enhanced language package TopTronic® E**

one SD card required per control module  
Consisting of the following languages:  
HU, CS, SL, RO, PL, TR, ES, HR,  
SR, JA, DA

6039 253

**HovalConnect**

HovalConnect domestic starter LAN  
HovalConnect domestic starter WLAN  
HovalConnect commercial starter LAN  
HovalConnect commercial starter WLAN  
SMS remote control unit  
System component SMS remote control unit

6049 496

6049 498

6049 495

6049 497

6018 867

6022 797

**TopTronic® E interface modules**

GLT module 0-10 V  
HovalConnect domestic starter Modbus  
HovalConnect domestic starter KNX  
HovalConnect commercial starter Modbus  
HovalConnect commercial starter KNX

6034 578

6049 501

6049 593

6049 500

6049 502

**TopTronic® E wall casing**

WG-190 Wall casing small  
WG-360 Wall casing medium  
WG-360 BM Wall casing medium with  
control module cut-out  
WG-510 Wall casing large  
WG-510 BM Wall casing large with  
control module cut-out

6035 563

6035 564

6035 565

6035 566

6038 533

**TopTronic® E sensors**

AF/2P/K Outdoor sensor  
TF/2P/5/6T Immersion sensor, L = 5.0 m  
ALF/2P/4/T Contact sensor, L = 4.0 m  
TF/1.1P/2.5S/6T Collector sensor, L = 2.5 m

2055 889

2055 888

2056 775

2056 776

**System housing**

System housing 182 mm  
System housing 254 mm

6038 551

6038 552

Bivalent switch

2061 826

**Further information**  
see "Controls"



■ Part No.



Part No.

**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* 242 902  
Thermostat with strap, without cable and plug

*Immersion thermostat RAK-TW1000.S SB 150* 6010 082  
Thermostat with pocket ½" - depth of immer-  
sion 150 mm brass nickel-plated

**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 plus 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 plus

Type		(420)	(530)	(620)	(750)	(1000)	(1250)
• Nominal output at 80/60 °C	kW	420	530	620	750	1000	1250
• Range of output (at 80/60 °C)	kW	147-420	185-530	217-620	263-750	350-1000	437-1250
• Burner input max.	kW	441	557	651	788	1050	1313
• Boiler working temperature max. <sup>1</sup>	°C	90	90	90	90	90	90
• Boiler working temperature min.	°C		see table operating conditions (below)				
• Return flow temperature min.	°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 80/60 °C in full-load operation (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	95.2/89.8	95.2/89.8	95.2/89.8	95.2/89.8	95.2/89.8	95.2/89.8
• Boiler efficiency at 30 % partial load (EN 303) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	97.1/91.6	97.1/91.6	97.1/91.6	97.1/91.6	97.1/91.6	97.1/91.6
• Nominal efficiency at 75/60 °C (DIN 4702-8) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	97.0/91.5	97.0/91.5	97.0/91.5	97.0/91.5	97.0/91.5	97.0/91.5
• Stand-by loss qB at 70 °C	Watt	1000	1035	1120	1180	1250	1380
• Flue gas resistance at nominal output natural gas: 10.8 % CO <sub>2</sub> , 500 m over sea level (tolerance ± 20 %)	mbar	6.5	8.0	8.2	9.5	10.0	12.0
• Flue gas mass flow at nominal output natural gas: 10.8 % CO <sub>2</sub>	kg/h	680	859	1004	1215	1619	2025
• 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	28.5	45.4	22.6	33.1	22.0	34.4
• Water flow resistance at 20 K	mbar	7.1	11.4	5.6	8.3	5.5	8.6
• Water flow volume at 10 K	m³/h	36.0	45.0	53.0	64.0	86.0	107.0
• Water flow volume at 20 K	m³/h	18.0	22.5	26.5	32.0	43.0	53.5
• 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	1111	1171	1795	1831	2535	2643
• 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					
• Draught/underpressure at flue gas outlet max.	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> Limited by the boiler controller E13.4 TopTronic® E and T 2.2 to 90 °C or by E13.5 TopTronic® E and T 0.2 to 105 °C.

<sup>3</sup> Max. safety temperature for boiler controller E13.4 TopTronic® E and T 2.2: 110 °C or E13.5 TopTronic® E and T 0.2: 120 °C.

### Possible operating conditions

Fuel		Heating oil EL	Natural gas H, low-sulphur heating oil EL
min. boiler temperature	°C	65	75
min. return temperature	°C	55	65
Return temperature control		yes	yes

## ■ Technical data

### Max-3 plus

Type		(1500)	(1800)	(2200)	(2700)
• Nominal output at 80/60 °C	kW	1500	1800	2200	2700
• Range of output (at 80/60 °C)	kW	525-1500	630-1800	770-2200	945-2700
• Burner input max.	kW	1575	1890	2310	2835
• Boiler working temperature max. <sup>1</sup>	°C	90	90	90	90
• Boiler working temperature min.	°C	see table operating conditions (below)			
• Return flow temperature min.	°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 80/60 °C in full-load operation (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	95.2/89.8	95.2/89.8	95.2/89.8	95.2/89.8
• Boiler efficiency at 30 % partial load (EN 303) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	97.1/91.6	97.1/91.6	97.1/91.6	97.1/91.6
• Nominal efficiency at 75/60 °C (DIN 4702-8) (related to net calorific value NCV / gross calorific value GCV, heating oil EL)	%	97.0/91.5	97.0/91.5	97.0/91.5	97.0/91.5
• Stand-by loss qB at 70 °C	Watt	1850	1950	2100	2300
• Flue gas resistance at nominal output natural gas: 10.8 % CO <sub>2</sub> , 500 m over sea level (tolerance ± 20 %)	mbar	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	2429	2916	3564	4374
• Flow resistance boiler <sup>3</sup>	z-value	0.002	0.002	0.002	0.002
• Water flow resistance at 10 K	mbar	33.0	47.6	71.1	107.1
• Water flow resistance at 20 K	mbar	8.3	11.9	17.8	26.8
• Water flow volume at 10 K	m³/h	129.0	154.0	189.0	231.0
• Water flow volume at 20 K	m³/h	84.5	77.0	94.5	115.5
• 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	3614	4693	5077	5649
• Weight (without casing)	kg	3266	4288	4647	5189
• Combustion chamber dimension Ø inside x length	mm	880/2415	980/2595	980/2895	980/3200
• Combustion chamber volume	m³	1.58	2.07	2.30	2.41
• Dimensions	see Dimensions				
• Draught/underpressure at flue gas outlet max.	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> Limited by the boiler controller E13.4 TopTronic® E and T 2.2 to 90 °C or by E13.5 TopTronic® E and T 0.2 to 105 °C.

<sup>3</sup> Max. safety temperature for boiler controller E13.4 TopTronic® E and T 2.2: 110 °C or E13.5 TopTronic® E and T 0.2: 120 °C.

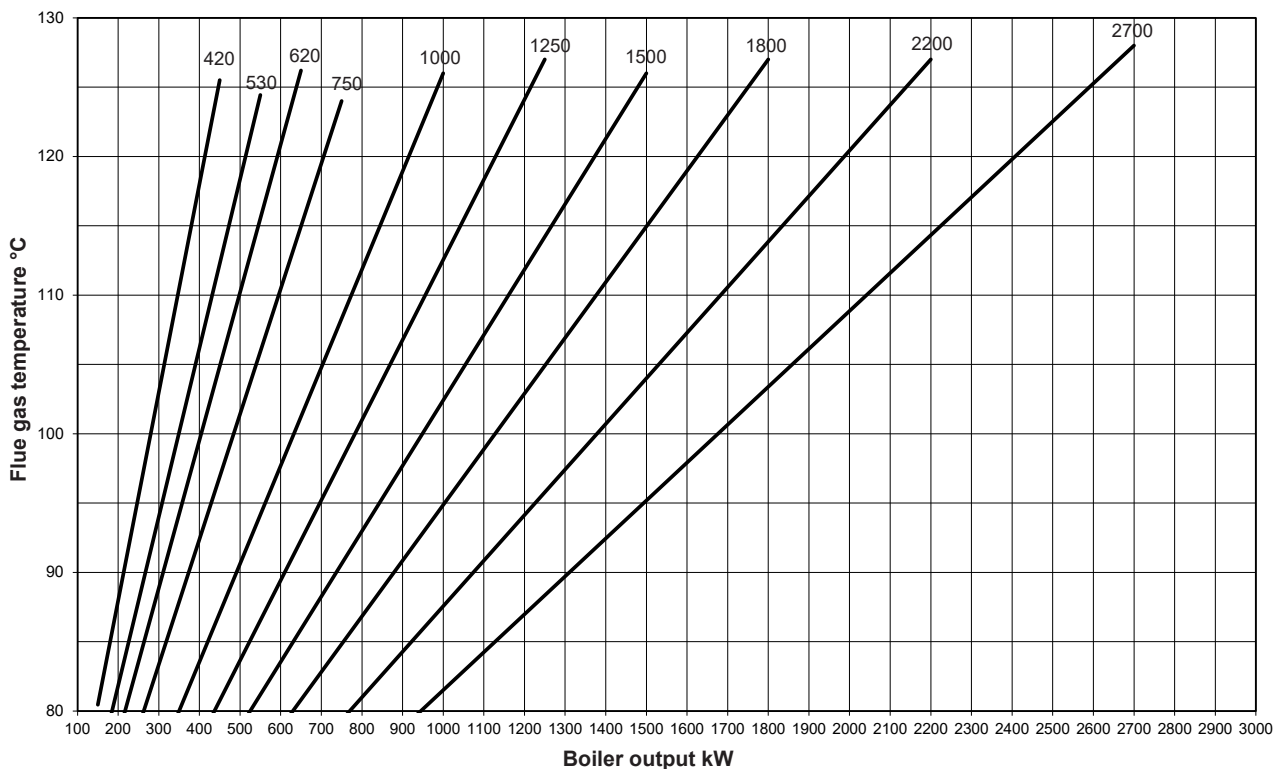
### Possible operating conditions

Fuel		Heating oil EL	Natural gas H, low-sulphur heating oil EL
min. boiler temperature	°C	65	75
min. return temperature	°C	55	65
Return temperature control		yes	yes

## ■ Technical data

## Flue gas output diagram

## Flue gas output diagram



kW = Boiler output

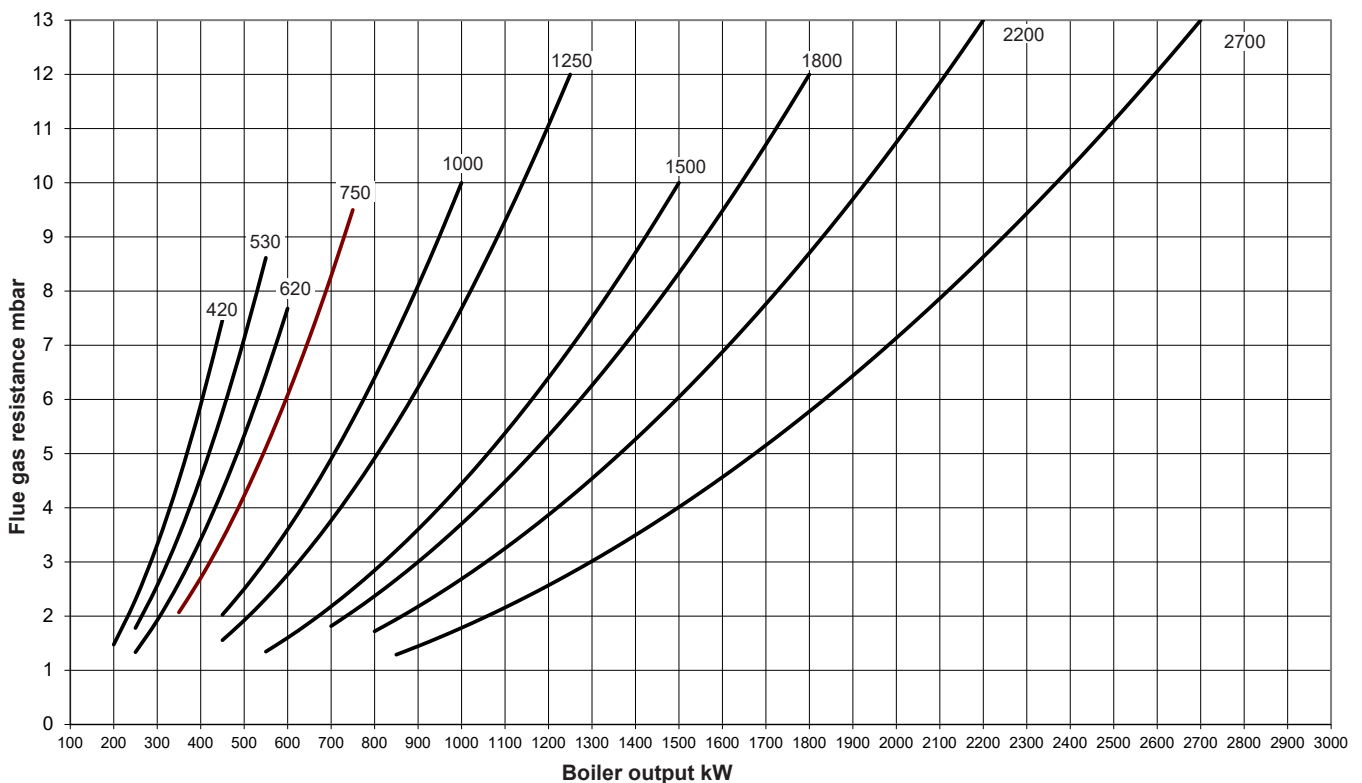
°C = Flue gas temperature on a clean surface, boiler flow temperature 80 °C, return temperature 60 °C (in accordance with DIN 4702).

- 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 of -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



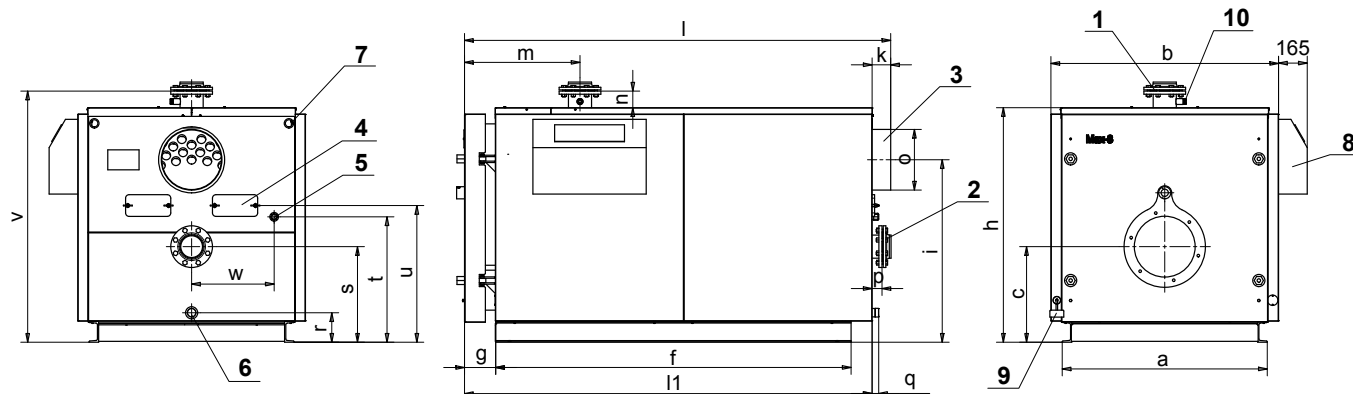
kW = Boiler output

mbar = Flue gas resistance  $\lambda = 1.11$  (Natural gas: CO<sub>2</sub> = 10.8 %) 500 above sea level (Tolerance: +/- 20 %)

## ■ Dimensions

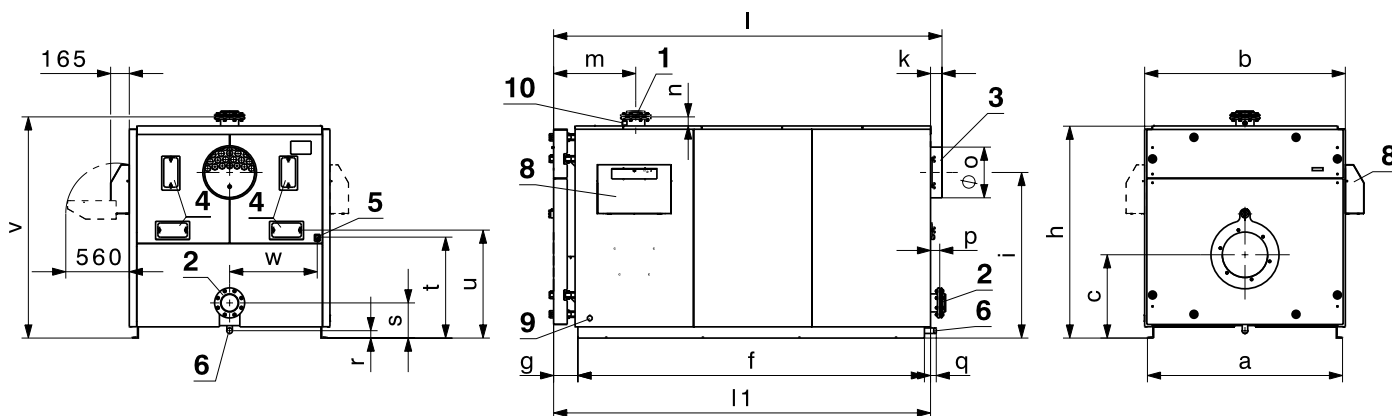
### Max-3 plus (420-1250)

(Dimensions in mm)



### Max-3 plus (1500-2700)

(Dimensions in mm)



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

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

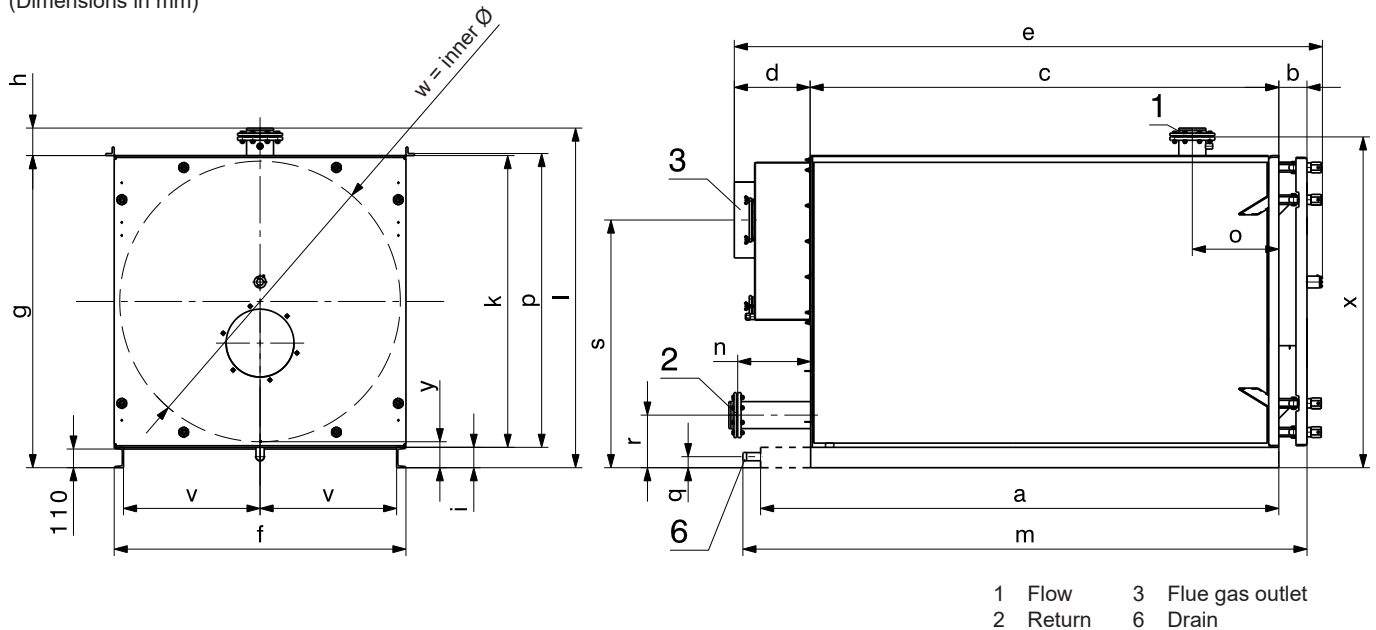
Max-3 plus Type	s	t	u	v	w	x
(420,530)	350	595	660	1330	450	-
(620,750)	550	722	786	1445	475	-
(1000,1250)	415	620	685	1660	590	-
(1500)	310	777	842	1790	695	1850
(1800)	310	890	952	1950	773	2040
(2200)	310	890	952	1950	773	2340
(2700)	370	917	982	1980	790	2670

## ■ Dimensions

### Base size

### Dimensions without insulation and casing

Boiler incl. flange, outlet without flue gas collector.  
(Dimensions in mm)



Max-3 plus 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 plus 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 plus (1500-2700) socket protrudes

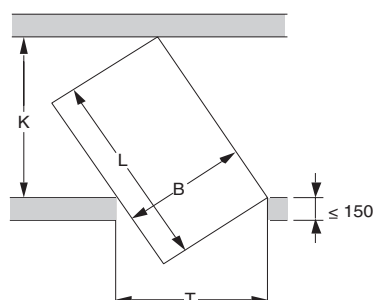
### Required min. width of door and corridor to bring in the boiler

The stated measurements are minimal dimensions

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

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

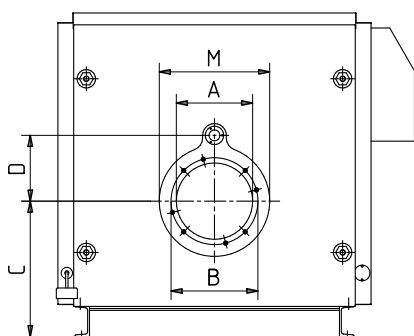
T Door width  
K Corridor width  
B Boiler width  
L Max. boiler length



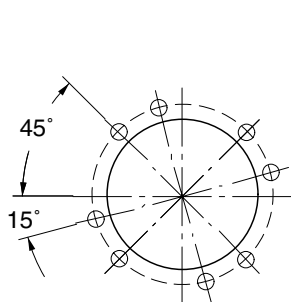
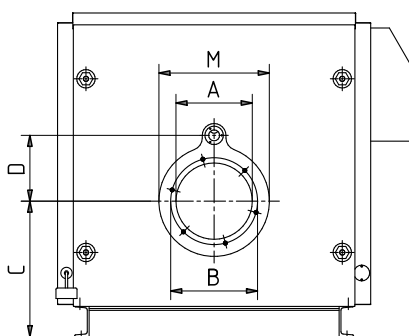
## ■ Dimensions

Furnace dimensions

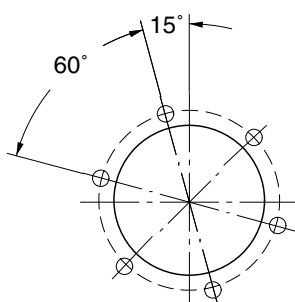
Max-3 plus (420,530)



Max-3 plus (620-2700)

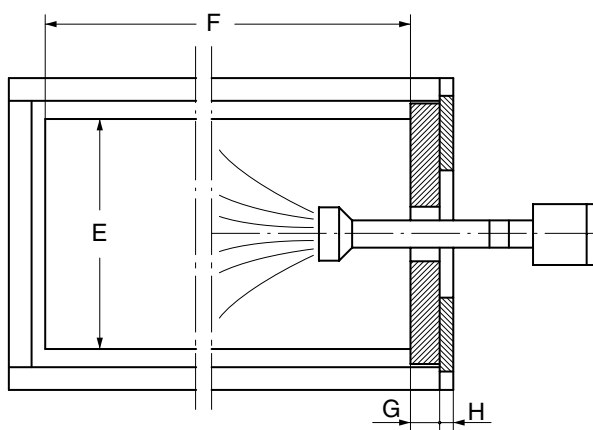


**Screw joint flange**  
Max-3 plus (420,530)  
4 x M12 (45°)  
4 x M12 (15°)

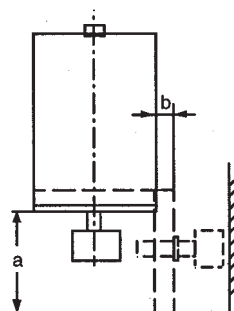


**Screw joint flange**  
Max-3 plus (620,750)  
6 x M12 (15°)

**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

## ■ 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
- 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.
- 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. underfloor 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 recommended 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 domestic water is generally best suited as filling and replacement water. However, the quality of the untreated domestic 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.

### Combustion air supply

The combustion air supply must be warranted. The air opening must not be lockable. It is very important to ensure that the combustion air is free from halogen compounds. These are present, for example, in spray cans, varnishes, glues, solvents and cleansing agents.

#### Room air dependent operation:

- Minimum free cross-section for the air opening can be assumed as follows by way of simplification. Nominal heat output is the determining factor!
- A minimum free cross-section of once 150 cm<sup>2</sup> or twice 75 cm<sup>2</sup> and an additional 2 cm<sup>2</sup> for each kW boiler capacity in excess of 50 kW is required for the air opening into the outside air.

### 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.
- Circulating 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).

### Measures for sound reduction

Make sure right from the planning phase that bedrooms are not situated in the immediate vicinity of the sound source (heating room, chimney).

A reduction of the radiated burner air sound level in the heating room (reduction of the burner noises) of up to approx. 12 dB can be achieved encapsulating the burner (sound absorbing hood).

A significant part of the noise development in the combustion chamber and in the secondary heating surfaces is radiated as airborne noise via the flue gas line.

In addition, depending on dimensioning of the chimney and intersection, resonance effects caused by the vibration of the combustion noises (amplification) can occur.

These noises can be reduced on the one hand by measures on the burner side, such as modification of the flame geometry, the atomisation characteristic or the fuel throughput.

On the other hand, flue gas silencers achieve an important noise reduction.

These silencers must usually be adapted to low frequencies of 60-250 Hz.

Flue gas silencers work based on the principle of sound absorption.

The kinetic energy of the flue gases is consumed due to friction, which means a draughting requirement increase in the flue gas line is necessary. This must be taken into account when dimensioning the burner.

The connection piece from the boiler to the flue gas silencer must be gas-tight as the draught and pressure zero points lie behind the flue gas silencer.

The space required of approx. 1 m for retrofitting of a flue gas silencer should be provided during planning.

Note also that secondary air devices are installed only behind a flue gas silencer.

### Maximum filling quantity without/with demineralisation

	Carbonate hardness of filling water up to...						
[mol/m <sup>3</sup> ] *	<0.1	0.5	1	1.5	2	2.5	3
f°H	<1	5	10	15	20	25	30
d°H	<0.56	2.8	5.6	8.4	11.2	14.0	16.8
e°H	<0.71	3.6	7.1	10.7	14.2	17.8	21.3
~mg/l	<10	50.0	100.0	150.0	200.0	250.0	300.0
Conductance <sup>2</sup>	<20	100.0	200.0	300.0	400.0	500.0	600.0
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

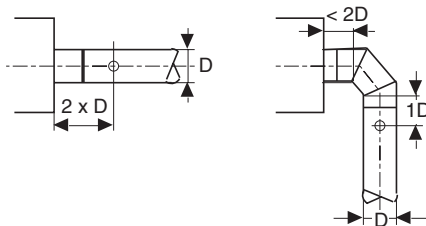
### Installation instructions

Please observe the installation instructions supplied with every boiler.

### Chimney/flue gas system

#### Flue gas line

- The flue gas connection pipe between the boiler and the vertical part of the flue gas line should be routed into the vertical part with a 30-45° incline.



- The insertion of the connection pipe into the vertical part of the flue gas line must be carried out in such a way that no condensate can flow into the boiler. A condensate trap must imperatively be mounted on the flue gas outlet of the boiler.
- A closeable flue gas measuring socket with an inner diameter of 10-21 mm must be foreseen.

#### Chimney

- The flue gas system must be humidity-insensitive and acid-proof and admitted for flue gas temperatures up to  $> 160^{\circ}\text{C}$ .
- 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.

### Expansion tank/expansion

- Ideally, the pressure expansion tank should be connected to the heating system as described in our example applications, with a removable or sealable actuation device. This means that it is not necessary to drain the entire system in order to carry out work.

#### Safety valve

- A safety valve and an automatic air vent must be installed in the safety flow.

■ Engineering  
Mounting on site

Max-3 plus (420-1250)

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

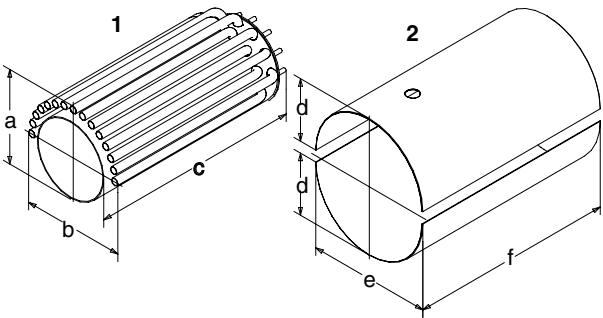
- The element welding on site incl. pressure test are to be coactive to obtain from Hoval.

Time to delivery approx. 8 weeks

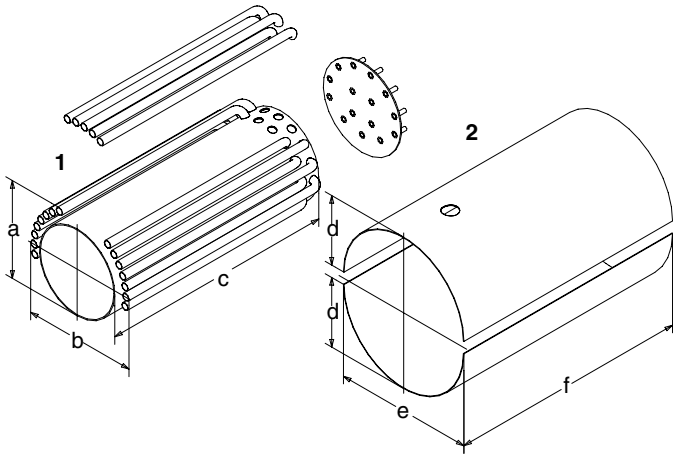


Dimensions and weights of the single parts

Max-3 plus (420,530)

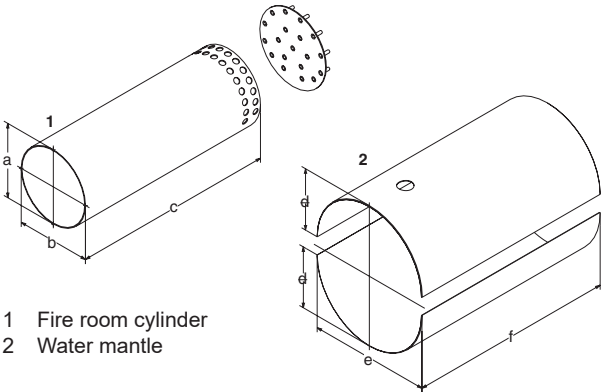


Max-3 plus (620,750)



Dimensions and weights of the single parts

Max-3 plus (1000-1250)



- 1 Fire room cylinder  
2 Water mantle

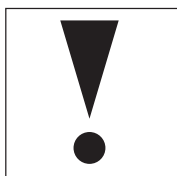
Max-3 plus Type	Combustion chamber 1			Weight kg
	a	b	c	
(420,530)	730	835	1725	325
(620,750)	745	915	2000	410
(1000,1250)	800	800	2180	375

Max-3 plus Type	Water mantle - half shell 2			Weight kg
	d	e	f	
(420,530)	500	1000	1665	105
(620,750)	560	1120	1940	135
(1000,1250)	655	1310	2225	215

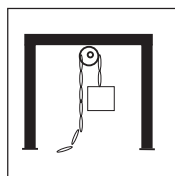
## ■ Engineering

Mounting on site

## Planning hints

**Important preparations**

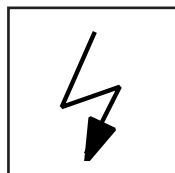
- Old boiler must be dismantled and removed.
- The heating room, if necessary with boiler base, must be available with beginning of work.

**Assembly aids**

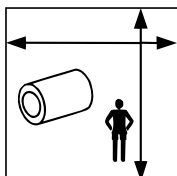
If no concrete cover is present, at which a chain course with Hilti pegs can be installed, an appropriate scaffold for loads up to 2500 kg must be present.

**Boiler material**

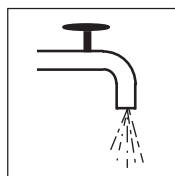
- The boiler material is delivered by Hoval (in single parts) and must be brought in on site.
- If bringing in the boiler parts does not take place immediately after unloading, the parts are to be stored weather-protected.

**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 ( $\frac{3}{4}$ " ) 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

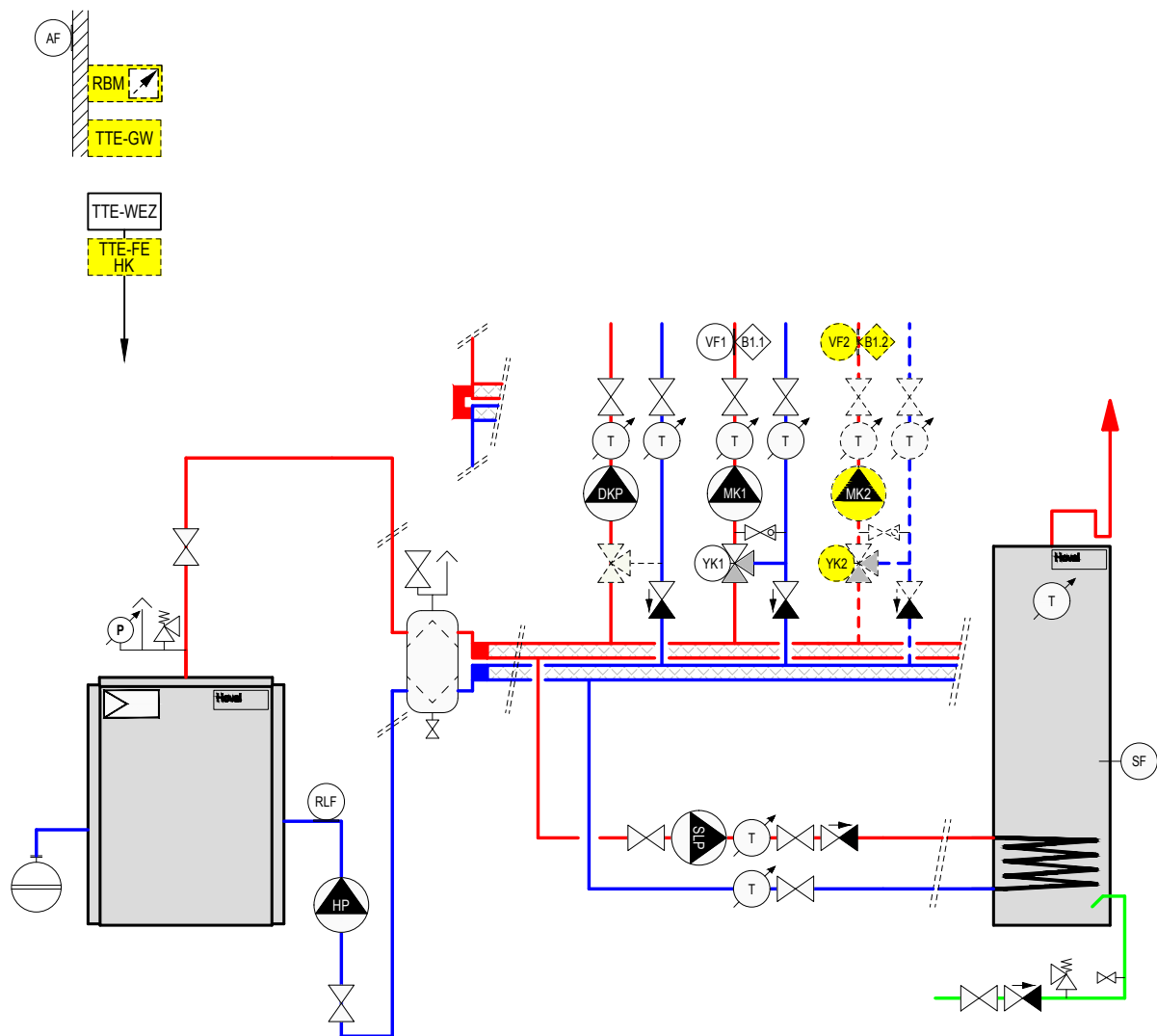
## Examples

### Max-3 (420-2700)

Oil/gas boiler with

- main pump
- return temperature control (effective on mixer circuit)
- hydraulic switch
- calorifier
- 1 direct circuit and 1-... mixer circuit(s)

#### Hydraulic schematic BEFE010



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
AF	Outdoor sensor
SF	Calorifier sensor
DKP	Pump for heating circuit without mixer
RLF	Return sensor
SLP	Calorifier charging pump
HP	Main pump
<i>Option</i>	
RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

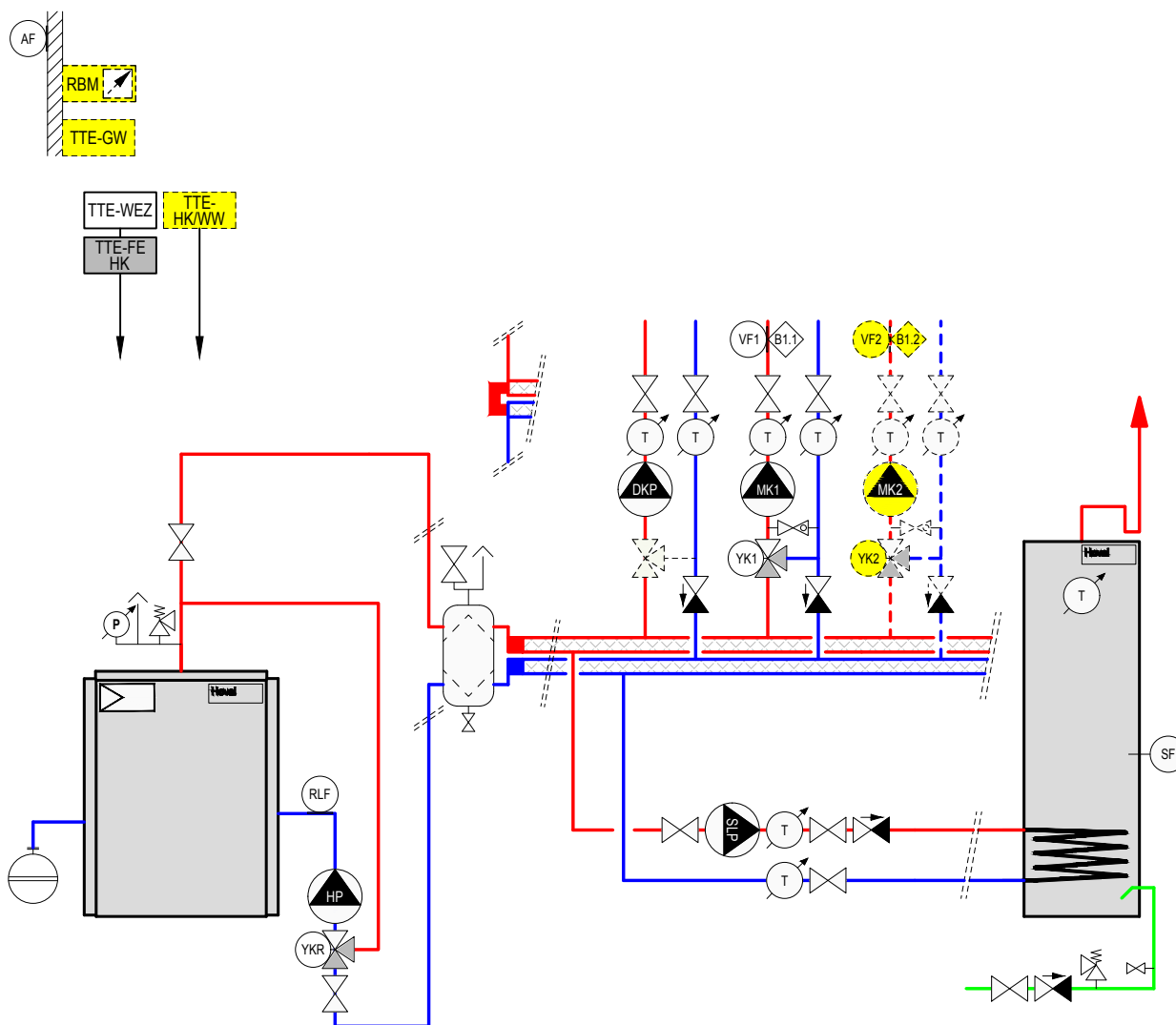
## Examples

### Max-3 (420-2700)

Oil/gas boiler with

- main pump
- return temperature control (continuous)
- hydraulic switch
- calorifier
- 1 direct circuit and 1-... mixer circuit(s)

Hydraulic schematic BEFE020



#### Notice:

- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With 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!

TTE-WEZ	TopTronic® E basic module heat generator (installed)
VF1	Flow temperature sensor 1
B1.1	Flow temperature guard (if required)
MK1	Pump mixer circuit 1
YK1	Actuator mixer 1
YKR	Actuator return mixer
SF	Calorifier sensor
RLF	Return sensor
DKP	Pump for heating circuit without mixer
SLP	Calorifier charging pump
KKP	Boiler circuit pump

#### Option

RBM	TopTronic® E room control module
TTE-GW	TopTronic® E Gateway
TTE-HK/WW	TopTronic® E heating circuit/hot water module

TTE-FE HK	TopTronic® E module expansion heating circuit
VF2	Flow temperature sensor 2
B1.2	Flow temperature guard (if required)
MK2	Pump mixer circuit 2
YK2	Actuator mixer 2

## ■ Description

**1. General**

- 1.1 The following Terms and Conditions shall apply to all our present and future contracts for deliveries and other services (even if the said Terms and Conditions are not specifically mentioned in verbal, telephonic or fax communications).
- 1.2 All deviations from the present Terms and Conditions, ancillary verbal agreements and subsequent contractual amendments shall only be valid if they have been confirmed by us in writing.
- 1.3 Buying terms and conditions of the client shall not be valid even if they are not specifically rejected by us. Our Standard Terms and Conditions of Delivery shall be regarded as accepted at the latest upon receipt of our goods and services by the client.
- 1.4 If a provision of the present Terms and Conditions of Delivery proves to be wholly or partially invalid, the contracting parties shall replace the aforesaid provision by a new provision which comes as close as possible to the legal and economic intention of the invalid provision.

**2. Offers**

- 2.1 Our offers shall be subject to change without notice.
- 2.2 Orders shall only be regarded as accepted when they have been confirmed by us in writing.
- 2.3 Illustrations, drawings and all technical details in catalogues and printed material shall be approximate values as customary within the industry. They shall only be binding if specific reference is made to them in the contract. We shall also reserve the right to make technical and design changes after the conclusion of the contract.
- 2.4 Cost estimates, drawings and other documents shall remain our property and shall be subject to copyright protection; they may not be made available to third parties.

**3. Regulations in the country of destination**

- 3.1 At the latest at the time of the order, the buyer shall draw our attention to the regulations and standards in force in the country of destination relating to the design of the delivered goods and the operation thereof and also to the execution of services.
- 3.2 Our deliveries and services shall comply with the regulations and standards in the country of destination provided the buyer has drawn our attention thereto in accordance with Section 3.1.
- 3.3 The buyer shall duly inform us of any special application features of goods ordered from us if these differ from our general recommendations.

**4. Prices**

- 4.1 Our prices shall be ex works, net, excluding packaging.
- 4.2 All ancillary costs, e.g. freight, insurance, export, transit, import and other approvals, licenses and authentications, shall be for the account of the buyer. The buyer shall also bear all taxes, charges, customs duty, etc., which are levied in connection with the contract.
- 4.3 We shall reserve the right to make price adjustments if wage rates or material prices change between the date of the order confirmation and the contractual performance of the contract. Price increases shall normally be notified three months in advance. We shall be bound to the price stated in the order confirmation for a period of three months after the effective date of the price increase.

**5. Payment terms**

- 5.1 Unless otherwise agreed in writing, our invoices shall be payable within thirty days with no cash discount. Payment shall be deemed to have been made when the amount in question is at our unrestricted disposal on our account in Swiss Francs.
- 5.2 Payment dates shall be observed even if any delays whatsoever occur after shipment of the goods from our works. The buyer shall not be permitted to reduce or withhold payments on account of complaints or counterclaims not recognised by us.
- 5.3 Payments shall also be made if insignificant components are missing but usage of the delivered goods is not rendered impossible as a result or if rectification work has to be carried out on the delivery. We shall be entitled to reject rectification of the defect as long as the buyer has not discharged his/its obligations to us.
- 5.4 If the buyer fails to comply with the agreed payment dates, default interest shall be paid from the agreed due date without a reminder being issued; the aforesaid interest shall be based on the interest rates prevailing at the domicile of the buyer, but shall be not less than four percent above the current discount rate of the Swiss Central Bank.

- 5.5 We shall be entitled to make deliveries of pending orders dependent upon settlement of outstanding claims.

**6. Reservation of title**

- 6.1 Delivered goods shall remain our property (reserved goods) pending full and complete payment of all present and future claims to which we are entitled regardless of their legal cause. This shall also apply if payments are made in settlement of specifically designated claims.
- 6.2 The buyer shall be entitled to process and sell reserved goods in the ordinary course of business.
- 6.3 If our reserved goods are combined or intermingled with other goods, the buyer shall hereby transfer his/its ownership rights in the new goods or chattels to us upon the conclusion of the contract in the amount of the invoice value of the reserved goods.
- 6.4 If the goods are resold by the buyer, he/it shall hereby transfer to us upon the conclusion of the contract with us his/its claims arising from the aforesaid resale in the amount of the invoice value of the reserved goods.
- 6.5 If the reserved goods are used by the buyer to perform a works or works delivery contract, his/its claim from the aforesaid works or works delivery contract shall hereby be assigned to us in the same amount and on the same date as for the purchase price claim (Section 6.4).
- 6.6 As long as he/it is honouring his/its payment obligations, the buyer shall, however, be authorised to collect his/its resale claim which has been assigned to us. He/it may not dispose of such claims by way of assignment to third parties, however. The empowerment of the buyer to collect the claim may be revoked by us at any time. We shall be entitled to notify third party debtors of the assignment. The buyer shall be entitled to provide us with the necessary information and documents in order to enable us to enforce our rights.
- 6.7 If the value of our securities exceeds our total claims by more than 10 %, we shall be obliged to release securities of our choice at the request of the buyer.
- 6.8 The buyer shall inform us immediately of any pledge or other impediment to our property enforced by third parties.
- 6.9 The buyer shall be obliged to collaborate in measures required to protect our title. He/it shall, in particular, empower us upon the conclusion of the contract to make entries or prior notice of the reservation of title at his/its cost in public registers, books and documents, etc., in accordance with the relevant national laws and shall perform all formalities in this respect.
- 6.10 The buyer shall maintain the reserved goods at his/its cost for the duration of the reservation of title and shall insure the said goods against theft, breakage, fire, water and other risks in our favour. He/it shall also take all steps to ensure that our property claims are neither adversely affected nor rescinded.

**7. Delivery periods**

- 7.1 Delivery periods and deadlines stated by us shall be approximate unless we have given an express written confirmation of a deadline as binding.
- 7.2 Delivery periods shall be deemed to have been met if notification of readiness to deliver has been sent to the buyer before the end of the delivery period.
- 7.3 The delivery period shall be prolonged if details required for the performance of the contract are not received on time or if they are subsequently changed by the buyer.
- 7.4 The delivery period shall also be reasonably prolonged if impediments arise which we cannot avert despite exercise of the necessary care (e.g. major operational disruptions, industrial disputes, delayed or defective deliveries, force majeure, etc.).
- 7.5 If an agreed delivery date is met by more than 14 days, the buyer shall be obliged to set us a reasonable period of grace. The buyer may only withdraw from the contract if our goods have not been delivered by the end of the said period of grace. Compensation claims for non-performance, delayed performance or any consequential losses shall be excluded unless there was gross negligence on our part.

**8. Transfer of risk**

- 8.1 Unless expressly agreed otherwise in writing, our "ex works" deliveries shall be made in accordance with the international rules



## ■ Description

on the interpretation of commercial clauses of the International Chamber of Commerce (Incoterms) in the version in force on the date of the order confirmation.

- 8.2 The transfer of risk shall be determined by the aforesaid Incoterms.
- 8.3 Insurance against damages of any kind shall be the responsibility of the buyer.
- 8.4 Complaints in connection with the transport shall be immediately notified by the buyer to the last carrier upon receipt of the delivery.
- 8.5 If despatch is delayed at the request of the buyer or for any other reasons not attributable to us, the risk shall pass to the buyer on the original date envisaged for the "ex works" delivery. We shall be entitled to demand payment from this date onwards.

## 9. Delivery inspection

- 9.1 The buyer shall be required to inspect deliveries immediately. If the goods do not comply with the order or the delivery note or if visible defects are identified, he/it shall be obliged to notify the aforesaid to us in writing within eight days of receipt. Later complaints shall not be recognised. (Re transport damages, cf. Section 8.4)

## 10. Assembly and operations

- 10.1 The assembly, putting into operation, operation and maintenance of the delivered goods shall be carried out in accordance with our guidelines. They may be executed by our staff or by appropriately trained third parties as agreed with the buyer.
- 10.2 If we require a commissioning certificate for certain product groups, warranty claims for the proper functioning of the equipment can only be enforced if a proper hand-over has been documented by a confirmed commissioning certificate received by us within one month of the hand-over.

## 11. Warranty

### 11.1 Warranty period

- 11.1.1 The general warranty period shall be 12 months from the first commissioning but no longer than 18 months from the date on which the relevant goods left our works.  
If despatch is delayed for reasons not attributable to us, the warranty shall lapse no later than 18 months after notification of the readiness to deliver.

The general warranty period shall exclude electrical components for which the warranty period shall be 6 months from the first commissioning but no later than 12 months from the date of shipment from our works.

- 11.1.2 We refer to Section 11.6.1 with regard to the warranty period for third party products.
- 11.1.3 The warranty period for components which we have repaired during the warranty period or have delivered as replacement shall be 12 months from the completion of our repair or from the date of the replacement delivery but no longer than the end of a period equivalent to twice the original warranty period as per Section 11.1.1.

### 11.2 Liability for material, design and workmanship defects

- 11.2.1 The contractual condition of the goods shall be based on the condition upon the transfer of risk.
- 11.2.2 Defects shall be notified to us immediately in writing.
- 11.2.3 We shall be liable for all components which can be shown to have become defective or unusable before the end of the warranty period as a result of defective materials, defective design or defective workmanship, with such components being repaired or replaced ex works immediately at our choice.

### 11.3 Liability for warranted qualities

- 11.3.1 Warranted qualities shall only be those which are specifically designated as such in the order confirmation or in the relevant specifications.
- 11.3.2 The aforesaid assurance shall apply at the latest until the end of the warranty period. If a taking-over test has been agreed with the buyer, the assurance shall be deemed as performed if proof of the relevant qualities is furnished during the aforesaid test.
- 11.3.3 If the warranted qualities are not performed or only partially performed, the buyer shall be entitled to an immediate rectification. The buyer shall grant us the necessary time and opportunity for this purpose.
- 11.3.4 If the rectification is abortive or only partially successful, the buyer shall be entitled to a reasonable reduction of the purchase price. If the defect is so serious that it cannot be rectified within

a reasonable period of time, and if deliveries or services for the notified purpose are not usable or are only usable to a much lesser extent, the buyer shall be entitled to refuse acceptance of the defective component or to withdraw from the contract if part-acceptance is economically unreasonable. We shall only be obliged to refund amounts which have been paid to us for the components affected by the aforesaid withdrawal.

### 11.4 Exclusion of liability for defects

- 11.4.1 Our liability shall exclude damages which cannot be proved to have been sustained as a result of defective material, defective design or defective workmanship.
- 11.4.2 Damages shall therefore be excluded for example which were caused by
  - improper work of other persons with regard to planning, site preparation, assembly, operation and maintenance;
  - plant concepts and designs which do not comply with the latest state of the art;
  - non-observance of our guidelines for planning, assembly, commissioning, operations and maintenance;
  - force majeure (e.g. thunderstorms).
- 11.4.3 The following shall be excluded in particular
  - corrosion damages (e.g. as a result of aggressive water, unsuitable water treatment, oxygen intakes, emptying the plant over a longer period of time, falling below the dew point, chemical or electrochemical effects, etc.);
  - damages caused by air pollution (e.g. the accumulation of intense dust, aggressive vapours, etc.);
  - damages caused by unsuitable equipment and fuels;
  - damages caused by overcharging, excessive water pressure, scaling, improper electrical connections and inadequate fuse protection.
- 11.4.4 Components shall also be excluded from the warranty which are subject to natural wear and tear (e.g. burner nozzles, combustion chamber inserts, ignition and monitoring components in contact with fire, fireclay and wall facings, fuses, seals and flexible tubes).

### 11.5 Commissioning certificate

- 11.5.1 We hereby draw attention to the due and proper hand-over and - if envisaged - the commissioning certificate in accordance with Section 10.2 as prerequisites for our warranty.

### 11.6 Deliveries and services of sub-contractors

- 11.6.1 Our liability for third party products which form a major part of the delivered goods (e.g. warehouse and conveying equipment, burners, measuring and control equipment, electrical components, flue gas and waste water cleaning equipment) shall - if permissible - be limited to an assignment of our claims against the suppliers of the said third party products.

## 12. Exclusion of further liability

- 12.1 The buyer shall have no rights and claims for materials, design and workmanship defects or the lack of warranted qualities unless specifically mentioned in Sections 11.1 to 11.6.
- 12.2 All claims for compensation, reduction in the contract price, rescission of the contract or withdrawal from the contract shall be excluded in particular unless these are specifically mentioned. Under no circumstances shall the buyer have any compensation claim for damages which were not sustained by the delivered goods themselves (e.g. replacement costs, cost for establishing the cause of the damage, expertises, production stoppages, production losses, lost orders, lost profit and other direct or indirect damages). The aforesaid liability exclusion shall not apply in the event of gross negligence on our part.
- 12.3 The exclusion as per Section 12.2 shall apply for all breaches of contract and all claims of the buyer regardless of why they were lodged from a legal point of view. It shall therefore also apply for a breach of any ancillary obligations (e.g. inadequate advice, etc.).

## 13. Jurisdiction

- 13.1 The place of jurisdiction for the buyer and for us shall be Vaduz. We shall be entitled to bring action against the buyer at his/its domicile, however.
- 13.2 The legal relationship between the parties shall be governed by the substantive laws of Switzerland. The application of the UN convention on contracts for the international sale of goods (CISG) shall be excluded.

## Responsibility for energy and environment.

The Hoval brand is internationally known as one of the leading suppliers of indoor climate control solutions. More than 66 years of experience have given us the necessary capabilities and motivation to continuously develop exceptional solutions and technically advanced equipment. Maximising energy efficiency and thus protecting the environment are both our commitment and our incentive. Hoval has established itself as an expert provider of intelligent heating and ventilation systems that are exported to over 50 countries worldwide.

Hoval Aktiengesellschaft  
Austrasse 70  
FL-9490 Vaduz  
Principality of Liechtenstein  
(Swiss customs territory)  
Phone +423 3992 400  
Fax +423 3992 618  
E-Mail [info@hoval.com](mailto:info@hoval.com)  
[www.hoval.com](http://www.hoval.com)



### Hoval heating technology

As an energy-neutral supplier with a full range of products, Hoval helps its customers to select innovative system solutions for a wide range of energy sources, such as heat pumps, biomass, solar energy, gas, oil and district heating. Services range from private residential units to large-scale industrial projects.



### Hoval residential ventilation

Increased comfort and more efficient use of energy from private housing to industrial halls: our controlled residential ventilation products provide fresh, clean air for living and working space. Our innovative system for a healthy room climate uses heat and moisture recovery, while at the same time protecting energy resources and providing a healthier environment.



### Hoval indoor climate systems

Supplying fresh air, removing extract air, heating, cooling, filtering and distributing air, utilising heat gains or recovering cold energy – no matter what the task, Hoval indoor climate systems provide tailor-made solutions with low planning and installation costs.