

■ Description

Hoval TopGas®

Wall-hanging gas condensing boiler

- With condensing boiler technology
- Heat exchanger made of corrosion resistant aluminium-silicone cast alloy integrated into stainless steel heating water tank
- Built-in:
 - pressure gauge
 - water pressure guard for water shortage protection
 - flue gas temperature sensor with flue gas limiter function
 - automatic quick aspirator
- Pre-mixing surface burner made of stainless steel
 - Modulating with gas/air group control
 - Automatic ignition
 - Ionisation guard
 - Gas pressure guard
- Minimum water flow necessary (see technical data)
- Wall-hanging gas condensing boiler fully cased with coated white steel plates, with red decorative strips



Basic boiler control panel N4.1

- Control unit for gas burner with monitoring unit BIC 335
- Modulating burner control
- Main guard "I/O"
- Operation and fault indication
- Connection for external gas valve and fault indication

Optional

- For propane
- Free-standing calorifier
- Boiler burner control in different designs

Delivery

- Wall-hanging gas condensing boiler fully cased

Heating regulator set RS-OT

- For 1 heating circuit without mixing operation
Weather-controlled regulation for continuously adjustable decreased boiler water temperature
- RS-OT with overpluggable room temperature sensor, located in boiler room or living room. Can optimally be installed in the boiler control panel.
- Outdoor sensor AF120
- Calorifier heater sensor TF 25 / 12K

BMS-Module 0-10 V/OT

(OpenTherm)

(building management system)

For boiler control as part of a building management system.

External temperature control 0-10 V.

0-1.0 V no requirement

1.0-9.5 V 0-100 °C

Can be installed in the boiler control panel!

Model range

TopGas® type	Output range at 40/30 °C kW
(35)	6.8-35.0
(45)	11.1-45.0
(60)	12.8-60.7

Permissions boilers

TopGas® (35-60):

CE product ID No. CE-0085BQ0218

BMS module 0-10 V

(building management system)

For boiler control as part of a building management system.

External temperature control 0-10 V.

0-1.0 V desired value

1.0-10.0 V 11.5-115 °C

External **temperature control** with 0-10 V

0-0.4 V without temperature control

(automatic)

0.5-0.9 V Boiler off 0%

1.0-10.0 V 10-100%

Cannot be installed in the boiler control panel!

Heating regulator set ZN3

As supplement for basic boiler control panel N4.1. Consisting of:

- Heating regulator Hoval TopTronic® T/N for
 - 1 heating circuit without mixing operation
 - 1 mixer circuit
 - domestic hot water loading circuit
- Function extension possibility via different key modules
- Large LCD displays
- Rotary push-button
- Buttons for
 - daytime room temperature
 - night room temperature
 - hot water temperature
 - operating mode selection (holiday, absent, heating operation prolongation, automatic, summer, continuous - reduced - frost protection)
 - adjusting the heating curves
 - system information
 - emission measurement and manual operation
- Outdoor sensor AF200
- Flow clamp on sensor VF204
- Calorifier heater sensor KVT20/5/6
- Cable set ZN3 for connecting the heating regulator TopTronic® T/N with the boiler control
- Connection available for room station

Delivery

- Heating regulator set separately packed, mounting on site

■ Part No.


**Wall-hanging gas condensing boiler
Hoval TopGas®**
Part No.

Heat exchanger made of aluminium alloy.
Modulating burner made of stainless steel and
basic boiler control panel, completely cased

TopGas® type	Output range at 40/30 °C kW	
(35)	6.8-35.0	7003 553
(45)	11.1-45.0	7003 554
(60)	12.8-60.7	7003 555


Accessories
Gas filter

with measurement nozzle before and behind
the filter inset (diameter: 9 mm)
Pore width of the filter inset < 50 µm
Max. pressure difference 10 mbar
Max. inlet pressure 100 mbar

Type	Connection	
70612/6B	Rp ¾"	2007 995
70602/6B	Rp 1"	2007 996

Modification set for propane

for UltraGas® (15-70),
TopGas® comfort (10-22), TopGas® (35-60),
TopGas® (100)
Output range see technical data.

6195 68


Connection set AS32-TG

consisting of:

Return:

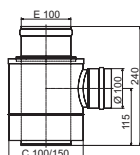
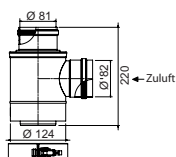
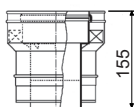
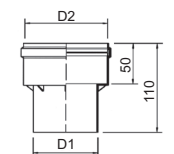
- Shut-off valve with gland nut 2" and side outflow with boiler filling/drainage valve and fitting G ¾" (outside) for connection of an expansion tank.
- circulating pump, different types

Flow:

- Fitting piece (180 mm) G2" with integrated non-return valve
- Shut-off valve with gland nut 2" and side outflow with safety valve DN 20 3 bar up to 100 kW incl. boiler filling/drainage valve

Connection set type	Pump type	
AS32-TG/AX13-2	AX13-2	6020 513
AS32-TG/A14-2	A14-2	6020 514
AS32-TG/A15-2	A15-2	6020 515

■ Part No.



Accessories

Part No.

Adapter piece E80 -> E100 PP

2018 532

Adapter piece C80/125 -> C100/150 PP

2018 533

Separating piece C80/125 -> 2xE80PP

2010 174

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

Only in combination with connection set
for ambient air independent operation.

Separating piece C100/150 -> 2xE100PP

2015 244

for UltraOil® (35,50), TopGas® (35-100),
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.

Boiler control panel with heating
regulator TopTronic®

Heating regulator set RS-OT

6020 566

(Not for mixing operation!)

For 1 heating circuit without
mixing operation

Flow temperature control controlled by
atmospheric conditions with outer
temperature sensor AF 120
water heater sensor TF 25/ 12K
and overridable room temperature sensor.
Can be implemented as a room
temperature control without
outdoor sensor.

TopGas® comfort (10-22)

TopGas® (35-100)

For integration into boiler control
panel:

Mounting set RS-OT must be ordered.

TopGas® classic and combi

Only wall mounting possible!

Mounting set RS-OT

6018 218

Assembly set for mounting of heating
regulator set RS-OT into boiler

BMS module 0 - 10 V/

6016 725

OT - OpenTherm

(bulding management system)

no control unit TopTronic®T necessary
power supply via OT bus

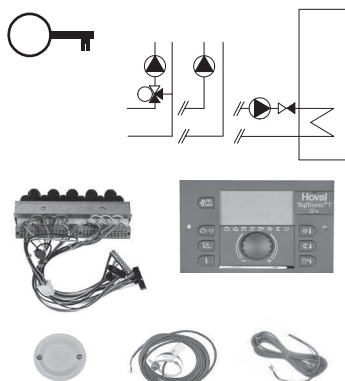
TopGas® classic

Cannot be installed in the boiler
control panel!

TopGas® (35-100), TopGas® comfort

Can be installed in the boiler control
panel!

■ Part No.

Boiler control panel with heating regulator TopTronic®
Part No.

Heating regulator set ZN3

6020 565

Can be built in as supplement for basic boiler controller N4.2!

Consisting of:

Heating regulator TopTronic®T/N for

- 1 mixer circuit
- 1 heating circuit without mixer
- hot water loading

Outdoor sensor AF200
Flow sensor VF204

with 4 m cable

1 immersion sensor KVT20/5/6

for calorifier with 5 m cable

Cable set ZN3

for connecting the heating regulator TopTronic® T/ N with the boiler controller

Accessories

To heating regulator TopTronic® T/N


Room station RS-T

2034 939

for TopTronic®T

effective on one mixing circuit


Remote control RFF-T

2022 239

for TopTronic® T

effective on one mixing circuit


Set BMS module 0-10 V (building management system)

6015 195

Control 1-10 V Δ 11.5-115°C

Consisting of: BMS module and trafo

Cannot be installed in the boiler control panel!

Casing to accommodate the BMS module
see Controls

Communication modules/remote connection
see Controls

Flow temperature guard

for underfloor heating

(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

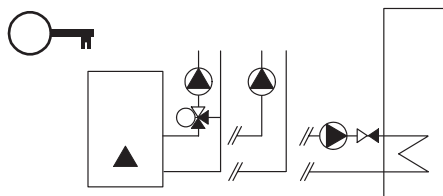
Thermostat with strap, without cable and plug

■ Part No.



Hoval
TopTronic® T
O-1

1-7



Accessories for heating regulator system Hoval TopTronic® T

Part No.

Key module for Hoval TopTronic® T

use to get more functions additionally to standard functions.

Key module consisting of:

function key to plug in TopTronic® T
incl. accessories

Only one key module possible!

Standard functions

already included in TopTronic® T.

- 1 mixing circuit
- 1 heating circuit without mixing operation
- domestic hot water loading circuit

Functions of the key modules

Key- 2nd mixing solid-fuel- solar
module circuit storage tank bi-fuel

①	•			
②		•		
③				•
④	•	•		
⑤	•			•
⑥		•		•
⑦	•	•		•

+ ①

Key module 1

for 2nd mixing circuit

Function 1, 1 flow sensor, 2 loose plugs

6012 154

+ ②

Key module 2

for solid fuel/storage tank/bivalent installation

Function key 2, 3 immersion sensors, 4 loose plugs

6012 155

+ ③

Key module 3

for solar plants

Function key 3, 1 collector sensor, 1 calorifier sensor, 4 loose plugs

6012 156

+ ④

Key module 4

for 2nd mixing circuit and solid fuel/storage tank/bivalent installation

Function key 4, 1 flow sensor, 3 immersion sensors, 6 loose plugs.

6012 157

+ ⑤

Key module 5

for 2nd mixing circuit and solar plants

Function key 5, 1 flow sensor, 1 collector sensor, 1 calorifier sensor, 6 loose plugs

6012 158

+ ⑥

Key module 6

for solid fuel/storage tank/bivalent installation and solar plants

Function key 6, 1 collector sensor, 4 immersion sensor, 6 loose plugs.

6012 159

+ ⑦

Key module 7

for 2nd mixing circuit, solid fuel/storage tank/bivalent installation and solar plants

Function key 7, 1 flow sensor, 1 collector sensor, 4 immersion sensors, 8 loose plugs

6012 160

Sensor type

Immersion-/calorifier sensor :

Type KVT20/5/6 (L = 5 m)
without immersion sleeve

flow sensor

Type VF204S with plug

Collector sensor

Type PT1000 (Silicone)

System approaches and applications
see Hoval CD

■ Part No.

**Accessories****Part No.**

For RS-OT and heating regulator TopTronic® T/N

Flow temperature guard

for underfloor heating systems (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

2429 02

Gas valve, passage DN 1/2"

with thermally releasing cut-off device

2012 075

Gas valve, passage DN 3/4"

with thermally releasing cut-off device

2012 077

Gas valve, corner version DN 1/2"

with thermally releasing cut-off device

2012 076

Gas valve, corner version DN 3/4"

with thermally releasing cut-off device

2012 078

Mud separator

made of brass

Type	ø D	Op. pressure max.	Temperature °C	kv-value m³/h	
DC 32	1 1/4"	10 bar	0-110	48.8	2029 532
DC 40	1 1/2"	10 bar	0-110	63.2	2029 533

Automatic quick release air vent 1/2"

with cut-off valve
Accessory for sludge separator

2002 582

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

TopGas® (30-60)

Type		(35)	(45)	(60)
• Nominal output 80/60 °C with natural gas ¹	kW	6.0-31.8	10.0-41.0	11.7-55.3
• Nominal output 40/30 °C with natural gas ¹	kW	6.8-35.0	11.1-45.0	12.8-60.7
• Nominal output 80/60 °C with propane ³	kW	6.6-31.9	10.8-41.0	13.1-54.9
• Nominal output 40/30 °C with propane ³	kW	7.3-35.2	11.9-45.0	14.1-60.3
• Nominal load with natural gas ¹	kW	6.4-33.0	10.6-42.5	12.2-57.3
• Nominal load with propane ³	kW	7.0-33.2	11.4-42.5	13.6-56.9
• Working pressure heating maximum/minimum	bar	3.0/1.0	3.0/1.0	3.0/1.0
• Working temperature maximum	°C	85	85	85
• Boiler water content	l	4.5	4.5	6.0
• Minimum water flow	l/h	300	350	470
• Boiler weight (without water content, incl. casing)	kg	83	83	89
• Boiler efficiency at partial load 30% (according to EN 303) (related to net/gross calorific value)	%	107.1/96.5	106.9/96.3	106.9/96.3
• Standard efficiency (according to DIN 4702 part 8) (related to net/gross calorific value)	40/30 °C % 75/60 °C %	109.1/98.3 106.1/95.6	109.0/98.2 106.0/95.5	109.0/98.2 106.0/95.5
• Stand-by loss at 70 °C	Watt	95	95	120
• Standard emission rate	Nitrogen oxides NOx mg/kWh Carbon monoxides CO mg/kWh	30.0 9.0	30.0 11.0	35.0 13.0
• Content of CO ₂ in the exhaust gas maximum/minimum output	%	9.0/8.8	9.0/8.8	9.0/8.8
• Dimensions	See table of dimensions			
• Connections	Flow/return Gas Flue gas/ combustion air Ø	Inches Inches mm	Rp 1 ¼" R ¾" C80/125	Rp 1 ¼" R ¾" C80/125
• Gas flow pressure minimum/maximum				
Natural gas E/LL	mbar	18-50	18-50	18-50
Propane	mbar	37-50	37-50	37-50
• Gas connection value at 0 °C/1013 mbar:				
Natural gas E (Wo = 15.0 kWh/m ³) H _u = 9.97 kWh/m ³	m ³ /h	3.3	4.3	5.8
Natural gas LL (Wo = 12.4 kWh/m ³) H _u = 8.57 kWh/m ³	m ³ /h	3.9	5.0	6.7
Propane ³ (H _u = 25.9 kWh/m ³)	m ³ /h	1.27	1.64	2.21
• Operation voltage	V/Hz	230/50	230/50	230/50
• Control voltage	V/Hz	24/50	24/50	24/50
• Minimum/maximum electrical power consumption	Watt	29/62	29/66	30/102
• Stand-by	Watt	13	13	13
• IP rating (integral protection)	IP	40	40	40
• Sound power level				
- Heating noise (EN 15036 part 1) (room air dependent)	dB(A)	61	63	63
- Exhaust noise is radiated from the mouth (DIN 45635 part 47) (room air dependent/room air independent)	dB(A)	63	66	66
• Sound pressure level (depending on installation conditions) ²	dB(A)	49	51	51
• Condensate quantity (natural gas) at 40/30 °C	l/h	3.1	4.0	5.4
• pH value of the condensate		approx. 4.2	approx. 4.2	approx. 4.2
• Flue gas system: requirements, values		T120	T120	T120
Type of connection		B23, C13(x), C33(x), C53(x), C63(x)		
Flue gas mass flow	kg/h	54.8	70.6	95.1
Flue gas temperature at nominal output and operation 80/60 °C	°C	69	75	79
Flue gas temperature at nominal output and operation 40/30 °C	°C	47	52	49
Volume flow rate combustion air	Nm ³ /h	41.3	53.1	71.6
Feed pressure total at the combustion air/flue gas pipe	Pa	95	115	140
Maximum draught/depression at flue gas outlet	Pa	-50	-50	-50

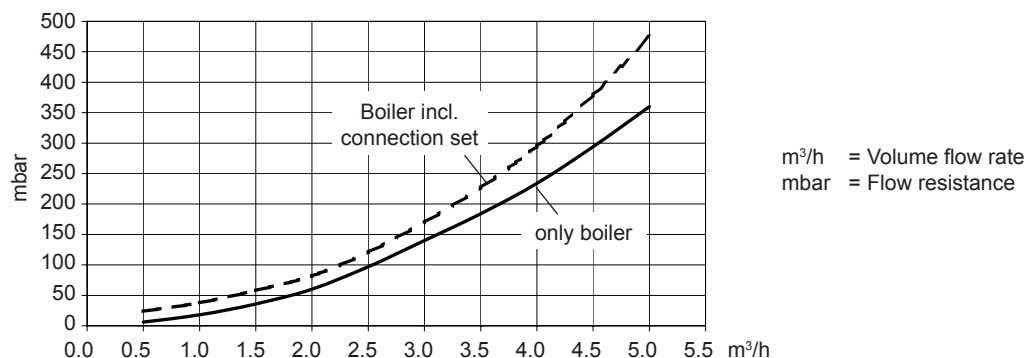
¹ Data related to H_u. The boiler series is tested for EE/H-settings. With a factory setting of the Wobbe coefficient of 15.0 kWh/m³ operation at a Wobbe coefficient of 12.0 up to 15.7 kWh/m³ is possible without new settings.

² See also notes at "Engineering".

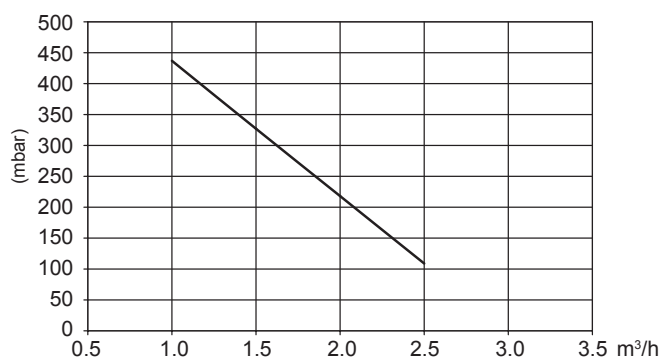
³ Data related to H_u. TopGas® can also be operated with propane.

■ Technical data

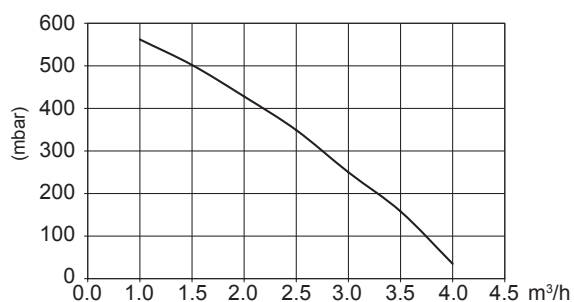
Boiler flow resistance



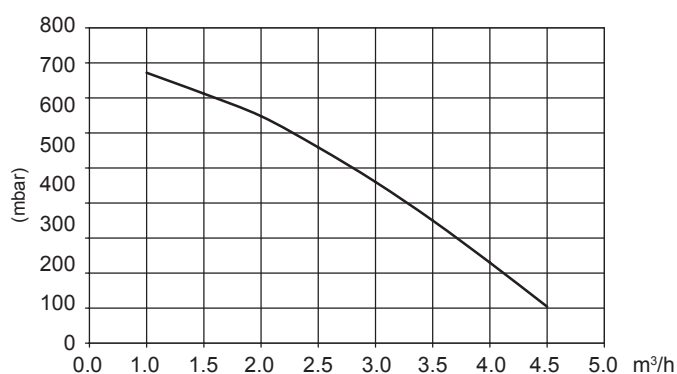
Maximum residual overpressure TopGas® (35-60) with connection set AS32-TG/AX13-2



Maximum residual overpressure TopGas® (35-60) with connection set AS32-TG/A14-2



Maximum residual overpressure TopGas® (35-60) with connection set AS32-TG/A15-2



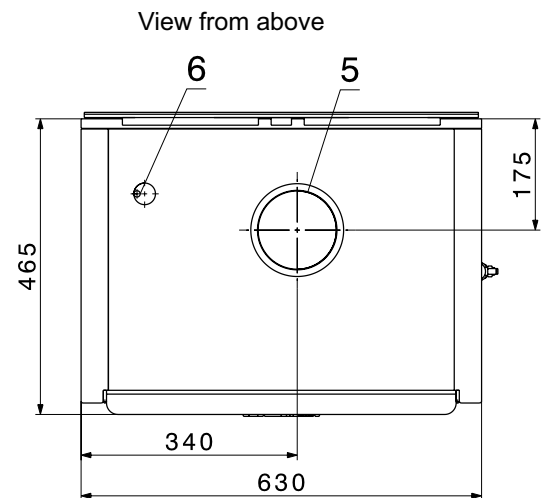
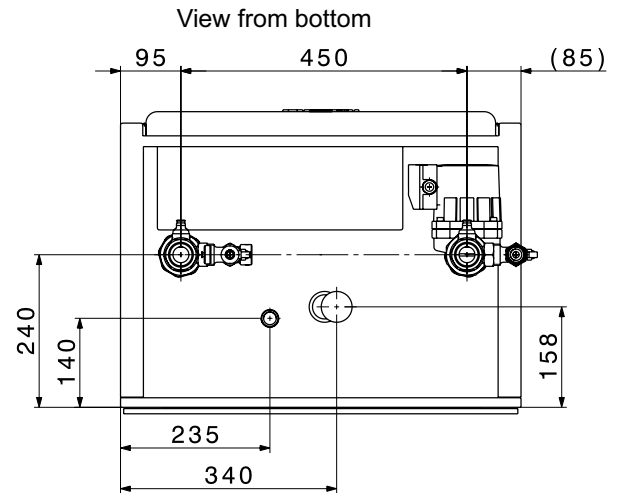
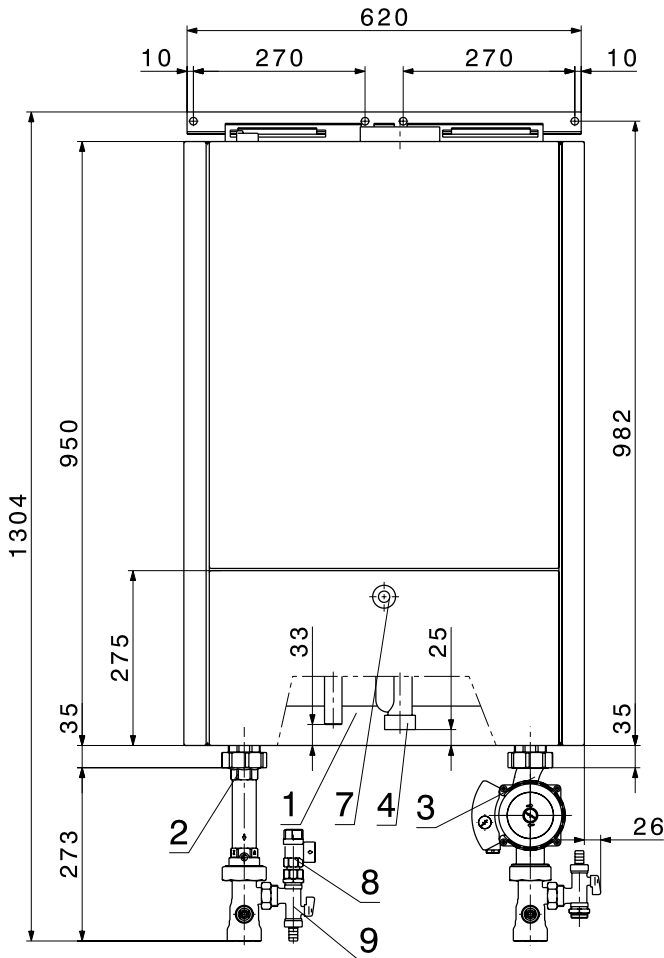
■ Dimensions

TopGas® (35-60)

Minimum spaces

(Dimensions in mm)

- Sideways 50 mm
- Space to ceiling dependent on the used flue gas system
- Front 500 mm



- | | |
|--|-----------------------|
| 1 Gas connection R 3/4" | 6 Automatic air vent |
| 2 Flow Rp 1 1/4" | 7 Cover control panel |
| 3 Return Rp 1 1/4" | 8 Safety valve |
| 4 Condensate drain Ø 32 | 9 Ball valve |
| 5 LAS flue gas/combustion air connection DN 80/125 | |

■ Engineering

Standards and guidelines

The following standards and guidelines must be complied with:

- Hoval technical information and installation instructions
- hydraulic and technical control regulations of Hoval
- local building law
- fire protection regulations
- DVGW regulations
- DIN EN 12828
Safety-relevant requirements
- DIN EN 12831 Heaters
Rules for the calculation of the heat requirements of buildings
- VDI 2035 Protection against damage by corrosion and boiler scale formation in hot water installations
- VDE 0100
- Local fire brigade regulations

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).

The following systems must be equipped with separate circuits:

- Systems with a specific water content of over 50 l/kW for the boiler (in cascades, for the smallest boiler)
- Plants with
 - **continuous** oxygen intake (e.g. under-floor heating systems without diffusion proof plastic piping or open expansion tank) or
 - **intermittent** oxygen intake (e.g. where frequent refilling is necessary)
- Older systems with formation of sludge in which increased concentrations of the metals which come into contact with the water are found in the existing heating water.
- Systems operated with softened water.
- Treated heating water must be tested at least once yearly, according to the inhibitor manufacturer's instructions, more frequent testing may be necessary.
- A refilling is not necessary if the quality of the heating water in existing installations (e.g. exchange of boiler) conforms to VDI 2035. The Directive VDI 2035 applies equally to the replacement water.
- New and if applicable existing installations must be adequately cleaned and flushed before being recharged! The boiler may only be filled after the heating system has been flushed.
- Parts of the boiler which have contact with water are made of aluminium.
- On account of the danger of spot 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 8.0 and 8.5 after 6 to 12 weeks of heating operation.

Filling and replacement water:

- For a plant using Hoval boilers untreated drinking water is generally best suited as filling and replacement water. However, the quality of the untreated drinking water must at least fulfil the standard set in VDI 2035 or be desalinated and/or be treated with inhibitors. The stipulations of EN 14868 must be observed.
- In order to maintain a high level of boiler efficiency and to avoid overheating of the heating surfaces the values given in the table should not be exceeded (dependent on boiler performance ratings - for multi-boiler plants rating of smallest boiler applies - and on the water content of the plant).
- The total amount of filling and replacement water which is used throughout the total service life of the boiler must not exceed three times the water capacity of the plant.
- Boilers with aluminium: generally inhibitors may be filled in only by a specialised company.
- If a reduction in water hardness is necessary we recommend a complete desalination (softening is not appropriate). Residual tap water might remain in the plant as a result of the preceding flushing process, entailing an increase in the sum of alkaline-earths to approx. 0.5 mol/m³. During the filling procedure the conductance of the filling water should be supervised. This should be to approx. 100 µS/cm.
- After filling the conductance of the plant water should be between 50 and 200 µS/cm. The pH value will adjust itself thereby from initially 6.5-7.5 after some weeks been in use on 8.0-8.5. If this should not be the case, then specialised company for the water treatment is to be assigned. This company must as soon as the adjustment of the correct pH value has been completed by inhibitors, which are suitable for aluminium materials also regularly check the inhibitor concentration and the pH value.

Table 1: Maximum filling capacity based on VDI 2035

Available for boiler with < 0.3 l/kW water capacity

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

¹ Total of alkaline earths

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

Frost protection agent

The boiler must not be operated with frost protection agent in the heating water. Separate circuits are required in frost-protected systems.

Space requirements

see "Dimensions".

Heating room

Gas boilers cannot be positioned in rooms in which halogen compounds can occur and into which combustion air can enter (e.g. wash-, dryer-, work room, hairdressers). Halogen compounds can be caused by cleaning and degreasing solutions, dissolvents, glue and bleaching lies.

■ Engineering

Combustion air supply

The supply of combustion air must be guaranteed. There must be no possibility to close the air supply opening. For a direct combustion air supply (LAS-system) insert connection C80/125 -> E80 PP or C100/150 -> E100PP.

The minimum free cross-section for the combustion air can be assumed simplified as follows: Considering nominal output!

- Room air-dependent operation:
Minimum free cross-section of the opening into the open: 150 cm² or twice 75 cm² and additionally 2 cm² necessary for each kW of output over 50 kW for vent in to the open.
- Room air-independent operation with separate combustion air pipe to the boiler: 0.8 cm² per 1 kW of output. The pressure loss in the combustion air pipe must be considered for the calculation of the exhaust system.

Gas connection

Commissioning

- Start-up is to be carried out only by a specialist.
- Burner setting values according to the installation instructions.

Shut-off valve

A shut-off valve must be built-in in front of every gas boiler.

Manual gas shut-off cock and gas filter

Immediately in front of the boiler a manual gas shut-off device (valve) must be installed according to relevant regulations. Should the local regulations or conditions demand this, an approved gas filter must be installed in the gas supply pipe between the gas valve (thermal released) and the boiler in order to prevent malfunction due to foreign particles being carried along with the gas.

Type of gas

- The boiler is only to be operated with the type of gas stated on the rating plate.
- A gas pressure controller to reduce the boiler inlet pressure must be installed on-site for propane.

Gas pressure

Necessary flow pressure at the boiler inlet: natural gas min. 18 mbar, max. 24 mbar; propane min. 37 mbar, max. 50 mbar

Mud collector

The fitting of a mud collector at the gas boiler return is recommendable.

Minimum water flow

- Depending upon type of boiler, different minimum quantities of rotating water are demanded. See also technical data.
- During the burner mode the circulation pump must always be in function and the minimum heating water circulating must be guaranteed.

Pump after-run time

- The circulation pump must continue to run for at least 2 minutes each time the burner is switched off (the pump after-run time is included in the boiler control with the TopTronic® regulation).

Heating boiler in the attic

A water pressure guard is built in the gas boiler, which automatically turns the gas boiler off in case of water shortage. Note: Mounting of an expansion tank in the boiler flow and pump in the boiler return. See also paragraph "expansion tank"!

Condensate drainage

- The authorisation for the drain of the flue gas condensate in the canalisation must be obtained by the responsible authority.
- The condensate from the exhaust system can be discharged through the boiler. A condensate trap is not needed anymore with the exhaust system.
- A siphon must be installed at the condensate outlet on the gas boiler (included in the boiler scope of delivery).
- The condensate must be openly lead into the canalisation (funnel).

Expansion tank

- An adequately dimensioned expansion tank must be provided.
- The minimum pressure in the expansion tank has to be 1.2 bar and the minimum operating pressure in the boiler has to be 1.5 bar.
- The pump has to be installed in the boiler return and the expansion tank has to be installed pump intake side).
- If the minimum operating pressure in the boiler, specified above, cannot be kept by 1.5 bar (e.g. roof central heating installations), must the expansion tank has to be installed in the boiler flow.
- Starting from 70 °C a connecting container is necessary.

Noise level

- The sound power level value is dependent on local and spacial circumstances.
- The sound pressure level is dependent on the installation conditions and can e.g. be 10 to 15 dB(A) lower than the sound power level at a distance of 1 m.
- DIN 4109 must be observed when installing in domestic living areas

Flue gas system

- Gas boilers must be connected to a certified and approved flue gas system such as flue gas lines.
- Flue gas lines must be gas-, condensate- and over pressure-tight.
- The flue gas system must be connected with an angle, so that the resulting condensate of the exhaust system can flow back to the boiler and can be neutralised there before discharging into the canalisation.
- Gas boilers with condensation heat utilisation are to be connected to a flue gas line min. temperature class T120.
- A flue gas temperature limiter is integrated into the boiler.

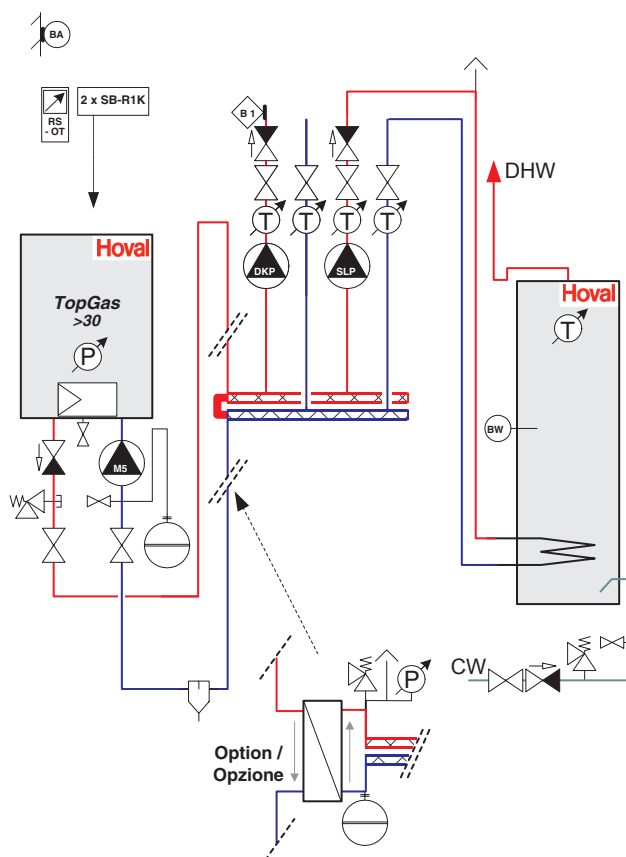
Examples

TopGas® (35-60)

Gas boiler with

- main pump,
- free-standing calorifier
- wall distributors
- a direct heating circuit

Hydraulic schematic BCOT030

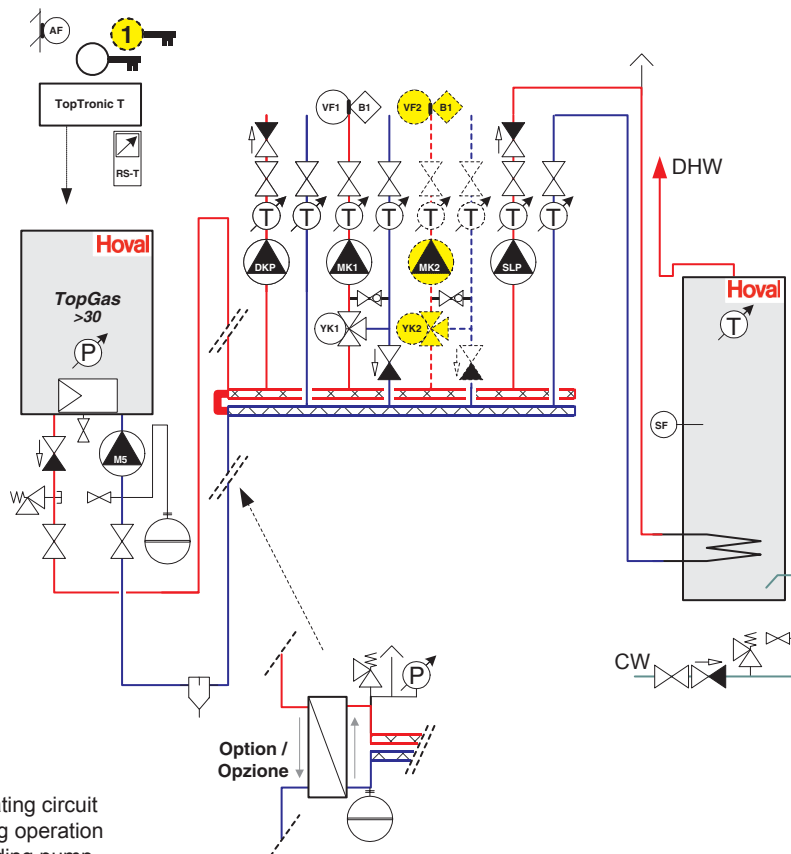


TopGas® (35-60)

Gas boiler with

- main pump,
- free-standing calorifier
- wall distributors
- a direct heating circuit and
- 1-2 mixed heating circuits

Hydraulic schematic BCOT040



Notice:

- This hydraulic schematic is a principle schematic. It does not contain all details for installation. The installation must be done according to local conditions, dimensioning and regulations
- For underfloor heating, a flow temperature monitor must be built in.
- Shut-off devices to the safety valve (presurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Anti-thermal siphon dip has to be installed.

RS-T	Room station
AF, BA	Outdoor sensor
VF1	Flow sensor 1
VF2	Flow sensor 2
SF, BW	Calorifier heater sensor
B1	Flow temperature guard (if required)
MK1	Pump mixing circuit 1
MK2	Pump mixing circuit 2

DKP	Pump for heating circuit without mixing operation
SLP	Calorifier loading pump
M5	Boiler circuit pump
YK1	Actuator mixer 1
YK2	Actuator mixer 2
CW	Cold Water
DHW	Domestic Hot Water