Hoval TopGas® comfort (10-22)

Wall-hanging gas condensing boiler
- With condensing boiler technology
- For the combustion of:
  - natural gas E
  - propane according to DIN 51622
  - biomethane according to EN 16723
- Heat exchanger made of corrosion resistant aluminium alloy with integrated forced flow copper coil;
  heating gas side: aluminium
  water side: copper
- Minimal water circulation necessary (see technical data)
- Integrated:
  - Pre-mixing burner with Venturi and surface burner
  - Automatic ignition and ionisation monitoring
  - Speed-controlled high-efficiency pump
  - Automatic quick aspirator
  - Safety valve 3 bar
  - Pressure gauge
  - One primary flow socket and one return flow socket for heating circuit and hot water production
  - Flue gas duct with corrosion free plastic device for draining condensation water
  - Condensate collecting tray for draining condensation water including siphon
  - Water pressure monitor for lack of water protection
  - Flue gas temperature limiter
  - Reverse switch, overflow valve, filling and draining cock, connection for diaphragm pressure expansion tank
- Factory setting for natural gas “H”
- Boiler fully cased with varnished white steel plates

Model range

TopGas® comfort type		Nominal heat output 50/30 °C kW
(10)	A	3.1-10
(16)	A	2.9-16
(22)	A	4.5-22

Energy efficiency class of the compound system with control.

Basic boiler control panel G04
- Control unit for gas burner BIC 335 for ignition and monitoring of the burner
- Modulating burner control
- Main switch “I/O”
- Operation- and fault indication
- Regulation of hot water production by means of sensor or by thermostatic demand
- For connecting a maximum of 1 room control device or 1 remote control with room sensor
- Control (device) for an external gas valve

Incl. control, optionally in two different versions:
- RS-OT controller
- TopTronic® E controller

Optional
- Propane

Delivery
- Wall-hanging gas condensing boiler fully cased

RS-OT controller
- For 1 heating circuit without mixing operation
- Controlled by atmospheric conditions for gliding boiler water temperature
- With integrated overplugable room temperature sensor
- Located in the boiler room, living room, or can optimally be installed in the boiler control panel.
- Outdoor sensor
- Immersion sensor (calorifier sensor)

Delivery
- Wall-hanging gas condensing boiler fully panelled
- Control separately packed, mounting on-site

TopTronic® E controller
(Can be built in) as supplement for basic boiler control panel G04.

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

TopTronic® E control module
- Colour touchscreen 4.3 inch
- 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 online HovalConnect)
- Adaptation of the heating strategy based on the weather forecast (with online HovalConnect)

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 charging circuit
  - bivalent and cascade management
- RAST 5 basic plug set
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Cable set ZE1 for connecting the TopTronic® E control to the basic boiler control panel

Options for TopTronic® E controller
- Can be expanded by max. 1 module expansion:
  - module expansion heating circuit or
  - module expansion heat balancing 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

No additional module expansions or controller modules can be installed in the boiler control panel!

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

Further information about the TopTronic® E
see “Controls”

Delivery
- Wall-hanging gas condensing boiler fully panelled
- Control separately packed, mounting on-site

Mounted below/free standing calorifier TopVal (130,160)

- Water heater with smooth pipe heat exchanger made of enamelled steel, fixed build in
- Floor-mounted calorifier for TopGas® comfort (10-22)
- Magnesium protection anode
- Thermal insulation using HCFC free PU foam, with foil mantle, white

Delivery
- Calorifier and thermal insulation completely installed

Heating armature groups and wall distributors
see “Various system components”

Calorifier CombiVal ERW (200), white

- Calorifier made of steel, enamelled inside
- Smooth pipe heat exchanger enamelled, built in
- Free-standing calorifier for TopGas® comfort (10-22)
- Magnesium protection anode integrated
- Flange for electric heating element
- Thermal insulation made of Polyurethane foamed on the calorifier, dismantable foil casing, white, completely mounted
- Pocket welded in including thermometer

On request
- Electric heating element

Delivery
- Calorifier and thermal insulation completely installed (foil jacket can be removed for installation)

Wall-mounted gas condensing boilers

Boiler permissions

TopGas® comfort (10-22):
CE product ID No.: CE-0085BR0482

Hoval TopGas® comfort (10-22)
incl. RS-OT controller (can be built in)

Heat exchanger made of corrosion-proof aluminium alloy with integrated copper meander with forced flow. With modulating, pre-mixing surface burner made of stainless steel. Including basic boiler control panel and control RS-OT. High-efficiency pump, fully cased incl. connection fittings.

TopGas® comfort type		Nominal heat output 50/30 °C kW	Part No.
(10)	A	3.1-10.0	7014 080
(16)	A	2.9-16.0	7014 081
(22)	A	4.5-22.0	7014 082

Energy efficiency class of the compound system with control

Hoval TopGas® comfort (10-22)
incl. TopTronic® E controller (mountable)

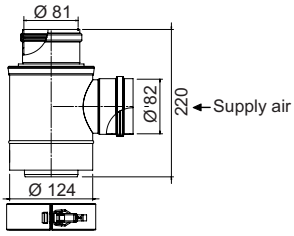
Design as above but with TopTronic® E controller.

TopGas® comfort type		Nominal heat output 50/30 °C kW	Part No.
(10)	A	3.1-10.0	7014 084
(16)	A	2.9-16.0	7014 085
(22)	A	4.5-22.0	7014 086

Energy efficiency class of the compound system with control

No additional module expansions or controller modules can be installed!

Accessories

		Part No.
	**Modification set for propane** for TopGas® comfort (10-22)	6047 633
	**Separating piece C80/125 -> 2 x E80 PP** for room air independent operation for separate conduction of flue gas and combustion air.	2010 174
	**Visible console** for TopGas® comfort for preinstallation of connections for gas R ½″ heating flow and return connections G ¾″ flat sealing	6015 444
	**Ball valve set - flow and return** Consisting of: 2 ball valves for flow and return 2 seals Connection ¾″	6017 173
	**Gas valve, passage DN 15, R ½″** with thermally releasing cut-off device	2012 075
	**Gas valve, corner version DN 15, R ½″** with thermally releasing cut-off device	2012 076
	**Sludge separator with magnet** Type: MB3 DN 25 Rp 1″ With variable connection for vertical or horizontal pipelines Removal of ferromagnetic and non-magnetic dirt and sludge particles from heating or cooling circuits with the medium water or water/glycol (50/50 %) Brass casing Sludge separation up to a particle size of 5 µm With unscrewable casing bottom part for cleaning and inspection work complete with sludge removal tap Nominal diameter: DN 25 Pipe connection: Rp 1″ internal thread Installation length: 90 mm Max. operating pressure: 6 bar Max. flow temperature: 110 °C Max. throughput: 2.0 m³/h Max. flow speed: 1.0 m/s Max. pressure drop: 3.8 kPa Contents: 0.36 l Weight: 2.3 kg	2062 165

Additional sludge separators
see “Various system components”

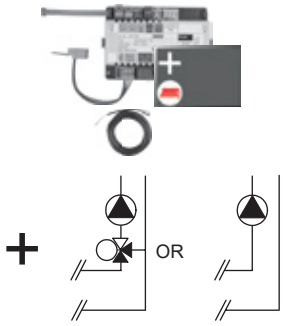
Free-standing calorifiers

		Part No.
	B **Calorifier TopVal (130) round** made of steel, inside enamel painted, with permanently installed coil 0.96 m² and magnesium sacrificial anode Useful volume: 128 l Operating/test pressure: 10/13 bar (SVGW 6/13 bar) Operating temperature max.: 95 °C Foil jacket made of synthetic material, RAL 9010, pure white	6037 757
	B **Calorifier TopVal (160) round** made of steel, inside enamel painted, with permanently installed coil 1.01 m² and magnesium sacrificial anode Useful volume: 157 l Operating/test pressure: 10/13 bar (SVGW 6/13 bar) Operating temperature max.: 95 °C Foil jacket made of synthetic material, RAL 9010, pure white	6037 758
	**Connection set** flexible piping between TopVal (130,160) and TopGas® comfort (10-22) with non-return flap in the primary flow to prevent single pipe circulation including sealing material.	2025 578
	B **Calorifier with thermal insulation** **Hoval CombiVal ERW (200) white** made from steel, enamelled on the inside With built-in enamelled plain-tube heat exchanger Magnesium protection anode built in Thermal insulation made of polyurethane rigid foam, foam-lined at the calorifier, removable foil jacket, colour white Technical data: Volume: 196 dm³ Energy efficiency class: B Inspection port flange Ø 180/120 mm Heating surface coil: 0.95 m² Operating temperature: max. 95 °C Operating pressure: max. 10 bar (SVGW 6 bar) Test pressure: 13 bar (SVGW 12 bar) Dimensions (H): 1464 mm, Ø 600 mm Tilting dimension: 1583 mm Weight: 77 kg Delivery: Calorifier, thermal insulation and thermometer mounted packaged and delivered SVGW No. 0503–4950	7015 961

Diaphragm pressure expansion tanks, heating armature groups and wall distributors
see “Various system components”

TopTronic® E module expansions

for TopTronic® E basic module heat generator



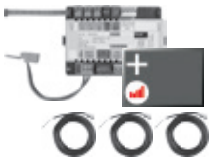
Notice
The supplementary plug set may have to be ordered to implement functions differing from the standard!

TopTronic® E module expansion heating circuit TTE-FE HK
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

Consisting of:
- Fitting accessories
- 1 contact sensor

ALF/2P/4/T, L = 4.0 m
- Basic plug set FE module

Part No. 6034 576



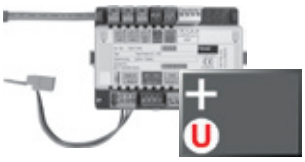
Notice
The flow rate sensor set must be ordered as well.

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

incl. energy balancing in each case
Consisting of:
- Fitting accessories
- 3 contact sensors

ALF/2P/4/T, L = 4.0 m
- Plug set FE module

Part No. 6037 062



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

TopTronic® E module expansion Universal TTE-FE UNI
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
Consisting of:
- Fitting accessories
- Plug set FE module

Part No. 6034 575

Further information
see “Controls” - “Hoval TopTronic® E module expansions” chapter

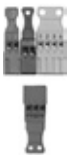
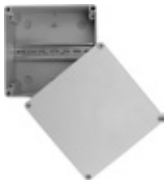
Flow rate sensor sets
Plastic housing

Size	Connection inches	Flow rate l/min	Part No.
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 1 ¼″	5-85	6038 509
DN 25	G 1 ½″	9-150	6038 510

Flow rate sensor sets
Brass housing

Size	Connection inches	Flow rate l/min	Part No.
DN 10	G 1″	2-40	6042 949
DN 32	G 1 ½″	14-240	6042 950

Accessories for TopTronic® E

		Part No.
	**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
	**Supplementary plug set**	
	for basic module heat generator TTE-WEZ	6034 499
	for controller modules and module expansion TTE-FE HK	6034 503
	**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** 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 LAN	6049 496
	HovalConnect WLAN	6049 498
	HovalConnect Modbus	6049 501
	HovalConnect KNX	6049 593
	TopTronic® E interface modules	
	GLT module 0-10 V	6034 578
	**TopTronic® E sensors**	
	AF/2P/K Outdoor sensor H x W x D = 80 x 50 x 28 mm	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
	**Bivalent switch** for various release or switching functions	
	Bivalent switch 1-piece	2056 858
	Bivalent switch 2-piece	2061 826
	**System housing**	
	System housing 182 mm	6038 551
	System housing 254 mm	6038 552
	**TopTronic® E wall casing**	
	WG-190 Wall casing small	6052 983
	WG-360 Wall casing medium	6052 984
	WG-360 BM Wall casing medium with control module cut-out	6052 985
	WG-510 Wall casing large	6052 986
	WG-510 BM Wall casing large with control module cut-out	6052 987

Further information
see “Controls”

	Part No.
 **Flow temperature guard** for underfloor heating (per heating circuit 1 guard) 15-95 °C, switching difference 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
 **BMS module 0-10 V/OT - OpenTherm (building management system)** no control unit TopTronic® E or RS-OT necessary power supply via OT bus Temp. control external with 0-10 V 0-1.0 V no request 1.0-9.5 V .....0-100 °C Cannot be installed in boiler control panel: - TopGas® classic (12-30) Can be installed in boiler control panel: - TopGas® classic (35-120), - TopGas® comfort	6016 725
Hoval TopGas® comfort (10-22) without controller on request	

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.

TopGas® comfort (10-22)

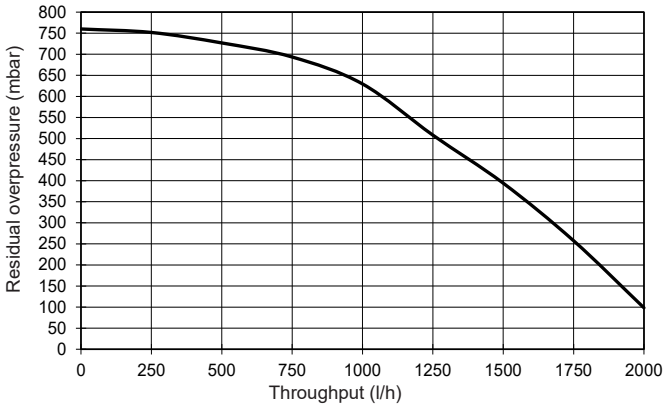
Type			(10)	(16)	(22)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	2.7-9.1	2.6-14.6	4.1-20.1
• Nominal heat output at 50/30 °C, natural gas [1]		kW	3.1-10.0	2.9-16.0	4.5-22.0
• Nominal heat output at 80/60 °C, propane [2]		kW	4.8-9.1	5.8-14.6	7.7-20.1
• Nominal heat output at 50/30 °C, propane [2]		kW	5.3-10.0	6.3-16.0	8.4-22.0
• Nominal heat input with natural gas [3]		kW	2.9-9.5	2.7-15.2	4.2-21.0
• Nominal heat input with propane [2]		kW	5.0-9.5	6.0-15.2	8.0-21.0
• Operating pressure heating min./max. (PMS)		bar	1/3	1/3	1/3
• Operating temperature max. (T_{max})		°C	85	85	85
• Boiler water content ($V_{(H20)}$)		l	1.4	1.7	2.0
• Flow resistance boiler				see diagram	
• Minimum circulation water quantity		l/h	180	180	180
• Boiler weight (without water content, incl. cladding)		kg	61	65	69
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV)		%	96.1/86.6	96.1/86.5	95.7/86.2
• Boiler efficiency at 30 % partial load operation (EN 15502) (NCV/GCV)		%	105.9/95.4	106.0/95.5	106.1/95.6
• Room heating energy efficiency					
- without control	ηs	%	89	90	90
- with control	ηs	%	91	92	92
- with control and room sensor	ηs	%	93	94	94
• NOx class (EN 15502)			-	-	-
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	6.3	18.9	23.4
• CO_2 content in flue gas at min./max. nominal heat output		%	8.8/9.0	8.8/9.0	8.8/9.0
• Heat loss in standby mode		watts	60	80	95
• Dimensions			see table of dimensions		
• Gas flow pressure min./max.					
- Natural gas E/LL		mbar	17.4-50	17.4-50	17.4-50
- Propane		mbar	37-50	37-50	37-50
• Gas connection values at 15 °C/1013 mbar:					
- Natural gas E (Wo = 15.0 kWh/m^3) NCV = 9.97 kWh/m^3		m^3/h	0.29-0.95	0.27-1.52	0.42-2.11
- Natural gas LL (Wo = 12.4 kWh/m^3) NCV = 8.57 kWh/m^3		m^3/h	0.34-1.11	0.32-1.77	0.49-2.45
- Propane [1] (NCV = 25.9 kWh/m^3)		m^3/h	0.19-0.37	0.23-0.59	0.31-0.81
• Operating voltage		V/Hz	230/50	230/50	230/50
• Electrical power consumption (incl. pump) min./max.		watts	20/32	19/38	20/44
• Standby		watts	7	7	7
• Type of protection		IP	40	40	40
• Permitted ambient temperature during operation		°C	5-40	5-40	5-40
• Sound power level					
- Heating noise (EN 15036 Part 1) (room air dependent)		dB(A)	46	51	54
• Condensate quantity (natural gas) at 50/30 °C		l/h	0.9	1.4	2.0
• pH value of the condensate		approx.	4.2	4.2	4.2
• Construction type			B23, C13(x), C33(x), C53(x), C63(x)		
• Flue gas system					
- Temperature class			T 120	T 120	T 120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	14.4	23.1	31.9
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	4.4	4.1	6.3
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	65	71	68
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	51	54	52
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	31	34	32
- Maximum permitted temperature of the combustion air		°C	50	50	50
- Flow rate combustion air		Nm^3/h	11.7	18.7	26.2
- Maximum supply pressure for supply air and flue gas line		Pa	75	75	75
- Maximum draught/depression at flue gas outlet		Pa	-50	-50	-50

[1] Data related to NCV. The TopGas® comfort can also be operated with propane.

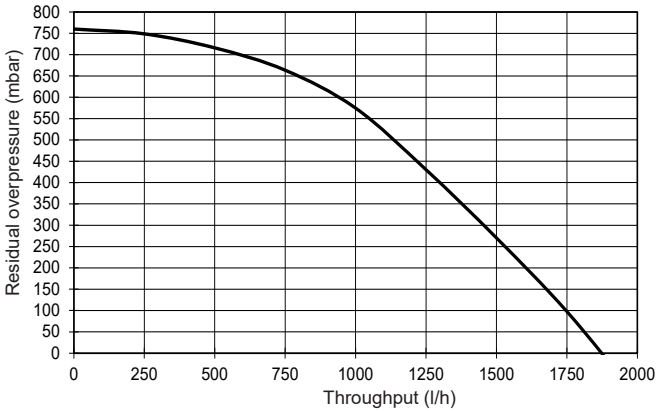
[2] Data related to NCV. The boiler series is tested for EE/H setting. With a factory setting to a Wobbe value of 15.0 kWh/m^3, operation in the Wobbe value range from 12.0 to 15.7 kWh/m^3 is possible without new settings.

Residual overpressures of heating pump

TopGas® comfort (10)

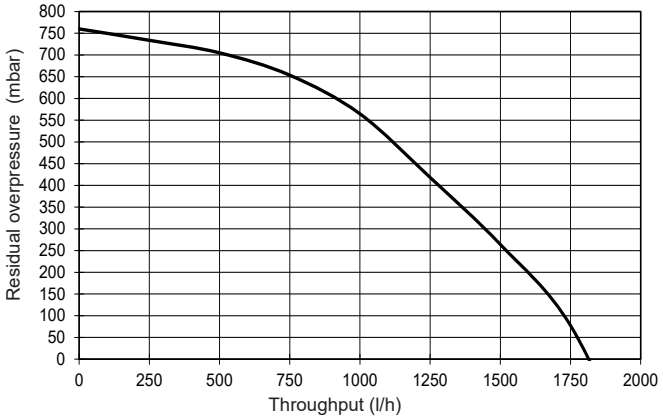


TopGas® comfort (16)



Residual overpressures of heating pump

TopGas® comfort (22)



Calorifier TopVal (130,160) and CombiVal ERW (200)

Type			TopVal (130)	TopVal (160)	CombiVal ERW (200)
• Volume		dm^3	128	157	196
• Operating pressure/test pressure		bar	10/13	10/13	10/13
• Max. operating temperature:		°C	95	95	95
• Fire protection class			B2	B2	B2
• Heat loss at 65 °C		W	53	56	49
• Weight		kg	53	56	56
• Dimensions	Diameter	mm	590	590	600
	Height	mm	869	1036	1464
Heater coils (integral)					
• Heating surface		m^2	0.96	1.01	0.95
• Heating water		dm^3	6.7	7.1	6.4
• Flow resistance boiler [1]		z-value	22	22	7
• Operating pressure/test pressure		bar	8/13	8/13	10/13
• Flow temperature maximum		°C	95	95	110

[1] Flow resistance boiler in mbar = flow rate $(m^3/h)^2$ x z

Hot water output TopVal, CombiVal with TopGas® comfort, heating flow 80 °C

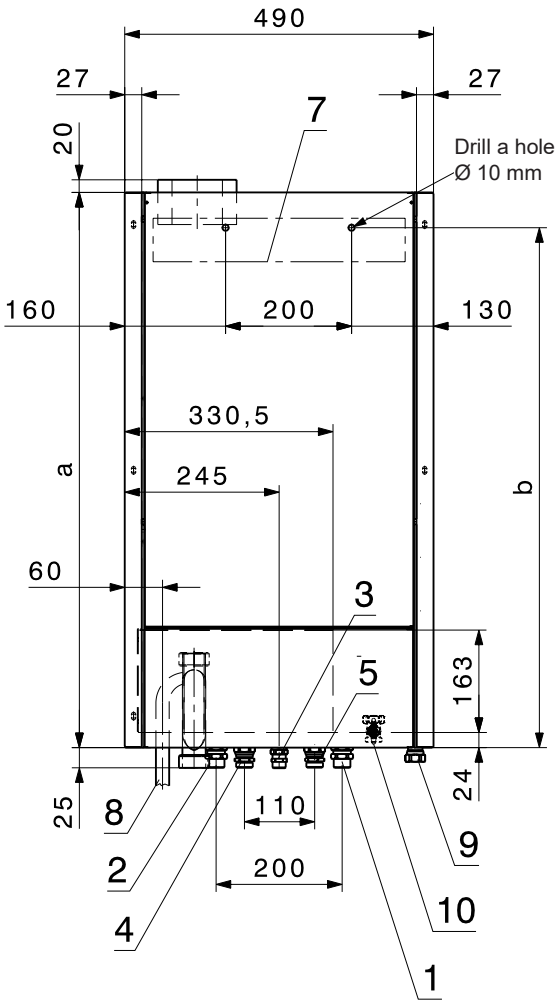
TopGas® comfort/ calorifier type	Hot water output dm^3/10 min [1] 45 °C	Hot water output dm^3/h [2] 45 °C	Number of flats [3]
(10)/TopVal (130)	162	215	1
(16)/TopVal (130)	173	345	1
(22)/TopVal (130)	184	475	1
(10)/TopVal (160)	195	215	1
(16)/TopVal (160)	206	345	1-2
(22)/TopVal (160)	217	475	1-2
(10)/CombiVal ERW (200)	239	215	1-2
(16)/CombiVal ERW (200)	250	345	1-2
(22)/CombiVal ERW (200)	261	475	2

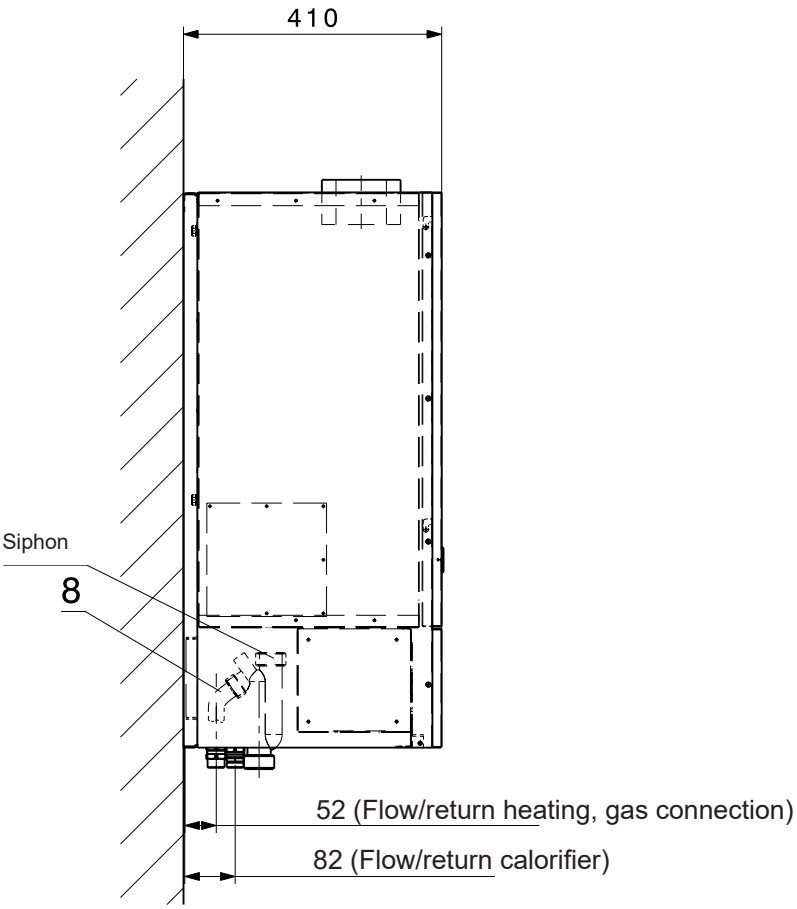
[1] Peak hot water output in 10 min.
[2] Continuous hot water output per hour.
[3] Normal flats (3-4 rooms with 4 people, 1 bath holding around 150 litres, 1 wash basin, 1 sink)

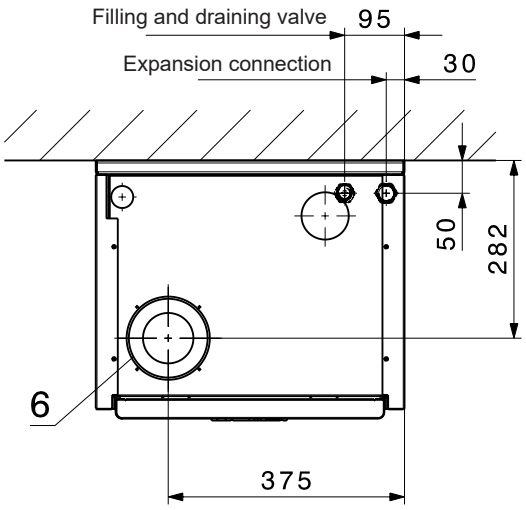
TopGas® comfort (10-22)

Minimal spaces
(Dimensions in mm)

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







TopGas® comfort type	a	b
(10)	820	764
(16)	880	824
(22)	940	884

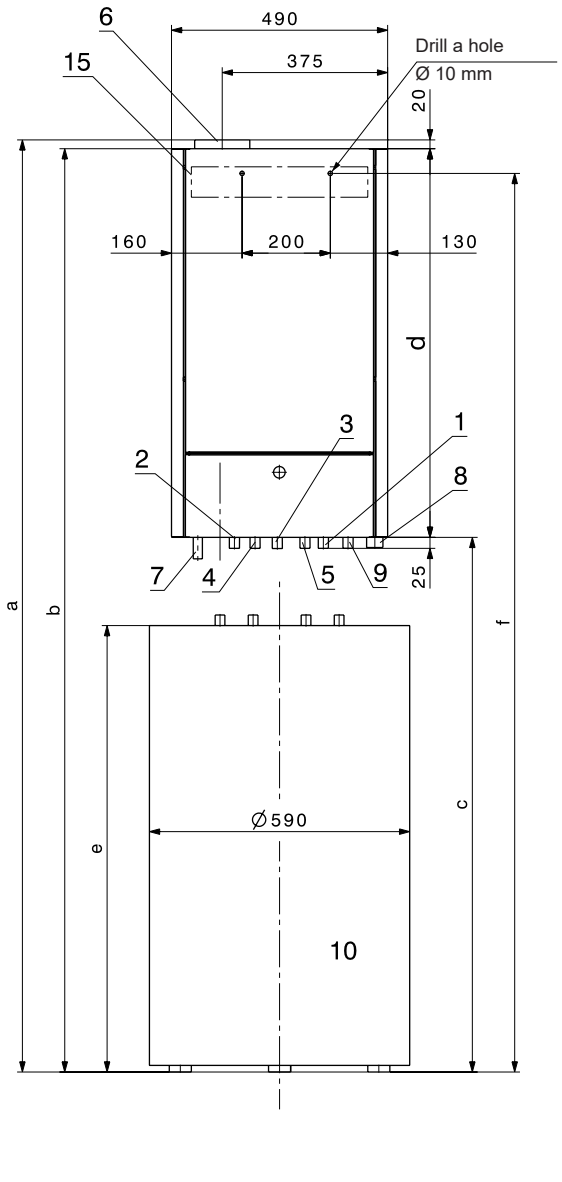
1 Return heating Ø 22 mm with locking ring including double nipple G ¾″
2 Flow heating Ø 22 mm with locking ring including double nipple G ¾″
3 Gas connection Ø 15 mm with locking ring including double nipple G ½″
4 Flow calorifier Ø 18 mm with locking ring including double nipple G ¾″
5 Return calorifier Ø 18 mm with locking ring including double nipple G ¾″
6 Concentrical supply air/flue gas connection C80/125
7 Wall rail
8 Condensate drain Ø 32 mm (hose Ø 25/21 mm)
9 Connection of diaphragm pressure expansion tank G ¾″
10 Filling and draining valve

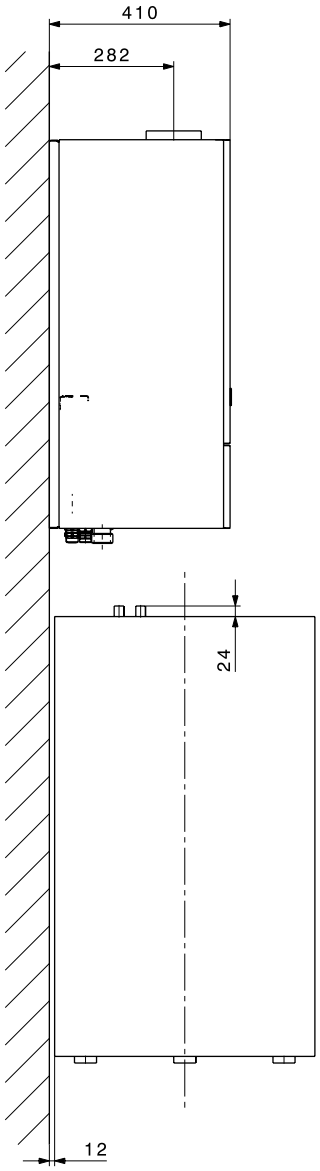
TopGas® comfort (10-22) with TopVal (130,160) placed below

CombiVal ERW (200)
see Calorifiers

Minimal spaces
(Dimensions in mm)

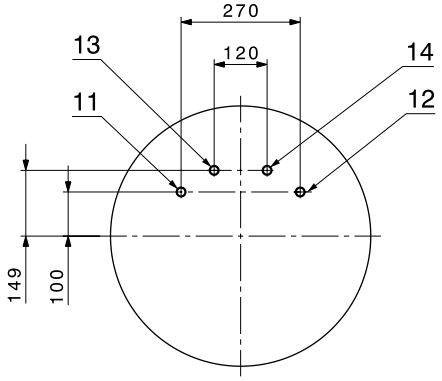
- Sideways 50 mm
- Space to ceiling dependent on the flue gas system
- Front 500 mm





1 Return heating Ø 22 mm with locking ring incl. double nipple G ¾″
2 Flow heating Ø 22 mm with locking ring incl. double nipple G ¾″
3 Gas connection Ø 15 mm with locking ring incl. double nipple G ½″
4 Flow calorifier Ø 18 mm with locking ring incl. double nipple G ¾″
5 Return calorifier Ø 18 mm with locking ring incl. double nipple G¾″
6 Concentrical supply air/flue gas connection C80/125
7 Condensate drain Ø 32 mm (hose Ø 25/21 mm)
8 Connection of diaphragm pressure expansion tank G ¾″
9 Filling and draining valve
10 Calorifier TopVal (130,160)
11 Flow heating G ¾″ ext. thread
12 Return heating G ¾″ ext. thread
13 Hot water R ¾″ ext. thread
14 Cold water R ¾″ ext. thread
15 Wall rail

View from above TopVal (130,160) without TopGas®



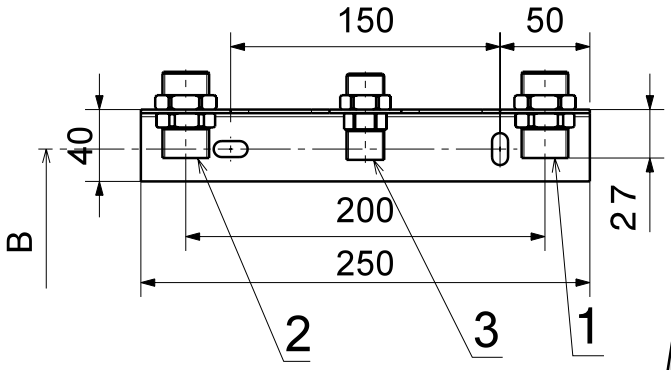
TopGas® comfort/TopVal type	type	a	b	c	d	e	f
(10)	(130)	1885	1865	1045	820	845	1810
	(160)	2082	2032	1212	820	1012	1977
(16)	(130)	1945	1925	1045	880	845	1870
	(160)	2112	2092	1212	880	1012	2037
(22)	(130)	2005	1985	1045	940	845	1930
	(160)	2172	2152	1212	940	1012	2097

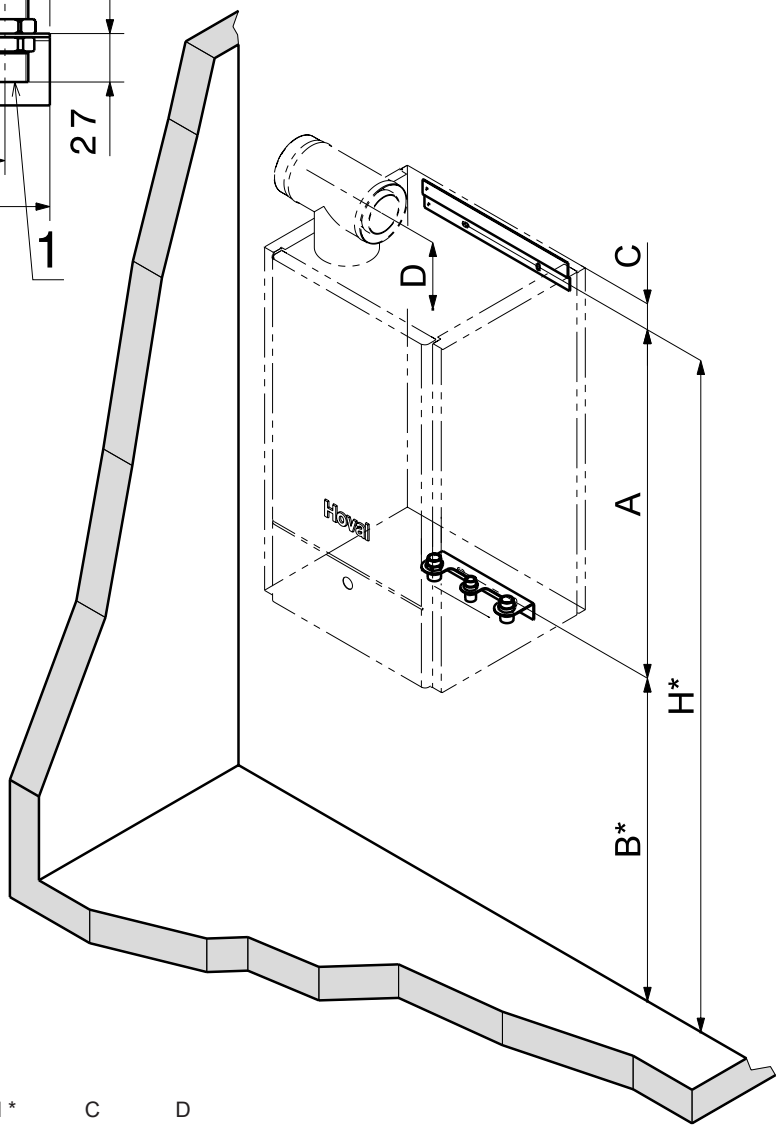
Measures for drill holes and visible console for preinstallation

(Dimensions in mm)

for

- TopGas® comfort with TopVal (130,160) placed below





1 Return G ¾″
2 Flow G ¾″
3 Gas connection G ½″

TopGas® comfort/ type	TopVal type	A	B	H *	C	D
(10)	(130)	814	996	1810	55	120
	(160)	814	1163	1977	55	120
(16)	(130)	874	996	1870	55	120
	(160)	874	1163	2037	55	120
(22)	(130)	934	996	1930	55	120
	(160)	934	1163	2097	55	120

* Measures for drill hole

Standards and guidelines

The official regulations for installation and operation must be observed. In particular, these are the country-specific standards (e.g. EN standard, DIN standards, …) as well as the corresponding regional regulations.

The following standards and guidelines must be complied with:

- Hoval technical information and installation instructions
- hydraulic and technical control regulations of Hoval
- DVGW directives
- 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 heating and service water installations
- EN 14868 “Protection of metallic materials against corrosion”
- VDE 0100 supplement 2

Water quality in heating systems

Filling and replacement water, heating water

The following applies:

- VDI 2035
- In addition, the EN 14868 standard must be applied, **as well as the manufacturer-specific specifications**

Manufacturer-specific specifications

Filling and replacement water

The filling and replacement water can be both fully demineralised and also merely softened.

Heating water

- In the case of **full demineralisation of the filling and replacement water**, the electrical conductivity of the heating water must not exceed the value of 100 µS/cm.
- In the case of **softening the filling and replacement water**, the following conditions must be complied with:
  - Electrical conductivity of the heating water for operation with water containing salts: > 100 µS/cm to ≤ 1500 µS/cm
  - pH value of the heating water for systems without aluminium alloy as water-side material 8.2 to 10.0 (measurement 10 weeks after commissioning at the earliest)
- The sum of the chloride, nitrate and sulphate contents in the heating water must not exceed 50 mg/l in total.

Additional notices

- Hoval boilers and calorifiers are suitable for heating systems without significant oxygen intake. (System type I according to EN 14868).
- Plants with continual oxygen intake (e.g. underfloor heating without diffusion-proof plastic piping) or intermittent oxygen intake (e.g. requiring frequent topping-up) must be equipped with a system separation.
- If only the boiler is replaced in an existing plant, it is not recommended for the entire heating system to be refilled, provided that the heating water already contained in the system complies with the relevant directives or standards.
- Before filling new systems and, where necessary, existing heating systems containing heating water that does not comply with the directives or standards, the heating system must be professionally cleaned and flushed. The boiler must not be filled until the heating system has been flushed.

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 rooms, hairdressers and so on). Halogen compounds can be caused by cleaning and degreasing solutions, dissolvents, glue and bleaching lyes.

Combustion air supply

The supply of combustion air must be guaranteed. There must be no possibility to close the air supply opening. An air pipe D = 80 for direct combustion air supply (air-exhaust system) can be directly connected to the boiler.

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

- *Room air-dependent operation*:
  A minimum ventilation outlet of at least 150 cm^2 or 2 x 75 cm^2 cross-section is necessary for a boiler output up to 50 kW. For each further kW of output 2 cm^2 more cross-section must be provided.

- Room air-independent operation with separate combustion air pipe to the boiler:
  0.8 cm^2 per 1 kW of output. The pressure drop in the combustion air pipe must be considered for the calculation of the flue gas system.

Gas connection

Commissioning

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

Manual gas shut-off valve 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 tap (thermally releasing) 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 gas flow pressure at the boiler inlet: natural gas min. 17.4 mbar, max. 50 mbar. Propane min. 37 mbar, max. 50 mbar.

Sludge separator

Installation of a sludge separator with magnetic ring in the gas boiler return is recommended.

Minimum heating water circulation quantity

- Depending on the boiler type, different minimum circulating water quantities are required through the boiler. For details, see the corresponding data sheets.
- During burner operation, the circulating pump must be constantly in operation and the minimum heating water circulation quantity must be guaranteed.
- After each burner switch-off, the circulating pump must be in operation for at least 2 minutes (is guaranteed by the boiler controller).

Heating boiler in the attic

The gas boiler TopGas® comfort is equipped with a safety mechanism to guard against water loss and can therefore be installed in upper stories.

Condensate drainage

- The allowance to lead the flue gas condensate into the canalisation must be obtained from the responsible authority.
- The condensate from the flue gas system can be discharged through the boiler. A condensate trap is not needed anymore with the flue gas system.
- The condensate must be openly lead into the canalisation (tunnel).
- Suitable materials for condensate drain:
  - stoneware pipes
  - pipes made from glass
  - pipes made from stainless steel
  - pipes made from plastic: PVC, PE, PP, ABS and UP

Diaphragm pressure expansion tank

- An adequately dimensioned diaphragm pressure expansion tank must be provided.
- The diaphragm pressure expansion tank has to be installed at the diaphragm pressure expansion tank connection (pump intake side) (see “Dimensions”).
- Starting from 70 °C an intermediate tank is necessary.

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 lines must be secured against unwanted loosening of the plug connections.
- The flue gas system must be connected with an angle, so that the resulting condensate of the flue gas 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.

Flue gas line dimensioning
see Rubrik «Flue gas line systems»

Looking for the appropriate hydraulic schematic?
Please contact your local Hoval partner.