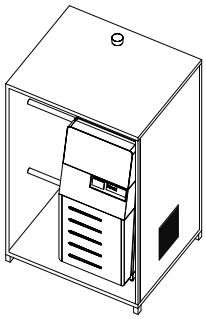
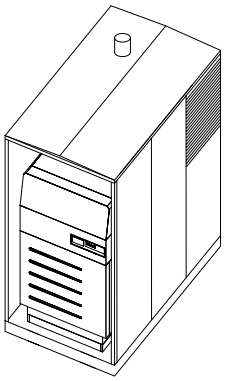
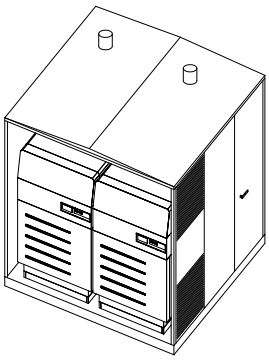
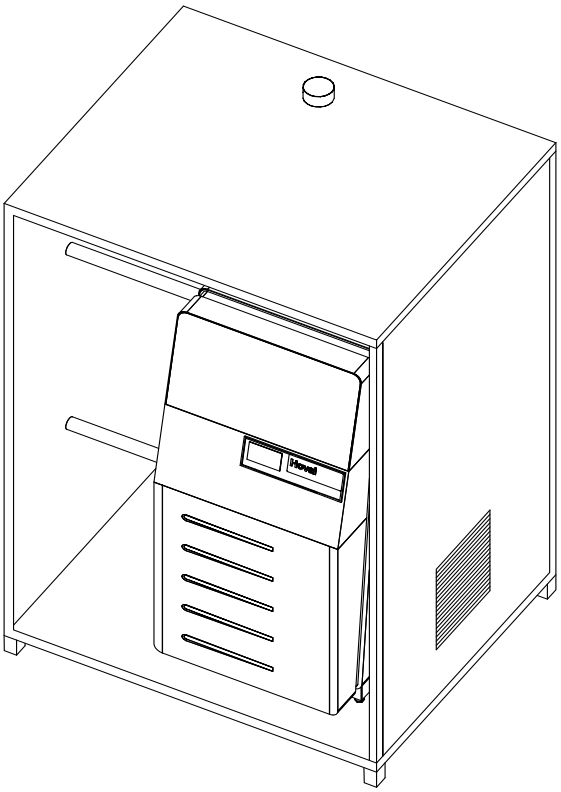
Cabin Slim Thermal Energy System: consists of protective housing and built-in equipment with gas condensing boiler







Cabin Slim Thermal Energy System AC: consists of protective housing and built-in equipment with gas condensing boiler UltraGas® (50-100)



Cabin Slim protective housing
- One-piece support stand made of steel profiles 100x50x3 mm
- Vertical angular and middle profiles painted in white RAL 9010
- Double sandwich panels which guarantee excellent thermal and sound insulation of the housing, mounted on the front, rear and sides, except for the top and bottom:

1. Inner side: galvanized sheet metal 0,8 mm thick;
2. rock wool insulation 20 mm thick, density 100 kg/m³ fire resistance class "A1";
3. Exterior: galvanized sheet metal - painted white RAL 9010, 0,6 mm thick

- Step surface made of structured aluminum sheet 3/4.5 mm thick, reinforced substructure for better fastening of accessories
- Front access door with door opening handle with lock and key, to allow access to all equipment for service and maintenance
- Back access door with door opening handle with lock and key, to allow access to the chimney
- Ventilation grilles installed for operation with natural or liquefied petroleum gas with openings for ventilation and securing the supply of combustion air, made of steel profiles
- The final roof surface guarantees the impermeability of the structure, made of galvanized steel sheet painted in white RAL 9010

Thermal Energy System AC built-in equipment
- Floor-standing gas condensing boiler UltraGas® (50-100) CE-0085AQ0620
- Hydraulic connections of boiler flow and return lines made of the steel pipes painted grey.
- Insulation of flow and return pipes with flexible elastomeric foam, intended to be used as thermal insulation for building equipment and industrial installations with aluminum foil
- Safety equipment according to EN 12828: safety chain (safety thermostat, low and high pressure switches), manometer with valve, calibrated safety valve
- Expansion diaphragm pressure vessel with quick release valve **only for boiler protection**, volume depends on the nominal heat output of the installed boiler and content of the heating medium
- Drain from safety valve with built-in funnel and drain pipe outside housing
- Condensate drain from the boiler with a plastic drain pipe outside the housing
- With condensate neutralization box
- Natural gas supply pipe painted in yellow color with thermal shut-off valve, gas filter with test connection, compensator and external shut-off valve
- Heating cable on the flow and return pipes, with thermostat, as an option the heating cable can be installed on the condensate drain
- Internal electrical installation for power supply and signal cables
- External terminal box with IP65 protection for boiler power supply and signal cables, with revision switch
- Stainless steel chimney with one wall and waterproof clamp, end about 0.25 m above the roof of the protective housing
- Inside lighting and service socket

Model range

Cabin Slim Thermal Energy System AC with UltraGas®	Nominal heat output at 50/30 °C kW
(50)	8.0-48.8
(70)	13.5-69.0
(100)	20.9-99.0

Options
- Circulation pump
- Heat exchanger
- Hydraulic switch
- Gas pressure regulator
- Hydraulic valve for cascade operation

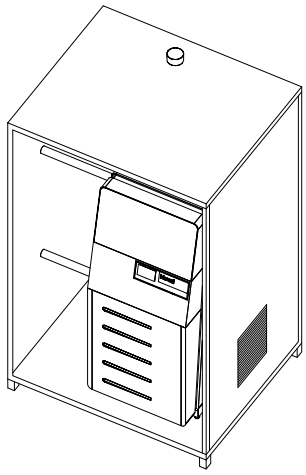
Floor-standing gas condensing boiler UltraGas®
- Steel boiler with condensation technology
- For the combustion of:
  - natural gas E
  - natural gas E with a hydrogen content (H_2) of up to 20 % by vol.
  - propane according to DIN 51622
  - biomethane according to EN 16723
- Combustion chamber made of stainless steel
- Maximal flue gas condensation through downstream heating surface made of aluFer® stainless steel bounded pipe; heating gas side: aluminium water side: stainless steel
- Thermal insulation with mineral wool mat
- Water pressure sensor (minimum and maximum pressure limiter integrated)
- Flue gas temperature sensor with flue gas limiter function
- Pre-mix burner
  - with blower and venturi
  - modulating operation
  - automatic ignition
  - ionisation guard
  - gas pressure monitor
- Gas boiler fully clad with steel plate, red powder-coated
- Heating connections to left and right for:
  - heating flow
  - high temperature return
  - low temperature return
- UltraGas® (50): Flue gas connection backwards to the top
- UltraGas® (70,100): concentrical supply air/flue gas connection, vertically upwards, horizontally to rear as op-tion, see accessories and dimension sheet
- TopTronic® E controller installed
- Possibility of connecting an external gas solenoid valve with error output

Delivery
- External thermal module with built-in equipment installed in protective housing, factory wired, ready for installation on-site

On-site
- Thermal Energy System positioning (suitable for transport using fork lift or crane with ropes)
- Lifting of the cabin must be done with the spreaders
- Cabin leveling
- Assembly of the chimney and/or connecting it to the external flue gas system
- Connection of the expansion vessel
- Connection to the heating system, gas pipeline and the power supply

Part number

Cabin Slim Thermal Energy System AC: consists of protective housing and built-in equipment with gas condensing boiler UltraGas® (50-100)



Cabin Slim Thermal Energy System AC UltraGas® (50-100)

Cabin Slim Thermal Energy System AC with Hoval UltraGas® (50-100) floor gas condensing boiler consists of protective housing and other built-in equipment for outdoor installation. Housing made of the steel profiles and double sandwitch panels.

With safety equipment according to EN 12828 norm, expansion vessel, neutralisation box. With hydraulic and gas connections to the side.

Boiler made of steel with TopTronic® E control, combustion chamber made of stainless steel. Secondary heating surfaces made of aluFer® stainless steel composite pipe.
Modulating premix burner with blower.

Delivery
- Built-in equipment and the boiler preassembled in protective housing, ready for installation.
- Expansion vessel - delivered packed in the box for transport, installation on site to the prepared connection
- Chimney - delivered disassembled for transport, installation on site

Cabin Slim Thermal Energy System AC with UltraGas®	Nominal heat output at 50/30 °C kW [1]	Operating pressure bar [2]	Part Nr.
(50)	8.0-48.8	3	CS 7013 304 HR
(70)	13.5-69.0	3	CS 7011 990 HR
(100)	20.9-99.0	3	CS 7011 991 HR

[1] kW = modulation range
[2] Optionally the boilers can be delivered with safety valve up to their maximum boiler working pressure

Options:

Additional heating
Heating cable installed on the condensate drain.

on request

Expansion vessel
As an option an expansion vessel with the bigger volume can be delivered, depending on the available space in the cabin

on request

Gas pressure regulator
Pressure regulator installed on the gas pipeline, installed before the gas valve.

on request

Through valve YVG48..
installed on the flow or return of the boiler. For connecting individual cabins in cascade.

	Part Nr.
UltraGas® (50) DN 32	6045 737
UltraGas® (70-100) DN 40	6045 738

Suitable motor drives

Type	Voltage	Control signal	Actuator run time	Part Nr.
SSC319	230 V / 50/60 Hz	3-point	150 s	245 236
SAS31.00	230 V / 50/60 Hz	3-point	120 s	2064 157
SAS31.03	230 V / 50/60 Hz	3-point	30 s	2064 158

Cabin Slim Thermal Energy System AC

Type		(50)	(70)	(100)
Part number		CS 7013 304 HR	CS 7011 990 HR	CS 7011 991 HR
• Flow and return connection		R 1 ¼″	R 1½″	R1½″
• Gas connection (outside module)		Rp ¾″	Rp 1″	Rp 1″
• Gas valve with thermal shut-off (on boiler)		DN 20, Rp ¾″	DN 25, Rp 1″	DN 25, Rp 1″
• Gas filter size (on boiler)		Rp ¾″	Rp 1″	Rp 1″
• Safety valve dimension (3 bar)		DN 15, Rp 1″	DN 20, Rp 1″	DN 20, Rp 1″
• Expansion vessel	l	12	18	18
• Neutralisation box	kg	3	3	3
• Operating voltage	V/Hz	230/50	230/50	230/50
• Electrical power consumption min./max.	W	26/119	25/91	21/230
• System weight (without water content) [1)]	kg	550	650	650
• System weight (with water content) [1)]	kg	600	800	800
• Flue gas chimney size	DN	80	100	100

[1)] Weight of the system is approximate and dependent on the additional equipment installed in the system.

Hoval UltraGas® (50-100)

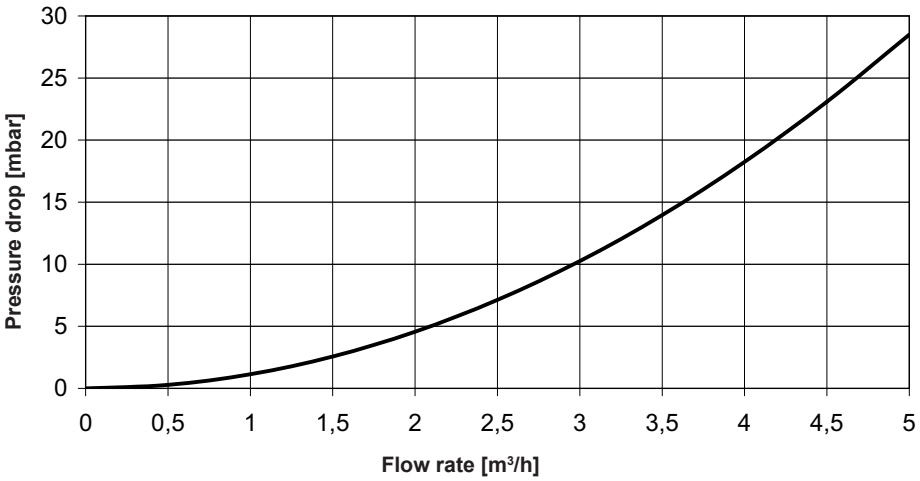
Type			(50)	(70)	(100)
• Nominal heat output at 80/60 °C natural gas [1]		kW	7.5-46.0	12.1-64.5	19.0-92.0
• Nominal heat output at 50/30 °C natural gas [1), 2)]		kW	8.0-48.8	13.5-69.0	20.9-99.0
• Nominal heat output at 80/60 °C propane [3)]		kW	9.9-45.5	15.4-63.3	23.0-92.0
• Nominal heat output at 50/30 °C propane [2)]		kW	10.9-49.9	17.1-69.0	25.0-99.0
• Nominal load with natural gas [4)]		kW	7.7-46.9	12.5-65.5	19.6-94.1
• Nominal load with propane [3]		kW	10.2-47.2	16.0-65.5	23.8-94.1
• Operating pressure heating min./max. (PMS)		bar	1/3	1/4	1/4
• Operating temperature max. (T_{max})		°C	85	85	85
• Boiler water content ($V_{(H20)}$)		l	75	157	144
• Flow resistance boiler [5)]		z value	1.1	1.5	1.5
• Minimum circulation water quantity		l/h	-	-	-
• Boiler weight (with water content. incl. casing)		kg	700	800	800
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV)		%	98.0/88.3	98.0/88.3	97.6/87.9
• Boiler efficiency at 30 % partial load (EN 15502) (NCV/GCV)		%	108.1/97.4	108.1/97.4	108.1/97.4
• Energy efficiency class					
- without control	ηs	%	92	92	92
- with control	ηs	%	94	94	94
- with control and room sensor	ηs	%	96	96	96
• NOx class (EN 15502)			-	-	-
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	28	28	29
• O_2-content in flue gas at min./max. nominal heat output		%	5.5/5.1	5.5/5.1	5.5/5.1
• Heat loss in standby mode		Watt	220	290	290
• Dimensions			See table of dimensions		
• Gas flow pressure minimum/maximum					
- Natural gas E/LL		mbar	17.4-50	17.4-50	17.4-50
- Propane		mbar	37-50	37-50	37-50
• Gas connection value at 15 °C/1013 mbar:					
- Natural gas E (Wo = 15.0 kWh/m³) NCV = 9.97 kWh/m³		m³/h	0.77-4.70	1.25-6.57	1.97-9.44
- Natural gas LL (Wo = 12.4 kWh/m³) NCV = 8.57 kWh/m³		m³/h	0.90-5.47	1.46-7.64	2.29-10.98
- Propane (NCV = 25.9 kWh/m³)		m³/h	0.39-1.82	0.62-2.53	0.92-3.63
• Operation voltage		V/Hz	230/50	230/50	230/50
• Electrical power consumption min./max.		Watt	26/119	25/91	21/230
• Stand-by		Watt	9	9	9
• IP rating (integral protection)		IP	20	20	20
• 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)	60	64	67
- Exhaust noise is radiated from the mouth (DIN 45635 part 47) (room air dependent/room air independent		dB(A)	58	55	59
- Sound pressure level (depending on installation conditions) [6)]		dB(A)	53	57	59
• Condensate quantity (natural gas) at 40/30 °C		l/h	4.4	6.2	8.9
• pH value of the condensate		approx.	4.2	4.2	4.2
• Construction type			B23, B23P, C53, C63		
• Flue gas system					
- Temperature class			T120	T120	T120
- Flue gas mass flow at nominal heat load (dry)		kg/h	78.0	109.0	157.0
- Flue gas mass flow at lowest nominal heat load (dry)		kg/h	11.6	18.8	29.5
- Flue gas temperature at nominal output and operation 80/60 °C		°C	68	63	65
- Flue gas temperature at nominal output and operation 40/30 °C		°C	46	43	44
- Flue gas temperature at lowest nominal heat load and operation 40/30 °C		°C	31	31	32
- Maximum permitted temperature of the combustion air		°C	50	50	50
- Volume flow rate combustion air		Nm³/h	58	81	117
- Maximum supply pressure for supply air and flue gas line		Pa	120	130	130
- Maximum draught/depression at flue gas outlet		Pa	-30	-30	- 30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H2) of up to 20 % by vol. in accordance with DVGW ZP3100, an output reduction of up to 7 % is possible.
[2] Factory measurements
[3] Data related to NCV.
[4] 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/m³, operation in the Wobbe value range from 12.0 to 15.7 kWh/m³ is possible (readjustment might be necessary).
[5] Flow resistance boiler in mbar = flow rate (m³/h)2 x z; resp. see diagrams.
[6] Compare notice at “Engineering”.

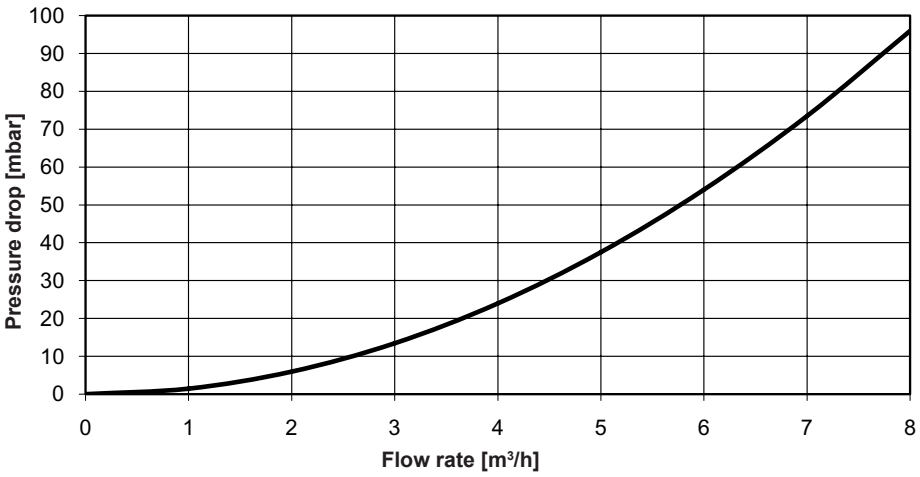
6

Hoval UltraGas® (50-100)
Flow resistance on the heating water side

UltraGas® (50)



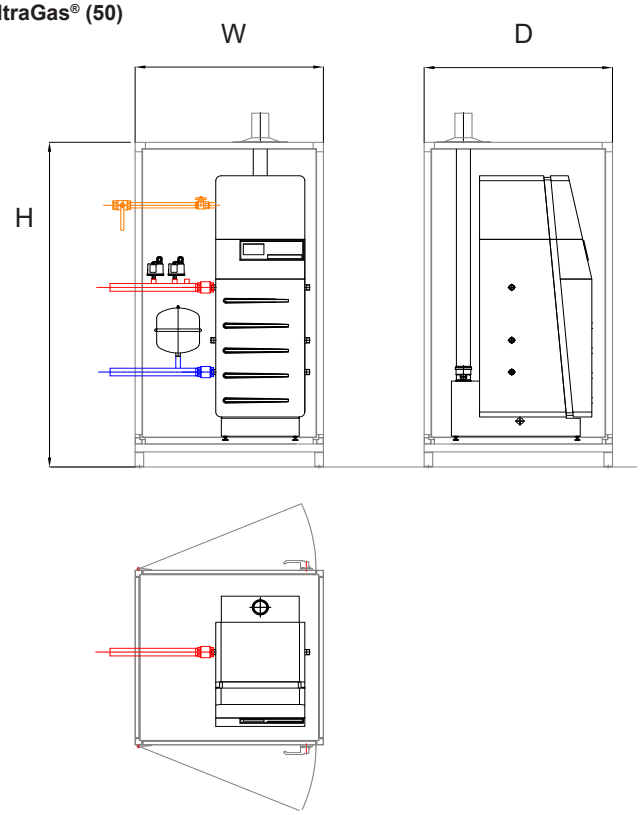
UltraGas® (70,100)



Cabin Slim Thermal Energy System AC UltraGas® (50-100)

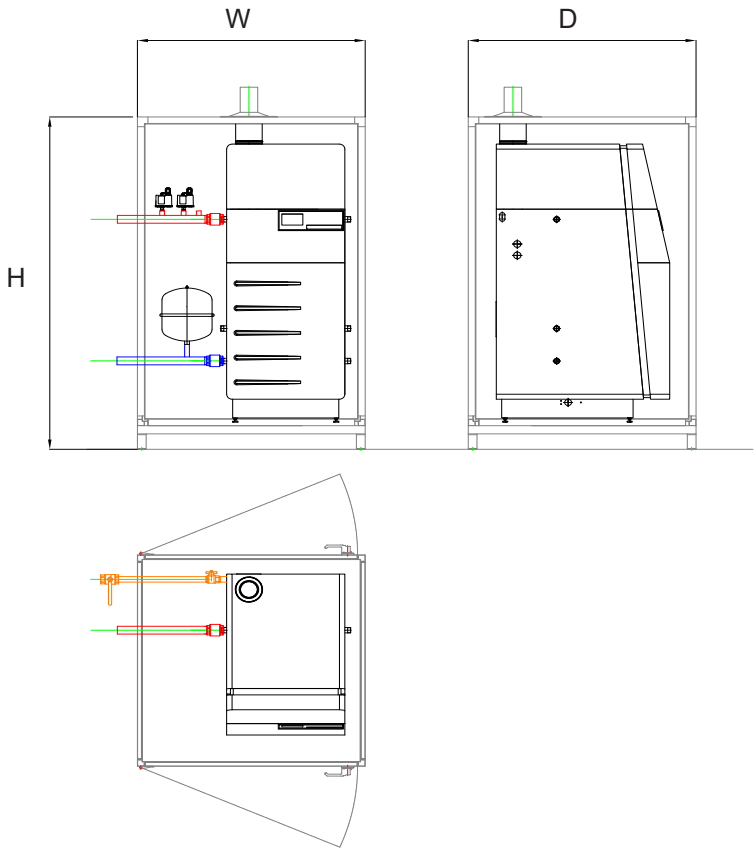
(Dimensions in mm)

UltraGas® (50)



UltraGas® Type	W	D	H
(50)	1100	1100	2045

UltraGas® (70,100)

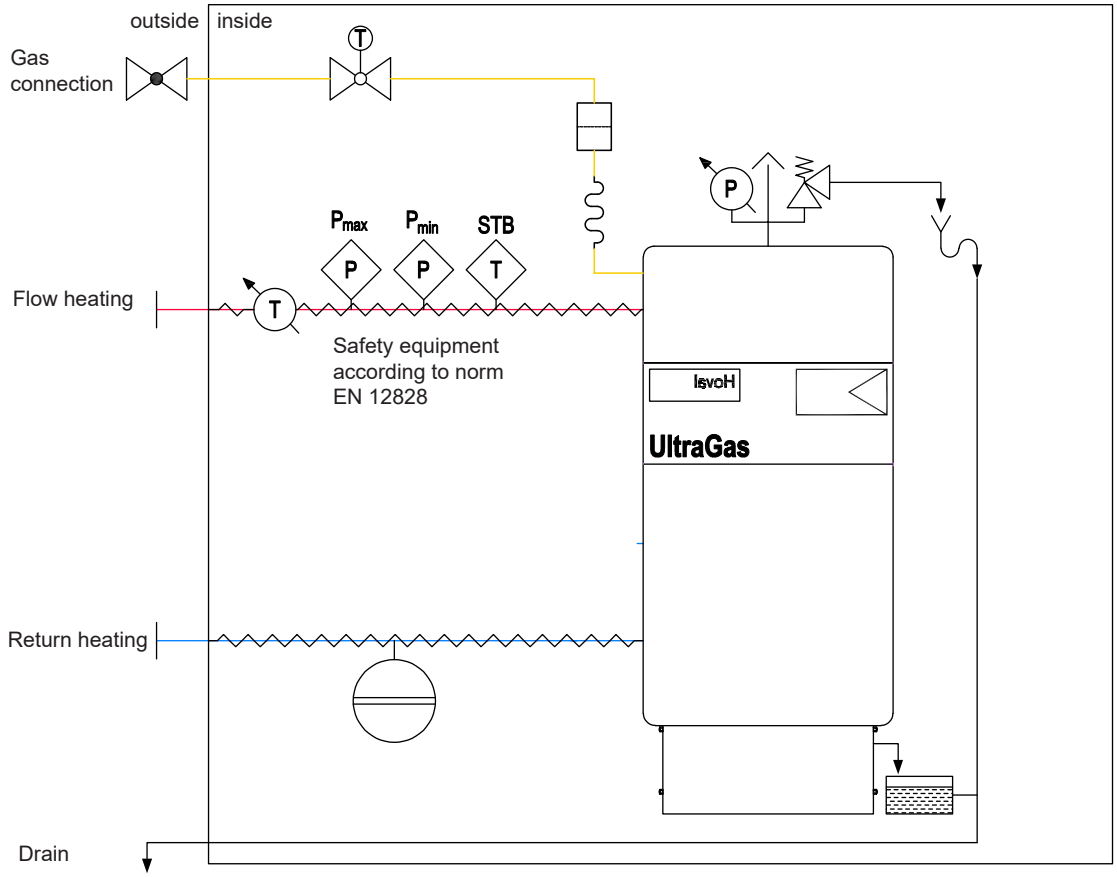


UltraGas® Type	W	D	H
(70,100)	1300	1300	2045

Dimensions refer to the size of the cabin. The connections extend approximately 15 cm to the side. The height of the chimney is approx 25 cm above the roof of the housing.

Air intake grille is located on the opposite side of the connections.

Cabin Slim Thermal Energy System AC
UltraGas® (50-100)
Installed equipment



	Manometer
	Thermometer
	Safety valve
	Gas valve with thermic shut-off function
	Gas pipe compensator
	Gas filter
STB	Safety thermostat
P_{min}	Pressure switch for minimum water pressure
P_{max}	Pressure switch for maximum water pressure

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 aluminum 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 sulfate 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 oxy-gen 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.
- In the case of bivalent heating systems, the values of the heat generator with the strictest requirement for water quality must be complied with.
- 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 nec-essary, 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.

Frost protection agent

- see separate engineering sheet “Use of frost protection agent”.

Cabin position

- Place the cabin on the level supporting base
- Cabins cannot be positioned close to the places where halogen compounds can occur and into which combustion air can enter (e.g. launderettes, hairdressers).
- Halogen compounds can be caused by cleaning and degreasing solutions, dissolvents, glue and bleaching lyes. Pay attention to the Procal leaflet, corrosion through Halogen compounds.

Combustion air

Combustion air is supplied via ventilation grille located on the side panel of the cabin.
Air grille is located on the opposite side from the hydraulic connections.
The cabin must be positioned so the air intake through the grilles is unobstructed.

Gas connection

Gas valve and gas filter

Immediately in front of the boiler a manual gas valve with thermally releasing cut-off device and gas filter are installed according to relevant regulations.

Manual gas shut-off tap

The manual shut-off tap is delivered with the cabin for installation.
Supplied loose, installation on site, outside the cabin.

Commissioning

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

Shut-off valve

- A shut-off valve must be installed upstream of every gas boiler.

Type of gas

- The boiler is only to be operated with the type of gas stated on the rating plate.

Gas pressure natural gas

- Necessary flow pressure at the boiler inlet: UltraGas® (50-100) min. 17.4 mbar, max. 50 mbar

Gas pressure propane

- A gas pressure controller to reduce the boiler inlet pressure must be installed on-site for propane.
- Necessary flow pressure at the boiler inlet: UltraGas® (50-100) min. 37 mbar, max. 50 mbar

Gas pressure regulator

- The installation of a gas pressure regulator is only necessary if the gas flow pressure in the gas network exceeds the maximum permissible gas flow pressure of the UltraGas® or if there are considerable fluctuations in the gas flow pressure.
- Pressure fluctuations in the gas network must be prevented by suitable measures (e.g. gas storage tanks or pressure regulators). The local conditions must be checked in each individual case.

Closed heating system

The boiler is only approved for use in closed heating systems.

Minimum circulation water quantity

No minimum water circulation volume is required.

Installation instructions
Please observe the installation instructions supplied with every thermal module.

Space requirements
See “Dimensions”.

Heating pump
- The heating pump must be installed in the flow so that the pump works in a state of overpressure (prevention of cavitation).

Cabin on the roof
The low pressure sensor installed in the cabin acts as a low water protection for the installation of the cabin on the roof (the highest position of the building).

Condensate drain
- A condensate neutralisation box is installed at the condensate outlet on the gas boiler (included in the cabin scope of delivery).
- A permit for discharge of the flue gas condensate into the sewage system must be obtained from the relevant authority or sewer operator.
- The condensate must be conducted openly (funnel) into the sewage system.
- Suitable materials for condensate drain:
  - stoneware pipes
  - pipes made from PVC
  - pipes made from polyethylene (PE)
  - pipes made from ABS or ASA
  -

Expansion vessel
- An adequately dimensioned expansion tank for the heating system must be provided.
- The expansion tank installed in the cabin is intended **only** for protection of the boiler.
- The expansion tank is delivered in the box for transport and needs to be assembled on site.
- At the safety flow a safety valve and an automatic exhauster are installed.

Noise damping
The following measures are possible for sound insulation:
- If there are living areas below the boiler cabin, connect pipes flexibly using expansion joints.
- Connect circulating pumps to the piping network using expansion joints

Noise level
- The acoustic **power** level value is independent on the local and spacial circumstances.
- The acoustic **pressure** level is dependent on the installation conditions and can for instance be 5 to 10 dB(A) lower than the acoustic **power** level at a distance of 1 m.

Flue gas system
- Standard delivery is with flue gas with installation on site installation on site by the installer.
- Chimney is protruding 20-30 cm outside of the cabin after installation
- A flue gas temperature limiter is integrated into the boiler.

Cabin Slim Thermal Energy System AC UltraGas® 2 (125-1550)

Floor-standing thermal module for outdoor installation

Cabin Slim Thermal Energy System AC: consists of protective housing and built-in equipment with gas condensing boiler UltraGas® 2 (125-1550)

Cabin Slim protective housing

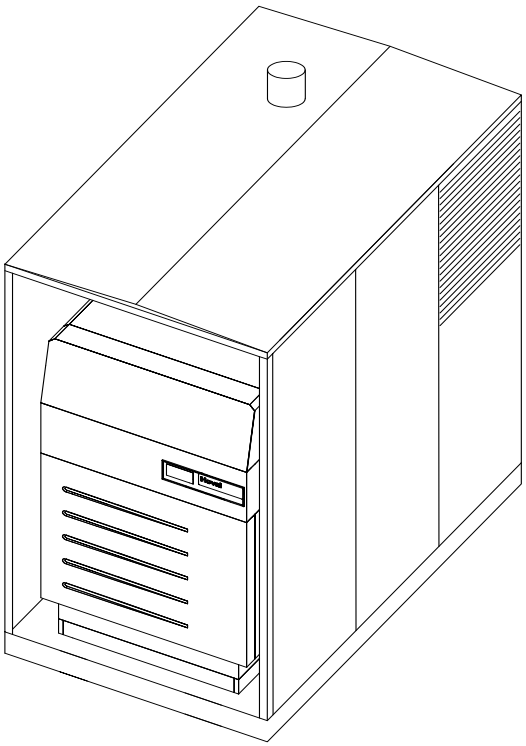
- One-piece support stand made of steel profiles 100x50x3 mm with reinforcements for carrying 100x80x3 mm, contains holes for inserting the forklift forks from front or the back side;
- Vertical angular and middle profiles painted in white RAL 9010;
- Double sandwich panels which guarantee excellent thermal and sound insulation of the housing, mounted on the front, rear and sides, except for the top and bottom:

1. Inner side: galvanized sheet metal 0,8 mm thick;
2. rockwool insulation 20 mm thick, density 100 kg/m³ fire resistance class "A1";
3. Exterior: galvanized sheet metal - painted white RAL 9010, 0,6 mm thick;

- Step surface made of structured aluminum sheet 3/4.5 mm thick, reinforced substructure for better fastening of accessories.
- Front access door with opening on one or two sides, side door on one side, both doors opening handles with lock and key, to allow access to all equipment for service and maintenance including the chimney;
- Ventilation grilles installed for operation with natural gas or propane with openings for ventilation and securing the supply of combustion air, made of steel profiles.
- The final roof surface guarantees the impermeability of the structure, made of galvanized steel sheet painted in white RAL 9010.

Thermal Energy System AC built-in equipment

- Floor-standing gas condensing boiler UltraGas® 2 CE-0085DL0175
- Hydraulic connections of boiler flow and return lines made of steel pipes painted grey with PN6 flanges on the boiler side.
- Insulation of flow and return pipes with flexible elastomeric foam, intended to be used as thermal insulation for building equipment and industrial installations, with aluminum foil.
- Heating cable on the flow and return pipes, with thermostat, as an option the heating cable can be installed on the condensate drain
- Safety equipment according to EN 12828: safety chain (safety thermostat, low and high pressure switches), manometer with valve, calibrated safety valve
- Expansion diaphragm pressure vessel with quick release valve **only for boiler protection**, volume depends on the nominal heat output installed boiler and the content of the heating water in the cabin
- Drain from safety valve with built-in funnel and drain pipe outside housing
- Condensate drain from the boiler with a plastic drain pipe outside the housing
- With condensate neutralization box
- Natural gas supply pipe painted in yellow color with thermal shut-off valve, gas filter with test connection, compensator and external shut-off valve
- Internal electrical installation for power supply and signal cables
- External terminal box with IP65 protection for boiler power supply and signal cables, with revision switch
- Stainless steel chimney with one wall and waterproof clamp, end about 0.25 m above the roof of the protective housing
- Inside lighting and service socket



Model range

Cabin Slim Thermal Energy System AC with UltraGas® 2	Nominal heat output at 50/30 °C kW
(125)	25-126
(150)	35-151
(190)	38-191
(230)	51-233
(300)	58-299
(350)	70-352
(400)	69-399
(450)	77-451
(500)	77-491
(620)	136-622
(700)	146-703
(800)	166-804
(1000)	205-999
(1100)	229-1112
(1300)	269-1320
(1550)	324-1550

Options

- Circulation pump
- Heat exchanger
- Hydraulic switch
- Gas pressure regulator
- Hydraulic butterfly valve for cascade operation

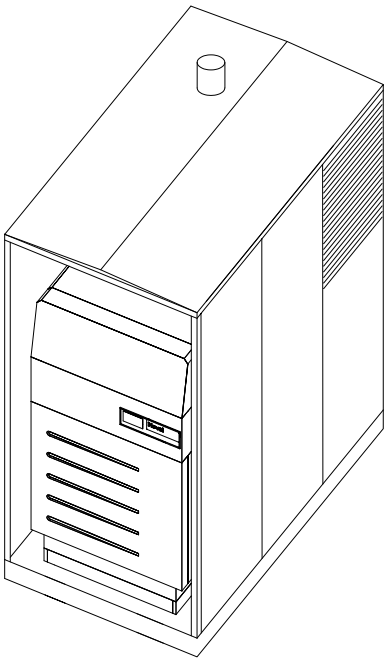
Floor-standing gas condensing boiler UltraGas® 2

- Floor-standing gas condensing boiler
- For the combustion of:
  - natural gas E
  - natural gas E with a hydrogen content (H2) of up to 20 % by vol.
  - propane according to DIN 51622
  - biomethane according to EN 16723
- Combustion chamber made of stainless steel
- Maximum flue gas condensation by secondary heating surfaces made of TurboFer® hybrid stainless steel composite pipes; heating gas side: stainless steel/aluminium water side: stainless steel
- Thermal insulation with mineral wool mat
- Water pressure sensor:
  - Fulfils the function of a minimum and maximum pressure limiter
  - Replacement for the low water level protection
- Flue gas temperature sensor with flue gas limiter function
- Pre-mix burner
  - with fan and venturi
  - modulating operation
  - automatic ignition
  - ionisation guard
  - gas pressure monitor
- Gas boiler fully clad with steel plates, red powder-coated
- Heating connections backwards incl. counter flange, screws and seals for:
  - heating flow
  - high temperature return
  - low temperature return
- UltraGas® 2 (125-1550): with integrated gas pipe compensator
- TopTronic® E controller installed
- Possibility of connecting an external gas solenoid valve with error output

On-site

- Thermal Energy System positioning (suitable for transport using fork lift or crane with ropes)
- Lifting of the cabin must be done with the spreaders
- Assembly of the chimney and/or connecting it to the external flue gas system
- Connection to the heating system, gas pipeline and to the power supply

Thermal module in a protective housing for outdoor installation with UltraGas boiler:



Cabin Slim Thermal Energy System AC UltraGas® 2 (125-1550)

Cabin Slim Thermal Energy System AC with Hoval UltraGas® floor gas condensing boiler consists of protective housing and other built-in equipment for outdoor installation.
Housing made of the steel profiles and double sandwitch panels.
With safety equipment according to EN 12828 norm, expansion vessel, neutralisation box.
With hydraulic and gas connections to the rear side.

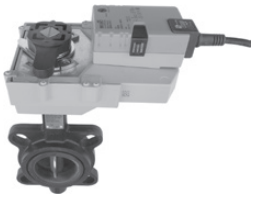
Boiler made of steel with TopTronic® E control, combustion chamber made of stainless steel.
Secondary heating surfaces made of TurboFer® hybrid stainless steel composite pipes.
Modulating premix burner with fan.

Delivery
- External thermal module with built-in equipment installed in protective housing, factory wired, ready for installation on-site

Cabin Slim Thermal Energy System AC with UltraGas® 2	Nominal heat output at 50/30 °C kW [1]	Operating pressure bar [2]	Part Nr.
(125)	25-126	6	CS 7018 911 HR
(150)	35-151	6	CS 7018 912 HR
(190)	38-191	6	CS 7018 913 HR
(230)	51-233	6	CS 7018 914 HR
(300)	58-299	6	CS 7018 823 HR
(350)	70-352	6	CS 7018 824 HR
(400)	69-399	6	CS 7018 825 HR
(450)	77-451	6	CS 7019 125 HR
(500)	77-491	6	CS 7018 826 HR
(620)	136-622	6	CS 7018 848 HR
(700)	146-703	6	CS 7018 869 HR
(800)	166-804	6	CS 7018 841 HR
(1000)	205-999	6	CS 7018 842 HR
(1100)	229-1112	6	CS 7018 843 HR
(1300)	269-1320	6	CS 7018 891 HR
(1550)	324-1550	6	CS 7018 892 HR

[1] kW = modulation range
[2] Optionally the boilers can be delivered with safety valve up to their maximum boiler working pressure

Options:

	Part Nr.
 **Additional heating** Heating cable installed on the condensate drain.	on request
 **Expansion vessel** Expansion vessel with bigger volume, depending on the available space in the cabin	on request
Gas pressure regulator Pressure regulator installed on the gas pipeline, installed before the gas valve.	on request
Chimney on the rear cabin wall Chimney is routed on the back side of the cabin, instead of the standard version through the roof.	on request
 **Heat exchanger** Installed in the cabin, depending on the available space in the cabin.	on request
 **Hydraulic switch** Installed in the cabin, depending on the available space in the cabin.	on request
Circulating pump Installed in the cabin, depending on the available space in the cabin.	on request
 **Hydraulic butterfly valve** installed on the flow or return of the boiler. For 24 V, pre-wired. Operating method: continuously controlling (2 .... 10 V), via boiler control UltraGas® 2 (125-230) DN 65 UltraGas® 2 (300-700) DN 100 UltraGas® 2 (800-1100) DN 125 UltraGas® 2 (1300, 1550) DN 150	 6050 605 6050 606 6050 607 6051 894

Hoval UltraGas® 2 (125-1550)

Type		(125)	(150)	(190)	(230)
Part number		CS 7018 911 HR	CS 7018 912 HR	CS 7018 913 HR	CS 7018 914 HR
• Flow and return connection		DN 65	DN 65	DN 65	DN 65
• Gas connection (outside module)		Rp 1″	Rp 1″	Rp 1½″	Rp 1½″
• Gas valve with thermal shut-off (on boiler)		DN 25, Rp 1″	DN 40, Rp 1″	DN 40, Rp 1½″	DN 40, Rp 1½″
• Gas filter (on boiler)		Rp 1″	Rp 1″	Rp 1½″	Rp 1½″
• Safety valve		DN 25, Rp 1″	DN 25, Rp 1″	DN 25, Rp 1″	DN 32, Rp 1¼″
• Safety valve response pressure	bar	3	3	3	3
• Expansion vessel	l	35	35	35	35
• Neutralisation box	kg	3	3	3	3
• Operating voltage	V/Hz	230/50	230/50	230/50	230/50
• Electrical power consumption min./max.	W	41/140	43/225	38/151	49/228
• System mass (without water content) [1]	kg	1100	1100	1100	1100
• System mass (with water content) [1]	kg	1200	1300	1400	1400
• Flue gas chimney connection	mm	Ø 155/159	Ø 155/159	Ø 155/159	Ø 155/159

Type		(300)	(350)	(400)	(450)
Part number		CS 7018 823 HR	CS 7018 824 HR	CS 7018 825 HR	CS 7019 125 HR
• Flow and return connection		DN 100	DN 100	DN 100	DN 100
• Gas connection (outside module)		Rp 1½″	Rp 1½″	Rp 1½″	Rp 1½″
• Gas valve with thermal shut-off (on boiler)		DN 50, Rp 1½″	DN 50, Rp 1½″	DN 50, Rp 1½″	DN 50, Rp 1½″
• Gas filter size (on boiler)		Rp 1½″	Rp 1½″	Rp 1½″	Rp 1½″
• Safety valve dimension		DN 32, Rp 1¼″	DN32/DN50	DN32/DN50	DN32/DN50
• Safety valve response pressure	bar	3	3	3 (optionally up to 6)	3 (optionally up to 6)
• Expansion vessel	l	50	50	50	50
• Neutralisation box	kg	3	3	3	6
• Operating voltage	V/Hz	230/50	230/50	230/50	230/50
• Electrical power consumption min./max.	W	51/365	55/350	56/518	56/590
• Cabin mass (without water content) [1]	kg	1500	1500	1500	1500
• Cabin mass (with water content) [1]	kg	2000	2000	2000	2000
• Flue gas chimney size	DN	Ø 252/256	Ø 252/256	Ø 252/256	Ø 252/256

Type		(500)	(620)	(700)	(800)
Part number		CS 7018 826 HR	CS 7018 848 HR	CS 7018 869 HR	CS 7018 841 HR
• Flow and return connection		DN 100	DN 100	DN 100	DN 125
• Gas connection (outside module)		Rp 2″	Rp 2″	Rp 2″	Rp 2″
• Gas valve with thermal shut-off (on boiler)		DN 50, Rp 2″	DN 50, Rp 2″	DN 50, Rp 2″	DN 50, Rp 2″
• Gas filter size (on boiler)		Rp 2″	Rp 2″	Rp 2″	Rp 2″
• Safety valve dimension		DN32/DN50	DN32/DN50	DN32/DN50	DN32/DN50
• Safety valve response pressure	bar	3 (optionally up to 6)	3 (optionally up to 6)	3 (optionally up to 6)	3 (optionally up to 6)
• Expansion vessel	l	50	50	50	80
• Neutralisation box	kg	6	6	6	6
• Operating voltage	V/Hz	230/50	230/50	230/50	230/50
• Electrical power consumption min./max.	W	57/716	63/831	67/1060	94/1012
• Cabin mass (without water content) [1]	kg	1800	1800	1800	2300
• Cabin mass (with water content) [1]	kg	2000	2400	2400	3100
• Flue gas chimney size	DN	Ø 302/306	Ø 302/306	Ø 302/306	Ø 302/306

Type		(1000)	(1100)	(1300)	(1550)
Part number		CS 7018 842 HR	CS 7018 843 HR	CS 7018 891 HR	CS 7018 892 HR
• Flow and return connection		DN 125	DN 125	DN 150	DN 150
• Gas connection (outside module)		Rp 2″	Rp 2″	DN 65	DN 65
• Gas valve with thermal shut-off (on boiler)		DN 50, Rp 2″	DN 50, Rp 2″	DN 50, Rp 2″	DN 50, Rp 2″
• Gas filter size (on boiler)		Rp 2″	Rp 2″	DN 65	DN 65
• Safety valve dimension		DN40/DN65	DN40/DN65	DN40/DN65	DN40/DN65
• Safety valve response pressure	bar	3 (optionally up to 6)	3 (optionally up to 6)	3 (optionally up to 6)	3 (optionally up to 6)
• Expansion vessel	l	80	80	100	100
• Neutralisation box	kg	9	9	12	12
• Operating voltage	V/Hz	400/50	400/50	400/50	400/50
• Electrical power consumption min./max.	W	203/1873	203/1933	271/4111	301/4141
• Cabin mass (without water content) [1]	kg	2300	2300	3200	3200
• Cabin mass (with water content) [1]	kg	3200	3200	4500	4500
• Flue gas chimney size	DN	Ø 302/306	Ø 302/306	Ø 402/406	Ø 402/406

[1] Mass of the system is approximate and dependent on the additional equipment installed in the system.

Hoval UltraGas® 2 (125-230)

Type			(125)	(150)	(190)	(230)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	21-114	33-139	35-177	47-218
• Nominal heat output at 50/30 °C, natural gas [1]		kW	25-126	35-151	38-191	51-233
• Nominal heat output at 80/60 °C, propane [2]		kW	32-113	43-138	52-175	66-217
• Nominal heat output at 50/30 °C, propane [2]		kW	35-126	48-151	59-191	73-233
• Nominal heat input with natural gas [3]		kW	23-116	32-142	35-179	47-223
• Nominal heat input with propane [2]		kW	33-116	44-142	54-179	68-223
• Operating pressure heating min./max. (PMS)		bar	1/6	1/6	1/6	1/6
• Operating temperature max. (T_{max})		°C	95	95	95	95
• Boiler water content ($V_{(H20)}$)		l	207	195	276	265
• Flow resistance boiler			see diagram			
• Minimum circulation water quantity		l/h	-	-	-	-
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.6/88.9	97.6/88.1	98.5/88.7	98.2/88.5
• Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	108.7/98.1	108.7/98.1	109.0/98.2	108.4/97.8
• Room heating energy efficiency						
- without control	ηs	%	93	93	93	93
- with control	ηs	%	95	95	95	95
- with control and room sensor	ηs	%	97	97	97	97
- annual energy consumption	Q_{HE}	GJ	209	265	326	412
• NOx class (EN 15502)			-	-	-	-
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	25	28	33	37
• Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2)	CO	mg/Nm^3	31	21	25	13
• O_2 content in flue gas min./max. output		%	5.9/5.6	5.5/6.0	5.9/6.0	6.0/5.9
• Heat loss in standby mode (EN 15502) (50°C)		Watt	260	260	320	320
• Dimensions			see dimensional drawing			
• Gas flow pressure min./max.						
- Natural gas E/LL		mbar	17.4-80	17.4-80	17.4-80	17.4-80
- Propane		mbar	37-57	37-57	37-57	37-57
• Gas inlet pressure max. (idle pressure)		mbar	80	80	80	80
• Gas connection values at 15 °C/1013 mbar:						
- Natural gas E (Wo = 15.0 kWh/m^3) NCV = 9.7 kWh/m^3		m^3/h	2.4-12.0	3.3-14.6	3.6-18.5	4.8-23.0
- Natural gas LL (G25) - (Wo = 12.4 kWh/m^3) NCV = 8.13 kWh/m^3		m^3/h	2.8-14.3	3.9-17.5	4.3-22.0	5.8-27.4
- Propane (G31) NCV = 24.4 kWh/m^3 [2]		m^3/h	1.2-4.8	1.8-5.8	2.3-7.3	3.4-9.1
• Operating voltage (50/60 Hz)		V	1 x 230	1 x 230	1 x 230	1 x 230
• Electrical power consumption min./max.		Watt	41/140	43/225	38/151	49/228
• Standby		Watt	7	8	8	8
• Type of protection		IP	20	20	20	20
• Permitted ambient temperature during operation		°C	5-40	5-40	5-40	5-40
• Sound power level						
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	64	69	63	66
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air)		dB(A)	69	70	66	68
- Sound pressure level heating noise (reference value depending on installation conditions)		dB(A)	54	59	53	56
• Condensate quantity (natural gas) at 50/30 °C		l/h	11	12	15	20
• pH value of the condensate (approx.)		pH	4.2	4.2	4.2	4.2
• Construction			B23, B23P, C53, C63			
• Flue gas system						
- Temperature class			T120	T120	T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	188	226	283	344
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	37	51	55	63
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	64	65	68	69
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	43	45	46	47
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	29	28	29	29
- Max. permissible temperature of the combustion air		°C	48	48	48	48
- Combustion air flow rate		Nm^3/h	154	180	232	280
- Maximum supply pressure for combustion air supply and flue gas line		Pa	120	120	130	130
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

[2] Data related to NCV, conditional data

[3] 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 resetting.

[4] Conversion acc. to EN 15502-1, Appendix J

Hoval UltraGas® 2 (300-450)

Type			(300)	(350)	(400)	(450)
Nominal heat output at 80/60 °C, natural gas [1]		kW	54-274	67-315	62-362	73-415
Nominal heat output at 50/30 °C, natural gas [1]		kW	58-299	70-352	69-399	77-451
Nominal heat output at 80/60 °C, propane [2]		kW	83-274	95-311	109-361	124-408
Nominal heat output at 50/30 °C, propane [2]		kW	93-299	109-352	123-399	138-451
Nominal heat input with natural gas [3]		kW	54-282	64-331	62-374	71-427
Nominal heat input with propane [2]		kW	87-282	102-331	114-374	130-427
Operating pressure heating min./max. (PMS)		bar	1/6	1/6	1/6	1/6
Operating temperature max. (T_{max})		°C	95	95	95	95
Boiler water content ($V_{(H20)}$)		l	472	452	432	412
Flow resistance boiler			see diagram			
Minimum circulation water quantity		l/h	-	–	-	-
Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.2/88.5	98.2/88.5	98.2/88.5	98.2/88.5
Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	109.2/98.4	108.9/98.1	109.0/98.2	108.9/98.1
Room heating energy efficiency						
- without control	ηs	%	94	93	93	-
- with control	ηs	%	96	95	95	-
- with control and room sensor	ηs	%	98	97	97	-
- annual energy consumption	Q_{HE}	GJ	505	590	653	-
NOx class (EN 15502)			-	-	-	6
Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	39	45	39	45
Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2) O_2	CO	mg/Nm^3	18	26	23	30
content in flue gas min./max. output		%	5.5/5.8	5.7/5.7	5.9/5.9	6.0/5.6
Heat loss in standby mode (EN 15502) (50°C)		Watt	430	430	430	430
Dimensions			see dimensional drawing			
Gas flow pressure min./max.						
- Natural gas E/LL		mbar	17.4-80	17.4-80	17.4-80	17.4-80
- Propane		mbar	37-57	37-57	37-57	37-57
Gas inlet pressure max. (idle pressure)		mbar	80	80	80	80
Gas connection values at 15 °C/1013 mbar:						
- Natural gas E (Wo = 15.0 kWh/m^3) NCV = 9.7 kWh/m^3		m^3/h	5.6-29.1	6.6-34.1	6.4-38.6	7.3-44.0
- Natural gas LL (G25) - (Wo = 12.4 kWh/m^3) NCV = 8.13 kWh/m^3		m^3/h	6.6-34.7	7.9-40.7	7.6-46.0	8.7-52.5
- Propane (G31) NCV = 24.4 kWh/m^3 [2]		m^3/h	3.6-11.6	5.0-13.6	4.1-15.3	4.7-17.5
Operating voltage (50/60 Hz)		V	1 x 230	1 x 230	1 x 230	1 x 230
Electrical power consumption min./max.		Watt	51/365	55/350	56/518	56/590
Standby		Watt	5	5	5	5
Type of protection		IP	20	20	20	20
Permitted ambient temperature during operation		°C	5-40	5-40	5-40	5-40
Sound power level						
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	73	70	73	74
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air)		dB(A)	71	72	73	74
- Sound pressure level heating noise (reference value depending on installation conditions)		dB(A)	63	60	63	64
Condensate quantity (natural gas) at 50/30 °C		l/h	22	25	28	29
pH value of the condensate (approx.)		pH	4.2	4.2	4.2	4.2
Construction			B23, B23P, C53, C63			
Flue gas system						
- Temperature class			T120	T120	T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	445	522	591	674
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	85	101	98	112
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	64	65	66	67
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	43	44	48	47
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	29	29	29	29
- Max. permissible temperature of the combustion air		°C	48	48	48	48
- Combustion air flow rate		Nm^3/h	364	428	483	552
- Maximum supply pressure for combustion air supply and flue gas line		Pa	130	130	130	130
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

[2] Data related to NCV, conditional data

[3] 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 resetting.

[4] Conversion acc. to EN 15502-1, Appendix J

Hoval UltraGas® 2 (500-800)

Type			(500)	(620)	(700)	(800)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	71-449	125-580	132-653	150-743
• Nominal heat output at 50/30 °C, natural gas [1]		kW	77-491	136-622	146-703	166-804
• Nominal heat output at 80/60 °C, propane [2]		kW	133-441	173-569	174-643	233-744
• Nominal heat output at 50/30 °C, propane [2]		kW	147-491	184-622	187-703	254-804
• Nominal heat input with natural gas [3]		kW	71-463	124-591	134-668	151-759
• Nominal heat input with propane [2]		kW	140-463	179-591	180-668	236-759
• Operating pressure heating min./max. (PMS)		bar	1/6	1/6	1/6	1/6
• Operating temperature max. (T_{max})		°C	95	95	95	95
• Boiler water content ($V_{(H20)}$)		l	408	536	509	831
• Flow resistance boiler			see diagram			
• Minimum circulation water quantity		l/h	-	–	-	-
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.2/88.5	98.2/88.5	98.2/88.5	98.3/88.6
• Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	109.0/98.2	109.0/98.2	108.9/98.1	109.1/98.3
• Room heating energy efficiency						
- without control	ηs	%	-	-	-	-
- with control	ηs	%	-	-	-	-
- with control and room sensor	ηs	%	-	-	-	-
- annual energy consumption	Q_{HE}	GJ	-	-	-	-
• NOx class (EN 15502)			6	6	6	6
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	50	33	40	36
• Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2)	CO	mg/Nm³	46	24	26	23
• O_2 content in flue gas min./max. output		%	5.5/5.8	5.9/6.0	6.0/5.7	6.0/5.8
• Heat loss in standby mode (EN 15502) (50°C)		Watt	430	540	540	600
• Dimensions			see dimensional drawing			
• Gas flow pressure min./max.						
- Natural gas E/LL		mbar	17.4-80	17.4-80	17.4-80	17.4-300
- Propane		mbar	37-57	37-57	37-57	37-57
• Gas inlet pressure max. (idle pressure)		mbar	80	80	80	300
• Gas connection values at 15 °C/1013 mbar:						
- Natural gas E (Wo = 15.0 kWh/m³) NCV = 9.7 kWh/m³		m³/h	7.3-47.7	12.8-60.9	13.8-68.9	15.6-78.2
- Natural gas LL (G25) - (Wo = 12.4 kWh/m³) NCV = 8.13 kWh/m³		m³/h	8.7-56.9	15.3-72.7	16.5-82.2	18.6-93.4
- Propane (G31) NCV = 24.4 kWh/m³ [2]		m³/h	5.7-19.0	7.3-24.2	7.4-27.4	9.7-31.1
• Operating voltage (50/60 Hz)		V	1 x 230	1 x 230	1 x 230	1 x 230
• Electrical power consumption min./max.		Watt	57/716	63/831	67/1060	94/1012
• Standby		Watt	5	5	5	7
• Type of protection		IP	20	20	20	20
• Permitted ambient temperature during operation		°C	5-40	5-40	5-40	5-40
• Sound power level						
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	78	75	76	78
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air) - Sound pressure level heating noise (reference value depending on installation conditions)		dB(A)	77 / 68	72 / 65	71 / 66	- / 68
• Condensate quantity (natural gas) at 50/30 °C		l/h	37	51	48	57
• pH value of the condensate (approx.)		pH	4.2	4.2	4.2	4.2
• Construction			B23, B23P, C53, C63			
• Flue gas system						
- Temperature class			T120	T120	T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	736	933	1055	1198
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	112	196	211	238
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	66	68	69	66
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	44	47	49	44
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	28	28	29	28
- Max. permissible temperature of the combustion air		°C	48	48	48	48
- Combustion air flow rate		Nm³/h	602	764	863	981
- Maximum supply pressure for combustion air supply and flue gas line		Pa	130	130	130	130
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

[2] Data related to NCV, conditional data

[3] 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/m³, operation in the Wobbe value range from 12.0 to 15.7 kWh/m³ is possible without resetting.

[4] Conversion acc. to EN 15502-1, Appendix J

Hoval UltraGas® 2 (1000-1550)

Type			(1000)	(1100)	(1300)	(1550)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	185-926	203-1038	241-1230	297-1447
• Nominal heat output at 50/30 °C, natural gas [1]		kW	205-999	229-1112	269-1320	324-1550
• Nominal heat output at 80/60 °C, propane [2]		kW	262-926	299-1033	362-1227	427-1439
• Nominal heat output at 50/30 °C, propane [2]		kW	282-999	316-1112	385-1320	453-1550
• Nominal heat input with natural gas [3]		kW	187-943	206-1057	247-1251	297-1469
• Nominal heat input with propane [2]		kW	265-943	306-1057	371-1251	437-1469
• Operating pressure heating min./max. (PMS)		bar	1/6	1/6	1/6	1/6
• Operating temperature max. (T_{max})		°C	95	95	95	95
• Boiler water content ($V_{(H20)}$)		l	756	718	1211	1118
• Flow resistance boiler			see diagram			
• Minimum circulation water quantity		l/h	-	-	-	-
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.2/88.5	98.2/88.5	98.2/88.5	98.2/88.5
• Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	109.0/98.2	108.6/97.8	108.7/97.9	108.5/97.7
• Room heating energy efficiency						
- without control	ηs	%	-	-	-	-
- with control	ηs	%	-	-	-	-
- with control and room sensor	ηs	%	-	-	-	-
- annual energy consumption	Q_{HE}	GJ	-	-	-	-
• NOx class (EN 15502)			6	6	6	6
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	36	41	37	35
• Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2)	CO	mg/Nm^3	25	26	23	23
• O_2 content in flue gas min./max. output		%	6.0/5.9	6.0/5.9	6.0/5.9	6.0/6.0
• Heat loss in standby mode (EN 15502) (50°C)		Watt	600	600	740	740
• Dimensions			see dimensional drawing			
• Gas flow pressure min./max.						
- Natural gas E/LL		mbar	17.4-300	17.4-300	17.4-300	17.4-300
- Propane		mbar	37-57	37-57	37-57	37-57
• Gas inlet pressure max. (idle pressure)		mbar	300	300	300	300
• Gas connection values at 15 °C/1013 mbar:						
- Natural gas E (Wo = 15.0 kWh/m^3) NCV = 9.7 kWh/m^3		m^3/h	19.3-97.2	21.2-109.0	25.5-129.0	30.6-151.4
- Natural gas LL (G25) - (Wo = 12.4 kWh/m^3) NCV = 8.13 kWh/m^3		m^3/h	23.0-116.0	25.3-130.0	30.4-153.9	36.5-180.7
- Propane (G31) NCV = 24.4 kWh/m^3 [2]		m^3/h	10.2-38.6	12.5-43.3	15.2-51.3	17.9-60.2
• Operating voltage (50/60 Hz)		V	1 x 230 3 x 400	1 x 230 3 x 400	1 x 230 3 x 400	1 x 230 3 x 400
• Electrical power consumption min./max.		Watt	203-1873	203-1933	271/4111	301/4141
• Standby		Watt	7	7	5	7
• Type of protection		IP	20	20	20	20
• Permitted ambient temperature during operation		°C	5-40	5-40	5-40	5-40
• Sound power level						
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	83	82	86	85
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air)		dB(A)	-	-	-	-
- Sound pressure level heating noise (reference value depending on installation conditions)		dB(A)	73	72	76	75
• Condensate quantity (natural gas) at 50/30 °C		l/h	68	72	100	138
• pH value of the condensate (approx.)		pH	4.2	4.2	4.2	4.2
• Construction			B23, B23P, C53, C63			
• Flue gas system						
- Temperature class			T120	T120	T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	1488	1669	1975	2230
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	295	325	390	450
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	69	70	66	68
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	47	49	45	46
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	28	29	29	28
- Max. permissible temperature of the combustion air		°C	48	48	48	48
- Combustion air flow rate		Nm^3/h	1219	1366	1617	1830
- Maximum supply pressure for combustion air supply and flue gas line		Pa	130	130	130	130
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

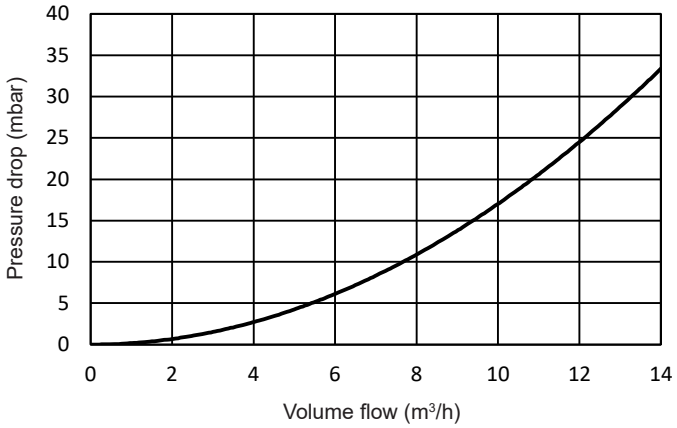
[2] Data related to NCV, conditional data

[3] 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 resetting.

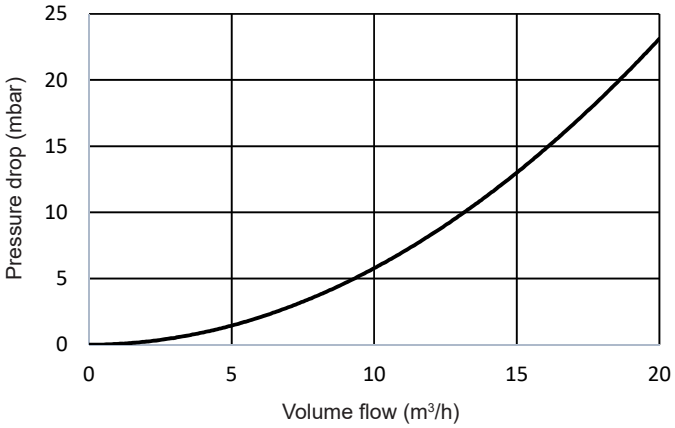
[4] Conversion acc. to EN 15502-1, Appendix J

Hoval UltraGas® 2 (125-1550)
Flow resistance on the heating water side

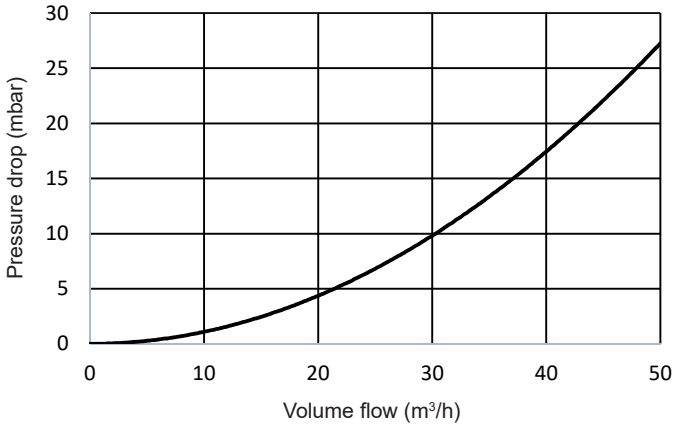
UltraGas® 2 (125,150)



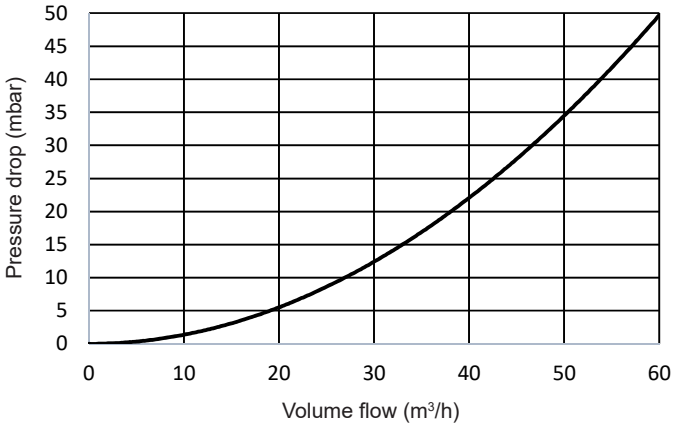
UltraGas® 2 (190,230)



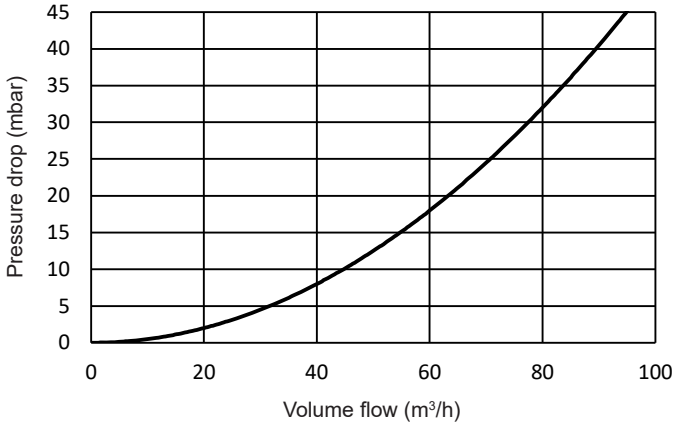
UltraGas® 2 (300-500)



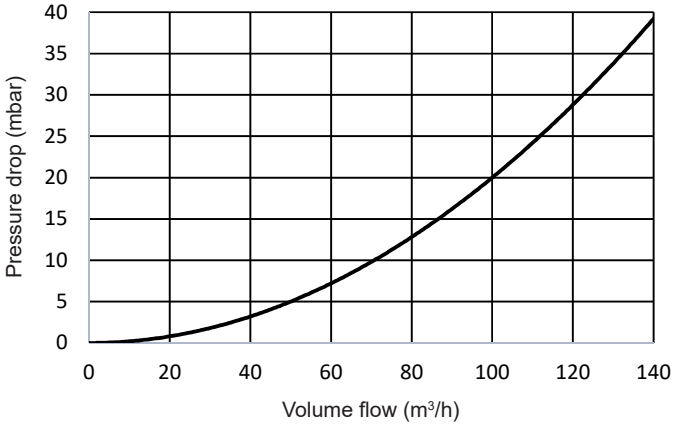
UltraGas® 2 (620,700)



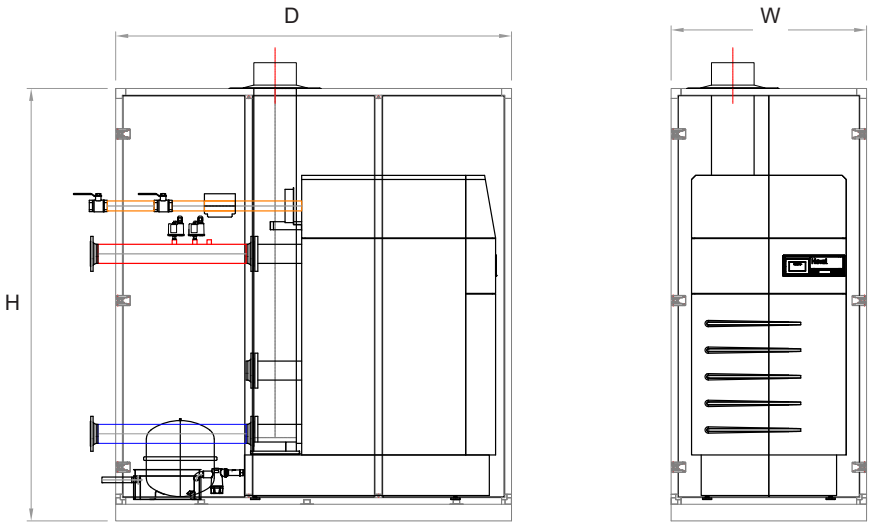
UltraGas® 2 (800-1100)

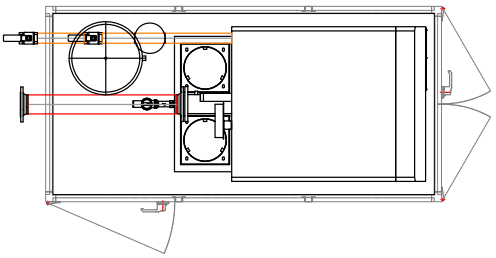


UltraGas® 2 (1300,1550)



Cabin Slim Thermal Energy System AC UltraGas® 2 (125 - 1550)
(Dimensions in mm)



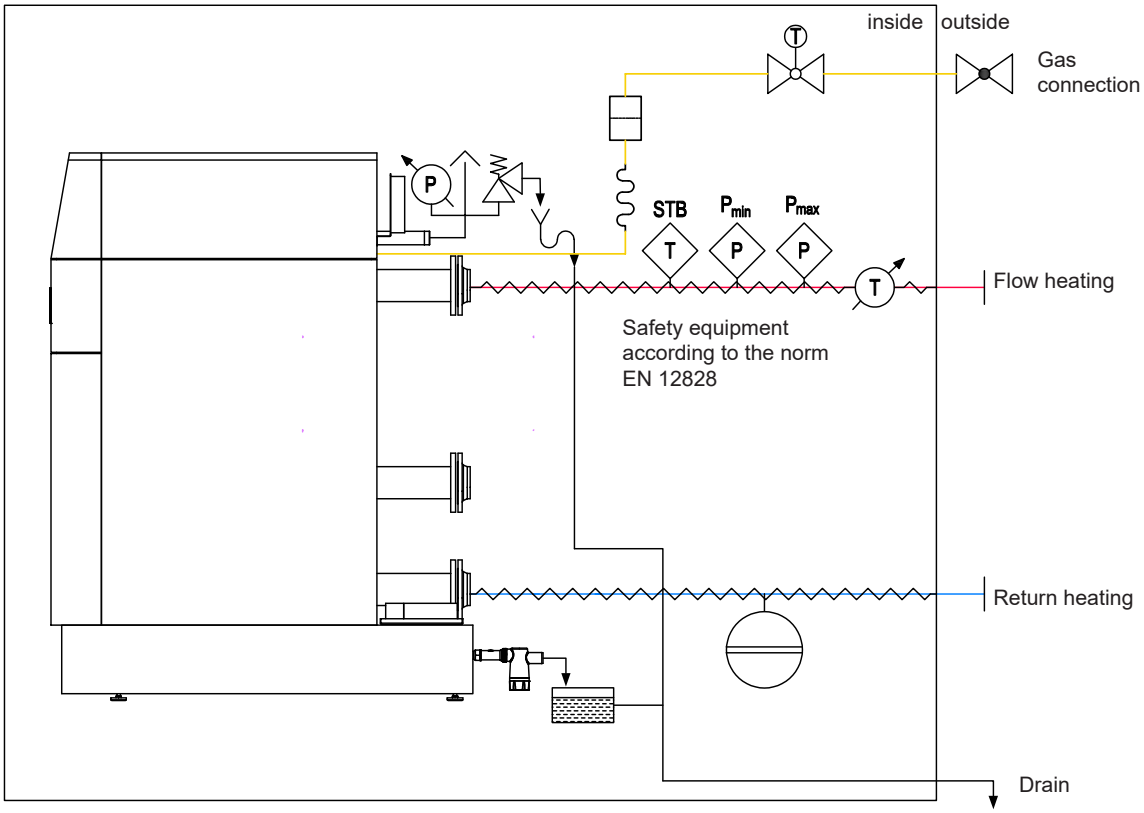


UltraGas® 2 Type	D	W	H
(125 - 230)	2000	1175	2450
(300 - 500)	2380	1175	2650
(620 - 700)	2380	1355	2650
(800 - 1100)	2500	1555	2750
(1300 - 1550)	2780	1760	2900

The side door can be installed on the left or right side, depending on the requirements. Define the door position in the Order form. Fill it out and send it with the order.

Dimensions refer to the size of the cabin (chimney not included). The connections extend approximately 15 cm to the back side of the cabin. The height of the chimney is approx 25 cm above the roof of the housing.

Cabin Slim Thermal Energy System AC UltraGas® 2 (125 - 1550) Installed equipment



P	Manometer, on cabins with boilers above 300 kW the manometer is installed in heating flow
T	Thermometer
	Safety valve
	Gas valve with thermic shut-off function
	Gas pipe compensator
	Gas filter
STB	Safety thermostat
P_{min}	Pressure switch for minimum water pressure
P_{max}	Pressure switch for maximum water pressure

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, ÖNORM, 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/ÖVGW 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
- ÖNORM H 5195
- 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 manu-facturer-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:
  The quality of the heating water must be checked and documented periodically:
  - For an installed heat output above 100 kW up to and including 1000 kW, an annual check of the heating water is required.
  - For an installed heat output above 1000 kW, an check of the heating water is required twice a year.

  The following standard values for heating water must be measured and adhered to:
  - 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 aluminum 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 sulfate contents in the heating water must not exceed 50 mg/l in total.

Additional notices

- Hoval boilers and calorifiers are suitablefor 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.
- In the case of bivalent heating systems,the values of the heat generator with the strictest requirement for water quality must be complied with.
- 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.

Frost protection agent

- see separate engineering sheet “Use of frost protection agent”.

Cabin position

- Place the cabin on the level supporting base
- Cabins cannot be positioned close to the places where halogen compounds can occur and into which combustion air can enter (e.g. launderettes, hairdressers).
- Halogen compounds can be caused by cleaning and degreasing solutions, dissolvents, glue and bleaching lyes. Pay attention to the Procal leaflet, corrosion through Halogen compounds.

Combustion air

Combustion air is supplied via ventilation grilles located on the side panels of the cabin. The cabin must be positioned so the air intake through the grilles is unobstructed.

Gas connection

Gas valve and gas filter

Immediately in front of the boiler a manual gas valve with thermally releasing cut-off device and gas filter are installed according to relevant regulations.

Manual gas shut-off tap

The manual shut-off tap is delivered with the cabin for installation.
Supplied loose, installation on site, outside the cabin.

Commissioning

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

Shut-off valve

- A shut-off valve must be installed upstream of the cabin.

Type of gas

- The boiler is only to be operated with the type of gas stated on the rating plate.

Gas pressure natural gas

- Necessary flow pressure at the boiler inlet: see technical data

Gas pressure propane

- Necessary flow pressure at the boiler inlet: see technical data

Gas pressure regulator

- In boilers with a heat input in excess of 70 kW, install a pressure regulator in accordance with EN88-1 in the gas supply line directly before the boiler.

Closed heating system

The boiler is only approved for use in closed heating systems.

Minimum circulation water quantity

No minimum water circulation volume is required.

Installation instructions
Please observe the installation instructions supplied with every thermal module.

Space requirements
See “Dimensions” for information

Cabin on the roof
The low pressure sensor installed in the cabin acts as a low water protection for the installation of the cabin on the roof (the highest position of the building).

Condensate drain
- A condensate neutralisation box is installed at the condensate outlet on the gas boiler (included in the cabin scope of delivery).
- A permit for discharge of the flue gas condensate into the sewage system must be obtained from the relevant authority or sewer operator.
- The condensate must be conducted openly (funnel) into the sewage system.
- Suitable materials for condensate drain:
  - stoneware pipes
  - pipes made from PVC
  - pipes made from polyethylene (PE)
  - pipes made from ABS or ASA

Expansion tank
- An adequately dimensioned expansion tank for the heating system must be provided.
- The expansion tank installed in the cabin is intended **only** for protection of the boiler. Required volume is determined from the water content of the heat generator.
- At the safety flow a safety valve and an automatic exhauster are installed.

Noise damping
The following measures are possible for sound insulation:
- If there are living areas below the boiler cabin, connect pipes flexibly using expansion joints.
- Connect circulating pumps to the piping network using expansion joints

Noise level
- The acoustic **power** level value is dependent on the local and spacial circumstances.
- The acoustic **pressure** level is dependent on the installation conditions and can for instance be 5 to 10 dB(A) lower than the acoustic **power** level at a distance of 1 m.

Flue gas system
- Standard delivery is with flue gas chimney 20-30 cm outside of the cabin. Chimney is delivered loose, installation on site by the installer.
- A flue gas temperature limiter is integrated into the boiler.

Cabin Slim AC UltraGas® 2 D (250-2200): consists of protective housing and built-in equipment with gas condensing boiler UltraGas® 2 D (250-2200)

Cabin Slim protective housing

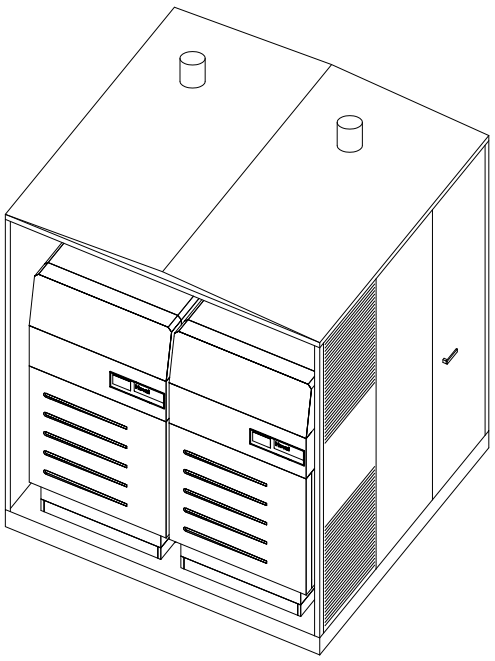
- One-piece support stand made of steel profiles 100x50x3 mm with reinforcements for carrying 100x80x3 mm, contains holes for inserting the forklift forks from front or the back side;
- Vertical angular and middle profiles painted in white RAL 9010;
- Double sandwich panels which guarantee excellent thermal and sound insulation of the housing, mounted on the front, rear and sides, except for the top and bottom:

1. Inner side: galvanized sheet metal 0,8 mm thick;
2. rockwool insulation 20 mm thick, density 100 kg/m³ fire resistance class "A1";
3. Exterior: galvanized sheet metal - painted white RAL 9010, 0,6 mm thick;

- Step surface made of structured aluminum sheet 3/4.5 thick, reinforced substructure for better fastening of accessories.
- Front access door with opening on one or two sides, side doors on both sides, with door opening handles with lock and key, to allow access to all equipment for service and maintenance;
- Ventilation grilles installed for operation with natural gas or propane with openings for ventilation and securing the supply of combustion air, made of steel profiles.
- The final roof surface guarantees the impermeability of the structure, made of galvanized steel sheet painted in white RAL 9010.

Thermal Energy System AC built-in equipment

- Floor-standing gas condensing boiler UltraGas® 2 D
- Double boiler made of steel with condensing technology consisting of 2 individual boilers of 125, 150, 190, 230, 300, 350, 400, 450, 500, 620, 700, 800, 1000, 1100, 1300 or 1550 kW
- For the combustion of:
  - natural gas E
  - natural gas E with a hydrogen content (H2) of up to 20 % by vol.
  - propane according to DIN 51622
  - biomethane according to EN 16723
- Combustion chamber made of stainless steel
- Maximum flue gas condensation by second-ary heating surfaces made of TurboFer® hybrid stainless steel composite pipes; heating gas side: stainless steel/aluminium water side: stainless steel
- Thermal insulation with mineral wool mat
- Water pressure sensor:
  - Fulfils the function of a minimum and maximum pressure limiter
  - Replacement for the low water level protection
- Flue gas temperature sensor with flue gas limiter function
- Pre-mix burner
  - with fan and venturi
  - modulating operation
  - automatic ignition
  - ionisation guard
  - gas pressure monitor
- Gas boiler fully clad with steel plates, red powder-coated
- Flue gas overpressure set consisting of motorised air intake suction flap (connection for direct combustion air supply without accessories possible) and flue gas collector.
- Heating connections backwards incl. counter flange, screws and seals for:
  - heating flow
  - high temperature return
  - low temperature return
- UltraGas® 2 D (600-2200): with integrated gas pipe compensator
- Each individual boiler has a Hoval TopTronic® E control built in
- Possibility of connecting an external gas solenoid valve with error output



Model range

Cabin Slim Thermal Energy System AC with UltraGas® 2 D	Nominal heat output at 50/30 °C kW
D (250)	25-252
D (300)	35-302
D (380)	38-382
D (460)	51-466
D (600)	58-598
D (700)	70-704
D (800)	69-798
D (900)	77-902
D (1000)	77-982
D (1240)	136-1244
D (1400)	146-1406
D (1600)	166-1608
D (2000)	205-1998
D (2200)	229-2224

Options

- Indoor lighting and service socket
- Circulation pump
- Heat exchanger
- Hydraulic switch
- Gas pressure regulator
- Single chimney for the situations where there is need to extend the chimney, e.g. if the cabin is next to the building

Floor-standing gas condensing boiler UltraGas® 2 D

- Hydraulic connections of boilers flow and return lines made of steel pipes painted grey with PN6 flanges on the boiler side
- Insulation of flow and return pipes flexible elastomeric foam, intended to be used as thermal insulation for building equipment and industrial installations, with aluminum foil
- Heating cable on the flow and return pipes, with thermostat, safety chain (safety thermostat, low and high pressure switches), manometer with valve, calibrated safety valve
- In the cabins AC 2D (600>) each boiler is equipped with an individual safety chain
- Expansion diaphragm pressure vessels with quick release valve **only for boilers protection**, volume depends on the nominal heat output installed boilers and the content of the heating water in the cabin
- Drain from safety valves with built-in funnels and drain pipe outside housing
- Condensate drain from the boilers with a plastic drain pipe outside the housing
- With condensate neutralization box
- Natural gas supply pipe painted in yellow color with thermal shut-off valves, gas filters with test connection, compensators and external shut-off valve
- Internal electrical installation for power supply and signal cables
- External terminal box with IP65 protection for boilers power supply and signal cables
- Two stainless steel chimneys with one wall (for each boiler), with waterproof clamp, ends about 0.25 m above the roof of the protective housing.
- Inside lighting and service socket set. Watertight LED lamp, IP65, 120 cm,2 pieces. Wall socket for service, Schuko, IP54.

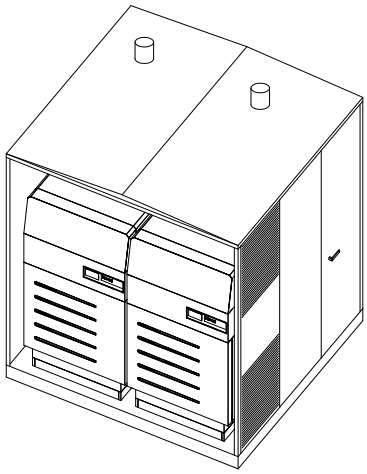
Delivery

- External thermal module with built-in equipment installed in protective housing, factory wired, ready for installation on-site

On-site

- Thermal Energy System positioning (suitable for transport using fork lift or crane with ropes)
- Lifting of the cabin must be done with the spreaders
- Assembly of the chimney and/or connecting it to the external flue gas system
- Connection to the heating system, gas pipeline and to power supply

Thermal module in a protective housing for outdoor installation with double UltraGas boiler:



Cabin Slim Thermal Energy System AC UltraGas® 2 D (250-2200)

Cabin Slim Thermal Energy System AC with Hoval UltraGas® 2 D floor gas condensing double boiler consists of protective housing and other built-in equipment for outdoor installation. Housing made of the steel profiles and double sandwitch panels.
With safety equipment according to EN 12828 norm, expansion vessels, neutralisation boxes. With hydraulic and gas connections to the rear side.

Gas boiler made of steel with TopTronic® E control, combustion chamber made of stainless steel. Secondary heating surfaces made of TurboFer® stainless steel composite pipes. Premix burner with fan.

Delivery
- The boilers and installation preassembled in housing, ready for installation.

Cabin Slim Thermal Energy System AC with UltraGas® 2 D	Nominal heat output at 50/30 °C kW [1]	Operating pressure bar [2]	Part Nr.
D (250)	25-252	6	CS 7018 907 HR
D (300)	35-302	6	CS 7018 908 HR
D (380)	38-382	6	CS 7018 933 HR
D (460)	51-466	6	CS 7018 934 HR
D (600)	58-598	6	CS 7018 812 HR
D (700)	70-704	6	CS 7018 813 HR
D (800)	69-798	6	CS 7018 814 HR
D (900)	77-902	6	CS 7019 143 HR
D (1000)	77-982	6	CS 7018 815 HR
D (1240)	136-1244	6	CS 7018 880 HR
D (1400)	146-1406	6	CS 7018 881 HR
D (1600)	166-1608	6	CS 7018 857 HR
D (2000)	205-1998	6	CS 7018 858 HR
D (2200)	229-2224	6	CS 7018 859 HR

[1] kW = modulation range
[2] Optionally the boilers can be delivered with safety valve up to their maximum boiler working pressure

Options:

Additional heating
Heating cable installed on the condensate drain.

on request

Expansion vessel
Expansion vessel with bigger volume, depending on the available space in the cabin

on request

Gas pressure regulator
Pressure regulator installed on the gas pipeline, installed before the gas valve.

on request

One chimney with the flue gas collector
Flue gas overpressure set consisting of motorised air intake suction flap (connection for direct combustion air supply without accessories possible), flue gas collector and one chimney exiting the cabin.
Routing through the roof or the back panel.

on request

Heat exchanger
Installed in the cabin, depending on the available space in the cabin.

on request

Hydraulic switch
Installed in the cabin, depending on the available space in the cabin.

on request

Circulating pump
Installed in the cabin, depending on the available space in the cabin.

on request

Hydraulic connection set
for Cabin Slim AC 2 D (1600-2200)
For connecting flow and return connections outside the cabin.
Without insulation, to be provided on site.

on request

Hoval UltraGas® 2 D (250-2200)

Type		D (250)	D (300)	D (380)	D (460)
Part number		CS 7018 907 HR	CS 7018 908 HR	CS 7018 933 HR	CS 7018 934 HR
• Flow and return connection		DN 80	DN 80	DN 80	DN 80
• Gas connection (outside module)		Rp 1½″	Rp 1½″	Rp 2″	Rp 2″
• Gas valve with thermal shut-off (on boiler)		2x DN 25, Rp 1″	2x DN 40, Rp 1″	2x DN 40, Rp 1½″	2x DN 40, Rp 1½″
• Gas filter (on boiler)		2x Rp 1″	2x Rp 1″	2x Rp 1½″	2x Rp 1½″
• Safety valve		2x DN 25, Rp 1″	2x DN 25, Rp 1″	2x DN 25, Rp 1″	2x DN 32, Rp 1¼″
• Safety valve response pressure	bar	3	3	3	3
• Expansion vessel	l	2x 35	2x 35	2x 35	2x 35
• Neutralisation box	kg	3	3	3	3
• Operating voltage	V/Hz	230/50	230/50	230/50	230/50
• Electrical power consumption min./max.	W	41/280	43/450	38/302	49/456
• System mass (without water content) [1]	kg	1900	1900	1900	1900
• System mass (with water content) [1]	kg	2000	2000	2400	2400
• Flue gas chimney connection	mm	2x Ø 155/159	2x Ø 155/159	2x Ø 155/159	2x Ø 155/159

Type		D (600)	D (700)	D (800)	D (900)
Part number		CS 7018 812 HR	CS 7018 813 HR	CS 7018 814 HR	CS 7019 143 HR
• Flow and return connection		DN 125	DN 125	DN 125	DN 125
• Gas connection (outside module)		Rp 2″	Rp 2″	Rp 2″	Rp 2″
• Gas valve with thermal shut-off (on boiler)		2x DN 50, Rp 1½″″	2x DN 50, Rp 1½″	2x DN 50, Rp 1½″″	2x DN 50, Rp 1½″″
• Gas filter size (on boiler)		2x Rp 1½″″	2x Rp 1½″″	2x Rp 1½″″	2x Rp 1½″″
• Safety valve dimension		2x DN 32, Rp 1¼″	2x DN32/DN50	2x DN32/DN50	2x DN32/DN50
• Safety valve response pressure	bar	3	3	3 (optionally up to 6)	3 (optionally up to 6)
• Expansion vessel	l	2x 50	2x 50	2x 50	2x 50
• Neutralisation box	kg	3	3	3	6
• Operating voltage	V/Hz	230/50	230/50	230/50	230/50
• Electrical power consumption min./max.	W	51/730	55/700	56/1036	56/1180
• Cabin mass (without water content) [1]	kg	2700	2700	2700	2700
• Cabin mass (with water content) [1]	kg	3500	3500	3500	3500
• Flue gas chimney size	DN	2x Ø 252/256	2x Ø 252/256	2x Ø 252/256	2x Ø 252/256

Type		D (1000)	D (1240)	D (1400)	D (1600)
Part number		CS 7018 815 HR	CS 7018 880 HR	CS 7018 881 HR	CS 7018 857 HR
• Flow and return connection		DN 125	DN 125	DN 125	DN 150
• Gas connection (outside module)		Rp 2″	DN 65	DN 65	DN 65
• Gas valve with thermal shut-off (on boiler)		2x DN 50, Rp 2″	2x DN 50, Rp 2″	2x DN 50, Rp 2″	2x DN 50, Rp 2″
• Gas filter size (on boiler)		2x Rp 2″	2x Rp 2″	2x Rp 2″	2x Rp 2″
• Safety valve dimension		2x DN32/DN50	2x DN32/DN50	2x DN32/DN50	2x DN32/DN50
• Safety valve response pressure	bar	3 (optionally up to 6)	3 (optionally up to 6)	3 (optionally up to 6)	3 (optionally up to 6)
• Expansion vessel	l	2x 50	2x50	2x50	2x80
• Neutralisation box	kg	6	6	6	6
• Operating voltage	V/Hz	230/50	230/50	230/50	230/50
• Electrical power consumption min./max.	W	57/1432	63/1662	67/2120	94/2024
• Cabin mass (without water content) [1]	kg	2700	3300	3300	4600
• Cabin mass (with water content) [1]	kg	3500	4400	4400	5800
• Flue gas chimney size	DN	2x Ø 252/256	2x Ø 302/306	2x Ø 302/306	2x Ø 302/306

Type		D (2000)	D (2200)
Part number		CS 7018 858 HR	CS 7018 859 HR
• Flow and return connection		DN 150	DN 150
• Gas connection (outside module)		DN 65	DN 65
• Gas valve with thermal shut-off (on boiler)		2x DN 50, Rp 2″	2x DN 50, Rp 2″
• Gas filter size (on boiler)		2x Rp 2″	2x Rp 2″
• Safety valve dimension		2x DN40/DN65	2x DN40/DN65
• Safety valve response pressure	bar	3 (optionally up to 6)	3 (optionally up to 6)
• Expansion vessel	l	2x80	2x80
• Neutralisation box	kg	9	9
• Operating voltage	V/Hz	400/50	400/50
• Electrical power consumption min./max.	W	203/3746	203/3866
• Cabin mass (without water content) [1]	kg	4600	4600
• Cabin mass (with water content) [1]	kg	6000	6000
• Flue gas chimney size	DN	2x Ø 302/306	2x Ø 302/306

[1] Mass of the system is approximate and dependent on the additional equipment installed in the system.

Hoval UltraGas® 2 D (250-460)

Type			D (250)	D (300)	D (380)	D (460)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	21-228	33-278	35-354	47-436
• Nominal heat output at 50/30 °C, natural gas [1]		kW	25-252	35-302	38-382	51-466
• Nominal heat output at 80/60 °C, propane [2]		kW	32-226	43-276	52-351	66-434
• Nominal heat output at 50/30 °C, propane [2]		kW	35-252	48-302	59-382	73-466
• Nominal heat input with natural gas [3]		kW	23-232	32-284	35-358	47-446
• Nominal heat input with propane [2]		kW	33-232	44-284	54-358	68-446
• Operating pressure heating min./max. (PMS)		bar	1/6	1/6	1/6	1/6
• Operating temperature max. (T_{max})		°C	95	95	95	95
• Boiler water content ($V_{(H20)}$)		l	2 x 207	2 x 195	2 x 276	2 x 265
• Flow resistance boiler			see diagram			
• Minimum circulation water quantity		l/h	-	-	-	-
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.6/88.9	97.6/88.1	98.5/88.7	98.2/88.5
• Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	108.7/98.1	108.7/98.1	109.0/98.2	108.4/97.8
• Room heating energy efficiency						
- without control	ηs	%	93	93	93	93
- with control	ηs	%	95	95	95	95
- with control and room sensor	ηs	%	97	97	97	97
- annual energy consumption	Q_{HE}	GJ	386	479	598	751
• NOx class (EN 15502)			-	-	-	6
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	25	28	33	37
• Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2)	CO	mg/Nm^3	31	21	25	13
• O_2 content in flue gas min./max. output		%	5.9/5.6	5.5/6.0	5.9/6.0	6.0/5.9
• Heat loss in standby mode (EN 15502) (50°C)		Watt	520	520	640	640
• Dimensions			see dimensional drawing			
• Gas flow pressure min./max.						
- Natural gas E/LL		mbar	17.4-80	17.4-80	17.4-80	17.4-80
- Propane		mbar	37-57	37-57	37-57	37-57
• Gas inlet pressure max. (idle pressure)		mbar	80	80	80	80
• Gas connection values at 15 °C/1013 mbar:						
- Natural gas E (Wo = 15.0 kWh/m^3) NCV = 9.7 kWh/m^3		m^3/h	2.4-23.9	3.3-29.3	3.6-36.9	4.8-46.0
- Natural gas LL (G25) - (Wo = 12.4 kWh/m^3) NCV = 8.13 kWh/m^3		m^3/h	2.8-28.5	3.9-34.9	4.3-44.0	5.8-54.9
- Propane (G31) NCV = 24.4 kWh/m^3 [2]		m^3/h	1.4-9.5	1.8-11.6	2.2-14.7	2.8-18.3
• Operating voltage (50/60 Hz)		V	1 x 230	1 x 230	1 x 230	1 x 230
• Electrical power consumption min./max.		Watt	41/280	43/450	38/302	49/456
• Standby		Watt	7	8	8	8
• Type of protection		IP	20	20	20	20
• Permitted ambient temperature during operation		°C	5-40	5-40	5-40	5-40
• Sound power level						
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	76	81	67	70
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air)		dB(A)	-	-	-	-
• Condensate quantity (natural gas) at 50/30 °C		l/h	22	24	30	40
• pH value of the condensate (approx.)		pH	4.2	4.2	4.2	4.2
• Construction			B23, B23P, C53, C63			
• Flue gas system						
- Temperature class			T120	T120	T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	376	452	566	688
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	37	51	55	63
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	64	65	68	69
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	43	45	46	47
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	29	28	29	29
- Max. permissible temperature of the combustion air		°C	48	48	48	48
- Combustion air flow rate		Nm^3/h	308	360	464	560
- Maximum supply pressure for combustion air supply and flue gas line		Pa	60	60	60	60
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

[2] Data related to NCV, conditional data

[3] 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 resetting.

[4] Conversion acc. to EN 15502-1, Appendix J

Hoval UltraGas® 2 D (600-1000)

Type			D (600)	D (700)	D (800)	D (900)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	54-548	67-630	62-724	73-830
• Nominal heat output at 50/30 °C, natural gas [1]		kW	58-598	70-704	69-798	77-902
• Nominal heat output at 80/60 °C, propane [2]		kW	83-548	94-622	109-722	124-816
• Nominal heat output at 50/30 °C, propane [2]		kW	93-598	109-704	123-798	138-902
• Nominal heat input with natural gas [3]		kW	54-564	64-662	62-748	71-854
• Nominal heat input with propane [2]		kW	87-564	102-662	114-748	130-854
• Operating pressure heating min./max. (PMS)		bar	1/6	1/6	1/6	1/6
• Operating temperature max. (T_{max})		°C	95	95	95	95
• Boiler water content ($V_{(H20)}$)		l	2 x 472	2 x 452	2 x 432	2 x 412
• Flow resistance boiler			see diagram			
• Minimum circulation water quantity		l/h	-	-	-	-
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.2/88.5	98.2/88.5	98.2/88.5	98.2/88.5
• Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	109.2/98.4	108.9/98.1	109.0/98.2	108.9/98.1
• Room heating energy efficiency						
- without control	ηs	%	94	93	93	-
- with control	ηs	%	96	95	95	-
- with control and room sensor	ηs	%	98	97	97	-
- annual energy consumption	Q_{HE}	GJ	926	1076	1212	-
• NOx class (EN 15502)			6	6	6	6
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	39	45	39	45
• Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2)	CO	mg/Nm³	18	26	23	30
• O_2 content in flue gas min./max. output		%	5.5/5.8	5.7/5.7	5.9/5.9	6.0/5.6
• Heat loss in standby mode (EN 15502) (50°C)		Watt	860	860	860	860
• Dimensions			see dimensional drawing			
• Gas flow pressure min./max.						
- Natural gas E/LL		mbar	17.4-80	17.4-80	17.4-80	17.4-80
- Propane		mbar	37-57	37-57	37-57	37-57
• Gas inlet pressure max. (idle pressure)		mbar	80	80	80	80
• Gas connection values at 15 °C/1013 mbar:						
- Natural gas E (Wo = 15.0 kWh/m³) NCV = 9.7 kWh/m³		m³/h	5.6-58.1	6.6-68.2	6.4-77.1	7.3-88.0
- Natural gas LL (G25) - (Wo = 12.4 kWh/m³) NCV = 8.13 kWh/m³		m³/h	6.6-69.4	7.9-81.4	7.6-92.0	8.7-105.0
- Propane (G31) NCV = 24.4 kWh/m³ [2]		m³/h	3.6-23.1	4.2-27.1	4.7-30.7	5.3-35.0
• Operating voltage (50/60 Hz)		V	1 x 230	1 x 230	1 x 230	1 x 230
• Electrical power consumption min./max.		Watt	51/730	55/700	56/1036	56/1180
• Standby		Watt	5	5	5	5
• Type of protection		IP	20	20	20	20
• Permitted ambient temperature during operation		°C	5-40	5-40	5-40	5-40
• Sound power level						
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	76	73	76	77
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air)		dB(A)	-	-	-	-
• Condensate quantity (natural gas) at 50/30 °C		l/h	44	50	56	58
• pH value of the condensate (approx.)		pH	4.2	4.2	4.2	4.2
• Construction			B23, B23P, C53, C63			
• Flue gas system						
- Temperature class			T120	T120	T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	890	1044	1182	1348
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	85	101	98	112
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	64	65	66	67
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	43	44	48	47
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	29	29	29	29
- Max. permissible temperature of the combustion air		°C	48	48	48	48
- Combustion air flow rate		Nm³/h	728	856	966	1104
- Maximum supply pressure for combustion air supply and flue gas line		Pa	60	60	60	60
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

[2] Data related to NCV, conditional data

[3] 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/m³, operation in the Wobbe value range from 12.0 to 15.7 kWh/m³ is possible without resetting.

[4] Conversion acc. to EN 15502-1, Appendix J

Hoval UltraGas® 2 D (1000-1600)

Type			D (1000)	D (1240)	D (1400)	D (1600)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	71-898	125-1160	132-1306	150-1486
• Nominal heat output at 50/30 °C, natural gas [1]		kW	77-982	136-1244	146-1406	166-1608
• Nominal heat output at 80/60 °C, propane [2]		kW	133-882	173-1139	193-1286	233-1488
• Nominal heat output at 50/30 °C, propane [2]		kW	147-982	184-1244	208-1406	254-1610
• Nominal heat input with natural gas [3]		kW	71-926	124-1182	134-1336	151-1518
• Nominal heat input with propane [2]		kW	140-926	179-1182	201-1336	236-1518
• Operating pressure heating min./max. (PMS)		bar	1/6	1/6	1/6	1/6
• Operating temperature max. (T_{max})		°C	95	95	95	95
• Boiler water content ($V_{(H20)}$)		l	2 x 408	2 x 536	2 x 509	2 x 831
• Flow resistance boiler			see diagram			
• Minimum circulation water quantity		l/h	-	-	-	-
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.2/88.5	98.2/88.5	98.2/88.5	98.3/88.6
• Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	109.0/98.2	109.0/98.2	108.9/98.1	109.1/98.3
• Room heating energy efficiency						
- without control	ηs	%	-	-	-	-
- with control	ηs	%	-	-	-	-
- with control and room sensor	ηs	%	-	-	-	-
- annual energy consumption	Q_{HE}	GJ	-	-	-	-
• NOx class (EN 15502)			6	6	6	6
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	50	33	40	36
• Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2)	CO	mg/Nm³	46	24	26	23
• O_2 content in flue gas min./max. output		%	5.5/5.8	5.9/6.0	6.0/5.7	6.0/5.8
• Heat loss in standby mode (EN 15502) (50°C)		Watt	860	1080	1080	1200
• Dimensions			see dimensional drawing			
• Gas flow pressure min./max.						
- Natural gas E/LL		mbar	17.4-80	17.4-80	17.4-80	17.4-300
- Propane		mbar	37-57	37-57	37-57	37-57
• Gas inlet pressure max. (idle pressure)		mbar	80	80	80	300
• Gas connection values at 15 °C/1013 mbar:						
- Natural gas E (Wo = 15.0 kWh/m³) NCV = 9.7 kWh/m³		m³/h	7.3-95.5	12.8-121.9	13.8-137.7	15.6-156.5
- Natural gas LL (G25) - (Wo = 12.4 kWh/m³) NCV = 8.13 kWh/m³		m³/h	8.7-113.9	15.3-145.4	16.5-164.3	18.6-186.7
- Propane (G31) NCV = 24.4 kWh/m³ [2]		m³/h	5.7-38.0	7.3-48.4	8.2-54.8	9.7-62.2
• Operating voltage (50/60 Hz)		V	1 x 230	1 x 230	1 x 230	1 x 230
• Electrical power consumption min./max.		Watt	57/1432	63/1662	67/2120	94/2024
• Standby		Watt	5	5	5	7
• Type of protection		IP	20	20	20	20
• Permitted ambient temperature during operation		°C	5-40	5-40	5-40	5-40
• Sound power level						
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	81	78	79	81
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air)		dB(A)	-	72	71	-
• Condensate quantity (natural gas) at 50/30 °C		l/h	74	102	96	114
• pH value of the condensate (approx.)		pH	4.2	4.2	4.2	4.2
• Construction			B23, B23P, C53, C63			
• Flue gas system						
- Temperature class			T120	T120	T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	1472	1866	2110	2396
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	112	196	211	238
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	66	68	69	66
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	44	47	49	44
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	28	28	29	28
- Max. permissible temperature of the combustion air		°C	48	48	48	48
- Combustion air flow rate		Nm³/h	1204	1528	1726	1962
- Maximum supply pressure for combustion air supply and flue gas line		Pa	60	60	60	60
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

[2] Data related to NCV, conditional data

[3] 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/m³, operation in the Wobbe value range from 12.0 to 15.7 kWh/m³ is possible without resetting.

[4] Conversion acc. to EN 15502-1, Appendix J

Hoval UltraGas® 2 D (2000-3100)

Type			D (2000)	D (2200)
• Nominal heat output at 80/60 °C, natural gas [1]		kW	185-1852	203-2076
• Nominal heat output at 50/30 °C, natural gas [1]		kW	205-1998	229-2224
• Nominal heat output at 80/60 °C, propane [2]		kW	262-1852	299-2067
• Nominal heat output at 50/30 °C, propane [2]		kW	282-1998	316-2224
• Nominal heat input with natural gas [3]		kW	187-1886	206-2114
• Nominal heat input with propane [2]		kW	265-1886	306-2114
• Operating pressure heating min./max. (PMS)		bar	1/6	1/6
• Operating temperature max. (T_{max})		°C	95	95
• Boiler water content ($V_{(H20)}$)		l	2 x 756	2 x 718
• Flow resistance boiler			see diagram	
• Minimum circulation water quantity		l/h	-	-
• Boiler efficiency at 80/60 °C in full-load operation (NCV/GCV) [4]		%	98.2/88.5	98.2/88.5
• Boiler efficiency at 30 % partial load (NCV/GCV) [4]		%	109.0/98.2	108.6/97.8
• Room heating energy efficiency				
- without control	ηs	%	-	-
- with control	ηs	%	-	-
- with control and room sensor	ηs	%	-	-
- annual energy consumption	Q_{HE}	GJ	-	-
• NOx class (EN 15502)			6	6
• Nitrogen oxide emissions (EN 15502) (GCV)	NOx	mg/kWh	36	41
• Carbon monoxide emissions at 50/30 °C (related to 3 % of O_2)	CO	mg/Nm³	25	26
• O_2 content in flue gas min./max. output		%	6.0/5.9	6.0/5.9
• Heat loss in standby mode (EN 15502) (50°C)		Watt	1200	1200
• Dimensions			see dimensional drawing	
• Gas flow pressure min./max.				
- Natural gas E/LL		mbar	17.4-300	17.4-300
- Propane		mbar	37-57	37-57
• Gas inlet pressure max. (idle pressure)		mbar	300	300
• Gas connection values at 15 °C/1013 mbar:				
- Natural gas E (Wo = 15.0 kWh/m³) NCV = 9.7 kWh/m³		m³/h	19.3-194.4	21.2-217.9
- Natural gas LL (G25) - (Wo = 12.4 kWh/m³) NCV = 8.13 kWh/m³		m³/h	23.0-232.0	25.3-260.0
- Propane (G31) NCV = 24.4 kWh/m³ [2]		m³/h	10.2-77.3	12.6-86.6
• Operating voltage (50/60 Hz)		V	1 x 230 3 x 400	1 x 230 3 x 400
• Electrical power consumption min./max.		Watt	203/3746	203/3866
• Standby		Watt	7	7
• Type of protection		IP	20	20
• Permitted ambient temperature during operation		°C	5-40	5-40
• Sound power level				
- Heating noise (EN 15036 part 1) (room air dependent)		dB(A)	86	85
- Flue gas noise radiated from the mouth (DIN 45635 part 47) (room air dependent/independent of room air)		dB(A)	-	-
• Condensate quantity (natural gas) at 50/30 °C		l/h	136	144
• pH value of the condensate (approx.)		pH	4.2	4.2
• Construction			B23, B23P, C53, C63	
• Flue gas system				
- Temperature class			T120	T120
- Flue gas mass flow at max. nominal heat input (dry)		kg/h	2976	3338
- Flue gas mass flow at min. nominal heat input (dry)		kg/h	295	325
- Flue gas temperature at max. nominal heat output and 80/60 °C		°C	69	70
- Flue gas temperature at max. nominal heat output and 50/30 °C		°C	47	49
- Flue gas temperature at min. nominal heat output and 50/30 °C		°C	28	29
- Max. permissible temperature of the combustion air		°C	48	48
- Combustion air flow rate		Nm³/h	2438	2732
- Maximum supply pressure for combustion air supply and flue gas line		Pa	60	60
- Maximum draught/underpressure at flue gas outlet		Pa	-30	-30

[1] In relation to natural gas G20 (100 % methane). With a hydrogen content (H_2) of up to 20 % by vol. in accordance with DVGW ZP3100 (D), an output reduction of up to 7 % is possible.

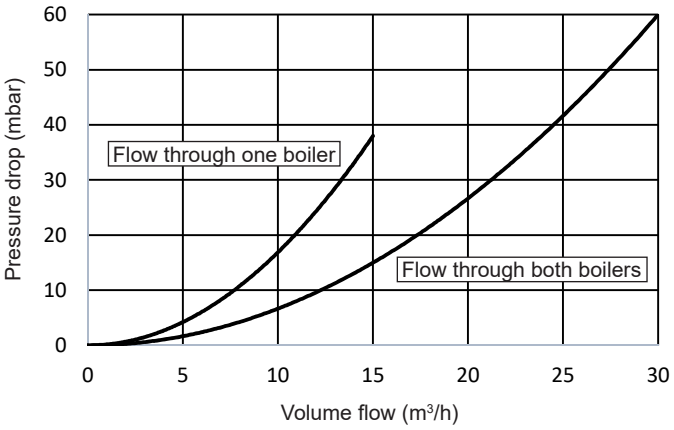
[2] Data related to NCV, conditional data

[3] 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/m³, operation in the Wobbe value range from 12.0 to 15.7 kWh/m³ is possible without resetting.

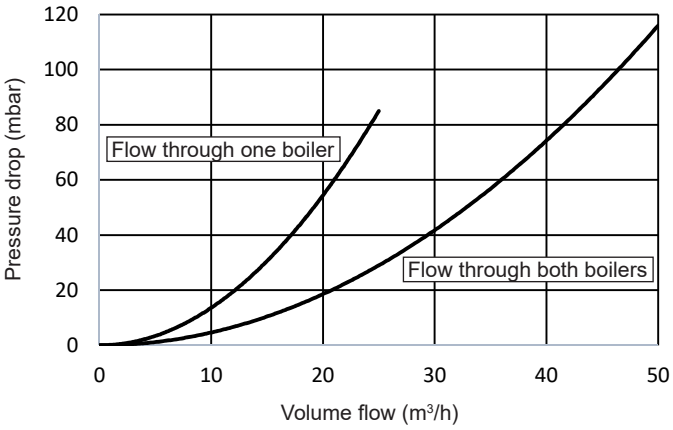
[4] Conversion acc. to EN 15502-1, Appendix J

Flow resistance on the heating water side

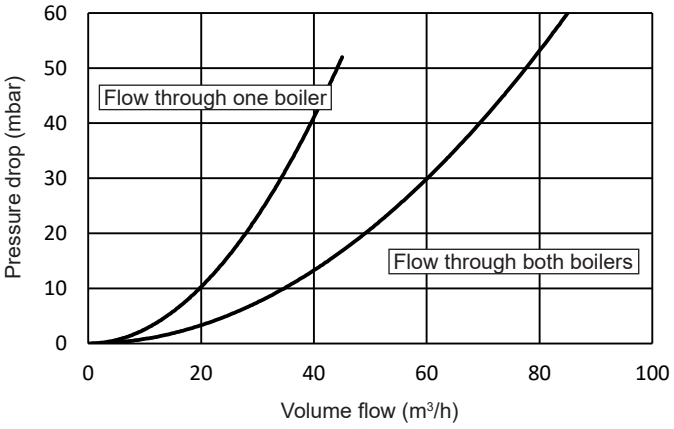
UltraGas® 2 D (250,300)



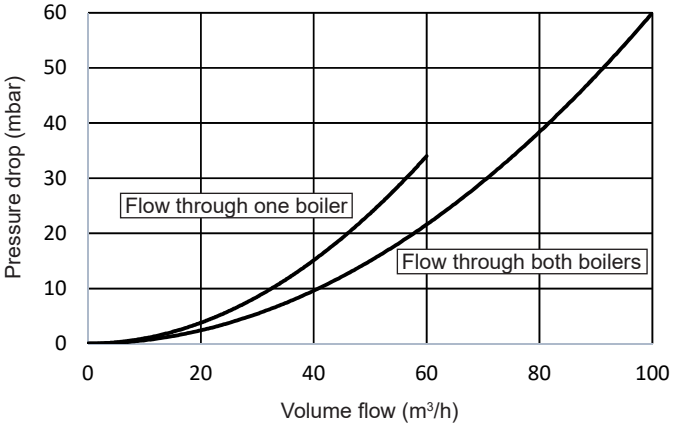
UltraGas® 2 D (380,460)



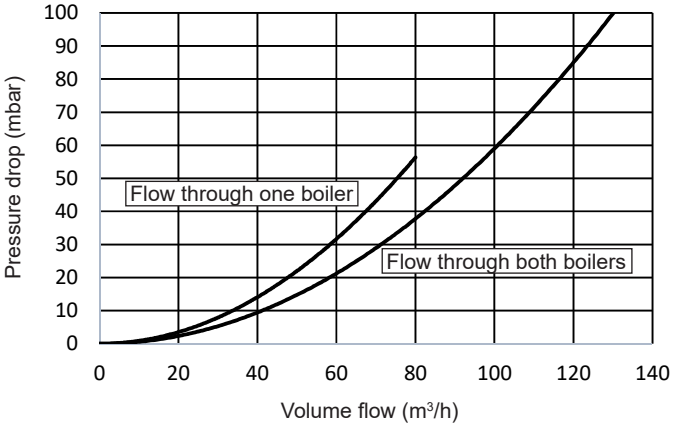
UltraGas® 2 D (600-900)



UltraGas® 2 D (1240,1400)

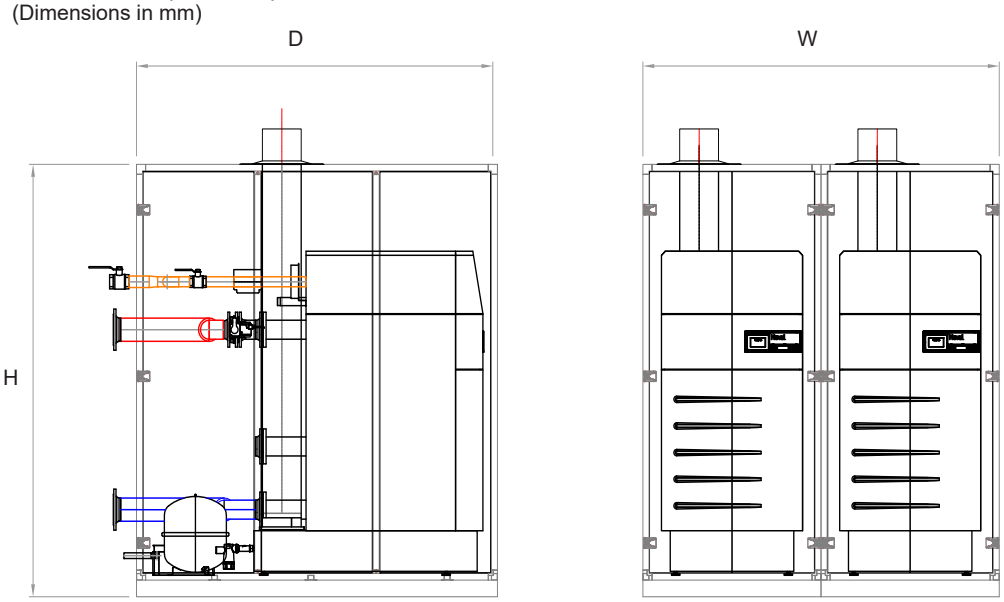


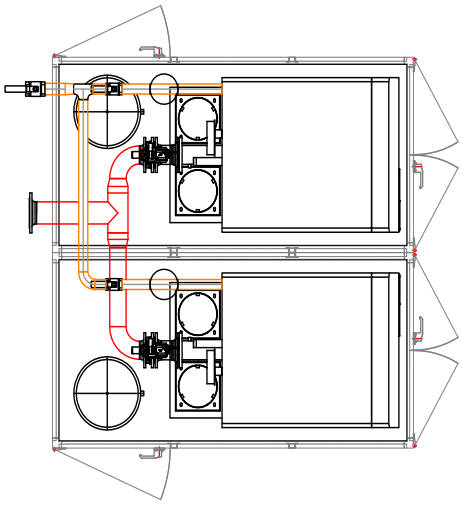
UltraGas® 2 D (1600-2200)



Cabin Slim Thermal Energy System AC UltraGas® 2 D (250-2200)

(Dimensions in mm)



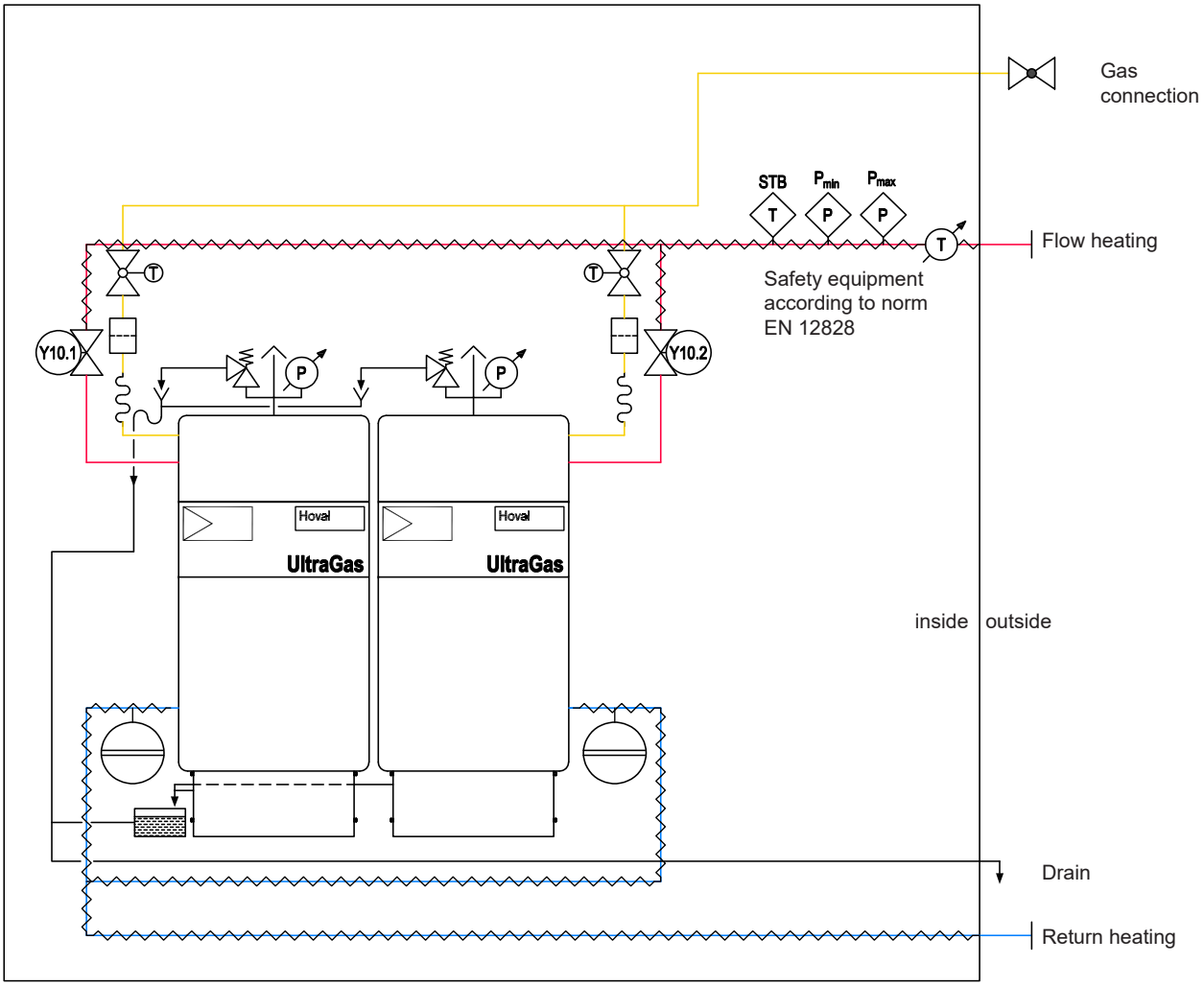


Dimensions refer to the size of the cabin. The connections extend approximately 15 cm to the back side of the cabin. The height of the chimney is approx 25 cm above the roof of the housing.

UltraGas® Type	D	W	H
D (250 - 460)	2000	2310	2450
D (600 - 1000)	2380	2350	2650
D (1240 - 1400)	2380	2710	2650
D (1600 - 2200) [1)]	2200	3800	2850

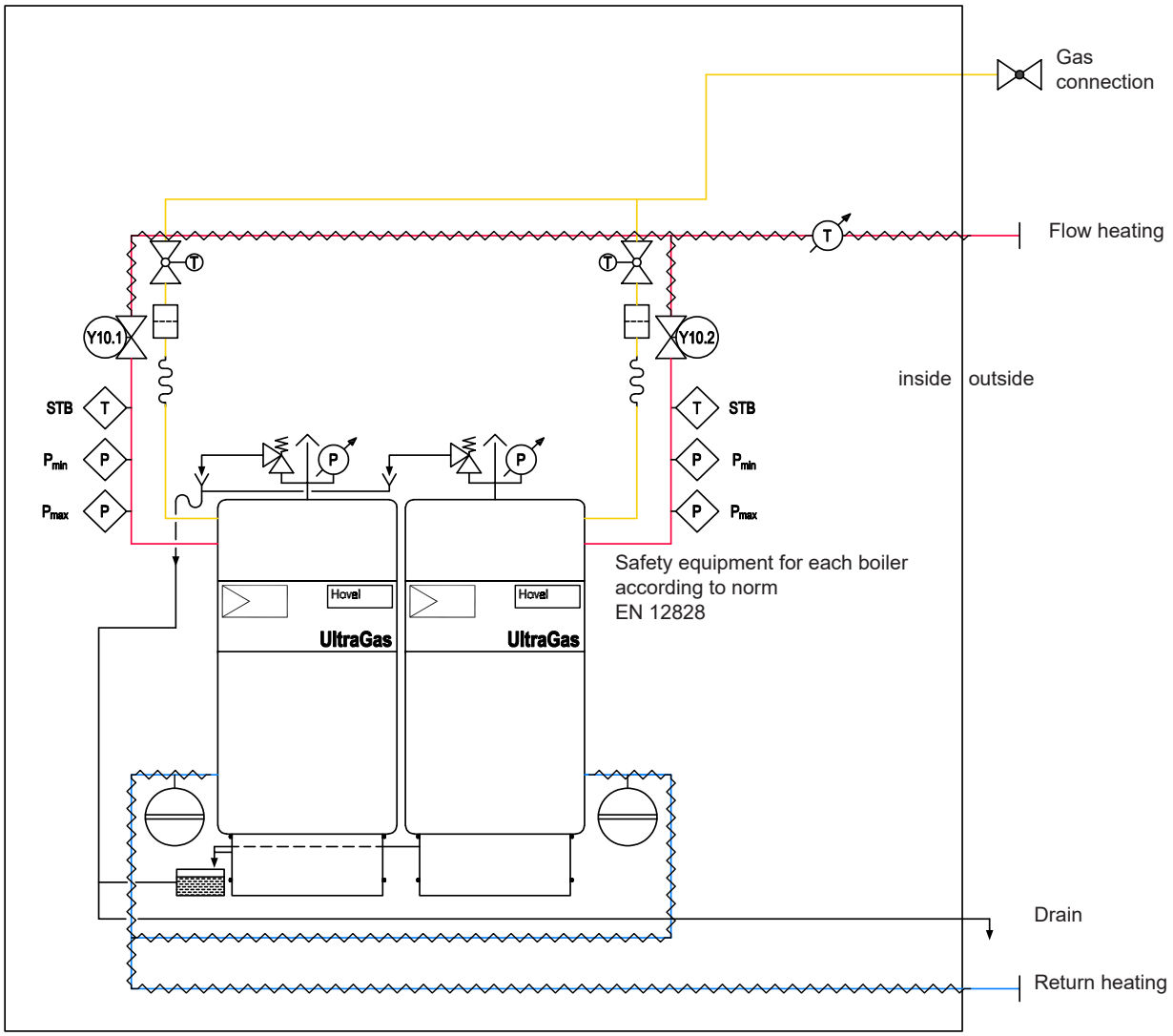
[1)] The cabin is delivered with separate flow and return connections from each boiler. Connecting piece can be ordered as an option and installed onsite, outside the cabin. Collector and distributor are delivered in the ‹›cabin››. Installation and insulation must be provided by the installer on the site.

Cabin Slim Thermal Energy System AC UltraGas® 2 D (250 - 460) Installed equipment

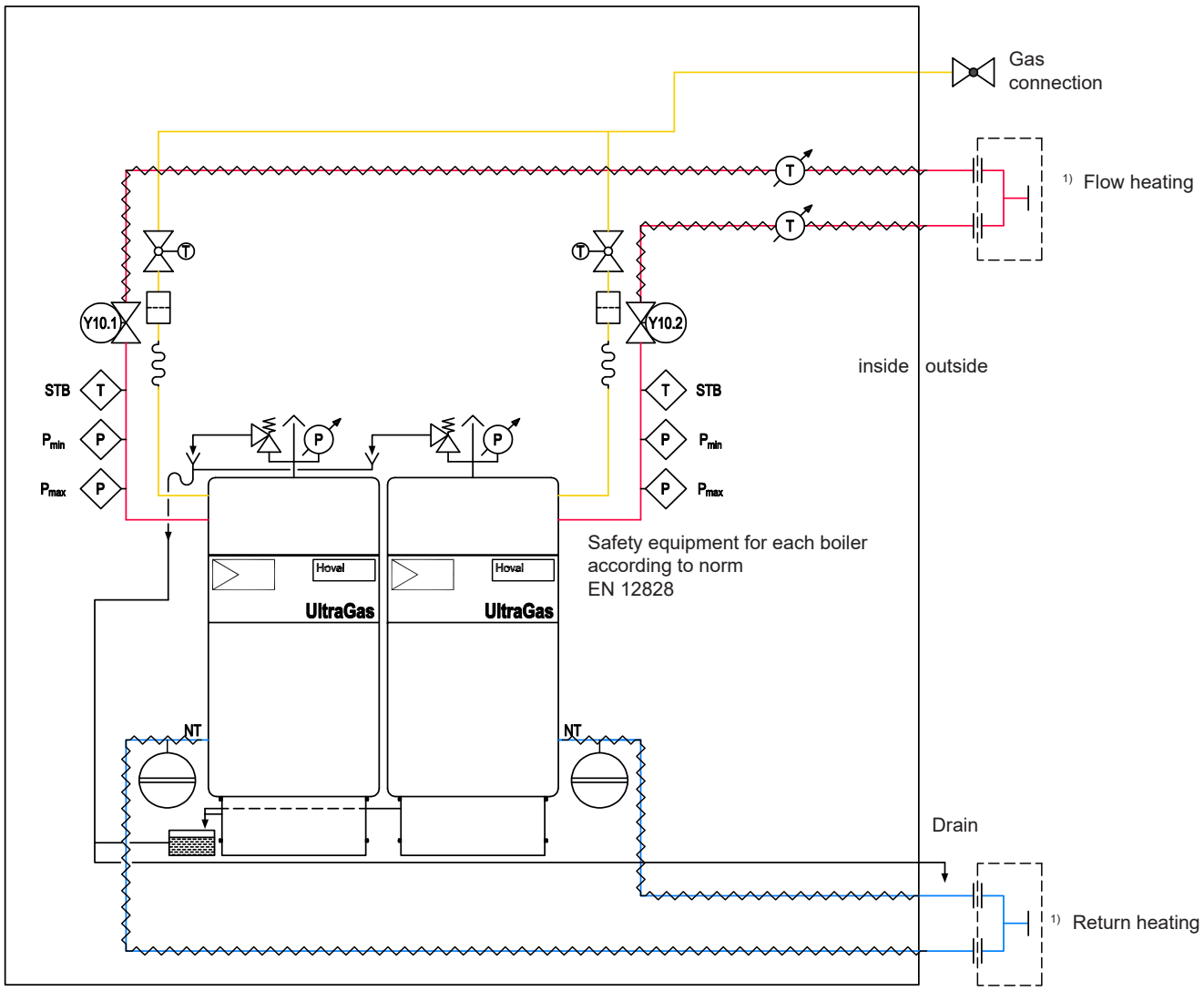


P	Manometer
T	Thermometer
Y10.1	Hydraulic flap
	Safety valve
T	Gas valve with thermic shut-off function
	Gas pipe compensator
	Gas filter
STB	Safety thermostat
P_{min}	Pressure switch for minimum water pressure
P_{max}	Pressure switch for maximum water pressure

Cabin Slim Thermal Energy System AC UltraGas® 2 D (600 - 1400) Installed equipment



Cabin Slim Thermal Energy System AC UltraGas® 2 D (1600 - 2200) Installed equipment



1) As an option a connecting hydraulic set can be ordered for flow and return. The set is delivered separately and must be installed on site. The set is not insulated.

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, ÖNORM, 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 re-quire-ments of buildings
- VDI 2035 Protection against damage by cor-rosion 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 manu-facturer-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:
  The quality of the heating water must be checked and documented periodically:
  - For an installed heat output above 100 kW up to and including 1000 kW, an annual check of the heating water is required.
  - For an installed heat output above 1000 kW, an check of the heating water is required twice a year.

  The following standard values for the heating water must be measured and adhered to:
  - 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 aluminum 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 sulfate 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 oxy-gen 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.
- In the case of bivalent heating systems, the values of the heat generator with the strictest requirement for water quality must be complied with.
- 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 nec-essary, 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.

Frost protection agent

- see separate engineering sheet “Use of frost protection agent”.

Cabin position

- Place the cabin on the level supporting base
- Cabins cannot be positioned close to the places where halogen compounds can occur and into which combustion air can enter (e.g. launderettes, hairdressers).
- Halogen compounds can be caused by cleaning and degreasing solutions, dissolvents, glue and bleaching lyes. Pay attention to the Procal leaflet, corrosion through Halogen compounds.

Combustion air

Combustion air is supplied via ventilation grilles located on the side panels of the cabin. The cabin must be positioned so the air intake through the grilles is unobstructed.

Gas connection

Gas valve and gas filter

Immediately in front of each boiler a manual gas valve with thermally releasing cut-off device and gas filter are installed according to relevant regulations.

Manual gas shut-off tap

The manual shut-off tap is delivered with the cabin for installation.
Supplied loose, installation on site, outside the cabin.

Commissioning

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

Shut-off valve

- A shut-off valve must be installed upstream of the cabin.

Type of gas

- The boiler is only to be operated with the type of gas stated on the rating plate.

Gas pressure natural gas

- Necessary flow pressure at the boiler inlet: see technical data

Gas pressure propane

- Necessary flow pressure at the boiler inlet: see technical data

Gas pressure regulator

- In boilers with a heat input in excess of 70 kW, install a pressure regulator in accordance with EN88-1 in the gas supply line directly before the boiler.

Closed heating system

The boiler is only approved for use in closed heating systems.

Minimum circulation water quantity

No minimum water circulation volume is required.

Installation instructions
Please observe the installation instructions supplied with every thermal module.

Space requirements
See “Dimensions” for information

Cabin on the roof
The low pressure sensor installed in the cabin acts as a low water protection for the installation of the cabin on the roof (the highest position of the building).

Condensate drain
- A condensate neutralisation boxes are installed at the condensate outlet on the gas boilers (included in the cabin scope of delivery).
- A permit for discharge of the flue gas condensate into the sewage system must be obtained from the relevant authority or sewer operator.
- The condensate from the flue gas line can be discharged via the boiler. A condensate trap is no longer needed in the flue gas system.
- A siphon is installed at the condensate outlet on the gas boiler (included in the cabin scope of delivery).
- Suitable materials for condensate drain outside of the cabin:
  - stoneware pipes
  - pipes made from PVC
  - pipes made from polyethylene (PE)
  - pipes made from ABS or ASA

Expansion tank
- An adequately dimensioned expansion tank for the heating system must be provided.
- The expansion tanks installed in the cabin are intended **only** for protection of the boilers. Required volume is determined from the water content of the heat generator.
- At the safety flow a safety valve and an automatic exhauster are installed.

Noise damping
The following measures are possible for sound insulation:
- If there are living areas below the boiler cabin, connect pipes flexibly using expansion joints.
- Connect circulating pumps to the piping network using expansion joints

Noise level
- The acoustic **power** level value is dependent on the local and spacial circumstances.
- The acoustic **pressure** level is dependent on the installation conditions and can for instance be 5 to 10 dB(A) lower than the acoustic **power** level at a distance of 1 m.

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

Flue gas system
- Standard delivery is with flue gas chimney for each boiler, 20-30 cm outside of the cabin. Chimneys are delivered loose, installation on site installation on site by the installer.
- As an option, it is possible to deliver thermal module with one common chimney.
- A flue gas temperature limiter is integrated into the boiler.