

## Datasheet

Part no. and prices: See pricelist

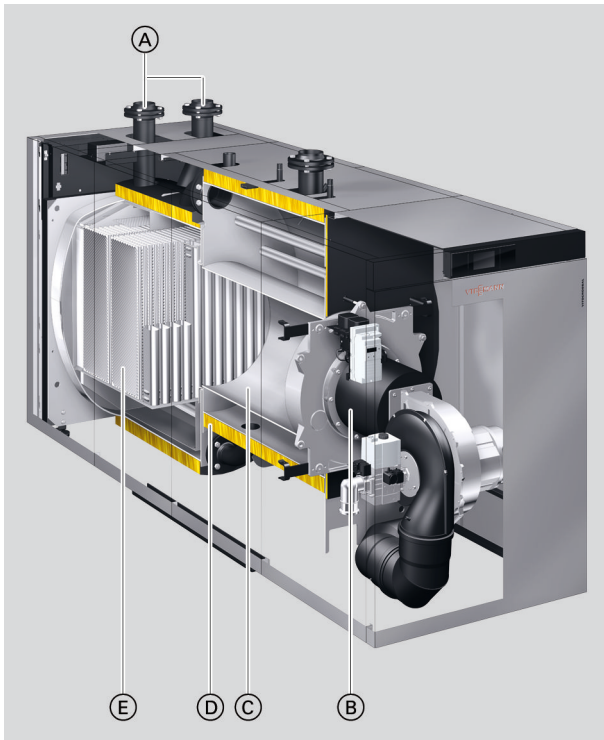


### **VITOCROSSAL** Type CRU

Gas condensing boiler for natural gas E and natural gas LL

## Benefits at a glance

- Standard seasonal efficiency [to DIN]: Up to 98 % (Hs) [gross cv]
- Stainless steel, corrosion-resistant Inox-Crossal heat exchanger ensures high operational reliability and a long service life
- Self-cleaning Inox-Crossal heat exchanger for highly effective heat transfer and high condensation rate
- Highly efficient and compact MatriX-Disk burner for particularly quiet and environmentally responsible operation, with a modulation range down to 1:6, emissions category 3
- Split design for easy handling
- 2 return connectors for hydraulic connection optimised for condensing technology
- Either open flue or room sealed operation; accessories are required for room sealed operation.
- Easy to use Vitotronic control unit with colour touchscreen
- Integral WiFi for service interface
- Economical and safe operation of the heating system through the Vitotronic control system with communication capability which, in conjunction with Vitogate 300 (accessories), enables integration into building management systems.
- Vitocontrol control panel available on request.



- (A) 2 return connectors
- (B) MatriX-Disk burner
- (C) Stainless steel combustion chamber
- (D) Highly effective thermal insulation
- (E) Stainless steel Inox-Crossal heat exchanger

## Specification

### Boiler specification

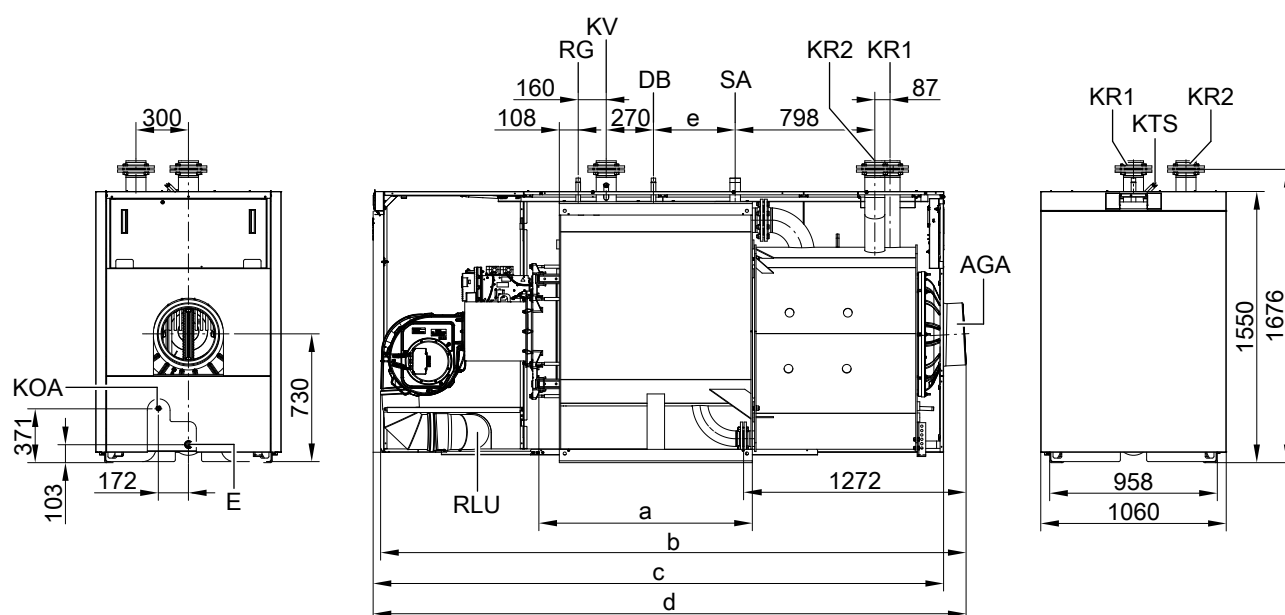
Vitocrossal, type		CRU 800	CRU 1000
<b>Rated heating output range</b>			
$P_n: T_F/T_R$ 80/60 °C	kW	125 to 750	156 to 938
$P_{cond}: T_F/T_R$ 50/30 °C	kW	137 to 800	171 to 1000
<b>Rated heating input range <math>Q_n</math></b> (sized for up to 1500 m above sea level)	kW	127 to 762	159 to 952
<b>Boiler product ID</b>		CE-0085CS0411	
<b>Permiss. operating temperature</b>	°C	95	95
<b>Permiss. flow temperature</b> (safety temperature)	°C	110	110
<b>Heating surface</b>	m <sup>2</sup>	24.2	31.5
<b>Max. permiss. operating pressure</b>	bar	6	6
	MPa	0.6	0.6
<b>Min. permiss. operating pressure</b>	bar	0.5	0.5
	MPa	0.05	0.05
<b>Test pressure</b>	bar	7.8	7.8
	MPa	0.78	0.78
<b>Boiler body dimensions</b>			
Total length	mm	2241	2441
Length of combustion chamber module	mm	1019	1219
Length of heat exchanger module	mm	1272	1272
Width	mm	960	960
Height	mm	1676	1676
<b>Total dimensions</b> incl. cladding			
Length	mm	3187	3389
Width	mm	1060	1060
Height	mm	1676	1676
<b>Foundation dimensions</b>			
Length	mm	2500	2700
Width	mm	1200	1200
<b>Weight</b>			
Combustion chamber module	kg	535	585
Heat exchanger module	kg	615	615
Burner	kg	120	120
Total weight, dry	kg	1435	1492
<b>Water capacity</b>	l	827	972
<b>Connections</b>			
Boiler flow	PN 6 DN	100	100
Boiler return 1 <sup>*1</sup>	PN 6 DN	100	100
Boiler return 2 <sup>*1</sup>	PN 6 DN	100	100
Safety connection (male thread)	R	2	2
Drain (male thread)	R	1¼	1¼
Condensate drain (male thread)	R	½	½
<b>Gas flow rate, natural gas E (G20) at 15 °C, 1.013 bar</b>			
– At rated heating output	m <sup>3</sup> /h	80.6	100.8
– At partial load	m <sup>3</sup> /h	13.4	16.8
<b>Gas flow rate, natural gas LL (G25) at 15 °C, 1.013 bar</b>			
– At rated heating output	m <sup>3</sup> /h	93.8	117.3
– At partial load	m <sup>3</sup> /h	15.6	19.6
<b>Flue gas parameters<sup>*2</sup></b>			
Flue gas temperature ( $T_F/T_R$ 50/30 °C)			
– At rated heating output	°C	43	45
– At partial load	°C	34	35
Flue gas temperature ( $T_F/T_R$ 80/60 °C)			
– At rated heating output	°C	67	69
– At partial load	°C	63	63
Flue gas mass flow rate, natural gas E (G20)			
– At rated heating output	kg/h	1249	1562
– At partial load	kg/h	233	291
Flue gas mass flow rate, natural gas LL (G25)			
– At rated heating output	kg/h	1273	1592
– At partial load	kg/h	237	297

<sup>\*1</sup> When connecting 2 heating circuits, connect the heating circuit with the higher temperature level to boiler return 2.

<sup>\*2</sup> Calculation for natural gas with nominal CO<sub>2</sub> content and combustion air temperature of 20 °C. Partial load corresponds to the lowest heating output that can be set.

## Specification (cont.)

Vitocrossal, type		CRU 800	CRU 1000
Flue gas connection	Ø mm	300	300
Max. draught at the flue outlet	Pa	200	200
	mbar	2	2
Max. flue gas flow <sup>*2</sup>	m³/h	1160	1425
Max. amount of condensate (to Code of Practice DWA-A-251)	kg/h	107	133
<b>Efficiency</b>			
– H <sub>s</sub> [gross cv] at T <sub>F</sub> /T <sub>R</sub> 80/60 °C, full load (100 %)	%	88	88
– H <sub>s</sub> [gross cv] at T <sub>F</sub> /T <sub>R</sub> 50/30 °C, full load (100 %)	%	96	95
– H <sub>s</sub> [gross cv] at T <sub>F</sub> /T <sub>R</sub> 50/30 °C, partial load (30 %)	%	98	97
<b>Standard seasonal efficiency [to DIN]</b>			
– H <sub>s</sub> [gross cv] at 40/30 °C	%	99	98
– H <sub>s</sub> [gross cv] at 75/60 °C	%	96	96
<b>Idle losses (via ambient temperature)</b>			
– 50 K	kW	2.7	2.8
– 30 K	kW	1.0	1.1
Standby loss q <sub>B,70</sub>	%	0.4	0.7
<b>NOx class (to EN 15502)</b>		6 ( < 56 mg/kWh)	
<b>Sound power level</b>			
– At 1 m distance (based on ISO 3743-1:2010)	dB(A)	83	85
– In the flue pipe (to EN 15036-2)	dB(A)	83	85



AGA Flue outlet, internal Ø 302

DB Female connection Rp ½ (female thread) for pressure limiter

E Drain R 1½ (male thread)

KOA Condensate drain R ½ (male thread)

KR 1 Boiler return 1, DN 100 PN 6

KR 2 Boiler return 2, DN 100 PN 6

KTS Boiler water temperature sensor Rp ¾ (female thread)

KV Boiler flow, DN 100 PN 6

RG Female connection Rp ½ (female thread) for additional control equipment

RLU Connection for room sealed operation  
The filter adaptor accessory **must** also be ordered (part no. ZK05416).

SA Safety connection R 2 (male thread)

### Dimensions

Vitocrossal, type	CR U	800	1000
a	mm	1019	1219
b	mm	3146	3346
c	mm	3060	3260
d	mm	3187	3389
e	mm	267	467

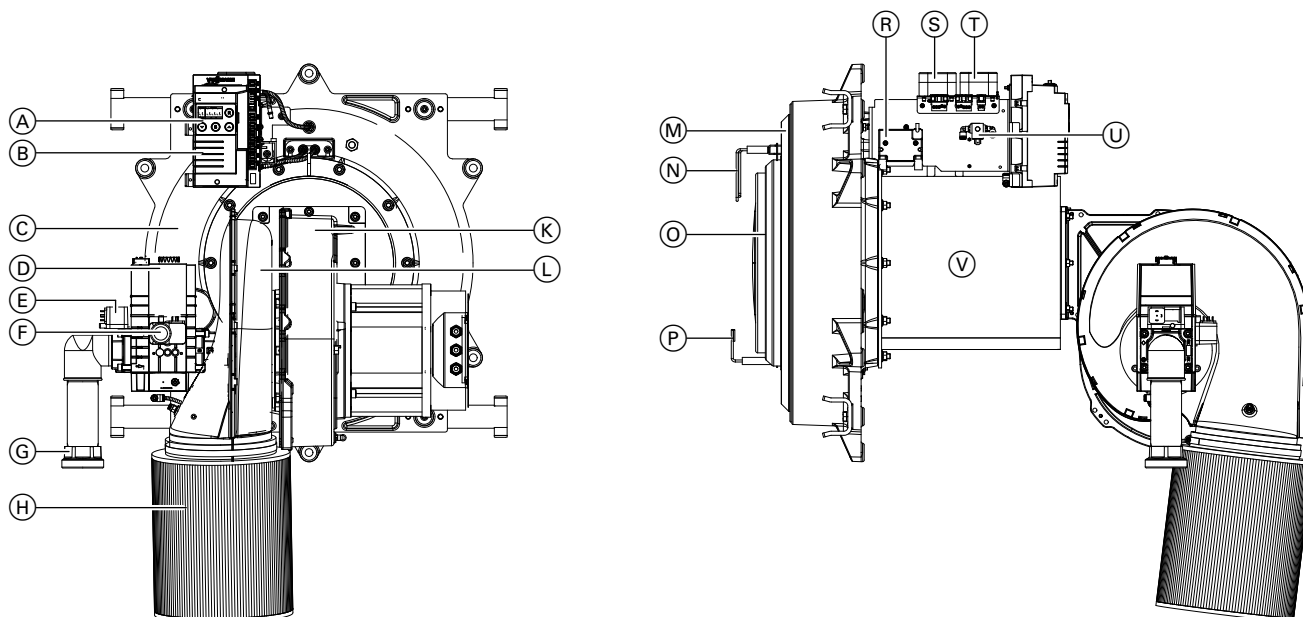
<sup>\*2</sup> Calculation for natural gas with nominal CO<sub>2</sub> content and combustion air temperature of 20 °C. Partial load corresponds to the lowest heating output that can be set.

## Specification (cont.)

### Specification – MatriX-Disk burner

Vitocrossal, type		CRU 800	CRU 1000
<b>Rated heating output range</b>			
$P_n: T_F/T_R$ 80/60 °C	kW	125 to 750	156 to 938
$P_{cond}: T_F/T_R$ 50/30 °C	kW	137 to 800	171 to 1000
<b>Rated heating input range <math>Q_n</math></b> (Sized for up to mean sea level (MSL) 1500 m)		127 to 762	159 to 952
<b>Burner type</b>		MDI	
<b>Burner product ID</b>		CE-0085CS0412	
<b>Dimensions</b>			
Length	mm	1122	
Width	mm	869	
Height	mm	776	
<b>Weight</b>	kg	120	
<b>Voltage</b> , 3/N/PE	V	400	400
<b>Frequency</b>	Hz	50	50
<b>Current</b> , max	A	16	16
<b>Power consumption</b>			
– At rated heating output	W	1500	2000
– At partial load	W	100	100
<b>Permiss. gas supply pressure</b>			
– Natural gas E and natural gas LL	mbar	17 to 25	
	kPa	1.7 to 2.5	
– Short-term max.	mbar	60	
	kPa	6	
<b>Emissions<sup>*3</sup></b>			
NOx emissions, natural gas E			
– At rated heating output	mg/kWh	53	55
– At partial load	mg/kWh	20	20
NOx emissions, natural gas LL			
– At rated heating output	mg/kWh	51	53
– At partial load	mg/kWh	20	20
CO emissions, natural gas E			
– At rated heating output	mg/kWh	35	35
– At partial load	mg/kWh	2	2
CO emissions, natural gas LL			
– At rated heating output	mg/kWh	35	35
– At partial load	mg/kWh	2	2
<b>NOx class</b> to EN 15502		6	
Available draught at the flue outlet			
	Pa	200	
	mbar	2.0	
<b>Sound power level</b>			
– At a distance of 1 m, with reference to ISO 3743-1:2010	dB(A)	83	85
– Inside flue pipe to EN 15036-2	dB(A)	83	85

### Overview of burner components



- (A) Display and programming unit
- (B) Burner control unit
- (C) Burner door
- (D) Gas train
- (E) Gas pressure switch 1
- (F) Gas pressure switch 2
- (G) Gas supply pipe
- (H) Air filter
- (K) Fan

- (L) Supply air collector
- (M) Thermal insulation block
- (N) Ignition electrodes
- (O) Burner gauze assembly, MatriX-Disk
- (P) Ionisation electrode
- (R) Ignition unit
- (S) Air pressure switch LDW2
- (T) Air pressure switch LDW1
- (U) 2/2-way solenoid valve
- (V) Fitting

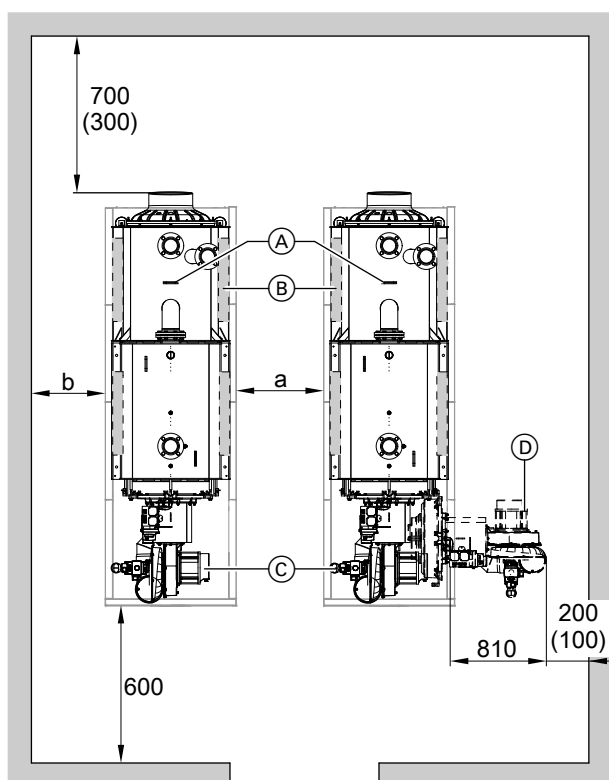
### Siting

#### Clearances and dimensions

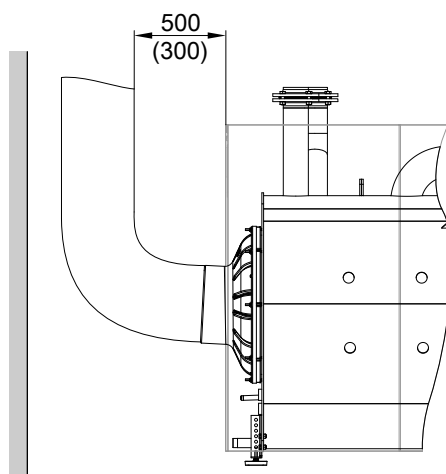
##### Note

The stated clearances are recommended clearances. Minimum clearances are indicated in brackets.

## Specification (cont.)



- (A) Boiler  
 (B) Anti-vibration boiler supports  
 (C) Burner  
 (D) Burner door opens to the right (delivered condition).  
 In order to open the burner door to the left, the hinge pins of the burner door can be swapped to the other side.



### Note

If routing the flue gas vertically, allow space for working on the control unit.

Dim. Clearance	a (mm)		b (mm)	
	Minimum clear- ance	Recommended clearance	Minimum clear- ance	Recommended clearance
Right-hand burner door opens to the right. <b>And</b> Left-hand burner door opens to the left.	400	500	910	1010
Right-hand burner door opens to the left. <b>Or</b> Left-hand burner door opens to the right.	910	1010	400	500
<b>For room sealed operation</b> (with filter adaptor – ac- cessory)				
– With 1 filter adaptor	970	1070	910	1010
– With 2 filter adaptors	1440	1540	910	1010

### Siting

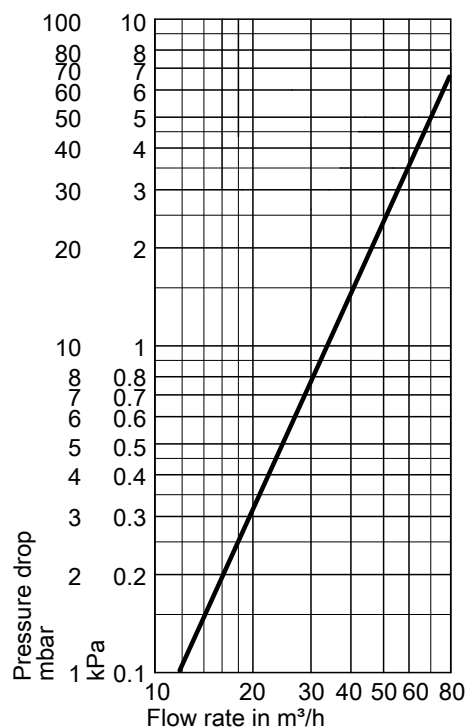
- Prevent air contamination by halogenated hydrocarbons (e.g. in sprays, paints, solvents and cleaning agents)
- Prevent very dusty conditions
- Prevent high levels of humidity
- Prevent frost and ensure good ventilation

Otherwise the system may suffer faults and damage.

In rooms where air contamination through **halogenated hydrocarbons** may occur, install the boiler only if adequate measures can be taken to provide a supply of uncontaminated combustion air.

## Specification (cont.)

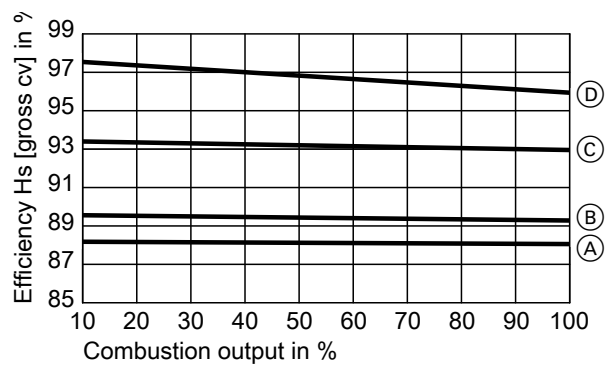
### Pressure drop on the heating water side



The Vitocrossal 300 is only suitable for fully pumped hot water heating systems.

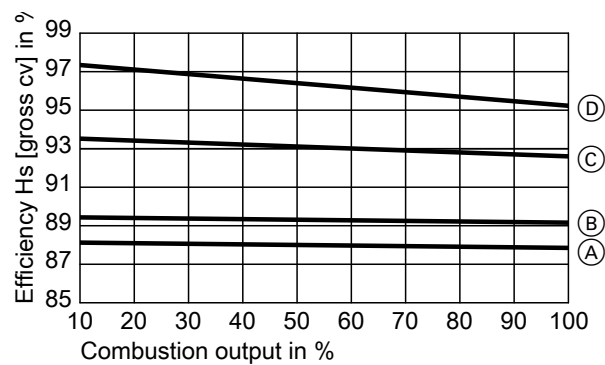
### Efficiency

Efficiency Hs [gross cv] of Vitocrossal, type CRU, 800



- (A) 80/60 °C
- (B) 70/50 °C
- (C) 60/40 °C
- (D) 50/30 °C

Efficiency Hs [gross cv] of Vitocrossal, type CRU, 1000



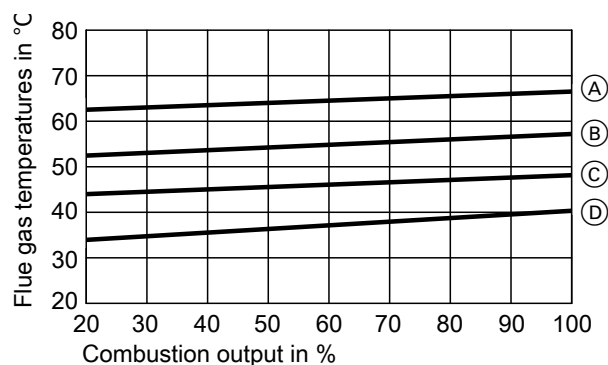
- (A) 80/60 °C
- (B) 70/50 °C
- (C) 60/40 °C
- (D) 50/30 °C



## Specification (cont.)

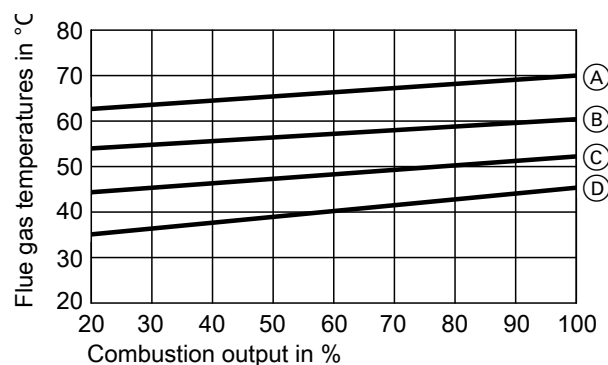
### Flue gas temperature

Flue gas temperature of Vitocrossal, type CRU, 800



- (A) 80/60 °C
- (B) 70/50 °C
- (C) 60/40 °C
- (D) 50/30 °C

Flue gas temperature of Vitocrossal, type CRU, 1000



- (A) 80/60 °C
- (B) 70/50 °C
- (C) 60/40 °C
- (D) 50/30 °C

## Delivered condition

Standard delivery:

- Combustion chamber module
- Heat exchanger module
- Thermal insulation (2 boxes)
- MatriX-Disk burner
- Boiler control unit

- Programming unit
- Cable set
- Technical documentation
- Mating flanges with screws and gaskets
- Connector safety assembly with 2nd return connection

## Control unit versions

### For a single boiler system

#### ■ Vitotronic 100, type CC11

For the control unit with a constant boiler water temperature  
For weather-compensated or room temperature-dependent operation in conjunction with an external control unit

#### ■ Vitotronic 200, type CO11

For weather-compensated operation and mixer control for up to 2 heating circuits with mixer. For the 2 heating circuits with mixer, the accessory "Extension for heating circuits 2 and 3" is required.

### For a multi boiler system (up to 8 boilers)

#### ■ Vitotronic 300, type CM11

For weather-compensated operation of a multi boiler system. This Vitotronic control unit also handles control of the boiler water temperature of a boiler within this multi boiler system.

#### Vitotronic 100, type CC11 and LON communication module

To control the boiler water temperature for each additional boiler in the multi boiler system

#### ■ Vitocrossal 100-M/200-M multi mode system controller

For weather-compensated cascade control of boilers with Vitotronic 100 control unit and a Vitobloc 200 CHP unit or other heat generators.

## Multi mode system controller in the control panel

For single and multi boiler systems

## Control unit versions (cont.)

### Vitocontrol 100-M

■ For operation of multi mode heating systems with up to 4 heat generators, with various combinations of oil/gas boilers, heat pumps, CHP units and solid fuel boilers. The Vitocontrol 100-M can operate a range of defined standard schemes. The schemes are available via the Viessmann Schematic Browser. For the compatibility of the Vitocontrol 100-M in conjunction with Viessmann control units, see the compatibility list. Connection to Vitoscada for web-based system visualisation is available as an option. This requires an internet connection.

Viessmann Schematic Browser: [www.viessmann-schemes.com](http://www.viessmann-schemes.com)

Compatibility list: [www.vitocontrol.info](http://www.vitocontrol.info)

### Vitocontrol 200-M

■ For the operation of customer-specific multi mode energy systems with any number of heat generators in various combinations, as well as cooling, solar, ventilation and electricity components. Solutions are based on a modular system and can be flexibly extended with new functions and process applications. Connection to Vitoscada for web-based system visualisation is available as an option. This requires an internet connection.

## Boiler accessories

See pricelist and technical guide.

## Operating conditions

### Operating conditions with Vitotronic boiler control units

For water quality requirements, see technical guide.

	Requirements
1. Heating water flow rate	None
2. Boiler return temperature (minimum value)	None
3. Low-end boiler water temperature	None
4. Lower boiler water temperature with frost protection	10 °C – ensured through the Viessmann control unit
5. Two-stage burner operation	None
6. Modulating burner operation	None
7. Reduced mode	None – total reduction is possible
8. Weekend setback	None – total reduction is possible

## Design information

### Siting for open flue operation

(B<sub>23</sub>, B<sub>23P</sub>)

For open flue combustion equipment with a total rated output in excess of 50 kW, the fresh ventilation is deemed to have been verified if the combustion equipment is located in areas which provide an aperture or duct leading outdoors.

The cross-section of the aperture must be at least 150 cm<sup>2</sup> and must be 2 cm<sup>2</sup> larger for each additional kW above 50 kW rated output.

Pipes must be sized to provide equivalent flow rates. The required cross-section may be split over a maximum of two apertures or pipes.

### Siting for room sealed operation

C<sub>63</sub>

For room sealed operation, the filter adaptor accessory **must** also be ordered (part no. ZK05416).

Route the ventilation air pipe to the boiler on site. The ventilation air pipe must be connected to the filter adaptor accessory (DN 300).

### Neutralisation

During condensation, acidic condensate is formed with a pH value of between 3 and 4. The condensate can be neutralised in a neutralising system with the aid of a neutralising medium.

For further information, see the technical guide.

### Further information on design/engineering

See the technical guide to this boiler.

## Tested quality



CE designation according to current EC Directives



Subject to technical modifications.

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