

Datasheet

**VITOMAX 100-LW** Type M148/System

Low pressure hot water boilers

Certified in accordance with Gas Appliances Directive 2009/142/EC, approved for flow temperatures up to 110 °C

Suitable for the combustion of fuel oil EL and gas

Permissible operating pressure 6, 10 bar

Specification for burner selection

Note

All diagrams are schematic, illustrative examples.

Tab. 1

Boiler size* ¹		1	2	3	4	5	6	7	8	9	A	B
Rated heating output - for natural gas/fuel oil EL	MW	0.65	0.85	1.1	1.4	1.8	2.3	2.9	3.5	4.2	5.0	6.0
Flame tube dimensions												
Lengths - Flame tube length	a mm	1500	1680	1860	2090	2250	2450	2650	2900	3300	3470	3700
Diameter - Flame tube min. internal \varnothing	d1 mm	678	726	799	847	895	966	1064	1139	1212	1310	1383
Burner connections												
- Max. flame head \varnothing	c mm	380	380	380	380	380	420	420	530	530	530	600
- Min. flame head length	e mm	335	335	335	335	335	335	360	400	400	430	480
Flame tube volume												
- Relative to flame tube length a	m ³	0.55	0.7	0.94	1.19	1.43	1.85	2.42	3.02	3.88	4.76	5.66

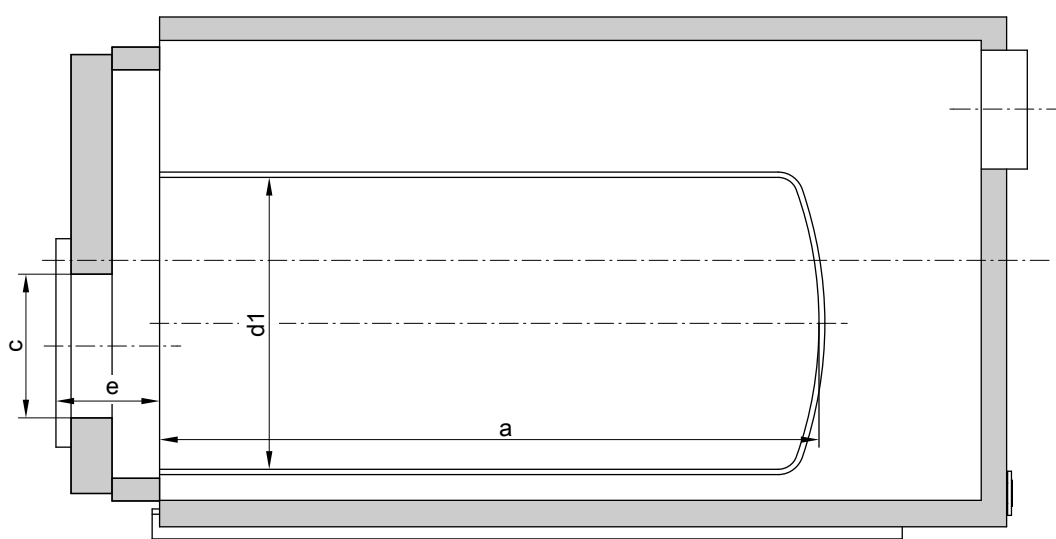


Fig. 1

Note

Tolerances related to production factors are not taken into consideration.

Tab. 2: Max. pressure drop on the flue gas side*²

Boiler size* ¹		1	2	3	4	5	6	7	8	9	A	B
- for natural gas	mbar	2.9	4.4	7.0	8.2	5.5	8.2	10.0	11.0	9.4	10.5	11.2
- for fuel oil EL	mbar	2.5	3.9	6.2	7.1	4.8	7.2	8.9	9.6	8.1	9.0	10.1

*1 Last digit of part number

*2 For a flow/return temperature of 80/60 °C

Specification for boiler

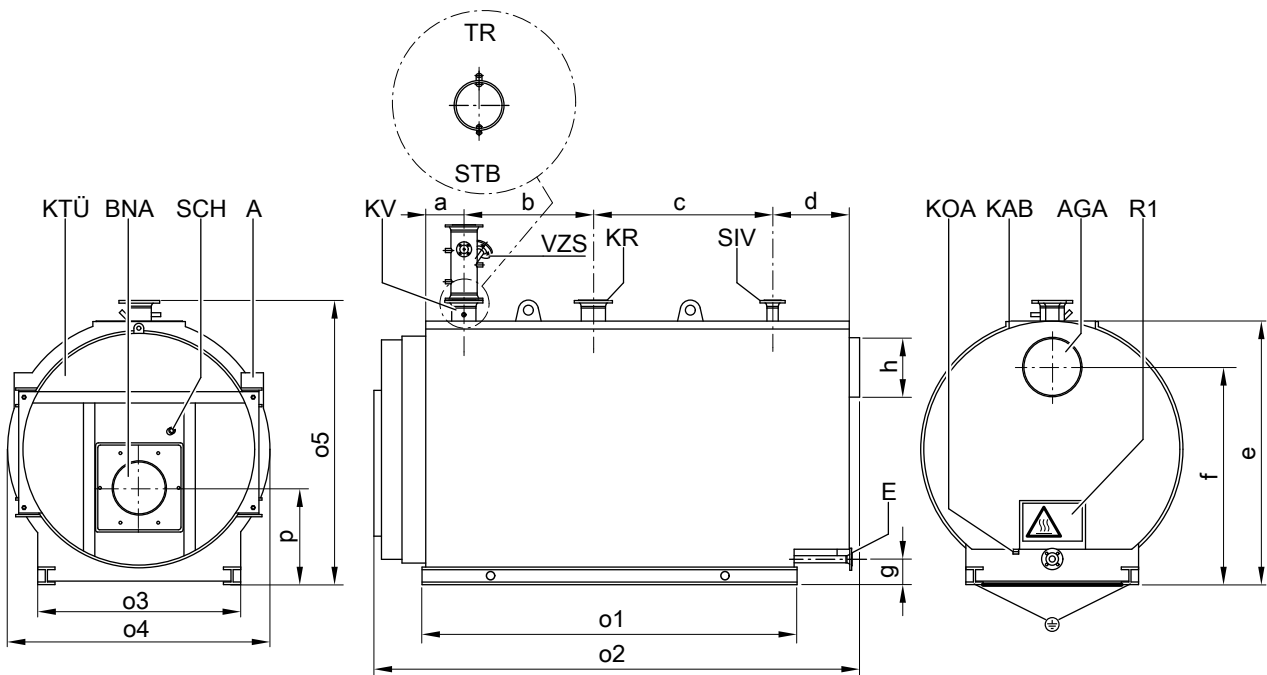


Fig. 2: Caution - hot surface

A	Type plate	KV	Boiler flow
AGA	Flue outlet	R1	Cleaning aperture, flue gas collector
BNA	Burner connection	SCH	Inspection port
E	Drain - Size 1-5: DN 32 PN 40 - Size 6-B: DN 40 PN 40	SIV	Safety valve connector
KAB	Boiler cover	STB	High limit safety cut-out - female connection (horizontal) R ½
KOA	Condensate drain - female connection R 1 ¼	TR	Temperature controller - female connection (slanted) R ½
KR	Boiler return	VZS	Intermediate flow piece as accessory - option
KTÜ	Boiler door	⊕	Equipotential bonding

Tab. 3: Nominal dimensions*3

Boiler size*1		1	2	3	4	5	6	7	8	9	A	B
a	mm	210	210	210	210	210	265	265	290	290	290	315
b	mm	595	685	775	890	970	1015	1115	1215	1415	1485	1575
c	mm	655	745	835	950	1030	1130	1230	1305	1505	1580	1645
d	mm	430	430	430	430	430	435	485	535	585	585	685
e	mm	1460	1515	1585	1650	1765	1830	1955	2075	2225	2345	2445
f	mm	1250	1280	1350	1400	1475	1510	1610	1705	1830	1925	2000
g	mm	190	190	190	190	190	180	180	200	200	220	220
h (internal Ø)*4	mm	192	242	242	272	346	400	450	500	550	600	650
o1	mm	1650	1830	2010	2240	2400	2600	2800	3050	3450	3595	3825
o2	mm	2310	2490	2670	2900	3060	3310	3580	3870	4320	4500	4825
o3	mm	1000	1050	1075	1100	1150	1200	1275	1375	1465	1600	1625
o4	mm	1450	1505	1575	1640	1755	1815	1940	2040	2190	2290	2390
o5	mm	1610	1665	1735	1800	1915	1975	2100	2220	2370	2490	2590
p	mm	560	580	612	632	652	670	720	778	820	875	908

*3 Subject to modification

*1 Last digit of part number

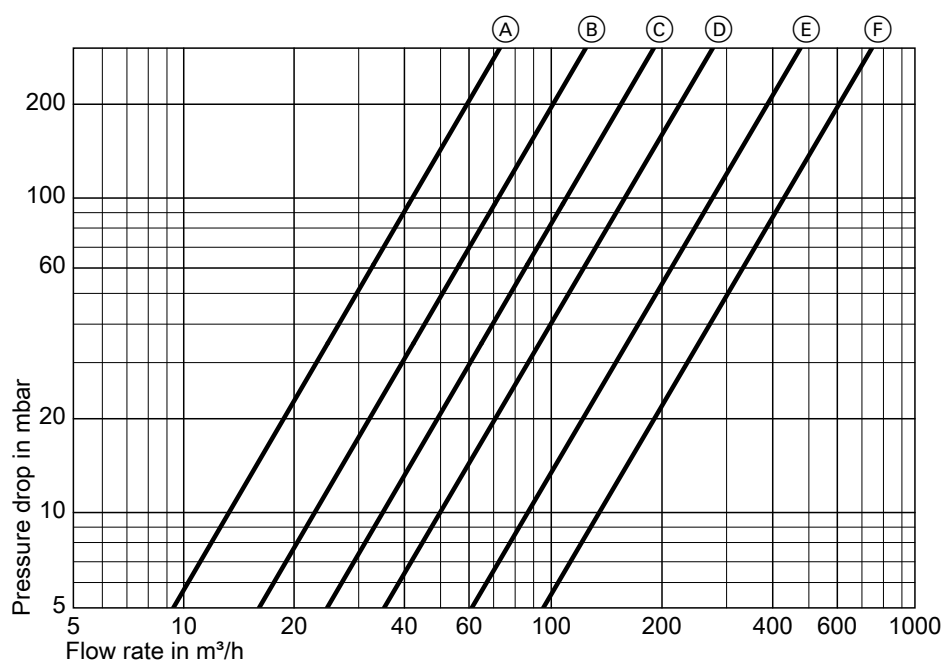
*4 Internal Ø + 8 mm (for sizes 1-5) and + 10 mm (for size 6-B) produces external Ø

Specification for boiler (cont.)

Tab. 4

Boiler size*1		1	2	3	4	5	6	7	8	9	A	B
Permiss. flow temperature*5		110										
- for permiss. op. pressure	6, 10 bar °C	110										
Shipping dimensions excl. packaging												
- Total length	m	2.3	2.5	2.7	2.9	3.1	3.4	3.6	3.9	4.4	4.5	4.9
- Total width	m	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.3	2.4	2.5
- Total height	m	1.65	1.7	1.75	1.8	1.95	2.1	2.2	2.3	2.4	2.5	2.6
Dry weight*6 boiler incl. thermal insulation												
- for permiss. op. pressure	6 bar t	1.5	1.8	2.1	2.6	3.2	3.7	4.3	5.3	6.4	7.3	8.6
	10 bar t	1.7	2.0	2.4	3.0	3.8	4.4	5.3	6.2	7.8	8.9	10.4
Boiler water content	m ³	1.1	1.3	1.5	1.8	2.2	2.3	2.9	3.4	4.5	4.9	5.6
Connections for boiler		Boiler flow and return										
- for rated heating output and temperature spread of 20 K	PN 16 DN	80	100	100	125	125	150	150	200	200	200	250
		Safety valve connector										
- for permiss. op. pressure	6 bar PN 16 DN	-	-	-	50	50	65	65	80	80	100	100
	6 bar PN 40 DN	32	40	40	-	-	-	-	-	-	-	-
	10 bar PN 16 DN	-	-	-	-	-	50	50	65	65	65	80
	10 bar PN 40 DN	25	32	32	40	40	-	-	-	-	-	-
Flue gas mass flow rate	- for natural gas t/h	1.5225 x combustion output in MW										
	- for fuel oil EL t/h	1.5 x combustion output in MW										
Flue gas side heating surface	m ²	16	19	22	28	38	42	51	61	77	87	104
Flue gas volume	m ³	1.0	1.2	1.5	1.9	2.4	2.8	3.8	4.7	6.3	7.5	9.1

Pressure drop on the heating water side



Connectors for boiler flow and return

- (A) DN 80
- (B) DN 100
- (C) DN 125
- (D) DN 150
- (E) DN 200
- (F) DN 250

Dia. 1

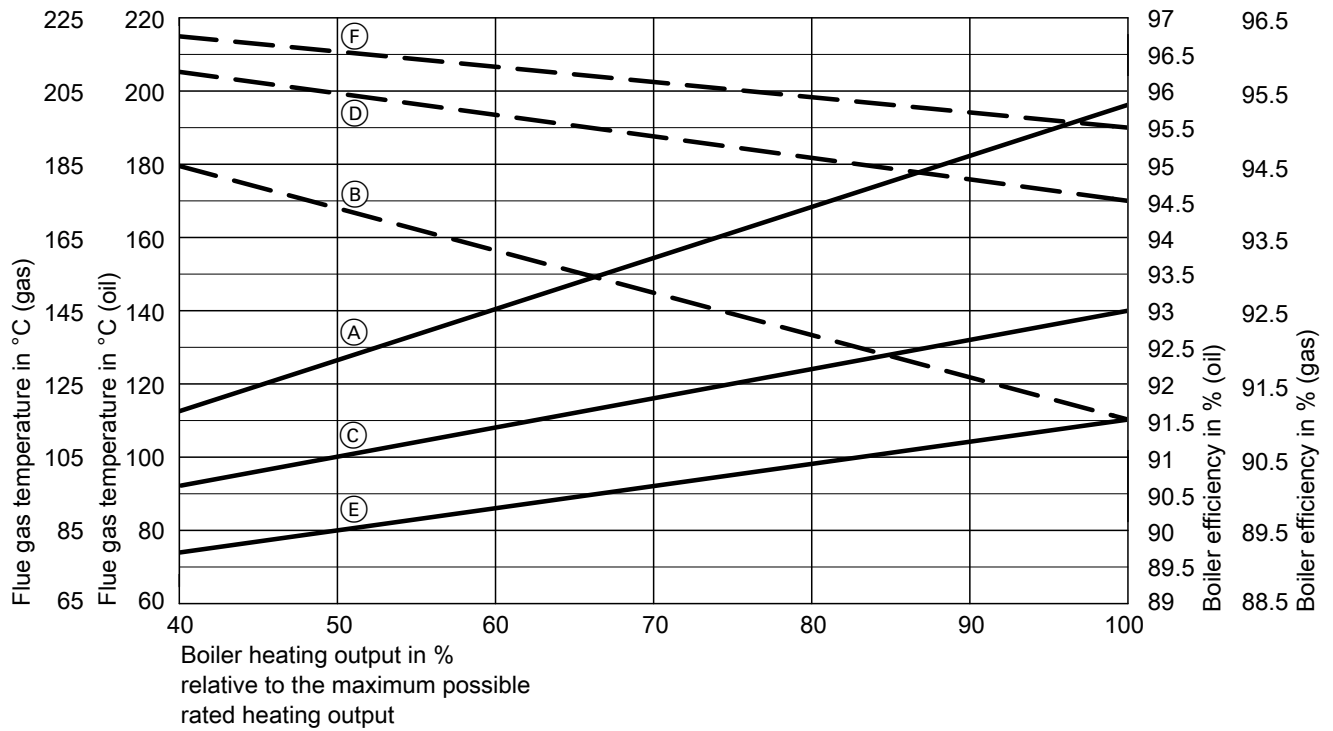
*1 Last digit of part number

*5 The maximum achievable flow temperature is approx. 15 K below the permissible flow temperature (= safety temperature)

*6 Deviations of 10 % are possible, subject to order

Specification for boiler (cont.)

Flue gas temperature and boiler efficiency



Dia. 2

Without Vitotrans 100-LW/200-LW

- Ⓐ Flue gas temperature in °C
- Ⓑ Boiler efficiency in %

With Vitotrans 100-LW

- Ⓒ Flue gas temperature in °C
- Ⓓ Boiler efficiency in %

With Vitotrans 200-LW

- Ⓔ Flue gas temperature in °C
- Ⓕ Boiler efficiency in %

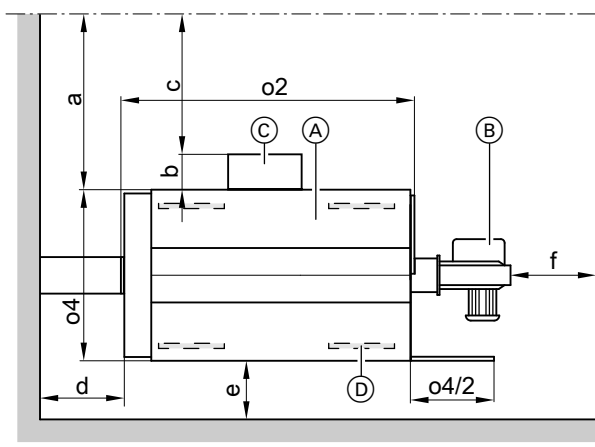
Subject to the boiler heating output

- For a boiler water temperature of 80/60 °C or
- For a boiler water temperature of 90/70 °C with Vitotrans 100-LW/200-LW flue gas/water heat exchanger

- Residual oxygen content in the flue gas: 3 %
- All efficiency figures ± 0.5 %, relative to heat exchanger use
- Lower limits averaged across all boiler sizes

Specification

Minimum clearances



a	≥ 1000 mm
b	≥ 500 mm
c	≥ 800 mm
d	≥ 500 mm
e	≥ 300 mm
f*7	≥ 500 mm

Fig. 3

Observe **risk warnings** and the information provided.

- (A) Steam boiler or hot water boiler
- (B) Burner
- (C) Regulating and control system
- (D) Option: anti-vibration supports

a	Control system not fitted
b	Control system depth
c	Control system fitted
d,e,f	Miscellaneous clearances
o2, o4	Max. length, max. width

Observe the given dimensions to ensure easy installation and maintenance.

The minimum clearances must be observed.

Reducing noise

Place **anti-vibration supports** (not included in standard delivery) under the boiler shell. Position supports evenly over the length and centrally underneath the base rails.

Siting conditions

- Prevent air contamination from halogenated hydrocarbons. Halogenated hydrocarbons can be found in sprays, paints, solvents and cleaning agents
If there is a risk of air contamination from **halogenated hydrocarbons** where the boiler is sited, an adequate supply of uncontaminated combustion air must be provided.
- Avoid very dusty conditions

- Avoid high levels of humidity
- Prevent frost and ensure good ventilation
- Site on a level surface
Impact can cause system faults and damage.

Delivered condition of boiler

Boiler

- Boiler shell with burner connection flange and burner plate supplied
- Fitted boiler door/doors
- Bolted down cleaning cover
- Fitted load bearing boiler cover
- Fitted thermal insulation and thermally insulated flue gas collector
- Turbulators (if installed)
- Turbulator extractor (if turbulators are installed)
- Packaging

Boiler accessories (option)

- Return temperature raising facility with shunt pump
- Return temperature raising facility with a 3-way mixing valve and a boiler circuit pump
- Vitotrans 100-LW/200-LW flue gas/water heat exchanger with compensator and mating flanges on the water side
- Flanged silencer with mating flanges
- Motorised flue gas damper with mating flanges
- Boiler control platform
- Gas train for gas supply pressure 100 or 300 mbar
- Thermally activated shut-off equipment (TAE)
- Pressure-maintaining facility
- For further accessories, see pricelist

*7 Leave one boiler length of space clear in front of the boiler door. This makes it easier to remove the turbulators and clean the boiler.

Delivered condition of system

As per the boiler, plus:

- Drilled burner plate
- Burner
- Shut-off damper for boiler flow and return connectors
- Drain shut-off valve
- Fitting assembly with pressure gauge
- Straight-through shut-off valve
- Mating flanges for boiler flow, boiler return and drain connectors
- Maximum pressure limiter

- Minimum pressure limiter
- Vitocontrol control panel with fitted Vitotronic 100 (type GC1B)
- Control panel with adaptor
- Flash trap replacement set
- Safety valve
- Intermediate flow piece with low water indicator
- Dial thermometer with sensor well
- Prepared for control platform installation

System accessories (option)

- Return temperature raising facility (RTRF) with shunt pump*⁸
- Return temperature raising facility with a 3-way mixing valve and a boiler circuit pump*⁸
- Temperature sensor for flue outlet
- Vitotrans 100-LW/200-LW flue gas/water heat exchanger, max. flow, with mating flanges on the water side for improved efficiency*⁸

- Flue gas silencer*⁸
- Steel or stainless steel motorised flue gas damper*⁸
- Gas train with 100 mbar or 300 mbar supply pressure
- Modular operating platform*⁸

Example, system with accessories

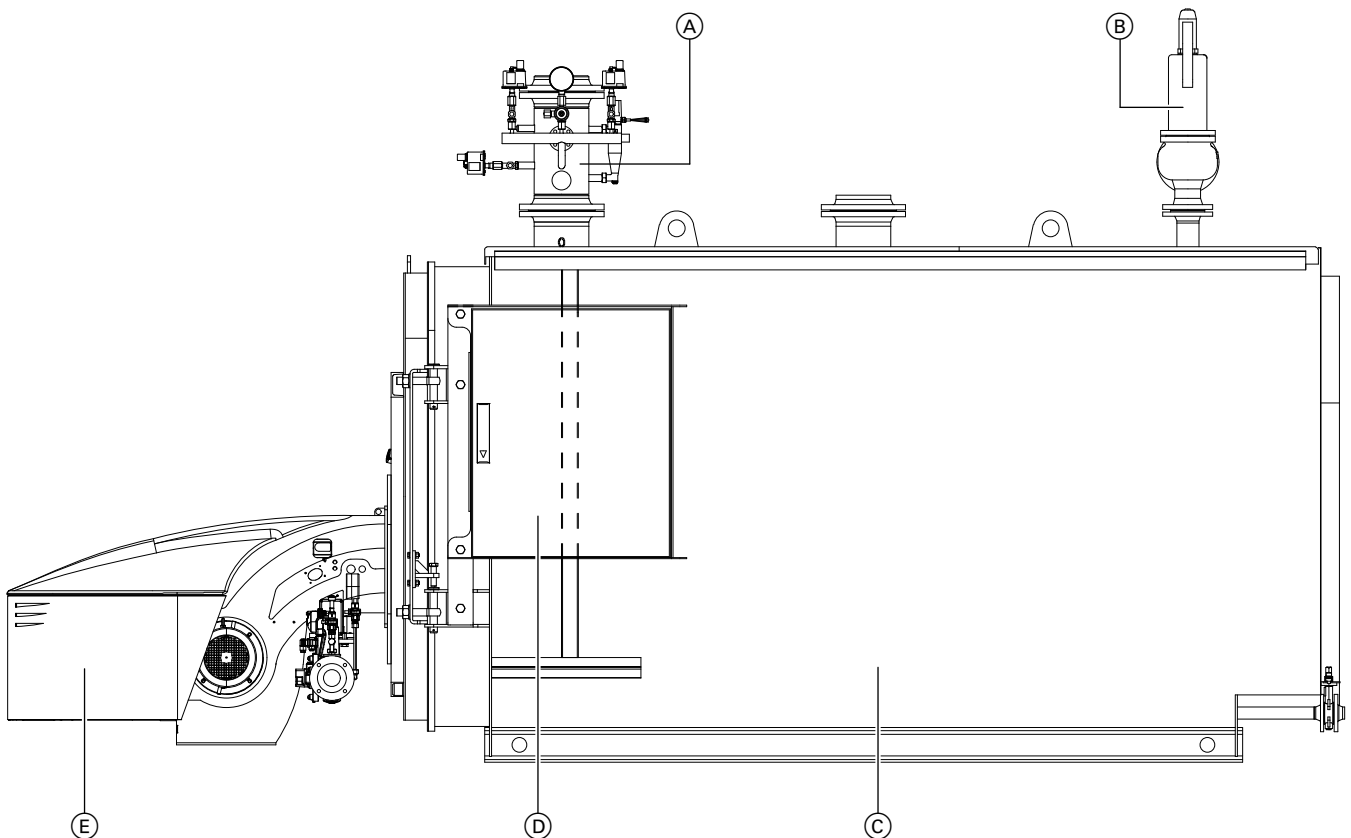


Fig. 4: Illustrative example

- (A) Intermediate flow piece with safety control and limiting equipment
- (B) Safety valve

- (C) Low pressure hot water boilers
- (D) Regulating and control system (Vitocontrol with Vitotronic)
- (E) Combustion system

Specification and dimensions

See component datasheets

Operating conditions

For water quality requirements

See the "Standard values for water quality" section

*⁸ For specification, see the manufacturer's datasheet

Operating conditions (cont.)

Tab. 5: M148 operating conditions ^{*9*10}

Vitotrans 100-LW/200-LW	Requirements	
	With	Without
1. Heating water flow rate	None	None
2. Boiler return temperature ^{*9} (minimum value)	Oil operation: Gas operation:	50 °C 55 °C
3. Max. spread	Oil operation: Gas operation:	40 K (45 K ^{*10}) 40 K
4. Two-stage burner operation	None	None
5. Modulating burner operation	None	None
6. Reduced mode	Multi boiler systems: lag boilers can be shut down	
7. Weekend setback	As per reduced mode	

Design information

Burner selection

See:

- "Specifications for burner selection" chapter
- Burner specification

Note

The minimum flame head length must be maintained

Criteria for burner selection:

- Burner must be selected in accordance with the combustion heating output and the pressure drops on the flue gas side
- Burner must be selected in accordance with the current flue gas standards
- Burner head must be suitable for operating temperatures of at least 500 °C

Burner type	Requirements
Pressure-jet oil burner	Test and identification in accordance with DIN EN 267
Pressure-jet gas burner	Test to DIN EN 676 CE designation in accordance with Directive 2009/142/EC

Burner connection

Preparing the burner plate - 2 options (M)

M 1: At the factory (by Viessmann)	M 2: On site
a) If the burner is supplied by Viessmann: commission Viessmann to carry out the preparatory work b) If the burner is not supplied by Viessmann: proceed as in (a), stating the burner type and make	If the burner plate is being adapted by the customer: create the flame tube aperture and fixing holes in the blank plate supplied. <i>To ensure correct burner operation, comply with the boiler manufacturer's specification for the flame head length.</i>

Burner adjustment

Adjust the oil or gas throughput of the burner to the rated boiler heating output.

Fuels

Oil

- Fuel oil EL to DIN 51603 part 1

Bio diesel

- To DIN EN 51603-6, EN 14213, EN 14214 (or similar)

Caution

Vitomax 100-LW, type M148, is not approved for fuel oil S (heavy fuel oil).

Alternative fuels on request

Gas

- Natural gas, town gas and LPG according to DVGW Code of Practice G 260/I and II or local regulations

^{*9} For an installation example of a return temperature raising facility, see "System examples" in the technical guide

^{*10} Assuming: safety temperature of 95 °C, max. flow temperature 15 K below safety temperature

Design information (cont.)

Permissible flow temperatures

Hot water boiler for permissible flow temperatures (= safety temperatures)

– **Up to 110 °C**

- Identification: in accordance with Gas Appliances Directive 2009/142/EC

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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