

Datasheet

Part no. and prices: see pricelist



VITOPLEX 100 Type PV1

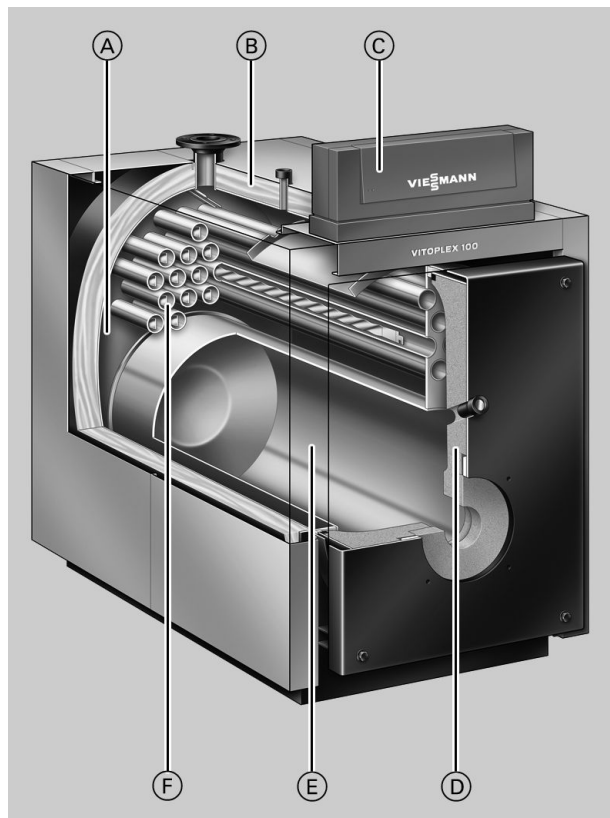
Standard oil/gas boiler

For operation with a constant boiler water temperature.

Benefits at a glance

- Standard seasonal efficiency [to DIN]: 86 % (H_s) [gross cv] / 92 % (H_i) [net cv].
- Thermostatic Vitotronic 100 control unit for single boiler systems.
- Extendable to a multi boiler system with the Vitotronic control system.

- No minimum heating water flow rate required.
- High operational reliability and safety through the use of high quality materials and advanced welding processes.



- Ⓐ Wide water galleries and large water content ensure excellent natural circulation and easy hydraulic connection
- Ⓑ Highly effective thermal insulation
- Ⓒ Vitotronic control unit – intelligent and easy to install, operate and maintain
- Ⓓ Thermal insulation
- Ⓔ Combustion chamber
- Ⓕ Second hot gas flue

Specification - Vitoplex 100

Specification

Rated heating output	kW	150	200	250	310	410	500	620
Rated heating input range	from kW to kW	121 165	166 220	221 275	276 341	342 440	441 550	551 682
Product ID		CE-0085BP0365						
Permiss. flow temperature (= safety temperature)	°C	110						
Permiss. operating pressure	bar MPa	5 0.5						
Pressure drop on the hot gas side	Pa mbar	60 0.6	120 1.2	130 1.3	230 2.3	250 2.5	230 2.3	310 3.1
Boiler body dimensions								
Length (dim. r) ^{*1}	mm	1245	1385	1385	1565	1730	1730	1830
Width (dim. e)	mm	650	650	730	730	800	800	865
Height (incl. connectors) (dim. l)	mm	1120	1120	1195	1195	1365	1365	1420
Overall dimensions								
Total length (dim. s)	mm	1350	1490	1490	1670	1840	1840	1940
Total width (dim. f)	mm	800	800	880	880	950	950	1015
Total height (dim. b)	mm	1290	1290	1360	1360	1530	1530	1585
Service height (control unit) (dim. a)	mm	1460	1460	1530	1530	1700	1700	1760
Height of anti-vibration boiler supports (under load)	mm	37	37	37	37	37	37	37
Foundation								
Length	mm	1000	1100	1100	1300	1400	1400	1500
Width	mm	800	800	900	900	950	950	1050
Combustion chamber diameter	mm	460	460	500	500	585	585	640
Combustion chamber length	mm	865	1005	1005	1185	1305	1305	1405
Weight boiler body	kg	370	415	475	525	730	785	940
Total weight	kg	415	460	525	580	790	845	1005
Boiler with thermal insulation and boiler control unit								
Boiler water content	l	200	230	280	340	490	460	535
Boiler connections								
Boiler flow and return	PN 6 DN	65	65	65	65	100	100	100
Safety connection (safety valve)	R (male thread)	1¼	1¼	1¼	1¼	1½	1½	1½
Drain connection	R (male thread)	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Flue gas parameters ^{*2}								
Temperature (at boiler water temperature 75 °C)								
– at rated heating output	°C	215	215	215	215	215	215	215
– at partial load	°C	140	140	140	140	140	140	140
Mass flow rate (for fuel oil EL and natural gas)								
– at rated heating output	kg/h	230	307	384	476	614	767	951
– at partial load	kg/h	138	184	171	286	369	460	571
Required draught	Pa/mbar	0	0	0	0	0	0	0
Flue gas connection	Ø mm	180	180	200	200	250	250	250
Standard seasonal efficiency [to DIN] for heating system temperature 75/60 °C	%	86 (H _s) [gross cv] / 92 (H _i) [net cv]						
Standby loss q_{B,70}	%	0.45		0.40		0.35	0.30	0.25

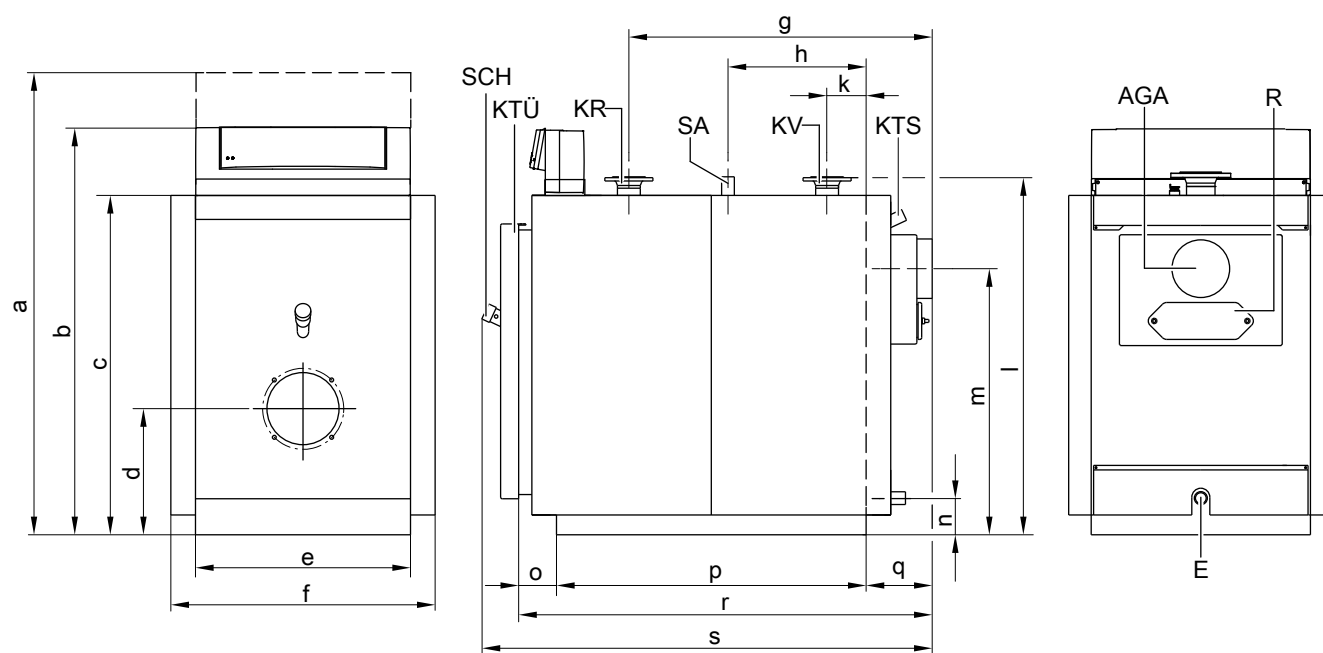
Note

For the specification of components in Viessmann system design, see separate datasheets.

^{*1} Boiler door removed.

^{*2} Values for calculating the size of the flue system to EN 13384 relative to 13 % CO₂ for fuel oil EL and 10 % CO₂ for natural gas. Flue gas temperatures captured as gross values at 20 °C combustion air temperature. The details for partial load refer to an output of 60 % of the rated heating output. If the partial load differs from that stated above (subject to operating mode), calculate the flue gas mass flow rate accordingly.

Dimensions



AGA	Flue outlet	KV	Boiler flow
E	Drain outlet	R	Cleaning aperture
KR	Boiler return	SA	Safety connection (safety valve)
KTS	Boiler water temperature sensor	SCH	Inspection port
KTÜ	Boiler door		

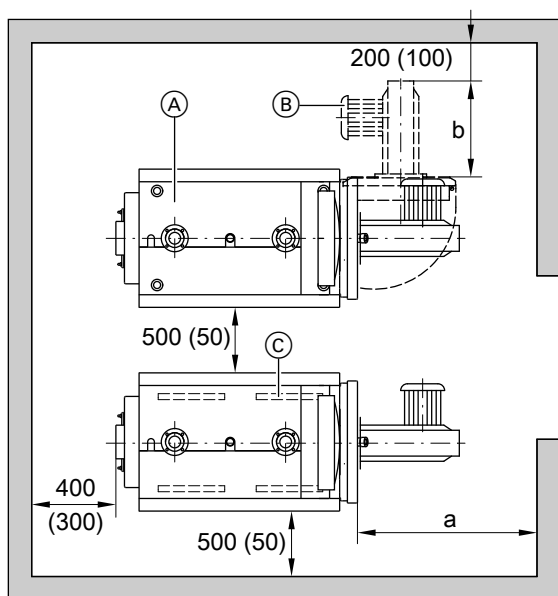
Dimensions

Rated heating output	kW	150	200	250	310	410	500	620
a	mm	1460	1460	1530	1530	1700	1700	1760
b	mm	1290	1290	1360	1360	1530	1530	1585
c	mm	1058	1058	1130	1130	1300	1300	1356
d	mm	400	400	420	420	465	465	495
e	mm	650	650	730	730	800	800	865
f	mm	800	800	880	880	950	950	1015
g	mm	670	810	810	976	1051	1051	1152
h	mm	410	480	480	563	611	611	662
k	mm	150	150	150	150	171	171	172
l	mm	1120	1120	1195	1195	1365	1365	1420
m	mm	833	833	886	886	1017	1017	1058
n	mm	123	123	122	122	124	124	125
o	mm	110	110	110	110	130	130	130
p (length of base rails)	mm	931	1071	1071	1251	1375	1375	1476
q	mm	203	203	203	203	224	224	224
r (transport dimension)	mm	1245	1385	1385	1565	1730	1730	1830
s	mm	1350	1490	1490	1670	1840	1840	1940

Dim. a: Height with control unit in maintenance position.
 Dim. d: Observe the installed burner height.
 Dim. r: Boiler door removed.

Specification - Vitoplex 100 (cont.)

Siting



To enable convenient installation and maintenance, observe the stated clearance dimensions; where space is tight, only the minimum clearances (dimensions in brackets) need to be maintained. In the delivered condition, the boiler door opens to the left. The hinge pins can be repositioned so the door swings open to the right.

- (A) Boiler
- (B) Burner
- (C) Anti-vibration boiler supports

Rated heating output	kW	150	200	250	310	410	500	620
a	mm	1100			1250	1500		
b	mm	Installed burner length						

Dim. a: Maintain this space in front of the boiler to enable removal of the turbulators and cleaning of the hot gas flues.

Siting

- Prevent air contamination by halogenated hydrocarbons (e.g. as contained 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.

Mounting the burner

The burner fixing hole circle, burner fixing holes and flame tube aperture meet the requirements of EN 303-1.

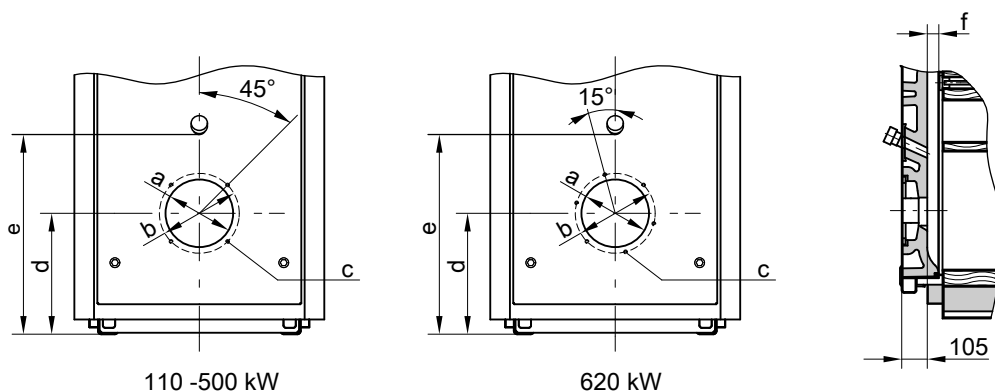
The burner may be mounted directly on the hinged boiler door. Alternative burner plates can be used (see boiler accessories) if the burner dimensions differ from those listed in EN 303-1.

Burner plates may be factory prepared on request (chargeable option). If this is required, state the burner make and type when ordering.

The flame tube must protrude from the thermal insulation of the boiler door. Maintain the required minimum flame tube length of 105 mm plus 50 or 75 mm (see **f** in table "Specification - Vitoplex 100").

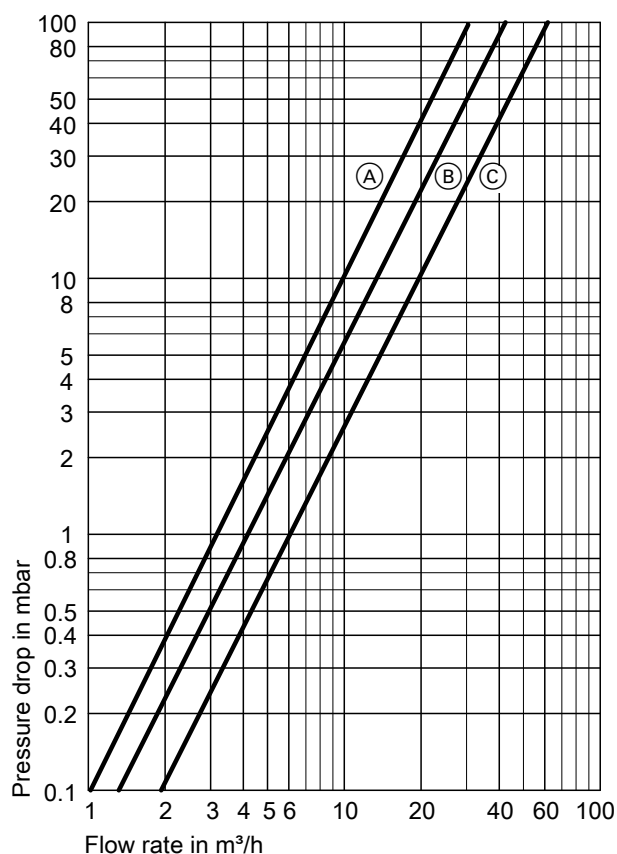
Where a burner with a shorter flame tube is to be used, verify its perfect function.

Specification - Vitoplex 100 (cont.)



Rated heating output	kW	150	200	250	310	410	500	620
a	Ø mm	240	240	240	290	290	290	350
b	Ø mm	270	270	270	330	330	330	400
c	Number/thread	4/M 10	4/M 10	4/M 10	4/M 12	4/M 12	4/M 12	6/M 12
d	mm	400	400	420	420	465	465	495
e	mm	655	655	690	690	775	775	795
f	mm	50	50	50	50	75	75	75

Pressure drop on the heating water side



The Vitoplex 100 is only suitable for fully pumped hot water heating systems.

- (A) Rated heating output 110 to 250 kW
- (B) Rated heating output 251 to 310 kW
- (C) Rated heating output 311 to 620 kW

Vitoplex 100 delivered condition

Boiler body with fitted boiler door and cleaning cover.

Vitoplex 100 delivered condition (cont.)

Sight glass closure, flame tube gasket and turbulator extractor are supplied inside the combustion chamber.

- 1 Box with thermal insulation
- 1 Bag with technical boiler documentation
- 1 Box with boiler control unit
- 1 Bag with technical documentation for boiler control unit
- 1 Coding card

Control unit versions

For single boiler systems:

Without Vitocontrol control panel

- **Vitotronic 100** (type GC3)
Thermostatic control unit for a constant boiler water temperature.
- **Vitotronic 100** (type GC1B)
For operation with a constant boiler water temperature or for weather-compensated operation in conjunction with a control panel (see below) or an external control unit.
- **Vitotronic 200** (type GW1B)
Weather-compensated boiler control unit
- **Vitotronic 300** (type GW2B)
Weather-compensated boiler and heating circuit control unit for up to 2 heating circuits with mixer

With Vitocontrol control panel

- **Vitotronic 100** (type GC1B) and **LON module** (accessories) and
- **Vitotronic 300-K** (type MW1B)
For weather-compensated operation and mixer control for up to 2 heating circuits with mixer and additional Vitotronic 200-H, type HK1B or HK3B for 1 or up to 3 heating circuits with mixer

or

Control panel with external control unit (on site)

For multi boiler systems (up to 4 boilers):

Without Vitocontrol control panel

- **Vitotronic 100** (type GC1B) and **LON module** in conjunction with **Vitotronic 300-K** (type MW1B)
For modulating boiler water temperature (one boiler is supplied with the standard controls for a multi boiler system) and

With Vitocontrol control panel

- **Vitotronic 100** (type GC1B) and **LON module** (accessories) for modulating boiler water temperature for every additional boiler in the multi boiler system and
- **Vitotronic 300-K** (type MW1B) for multi boiler systems, weather-compensated operation and mixer control for up to 2 heating circuits with mixer and additional Vitotronic 200-H, type HK1B or HK3B for 1 or up to 3 heating circuits with mixer

or

Control panel with external control unit (on site)

Boiler accessories

See pricelist and "Boiler accessories" datasheet.

Operating conditions with Vitotronic boiler control units

For water quality requirements, see page 7.

	Requirements
1. Heating water flow rate	None
2. Boiler return temperature (minimum value)	Oil and gas operation 65 °C
3. Lower boiler water temperature	75 °C
4. Two-stage burner operation	None
5. Modulating burner operation	None
6. Reduced mode	Not possible
7. Weekend setback	Not possible

Standard values for water quality

The service life of any boiler as well as that of the complete heating system is influenced by the quality of the water. In any event, the cost of a water treatment facility is less than the cost of repairing damage to your heating system.

Observing the following requirements is necessary to safeguard your warranty rights. The warranty excludes damage due to corrosion and scaling.

The following is a summary of essential water quality requirements. A mobile water treatment system can be hired from Viessmann for filling and commissioning.

Heating systems with rated operating temperatures in excess of 100 °C (VDI 2035)

Prevent excessive scale build-up (calcium carbonate) on the heating surfaces. For heating systems with operating temperatures up to 100 °C, VDI guideline 2035 sheet 1 "Prevention of heating system damage – scaling in DHW and hot water heating systems" applies [in Germany], together with the following standard values (see also the full explanations in the original guideline).

Total permissible hardness of the fill and top-up water

Total heating output kW	Specific system volume		
	< 20 l/kW	≥ 20 l/kW to < 50 l/kW	≥ 50 l/kW
≤ 50	≤ 3.0 mol/m ³ (16.8 °dH)	≤ 2.0 mol/m ³ (11.2 °dH)	< 0.02 mol/m ³ (0.11 °dH)
> 50 to ≤ 200	≤ 2.0 mol/m ³ (11.2 °dH)	≤ 1.5 mol/m ³ (8.4 °dH)	< 0.02 mol/m ³ (0.11 °dH)
> 200 to ≤ 600	≤ 1.5 mol/m ³ (8.4 °dH)	≤ 0.02 mol/m ³ (0.11 °dH)	< 0.02 mol/m ³ (0.11 °dH)
> 600	< 0.02 mol/m ³ (0.11 °dH)	< 0.02 mol/m ³ (0.11 °dH)	< 0.02 mol/m ³ (0.11 °dH)

The standard values assume the following:

- The volume of fill and top-up water will not exceed three times the water content of the heating system during its service life.
 - The specific system volume is less than 20 l/kW heating output. In multi boiler systems, apply the output of the smallest boiler.
 - All measures to prevent corrosion on the water side in accordance with VDI 2035 sheet 2 have been implemented.
- Softened the fill and top-up water in heating systems operating under the following conditions:
- The total of alkaline earths in the fill and top-up water exceeds the standard value.
 - Higher fill and top-up water volumes are expected.
 - The specific system volume is greater than 20 l/kW heating output. In multi boiler systems, apply the output of the smallest boiler.

When engineering the system, observe the following:

- Install shut-off valves in the different sections. This prevents the need for draining all the heating water in the case of repairs or system expansion.
- In systems > 50 kW, install a water meter to record the amount of fill and top-up water. Enter the volume of fill water and the water hardness into the boiler service instructions.
- For systems with a specific system volume in excess of 20 l/kW heating output (in multi boiler systems apply the output of the smallest boiler), apply the requirements of the next higher category of total output (in accordance with the table). In the case of severe excess (> 50 l/kW), soften the water down to a total of alkaline earths of ≤ 0.02 mol/m³

For systems with system boilers with a total heating output < 50 kW and total of alkaline earths in the fill and top-up water > 3.0 mol/m³, implement one of the following measures:

- Preferably soften the fill and top-up water.
- Install a filter or separating facility in the heating flow.

Operating information:

- Commission the system step by step, starting with the lowest boiler output and a high heating water flow rate. This prevents a localised concentration of limescale deposits on the boiler heating surfaces.
- In multi boiler systems, start all boilers simultaneously to prevent the entire limescale deposit settling in the heat transfer area of just one boiler.
- During expansion or repair work, only drain the necessary sections.
- Where water treatment is required, treat even the first fill of the heating system prior to commissioning. This also applies to any subsequent filling, e.g. after repairs or after system expansion, and for all amounts of top-up water.
- Check, clean and activate filters, dirt traps and other blow-down or separating facilities in the heating water circuit more frequently after commissioning or new installations; later on do so subject to requirements in line with the water treatment applied (e.g. water softening).

The build-up of limescale deposits on the heating surfaces will be minimised if these instructions are observed.

Any limescale deposits that have formed because of a failure to observe the requirements to VDI Directive 2035 will in most cases already have caused a reduction in the service life of the installed heating equipment. Removing the limescale deposits is one option for restoring operational viability. This measure must be carried out by a specialist. Inspect the heating system for possible damage prior to returning it into use. It is essential that the faulty operating parameters are corrected to prevent excessive scale from forming again.

Heating systems with permissible flow temperatures in excess of 100 °C (VdTÜV MB 1466)

Operation with circulating water with low salt content

Only use water with a low salt content as fill or top-up water, such as desalinated water, permeate or condensate.

Systems using mixed condensate generally create water with a low salt content if no boiler water is fed into the system for alkalisation.

Operation with saline water

Where possible, use water as fill or top-up water that has a low salt content and is at least free from alkaline earths (softened).

Standard values for water quality (cont.)

		Low salt content		Saline
		10 to 30	> 30 to 100	> 100 to 1500
El. conductivity at 25 °C	µS/cm	10 to 30	> 30 to 100	> 100 to 1500
General requirements		Clear, no sediment	Clear, no sediment	Clear, no sediment
pH value at 25 °C		9 - 10	9 - 10.5	9 - 10.5
According to the Drinking Water Ordinance/ Drinking Water Treatment Ordinance [Germany]		≤ 9.5	≤ 9.5	≤ 9.5
Oxygen (O ₂)	mg/l	< 0.1	< 0.05	< 0.02
Values for constant operation may be significantly lower. If suitable inorganic corrosion inhibitors are used, the oxygen concentration in the circulating water may be up to 0.1 mg/litre.				
Alkaline earths (Ca + Mg)	mmol/litre	< 0.02	< 0.02	< 0.02
Phosphate (PO ₄)	mg/l	< 5	< 10	< 15
According to the Drinking Water Ordinance/ Drinking Water Treatment Ordinance [Germany]	mg/l	≤ 7	≤ 7	≤ 7
For Viessmann hot water boilers	mg/l	< 2.5	< 5	< 15
When using oxygen binders:				
Sodium sulphite (Na ₂ SO ₃)	mg/l	–	–	< 10
When using suitable products, observe the guidelines issued by the respective supplier.				

Prevention of damage through corrosion on the water side

The corrosion resistance of ferrous materials on the heating water side of heating systems and boilers depends on the absence of oxygen in the heating water.

The oxygen introduced into the heating system with the first fill and the top-up water reacts with the system materials without causing damage.

The characteristic blackening of the water after some time in use indicates that free oxygen is no longer present.

The technical rules and in particular VDI Directive 2335-2 therefore recommend that heating systems are designed and operated so that a constant ingress of oxygen into the heating water is prevented.

Opportunities for oxygen ingress during the operation:

- Through overflowing open expansion vessels
- Through negative pressure in the system
- Through gas-permeable components

Sealed unvented systems, e.g. with a diaphragm expansion vessel, offer good protection against the ingress of airborne oxygen into the system, if correctly sized and operating at the correct pressure.

At every part of the heating system, even at the suction side of the pump and under all operating conditions, the system pressure should be above ambient atmospheric pressure.

The pre-charge pressure of the diaphragm expansion vessel should be checked at least during the annual service.

The use of permeable components, e.g. plastic pipes that are permeable to gas in underfloor heating systems, should be avoided. Provide system separation if such components are nevertheless used. This must separate the water flowing through the plastic pipes from other heating circuits, e.g. from the heat source, by the provision of a heat exchanger made of corrosion-resistant material.

No further anti-corrosion measures are required for sealed hot water heating systems subject to the above points being observed. However, take additional precautions where there is a risk of oxygen ingress, for example by adding oxygen binder sodium sulphite (5 - 10 mg/litre into the excess). The heating water should have a pH value between 9.0 and 10.5.

Different conditions apply to systems that contain aluminium components.

Where chemicals are used as part of the corrosion protection, we recommend that the manufacturer of the chemicals issues a certificate of suitability of the additives with regard to the boiler materials and the materials of the other heating equipment components.

We recommend you refer questions of water treatment to Viessmann industrial services or an appropriate specialist.

Further details can be found in VDI Directive 2335-2 and EN 14868.

Using antifreeze in boilers

Water is used as the heat transfer medium in Viessmann boilers. If frost protection is required for the boiler system, the boiler or circulating water will need to be mixed with antifreeze.

Observe the following when using antifreeze:

- The properties of antifreeze and water are very different.
- The boiling point of pure antifreeze based on glycol is approx. 170 °C.
- The temperature stability of the selected antifreeze must be sufficiently high.
- The sealing materials must be compatible with the selected antifreeze. If sealing materials other than those provided are used, take this into account when designing the system.
- Antifreeze developed especially for heating systems contains inhibitors and buffer substances as well as glycol. These additives assist with corrosion protection. When using antifreeze, always follow the manufacturer's instructions. Adhere to the stated minimum and maximum concentrations.

- In contrast to a heat transfer medium without antifreeze, the specific thermal capacity of a heat transfer medium changes if it consists of a water/antifreeze mixture. Take this change into consideration when selecting the boiler and system components such as the heat exchanger and pumps. Follow the manufacturer's instructions for the specific thermal capacity of the antifreeze. For calculating the change in output, see the sample calculation on page 10.

- A system filled with antifreeze must be marked accordingly.
- Only use boiler water and feedwater that comply with VDI Guideline 2335.
- Design the systems as sealed unvented systems. Please note that the concentration of inhibitors in the antifreeze falls if air-borne oxygen enters the system.
- Only use diaphragm expansion vessels that comply with DIN 4807.

Standard values for water quality (cont.)

- Only use metal hoses or hoses with low permeability to oxygen as flexible connection elements.
- The use of zinc-plated heat exchangers, vessels or pipes is not permissible on the primary side of the systems. Zinc can be dissolved by glycol/water mixtures.

The different properties of glycol and water may result in a reduction of boiler output. See the following sample calculation.

Sample calculation: Change in boiler output when operating with antifreeze

Target	Maximum boiler output when using antifreeze	$\dot{Q}_{K \text{ glycol}}$
Given	Boiler output Antifreeze Spec. thermal capacity Mixing ratio Tyfocor/water	$\dot{Q}_K = 2 \text{ MW}$ Tyfocor 3.78 kJ/kgK at 80 °C 40/60

Calculation:

$$\dot{m} = \frac{\dot{Q}}{c \cdot \Delta t} = \frac{2000 \text{ kW kg K} \cdot 3600 \text{ s}}{4.187 \text{ kWs} \cdot 20 \text{ K} \cdot 1 \text{ h}} = 86,000 \frac{\text{kg}}{\text{h}} \triangleq 86 \text{ t/h}$$

This results in the following:

$$\dot{V} \approx 86 \text{ m}^3/\text{h}$$

$$\dot{Q}_{K \text{ glycol}} = \dot{m} \cdot c \cdot \Delta t = 86,000 \frac{\text{kg}}{\text{h}} \cdot 3.78 \frac{\text{kJ}}{\text{h}} \cdot 20 \text{ K} \cdot \frac{1 \text{ h}}{3600 \text{ s}}$$

$$\dot{Q}_{K \text{ glycol}} = 1.8 \text{ MW}$$

Result:

If 40 % of the antifreeze given above is used in the heating network, the boiler output will be reduced by 10 %. The specific thermal capacity depends on the mixing ratio and the temperature. Individual sizing is therefore necessary.

Design/engineering information

Mounting a suitable burner

The burner must be suitable for the relevant rated heating output and the pressure drop on the hot gas side of the boiler (see burner manufacturer's specification).
The material of the burner head must be suitable for operating temperatures of at least 500 °C.

Pressure-jet oil burner

The burner must be tested and designated to EN 267.

Pressure-jet gas burner

The burner must be tested to EN 676 and be identified with the CE designation in accordance with Directive 90/396/EEC.

Burner adjustment

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

Permissible flow temperatures

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

- Up to 110 °C
CE designation:
CE-0085 compliant with the Gas Appliances Directive

Pump controlled pressure maintaining systems

In heating systems with automatic pressure maintaining systems, and in particular pump controlled systems with integral deaeration, we recommend the installation of a diaphragm expansion vessel for individual boiler protection.

Boiler output in kW	Diaphragm expansion vessel Capacity in litres
up to 300	50
up to 500	80
up to 1000	140

This reduces the frequency and level of pressure fluctuations. This contributes considerably to improved operational reliability and a longer service life of the system components.
Failure to observe these recommendations may result in damage to the boiler or to other system components.
To prevent corrosion, only use sealed unvented pump controlled pressure maintaining system that are protected against oxygen ingress into the heating water. Otherwise damage to the system through oxygen corrosion can result.

Design/engineering information (cont.)

Pump controlled pressure maintaining systems with atmospheric deaeration through cyclical pressure release effect a central post-ventilation of the heating system. They do not provide oxygen removal in the sense of corrosion protection as described in VDI 2035 Part 2.

Intended use

The appliance is only intended to be installed and operated in sealed unvented heating systems that comply with EN 12828, with due attention paid to the associated installation, service and operating instructions as well as the details in the datasheet. It is only designed for the heating up of heating water.

Commercial or industrial usage for a purpose other than the heating up of heating water shall be deemed inappropriate.

Intended use presupposes that a fixed installation in conjunction with permissible components designed for this purpose has been carried out.

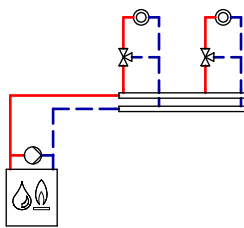
Every other use will be deemed to be inappropriate. Any resulting losses are excluded from the manufacturer's liability.

Any usage beyond this must be approved by the manufacturer for the individual case.

Intended use also includes the adherence to maintenance and inspection intervals.

System example 1, ID: 4605564_1306_01

Single boiler system with shunt pump for raising the return temperature



ID: 4605564_1306_01

Applications

Heating systems where temperature controller T1 (4) can influence the downstream heating circuits.

Main components

Single boiler system with:

- Vitoplex 100
- Vitotronic 100, type GC3
- Shunt pump

Function description

Operation with a constant boiler water temperature.

In the delivered condition, the temperature controller of the Vitotronic 100, type GC3, is set to 75 °C. Burner stage 2 switches ON or OFF 5 K below burner stage 1.

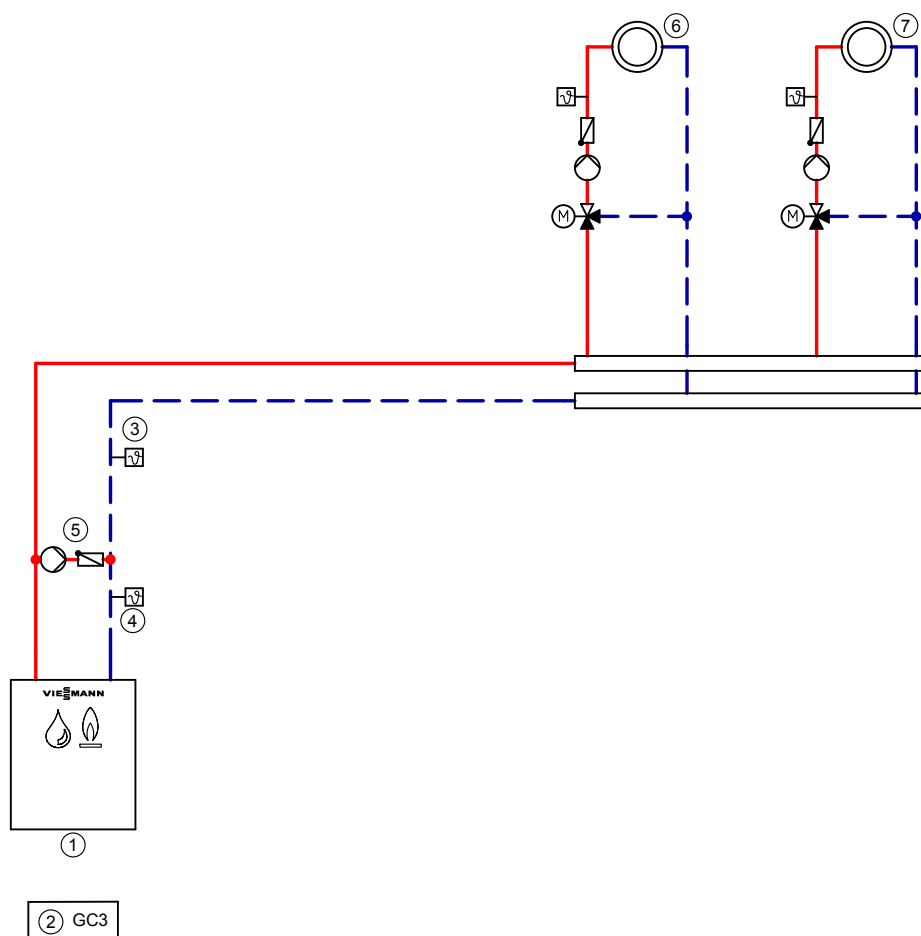
Return temperature raising facility

Temperature controller T2 (3) activates shunt pump BP (5) if the actual temperature falls below the required minimum return temperature. If the minimum return temperature is not achieved even though the return temperature has been raised, reduce the flow rate by at least 50 % via temperature controller T1 (4).

Size shunt pump BP (5) to approx. 30 % of the maximum boiler flow rate.

Design/engineering information (cont.)

Hydraulic installation scheme ID: 4605564_1306_01



Note: This scheme is a general example without shut-off valves or safety equipment. This does not replace the need for on-site engineering.

Equipment required

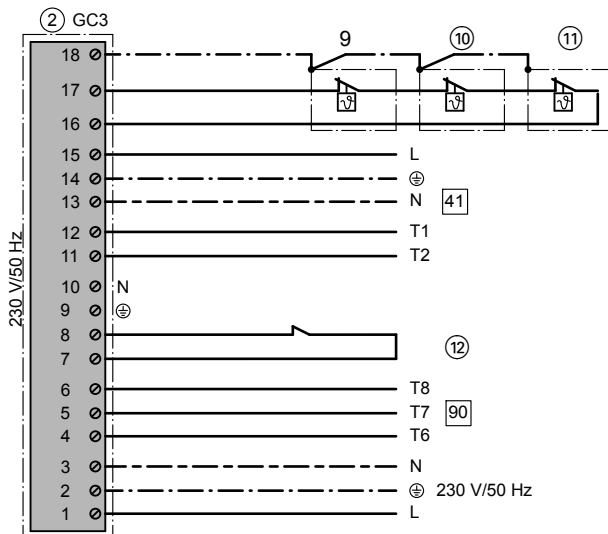
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Pos.	Designation	Part no.
①	Boiler	As per Viessmann pricelist
②	Vitotronic, type GC3	As per Viessmann pricelist
③	Temperature controller T2 – Immersion thermostat (with 200 mm long sensor well) or – Immersion thermostat (with 150 mm long sensor well)	Z001 887 Z001 888
④	Temperature controller T1 – Immersion thermostat (with 200 mm long sensor well) or – Immersion thermostat (with 150 mm long sensor well)	Z001 887 Z001 888
⑤	Shunt pump BP	On site
⑥	Heating circuit I	On site
⑦	Heating circuit II	On site
Accessories (optional)		
⑧	Junction box for external safety equipment	On site
⑨	Minimum pressure switch or limiter SDB	7438 030
⑩	Maximum pressure limiter SDB	7438 025
⑪	Water level limiter (low water indicator) WB	9529 050
⑫	Switching contact to enable the burner	On site

Design/engineering information (cont.)

Electrical installation scheme

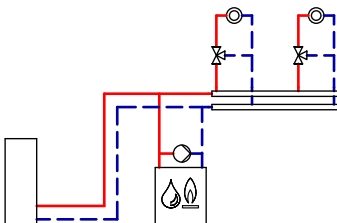
Main PCB 230 V



ID: 4605564_1306_01

System example 2 ID: 4605565_1306_01

Single boiler system with shunt pump for raising the return temperature



ID: 4605565_1306_01

Applications

Heating systems with distributor installed close to the boiler. The boiler water flow rate must be able to be reduced.

Main components

Single boiler system with:

- Vitoplex 100
- Vitotronic 100, type GC1B
- Shunt pump

Function description

Temperature sensor T2 (6) activates shunt pump (5) if the actual temperature falls below the required minimum return temperature. If the minimum return temperature is not achieved even though the return temperature has been raised, reduce the flow rate by at least 50 % by means of temperature sensor T1 (7).

Size shunt pump (5) to approx. 30 % of the maximum boiler flow rate.

If it is not possible to reduce the boiler water flow rate, e.g. in older systems, we would recommend the sample applications

- with shunt pump and 3-way mixing valve
- or
- with boiler circuit pump and 3-way mixing valve
- or
- with boiler circuit pump, low loss header and 3-way mixing valve, as single boiler systems.

DHW heating

DHW is heated up when the actual temperature at the cylinder temperature sensor falls below the DHW temperature selected. If the boiler water temperature is 7 K above the DHW temperature, the boiler water temperature is raised to the set DHW temperature +20 K and circulation pump for cylinder heating (10) starts.

Heating mode

Depending on the control unit used, the flow temperature of the heating circuits can be operated in modulating mode, subject to the outside temperature.

Design/engineering information (cont.)

Equipment required

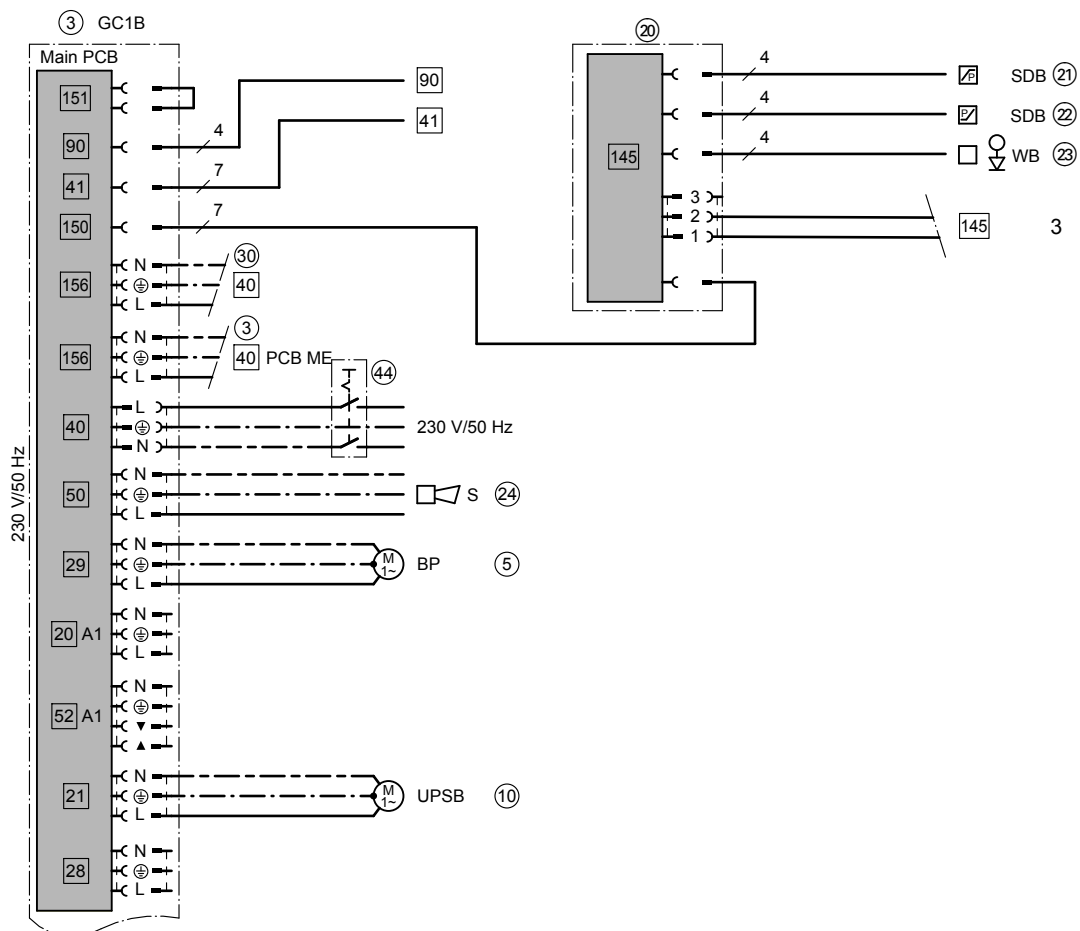
ID: 4605565_1306_01

Pos.	Designation	Part no.
①	Boiler	As per Viessmann pricelist
②	Boiler water temperature sensor KTS	Standard delivery pos. 3
③	Vitotronic, type GC1B	Standard delivery pos. 1
⑤	Shunt pump BP	On site
⑥	Temperature sensor T2	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
	Sensor well R $\frac{1}{2}$ x 100	7816 035
	Sensor well R $\frac{1}{2}$ x 150	7817 326
⑦	Temperature sensor T1	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
	Sensor well R $\frac{1}{2}$ x 100	7816 035
	Sensor well R $\frac{1}{2}$ x 150	7817 326
④④	ON/OFF switch	On site
⑧	DHW cylinder	As per Viessmann pricelist
⑨	Cylinder temperature sensor STS	Standard delivery of Vitotronic 200 and 300
		or
		7438 702 for the Vitotronic 100
⑩	Circulation pump for cylinder heating UPSB	As per Viessmann pricelist
⑪	DHW circulation pump ZP (controlled on site)	As per Vitoset pricelist
⑫	Heating circuit I	On site
⑯	Heating circuit II	On site
	Accessories (optional)	
⑳	Plug-in adaptor for external safety equipment	7164 404
㉑	Minimum pressure switch or limiter SDB	7438 030
㉒	Maximum pressure limiter SDB	7438 025
㉓	Water level limiter (low water indicator) WB	As per Viessmann pricelist
㉔	Central fault message system S	On site
㉕	Flue gas temperature sensor AGS	7452 531
㉘	Contactor relay	7814 681
㉙	EA1 extension:	7452 091
㉚	1 analogue input (0 to 10 V)	
	– Defaulting the set boiler water temperature	
㉛	3 digital inputs	
	– External blocking with central fault message	
	– Fault messages	
	External hook-ups	On site
㉜	– External demand	
㉝	– External changeover of stepped/modulating burners	
㉞	– External blocking	
㉟	KM BUS distributor, when there are several KM BUS subscribers	7415 028
	KM BUS subscribers:	As per Viessmann pricelist
	– EA1 extension	
	– Vitocom 100, type GSM2	
㊱	LON communication module for communication with the following components:	7172 173
	Vitotronic 200-H (for regulating additional heating circuits)	
㊲	Vitocom 100, type GSM2	Z011 396
㊳	Vitocom 200, type LAN2 with communication module	Z011 390
㊴	Vitocom 300, type LAN3 with LON communication module	Z011 399

Design/engineering information (cont.)

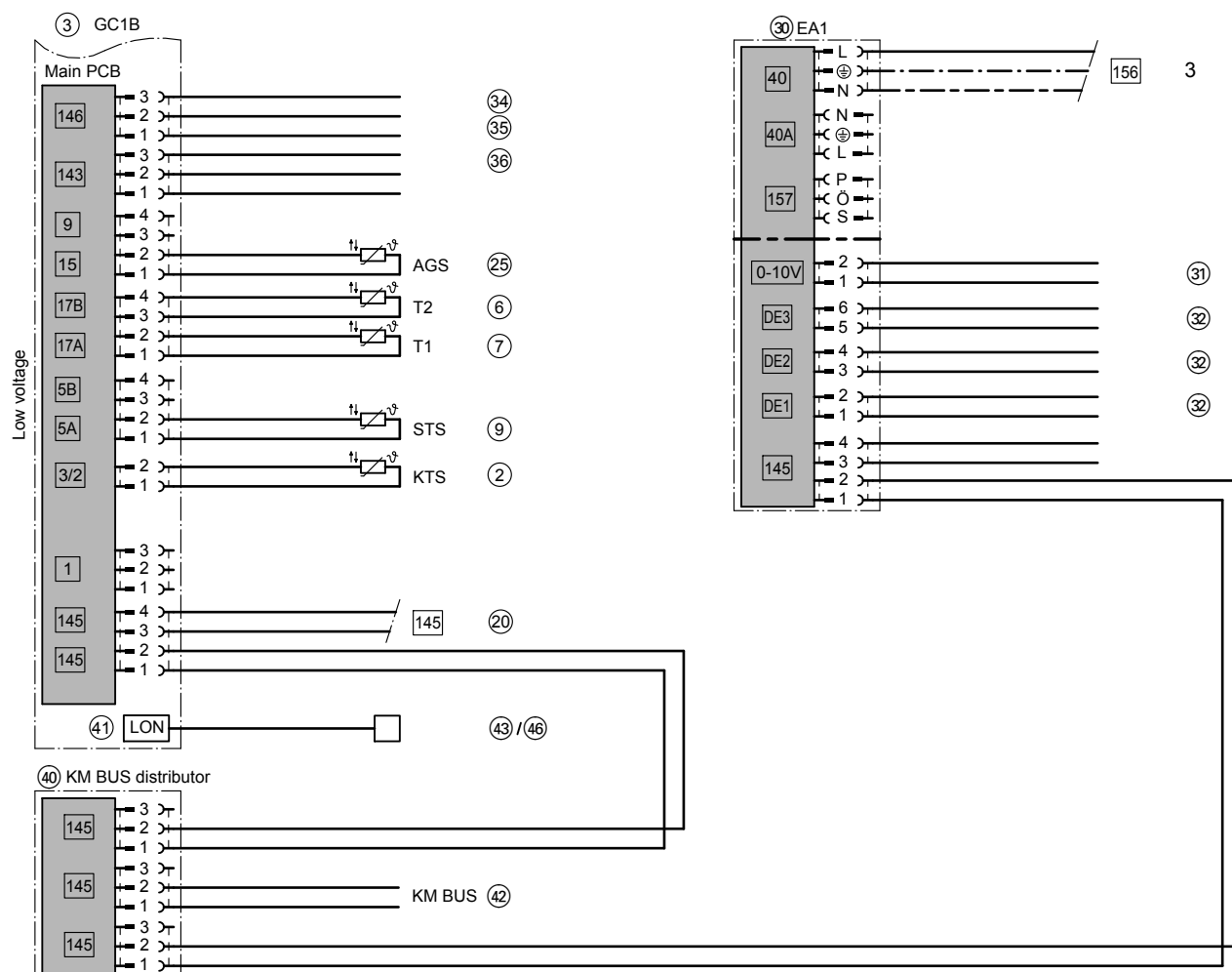
Electrical installation scheme

Main PCB 230 V



ID: 4605565_1306_01

Main PCB LV connections



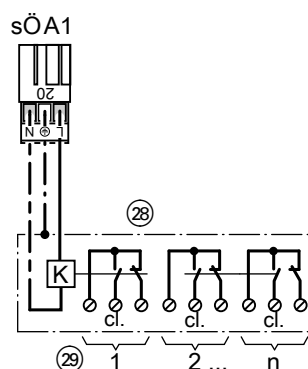
ID: 4605565_1306_01

Wiring diagram

Wiring for closing a mixer installed downstream via temperature sensor T1 in heating systems with heating circuit control units that are not connected to the boiler control unit via LON.

Required code:

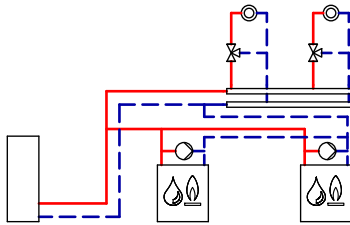
Change "4C" to "2" – use plug-in connection 20 A1 to close the downstream mixers. Change "0D" to "1" – T1 influences the mixers of the downstream heating circuits.



ID: 4605565_1306_01

System example 3, ID: 4605566_1306_01

Multi boiler system with one shunt pump for every boiler for raising the return temperature



ID: 4605566_1306_01

Applications

Heating systems with distributor installed close to the boiler. The boiler water flow rate is reduced by means of the motorised butterfly valves.

Main components

Multi boiler system with:

- Vitoplex 100
- Vitotronic 200-H
- and
 - Vitotronic 100, type GC1B, for each boiler in a multi boiler system
 - and
 - Vitotronic 300-K, type MW1B; one required for the multi boiler system
 - or
 - Vitotronic 100, type GC1B, for each boiler in a multi boiler system
 - and
 - Vitocontrol control panel with integral weather-compensated control unit Vitotronic 300-K, type MW1B
- Shunt pumps

Required codes

ID: 4605566_1306_01

Service address Vitotronic 300-K, type MW1B / pos. ④

Group	Code	Function
"General"	"00:8"	Two heating circuits with mixer M2 (heating circuit 2) and M3 (heating circuit 3) with DHW heating
"Cascade"	"35:2"	Number of connected heat generators
"Cascade"	"38:1"	Changeover of lead boiler (monthly)

Service address Vitotronic 100, type GC1B / pos. ③

"Boiler"	"01:2"	Multi boiler system with cascade control via LON
"Boiler"	"02:1"	Two-stage burner (delivered condition)
	or	
	"02:2"	Modulating burner

Service address Vitotronic 100, type GC1B / pos. ⑬

"General"	"77:2"	LON subscriber number
"Boiler"	"01:2"	Multi boiler system with cascade control via LON
"Boiler"	"02:1"	Two-stage burner (delivered condition)
	or	
	"02:2"	Modulating burner
"Boiler"	"07:2"	Consecutive boiler number in multi boiler systems

Service address Vitotronic 200-H, type HK1B / pos. ③④

"General"	"81:3"	Control unit receives the time
"General"	"97:1"	Control unit receives outside temperature

Function description

Temperature sensors T2 ⑧ and ⑮ activate shunt pumps ⑨ and ⑯ if the actual temperature falls below the required minimum return temperature. If this does not achieve the required minimum return temperature, the flow rate will be proportionally reduced via temperature sensors T1 ⑩ and ⑰, via butterfly valves ⑦ and ⑭ or heating circuit control units ④ and ③④.

Size shunt pump ⑨ and ⑯ to approx. 30 % of the total boiler flow rate.

The flow rate should be reduced by means of the heating circuit mixers when using Vitotronic 300-K ④ or controlling the heating circuits via Vitotronic 200-H ③④ connected to the boiler control unit. No additional protective measures are required on site.

No boiler circuit pump or costly mixing valve for raising the return temperature is required.

DHW heating

DHW is heated up when the actual temperature at cylinder temperature sensor ⑲ falls below the set DHW temperature, subject to cylinder heating being enabled by the time switch. The boiler water temperature is raised to the set cylinder temperature +20 K and circulation pump ⑳ for cylinder heating starts, if the boiler water temperature is 7 K above the cylinder temperature.

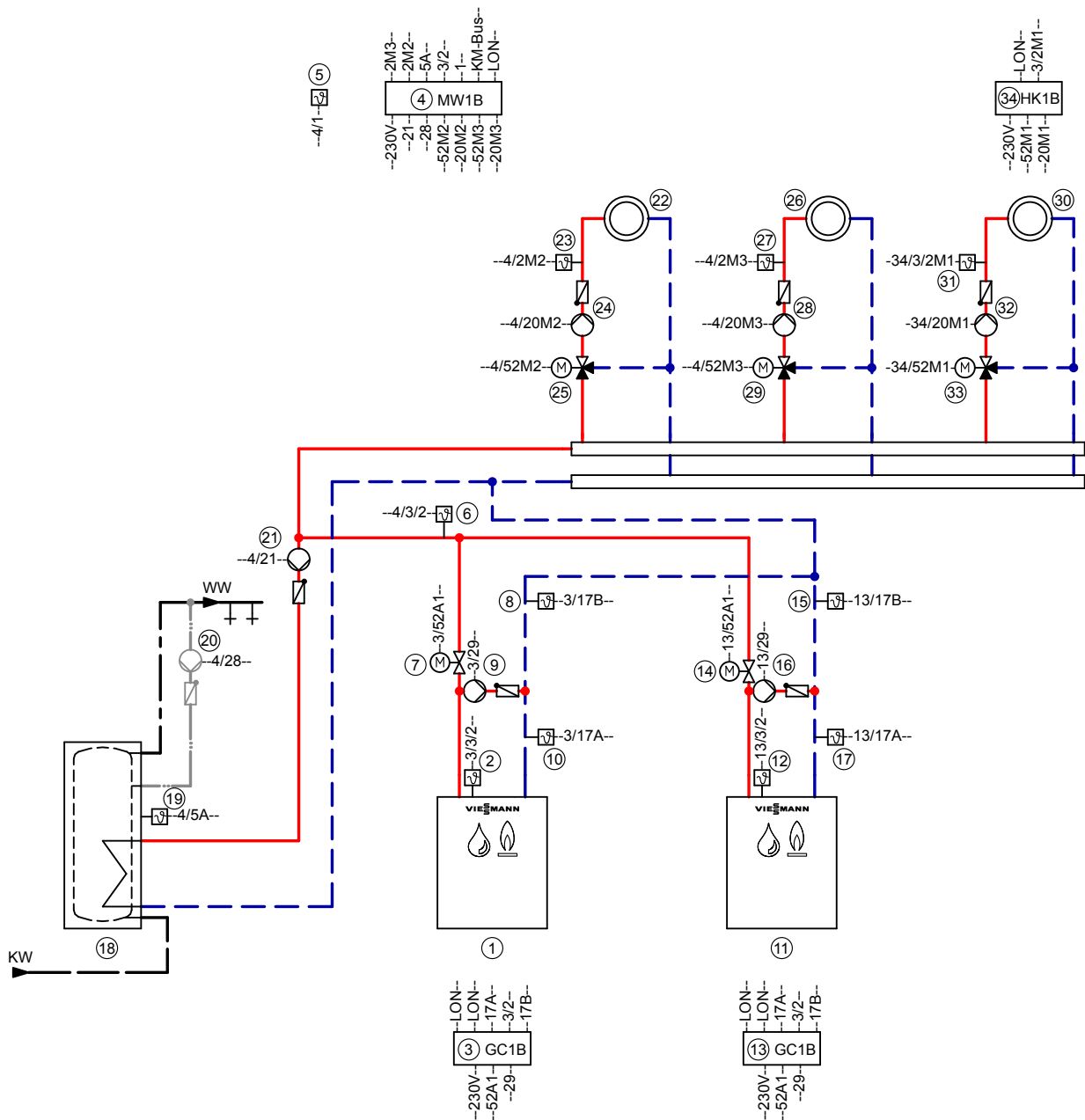
If the heating circuits are regulated via the Vitotronic, heating circuit pumps M2 and M3 are switched off, and mixers M2 and M3 are closed, subject to priority being enabled.

Heating mode

Depending on the control unit used, the flow temperature of the heating circuits can be operated in modulating mode, subject to the outside temperature. The boiler water temperature is regulated 8 K higher than the set flow temperature.

Design/engineering information (cont.)

Hydraulic installation scheme ID: 4605566_1306_01



Note: This scheme is a general example without shut-off valves or safety equipment. This does not replace the need for on-site engineering.

Design/engineering information (cont.)

Equipment required

ID: 4605566_1306_01

Pos.	Designation	Part no.
①	Boiler I	As per Viessmann pricelist
②	Boiler water temperature sensor KTS	Standard delivery pos. 3
③	Vitotronic 100, type GC1B	Standard delivery pos. 1
④	Vitotronic 300-K, type MW1B	Standard delivery pos. 1
⑤	Outside temperature sensor ATS	Standard delivery pos. 4
⑥	Flow temperature sensor	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
⑦	Motorised butterfly valve	As per Vitoset pricelist
⑧	Temperature sensor T2 in conjunction with the Vitotronic 100, type GC1B	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
⑨	Shunt pump	On site
⑩	Temperature sensor T1 in conjunction with the Vitotronic 100, type GC1B	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
⑪	Boiler II	As per Viessmann pricelist
⑫	Boiler water temperature sensor KTS	Standard delivery pos. 13
⑬	Vitotronic 100, type GC1B	Standard delivery pos. 11
⑭	Motorised butterfly valve	As per Vitoset pricelist
⑮	Temperature sensor T2 in conjunction with the Vitotronic 100, type GC1B	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
⑯	Shunt pump	On site
⑰	Temperature sensor T1 in conjunction with the Vitotronic 100, type GC1B	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
⑱	DHW cylinder	As per Viessmann pricelist
⑲	Cylinder temperature sensor STS	Standard delivery pos. 4
⑳	DHW circulation pump ZP	As per Vitoset pricelist
㉑	Circulation pump for cylinder heating UPSB	As per Viessmann pricelist
㉒	Heating circuit I	
㉔	Heating circuit pump M2 (heating circuit I)	On site
	Extension kit for one heating circuit with mixer M2 (heating circuit I)	7441 998
	Components:	
㉓	– Flow temperature sensor M2 (contact temperature sensor)	
	and	
㉕	– Mixer motor	
	or	
㉓	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
	and	
㉕	Mixer motor M2 for flanged mixer and plug	As per Viessmann pricelist
	and	
	Mixer	



Design/engineering information (cont.)

ID: 4605566_1306_01

Pos.	Designation	Part no.
②6	Heating circuit II	
②8	Heating circuit pump M3 (heating circuit II)	On site
	Extension kit for one heating circuit with mixer M2 (heating circuit II)	7441 998
	Components:	
②7	– Flow temperature sensor M2 (contact temperature sensor)	
	and	
②9	– Mixer motor	
	or	
②7	Contact temperature sensor	7426 463
	or	
	Immersion temperature sensor	7438 702
	and	
②9	Mixer motor M2 for flanged mixer and plug	As per Viessmann pricelist
	and	
	Mixer	

Design/engineering information (cont.)

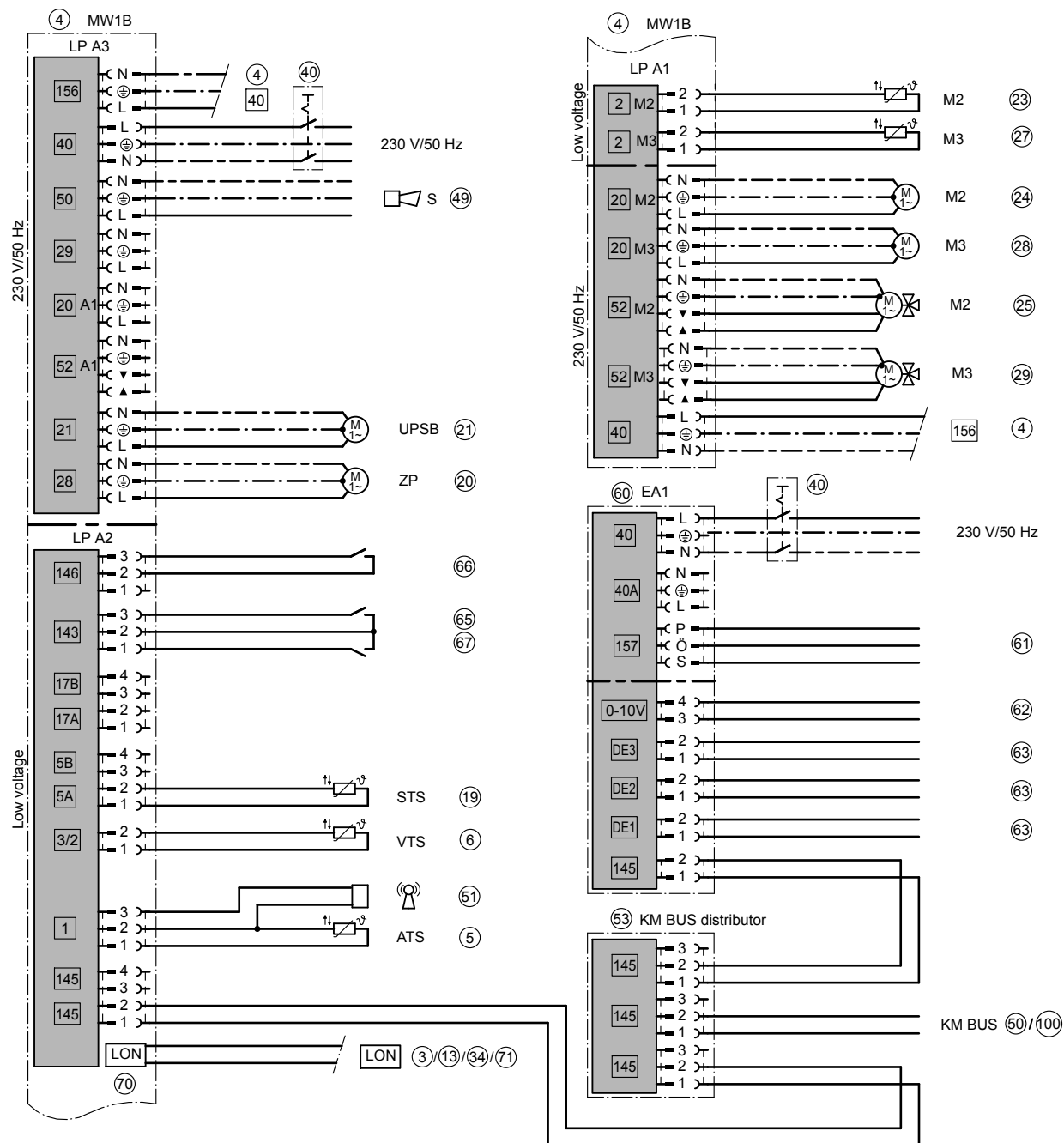
ID: 4605566_1306_01

Pos.	Designation	Part no.
③①	Heating circuit III	
③②	Heating circuit pump M1 (heating circuit III)	On site
③①	Extension kit for one heating circuit with mixer comprising	7441 998
③③	Flow temperature sensor M1 (heating circuit III)	
	and	
③③	Mixer motor M1 (heating circuit III)	
	or	
	– Contact temperature sensor	7426 463
③①	or	
	– Immersion temperature sensor	7438 702
	(see pricelist for further heating circuit control units)	
	and	
③③	Mixer motor for flanged mixer M1 (heating circuit III)	As per Viessmann pricelist
③④	Vitotronic 200-H, type HK1B	Z009 462
	and	
⑦①	LON communication module for pos. 34	7172 173
	and	
	LON cable	7143 495
③⑤	Outside temperature sensor ATS (ATS value can be adopted by the Vitotronic 300-K)	Standard delivery pos. 34
	Boiler accessories	
③⑥	Plug-in adaptor for external safety equipment	7164 404
③⑦	Minimum pressure limiter SDB	7438 030
③⑧	Maximum pressure limiter SDB	7438 025
③⑨	Water level limiter (low water indicator) WB	As per Viessmann pricelist
④①	Flue gas temperature sensor AGS	7452 531
⑥④	- External changeover of stepped/modulating burners	
⑥⑧	- External blocking, boiler	
⑥⑨	- Start boiler as the last one in the sequence	
	System accessories	
④①	ON/OFF switch	On site
④⑨	Central fault message facility	On site
⑤①	Vitotrol 200A	Z008 341
	or	
	Vitotrol 300A	Z008 342
	As an alternative to hardwired remote control units, the following wireless accessories may be used.	
①①①	Wireless base station	Z011 413
①①①	Vitotrol 200 RF	Z011 219
①①②	Vitotrol 300 RF with table-top dock	Z011 410
①①③	Vitotrol 300 RF with wall mounting bracket	Z011 412
①①④	Wireless outside temperature sensor	7455 213
①①⑤	Wireless repeater	7456 538
⑤①	Radio clock receiver	7450 563
⑤③	KM BUS distributor, when there are several KM BUS subscribers	7415 028
	– EA1 extension	
	– Vitotrol 200A, 300A	
	– Wireless base station	
⑥①	EA1 extension	7452 091
⑥①	1 switching output (floating changeover contact)	
	- Switching a feed pump to a substation	
	- Signalling reduced mode for one heating circuit	
⑥②	1 analogue input (0 to – 10 V)	
	- Defaulting the set flow temperature	
⑥③	3 digital inputs	
	- External changeover of operating state for heating circuits 1 to 3, may be switched individually	
	- External blocking with central fault message	
	- Fault messages	
	- Brief operation of the DHW circulation pump	
	External hook-ups	On site
⑥⑤	- External blocking, mixer close	
⑥⑥	- External demand	
⑥⑦	- External operating program changeover, mixer open	
⑦①	LON communication module (part of standard delivery for Vitotronic 300-K)	7172 173
⑦①	Vitocom 300, type LAN3	Z011 555

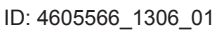
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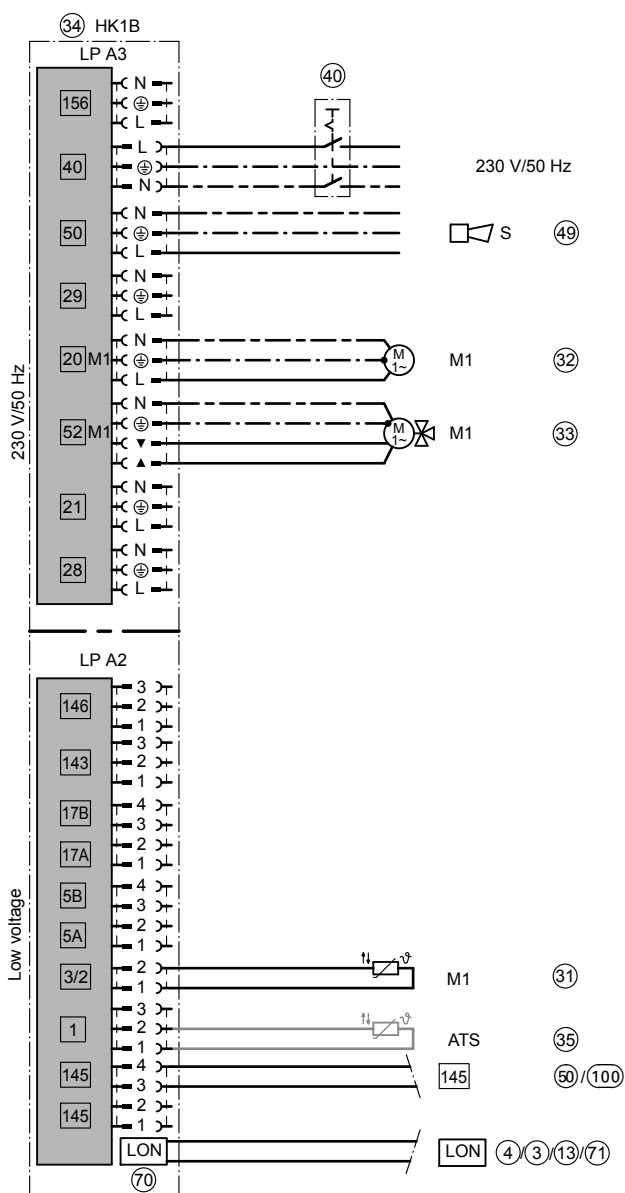
Design/engineering information (cont.)

Electrical installation scheme



ID: 4605566_1306_01

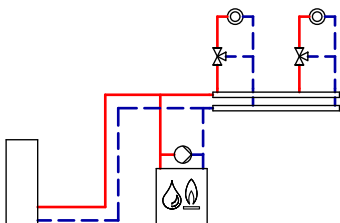




ID: 4605566_1306_01

System example 4, ID: 4605570_1306_01

Single boiler system: Boiler with shunt pump for raising the return temperature



ID: 4605570_1306_01

Applications

Heating systems with distributor installed close to the boiler. The boiler water flow rate must be able to be reduced.

Main components

Single boiler system with:

- Vitoplex 100
- Vitotronic 300, type GW1B, GW2B
- Shunt pump

Function description

Temperature sensor T2 (6) activates shunt pump (5) if the actual temperature falls below the required minimum return temperature. If the minimum return temperature is not achieved even though the return temperature has been raised, reduce the flow rate by at least 50 % by means of temperature sensor T1 (7).

Size shunt pump (5) to approx. 30 % of the maximum boiler flow rate.

Design/engineering information (cont.)

If it is not possible to reduce the boiler water flow rate, e.g. in older systems, we would recommend the sample applications

- with shunt pump and 3-way mixing valve
or
- with boiler circuit pump and 3-way mixing valve
or
- with boiler circuit pump, low loss header and 3-way mixing valve, as single boiler systems.

No boiler circuit pump or costly mixing valve for raising the return temperature is required.

DHW heating

DHW is heated up when the actual temperature at the cylinder temperature sensor falls below the set DHW temperature, subject to cylinder heating being enabled by the time switch. If the boiler water temperature is 7 K above the DHW temperature, the boiler water temperature is raised to the set DHW temperature +20 K and the circulation pump for cylinder heating (10) starts.

If the heating circuits are regulated by means of the Vitotronic, heating circuit pumps M2 (14) and M3 (18) are switched off, and mixers M2 (15) and M3 (19) are closed, subject to absolute priority being enabled. Subject to modulating priority, heating circuit pumps M2 and M3 remain switched on, and mixers M2 and M3 are closed far enough for the set boiler water temperature for cylinder heating to be achieved. In that case, the DHW cylinder and heating circuits will be heated simultaneously.

Heating mode

Depending on the control unit used, the flow temperature of the heating circuits can be operated in modulating mode, subject to the outside temperature. The boiler water temperature is regulated 8 K higher than the set flow temperature.

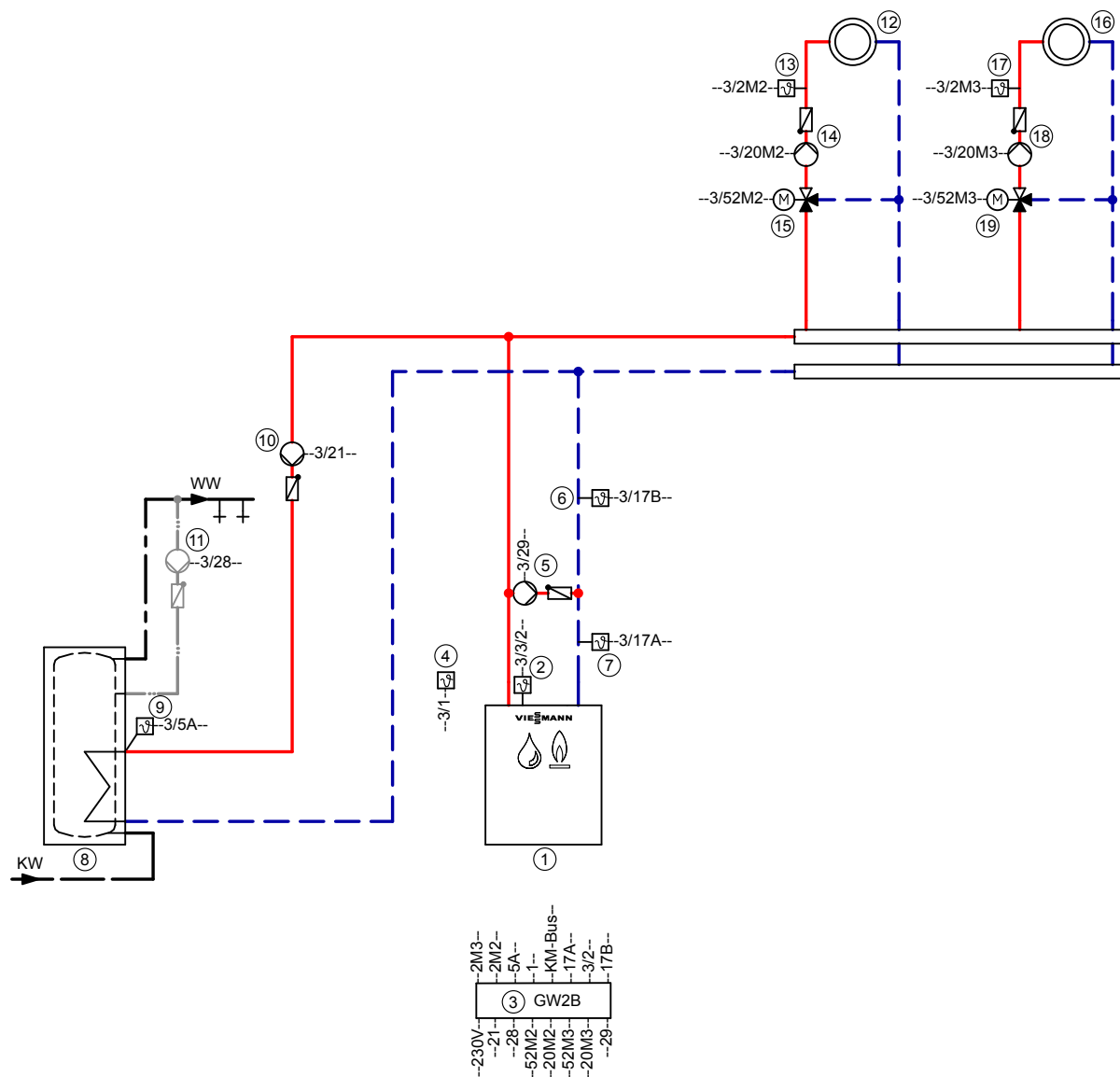
Required codes

ID: 4605570_1306_01

Group	Code	Function
"General"	"00:8"	Two heating circuits with mixer M2 (heating circuit 2) and M3 (heating circuit 3) with DHW heating
"Boiler"	"02:1"	Two-stage burner (delivered condition)
	or "02:2"	Modulating burner

Design/engineering information (cont.)

Hydraulic installation scheme ID: 4605570_1306_01



Note: This scheme is a general example without shut-off valves or safety equipment. This does not replace the need for on-site engineering.

Design/engineering information (cont.)

Equipment required

ID: 4605570_1306_01

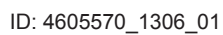
Pos.	Designation	Part no.
①	Boiler	As per Viessmann pricelist
②	Boiler water temperature sensor KTS	Standard delivery pos. 3
③	Vitotronic, type GW1B or GW2B	Standard delivery pos. 1
④	Outside temperature sensor ATS	Standard delivery pos. 3
⑤	Shunt pump BP	On site
⑥	Temperature sensor T2	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
	Sensor well R $\frac{1}{2}$ x 100	7816 035
	Sensor well R $\frac{1}{2}$ x 150	7817 326
⑦	Temperature sensor T1	
	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
	Sensor well R $\frac{1}{2}$ x 100	7816 035
	Sensor well R $\frac{1}{2}$ x 150	7817 326
④④	ON/OFF switch	On site
⑧	DHW cylinder	As per Viessmann pricelist
⑨	Cylinder temperature sensor STS	Standard delivery of Vitotronic 200 and 300
⑩	Circulation pump for cylinder heating UPSB	As per Viessmann pricelist
⑪	DHW circulation pump ZP	As per Vitoset pricelist
⑫	Heating circuit I (only for Vitotronic 300, type GW2B)	On site
⑭	Heating circuit pump M2 (heating circuit I)	On site
	Extension kit for one heating circuit with mixer comprising	7441 998
⑬	Flow temperature sensor M2 (heating circuit I)	
	and	
⑮	Mixer motor M2 (heating circuit I)	
	or	
	– Immersion temperature sensor	7438 702
	Sensor well R $\frac{1}{2}$ x 100	7816 035
	Sensor well R $\frac{1}{2}$ x 150	7817 326
	(see pricelist for further heating circuit control units)	
	and	
⑮	Mixer motor for flanged mixer M2 (heating circuit I)	As per Viessmann pricelist
⑯	Heating circuit II (only for Vitotronic 300, type GW2B)	On site
⑰	Heating circuit pump M3 (heating circuit II)	On site
⑱	Flow temperature sensor M3 (heating circuit II)	
	and	
⑲	Mixer motor M3 (heating circuit II)	
	or	
⑱	– Contact temperature sensor	7426 463
	or	
	– Immersion temperature sensor	7438 702
	Sensor well R $\frac{1}{2}$ x 100	7816 035
	Sensor well R $\frac{1}{2}$ x 150	7817 326
	(see pricelist for further heating circuit control units)	
	and	
⑲	Mixer motor for flanged mixer M3 (heating circuit II)	As per Viessmann pricelist

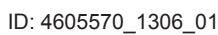


Design/engineering information (cont.)

ID: 4605570_1306_01

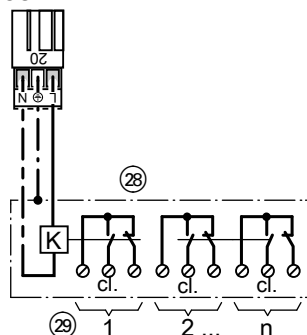
Pos.	Designation	Part no.
	Accessories (optional)	
②0	Plug-in adaptor for external safety equipment	7164 404
②1	Minimum pressure switch or limiter SDB	7438 030
②2	Maximum pressure limiter SDB	7438 025
②3	Water level limiter (low water indicator) WB	As per Viessmann pricelist
②4	Central fault message system S	On site
②5	Flue gas temperature sensor AGS	7452 531
②6	Vitotrol 200A	Z008 341
	or	
	Vitotrol 300A	Z008 342
	As an alternative to hardwired remote control units, the following wireless accessories may be used.	
⑩0	Wireless base station	Z011 413
⑩1	Vitotrol 200 RF	Z011 219
⑩2	Vitotrol 300 RF with table-top dock	Z011 410
⑩3	Vitotrol 300 RF with wall mounting bracket	Z011 412
⑩4	Wireless outside temperature sensor	7455 213
⑩5	Wireless repeater	7456 538
②7	Radio clock receiver	7450 563
②8	Contact relay	7814 681
③0	EA1 extension:	7452 091
③1	1 analogue input (0 to 10 V)	
	– Defaulting the set boiler water temperature	
③2	3 digital inputs	
	– External changeover of the operating status for heating circuits 1 to 3, may be switched individually (with weather-compensated control unit)	
	– External blocking with central fault message	
	– Fault messages	
	– Brief operation of DHW circulation pump (with weather-compensated control unit)	
③3	1 switching output (floating changeover contact)	
	– Switching a feed pump to a substation	
	– Signalling reduced mode for a heating circuit	
	External hook-ups for weather-compensated control units	On site
③4	– External demand	
③5	– External changeover of stepped/modulating burners	
③6	– External blocking, mixer close	
③7	– External operating program changeover, mixer open	
④0	KM BUS distributor, when there are several KM BUS subscribers	7415 028
	KM BUS subscribers:	As per Viessmann pricelist
	– EA1 extension	
	– Vitotrol 200A, 300A	
	– Wireless base station	
④1	LON communication module for communication with the following components:	7172 173
	Vitotronic 200-H (for regulating additional heating circuits)	
④2	Vitocom 100, type GSM2	Z011 396
④3	Vitocom 100, type LAN1 with communication module	Z011 224
④4	Vitocom 200, type LAN2 with communication module	Z011 390
④6	Vitocom 300, type LAN3 with LON communication module	Z011 399





Change "4C" to "2" – use plug-in connection  A1 to close the downstream mixers. Change "OD" to "1" – Therm-Control influences the mixers of the downstream heating circuits (delivered condition for the Vitotronic 300).

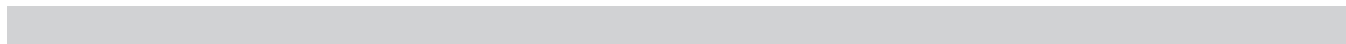
sÖA1



ID: 4605570_1306_01

Tested quality

CE CE designation according to current EC directives.



Subject to technical modifications.

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