

Technical guide

**VITOLIGNO 200-S**

High performance wood gasification boilers
for logs up to 50 cm long

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Principles of wood combustion for generating heat

1.1 Principles of log combustion for generating heat

Units of measurement for wood fuel

The units of measurement commonly used in forestry and the timber industry for wood fuel are solid measures of timber (smt) and stacked cubic metres (stcm). The solid measure of timber (smt) describes 1 m³ of solid timber mass in the form of assorted round timbers.

The stacked cubic metre (stcm) is a measure for stacked or tipped wood, measuring a total volume of 1 m³, including air gaps. On average, one solid measure of timber equals 1.4 stacked cubic metres.

Conversion table for assorted common wood fuel

Unit of measurement	Solid measure of timber (smt) Round timbers	Stacked cubic metre (stcm) Logs	Stacked cubic metre (stcm) Logs		Tipped cubic metre (tcm)
			Stacked	Tipped	
Assorted					
1 smt round timber	1	1.40	1.20	2.00	
1 stcm logs	0.70	1.00	0.80	1.40	
1 m long, stacked					
1 stcm logs	0.85	1.20	1.00	1.70	
boiler-ready, stacked					
1 tcm logs	0.50	0.70	0.60	1.00	
boiler-ready, tipped					

Calorific and emission values

Timber is a renewable fuel. During combustion, on average approx. 4.0 kWh/kg units of energy are released. The table shows the net calorific value of various types of timber with a water content of 20 %.

Type of timber	Density kg/m ³	Net calorific value (approx. at 20 % water content)		
		kWh/smt	kWh/stcm	kWh/kg
Conifers				
Spruce	430	2100	1500	4.0
Fir	420	2200	1550	4.2
Pine	510	2600	1800	4.1
Larch	545	2700	1900	4.0
Deciduous				
Birch	580	2900	2000	4.1
Elm	620	3000	2100	3.9
Beech	650	3100	2200	3.8
Ash	650	3100	2200	3.8
Oak	630	3100	2200	4.0
Hornbeam	720	3300	2300	3.7

1 litre of fuel oil can be replaced by 3 kg of timber, considering the usual efficiencies. A stacked cubic metre (stcm) of beech corresponds to the energy of approx. 200 litres of fuel oil or 200 m³ of natural gas. Therefore burning wood contributes to the preservation of the finite reserves of oil and gas.

Timber has a generally neutral CO₂ balance, as the CO₂ created during combustion is immediately reabsorbed into the photosynthesis cycle and therefore contributes to the formation of new biomass. A further aspect relevant to environmental considerations is the fact that timber contains hardly any sulphur, therefore almost no sulphur dioxide is created during combustion.

Influence of moisture on the net calorific value

The water content of timber substantially influences its net calorific value. The more water timber contains, the lower its net calorific value, since the water evaporates during combustion and consumes energy in the process.

Two measures are used to specify the water content:

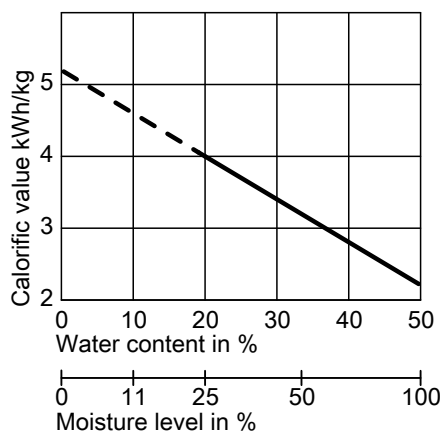
■ Water content

The water content of timber is its water mass as a percentage of the total timber mass.

■ Timber moisture level

The timber moisture level (hereafter referred to as moisture or moisture level) is the water mass as a percentage of the total timber mass excluding water.

The diagram shows the relationship between the water content and the moisture level, as well as the dependency of the net calorific value.



Principles of wood combustion for generating heat (cont.)

Freshly cut timber has a moisture level of 100 %. During storage over one summer, this moisture level reduces to approx. 40 %. During storage over several years, this moisture level reduces to approx. 25 %. The diagram shows the dependency of the net calorific value on the water content, using spruce as an example. With a water content of 20 % (moisture level 25 %), the net calorific value is 4.0 kWh/kg. The net calorific value of timber stored over several years is approx. twice that of freshly cut timber.

Storage

Not only is the combustion of moist timber uneconomical, but it also leads to low combustion temperatures and high emissions plus tar deposits inside the chimney stack.

Information on storing wood:

- Split round timbers that have a diameter of 10 cm or more.
- Stack the logs in a ventilated and preferably sunny spot underneath a rain canopy.
- Stack the logs with generous air gaps to enable the flowing air to carry off the dissipating moisture.
- A hollow space should be created underneath the wood pile, e.g. in the form of storage beams, to allow moist air to escape downwards.
- Never store freshly cut wood in a cellar, as air and sunshine are required for drying. However, dried wood can be stored in a well ventilated cellar.

1.2 Fuels

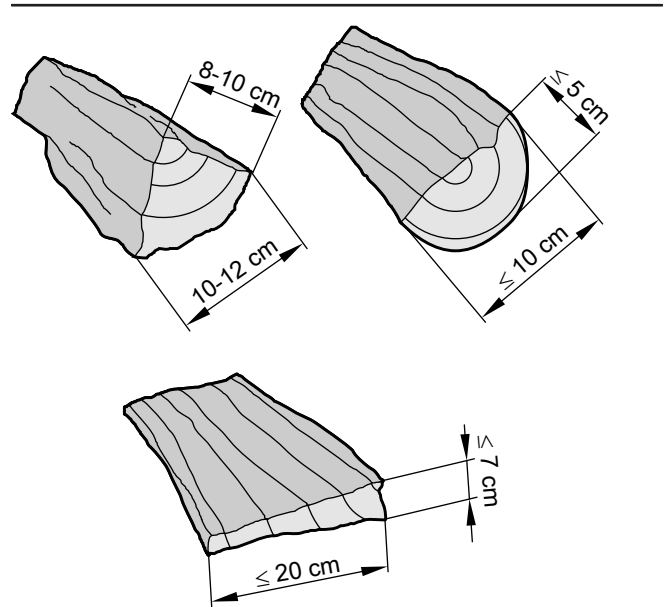
This boiler is only suitable for the combustion of natural logs. Logs should ideally be 45 to 50 cm in length. Do not use the appliance to burn fuels such as sawdust, fines (wood or coal), coke, woodchips, briquettes or logging residues. If shorter logs are used, they should be layered without air gaps. 25 cm logs can be inserted in line one after another. Logs of 33 cm in length cannot be layered without gaps between them and should not be used as they will reduce the boiler output and increase the risk of ineffective gasification.

The rated boiler heating output will only be achieved with dry wood with maximum 20 % water content or maximum humidity of 25 % (air-dried wood).

When using softwood, about 44 % more (volume) is needed to produce the same amount of energy as when using hardwood.

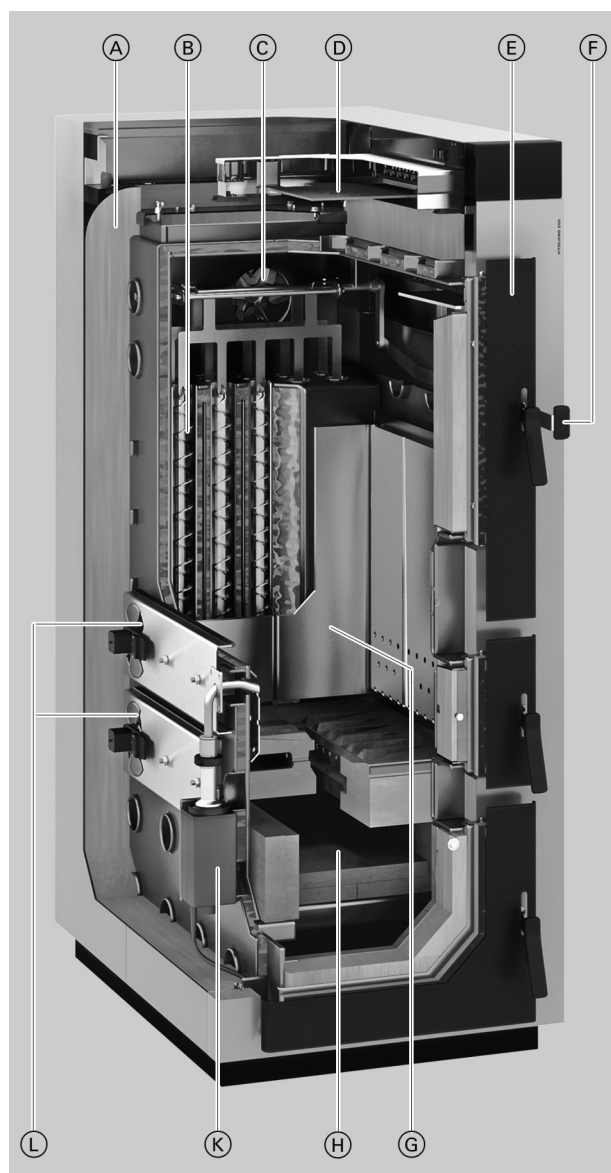
Wood of poor quality and high moisture content reduces the rated heating output and the length of combustion.

For combustion it is important to use split logs. Splitting the wood – preferably straight after felling – makes a significant contribution to improving the combustion process. Enlarging the surface area enables the wood to be degassed more quickly and simply. In addition, split logs dry more quickly.



Recommended split log dimensions

2.1 Product description



- Ⓐ 100 mm thick thermal insulation
- Ⓑ Heating surfaces
- Ⓒ Variable speed flue gas fan for modulating operation
- Ⓓ Fully wired menu-guided Ecotronic control unit
- Ⓔ Large hopper door
- Ⓕ Convenient cleaning of heating surfaces
- Ⓖ Large hopper for 50 cm logs
- Ⓗ Combustion chamber made from durable fireclay
- Ⓚ Automatic ignition (option)
- Ⓛ Infinitely variable primary and secondary air dampers

The Vitoligno 200-S biomass boiler is a good alternative to an oil or gas heating system: Wood is affordable and CO₂ neutral.

The Vitoligno 200-S is a high quality wood gasification boiler with output stages of 20, 30, 40 and 50 kW. With outputs of 30, 40 and 50 kW, it operates in modulating mode and adapts continuously to the current heat demand. In the 20 kW output stage, the wood gasification boiler operates solely under full load.

Up to 50 cm long logs are easily handled by the large stainless steel hopper. The combustion time is up to twelve hours without recharging.

Heat-up in just three minutes

The heat-up process is complete after just three minutes. The extraction of oxygen from inside the hopper means that the logs smoulder rather than burn. There is no flame, as the wood gas does not have the oxygen required to build a flame. The combustible wood gas burns cleanly in the combustion chamber at high temperatures, under partial as well as under full load.

Convenient with automatic ignition

Automatic ignition is available for heating the fuel. The ignition timing can be programmed using the Ecotronic control unit. This is especially practical for returning home after a holiday to a prewarmed apartment.

Ecotronic digital control unit

The menu-guided Ecotronic boiler control unit makes operating the Vitoligno 200-S particularly easy. Up to three heating circuits can be controlled. Alternatively to one heating circuit, DHW heating and heating water can be controlled conveniently via the buffer cylinder management system.

Easy cleaning

The heat exchanger of the Vitoligno 200-S can be cleaned easily and quickly using a mechanical lever mechanism. The wood burns with few residues, due to the high combustion efficiency up to 92 percent. An ash box with a lid is available for taking the ash to the waste container without any mess.

Benefits at a glance

- Large hopper in stainless steel and combustion chamber made of special ceramics, for logs up to 50 cm long.
- Lever mechanism for easy cleaning of heat exchanger pipes.
- Modulating operation with optimum matching to the current heat demand.
- Efficiency: up to 92 %.
- Menu-guided Ecotronic boiler control unit with control of up to three heating circuits and integral buffer cylinder management system.
- Easy mechanical cleaning of the heating surfaces and long cleaning intervals.
- Automatic ignition system available as an option.
- Effective carbonisation gas removal for low smoke recharging after full burnout.

Delivered condition

Steel boiler for split logs

Boiler body with fireclay lined gasification zone and combustion chamber.

With variable speed flue gas fan, carbonisation gas extraction and motorised air dampers for primary and secondary air.

Thermal insulation (packed separately)

Menu-guided Ecotronic boiler control unit with buffer management.

Flue gas temperature sensor, mechanical heating surface cleaner as well as stoking and cleaning equipment are supplied with the boiler body.

Note

The thermally activated safety valve is not included in the standard delivery and must be ordered separately (see page 61)

2.2 Specification

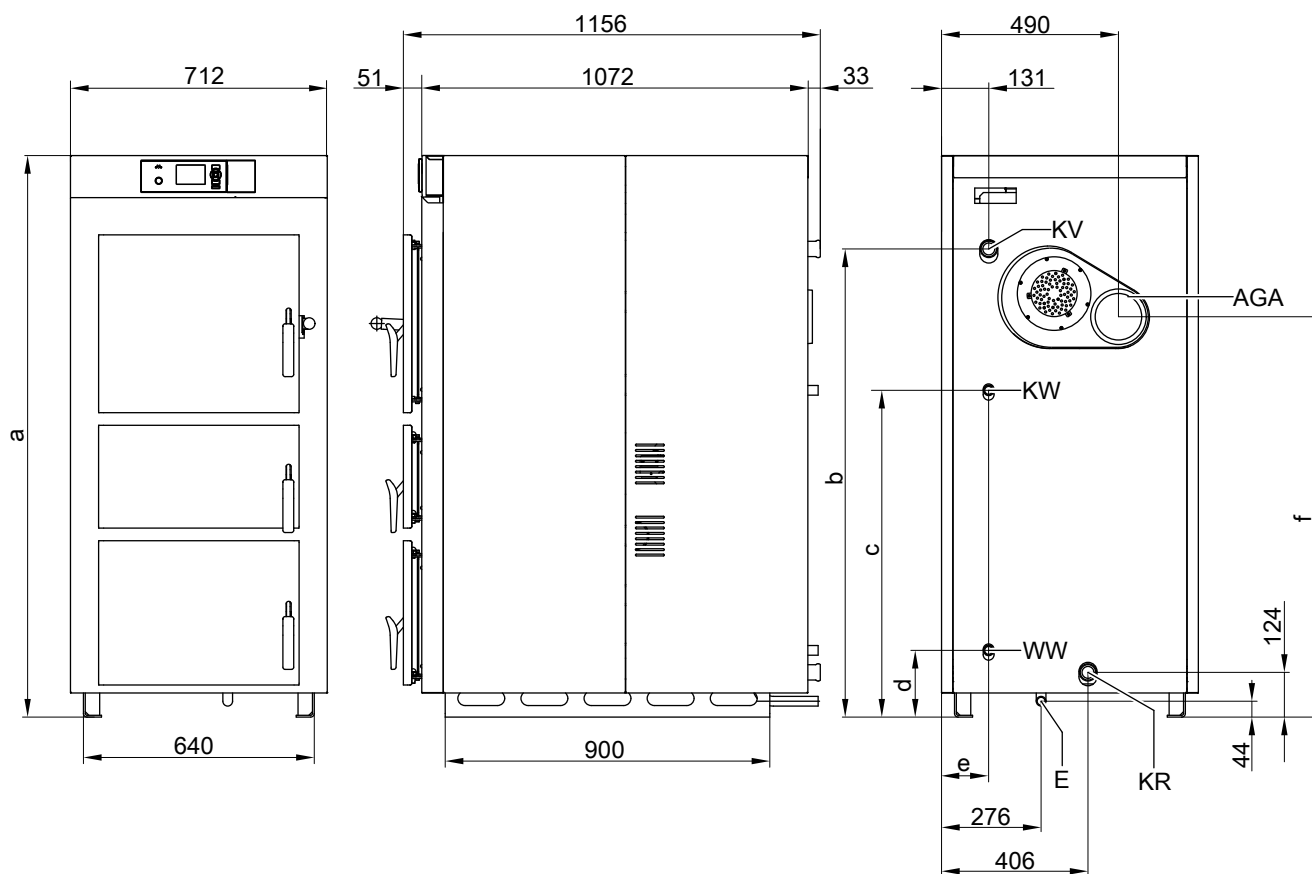
Rated heating output	kW	20	30	40	50
Min. heating output (Q_{min})	kW	20	16.7	22.9	27.2
Flow temperature					
– Permissible	°C	100	100	100	100
– Maximum	°C	90	90	90	90
– Minimum	°C	65	65	65	65
Minimum return temperature	°C	65	65	65	65
Permiss. operating pressure					
Boiler	bar	3	3	3	3
	MPa	0.3	0.3	0.3	0.3
Safety heat exchanger	bar	3 - 6	3 - 6	3 - 6	3 - 6
	MPa	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6	0.3 - 0.6
CE designation		CE			
Boiler class to EN 303-5		3 and 5	3 and 5	3 and 5	3 and 5
Overall dimensions					
Total length	mm	1156	1156	1156	1156
Total width	mm	712	712	712	712
Total height a	mm	1557	1557	1775	1775
Fill aperture dimensions					
Width	mm	450	450	450	450
Height	mm	364	364	432	432
Transport dimensions with transport protection					
Length	mm	1256	1256	1256	1256
Width	mm	782	782	782	782
Height	mm	1610	1610	1828	1828
Total weight	kg	770	770	865	865
Boiler body with thermal insulation					
Boiler body transport weight excl. thermal insulation	kg	695	695	773	773
Max. power consumption	W	120	120	120	120
Contents					
Boiler water	l	150	150	160	160
Fuel hopper	l	169	169	211	211
Boiler connections					
Boiler flow and return plus safety connection (safety valve)	G	1½	1½	1½	1½
Drain	R	¾	¾	¾	¾
Safety heat exchanger connections					
Cold water, DHW	R	¾	¾	¾	¾
Pressure drop on the heating water side					
– At ΔT = 20 K	Pa	90	90	340	340
	mbar	0.9	0.9	3.4	3.4
– At ΔT = 10 K	Pa	600	600	1950	1950
	mbar	6.0	6.0	19.5	19.5
Flue gas^{*1}					
(at rated heating output)					
– Average temperature (gross ^{*2})	°C	180	180	180	180
– Mass flow rate	kg/h	47	70	94	117
– CO ₂ content in the flue gas	%	14	14	14	14
Flue gas connection	Ø mm	150	150	150	150
Required draught at full load	Pa	8	8	8	8
	mbar	0.08	0.08	0.08	0.08
Max. permiss. draught^{*3}	Pa	15	15	15	15
	mbar	0.15	0.15	0.15	0.15
Recommended min. volume, heating water buffer cylinder^{*4}	l	1800	1800	2310	2800

^{*1} Values for calculating the size of the flue system, according to EN 13384 based on 10.0 % CO₂.

^{*2} Flue gas temperature measured at 20 °C combustion air temperature according to EN 304.

^{*3} The installation of a secondary air device (draught limiter) is recommended for chimneys with draughts in excess of 0.15 mbar.

^{*4} For the detailed design, see "Sizing of the heating water buffer cylinder", page 73.



AGA Flue outlet
E Drain R ¾
KR Boiler return G 1½
KV Boiler flow G 1½

KW Cold water inlet R ¾ for thermally activated safety valve (safety heat exchanger)
WW DHW outlet R ¾ for thermally activated safety valve (safety heat exchanger)

Dimensions

Rated heating output	kW	20 and 30	40 and 50
a (total height)	mm	1557	1775
b	mm	1298	1508
c	mm	906	1213
d	mm	185	190
e	mm	130	125
f	mm	1110	1320

Control unit

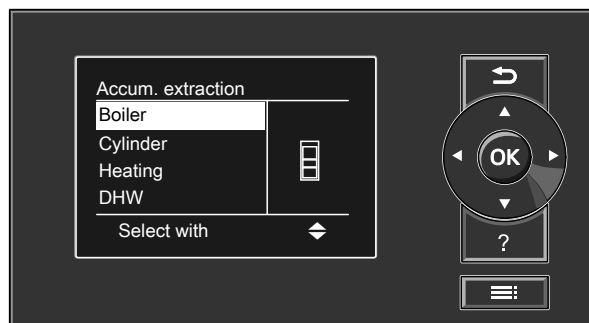
3.1 Specification for Ecotronic

Design and function

Modular design

The Ecotronic boiler control unit is a decentralised microprocessor system. To control the boiler system, the Ecotronic comprises a PCB and programming unit (display) integrated into the boiler. 3-sensor cylinder management is part of the standard Ecotronic version. The Ecotronic can be extended with mixer extensions (max. 3).

Display



Functions

- Constantly regulating air dampers optimise the heat-up and burnout procedure
- Lambda probe enables efficient combustion control and maximum efficiency

- Return temperature raising facility
- With electric return temperature raising facility: release of the complete heating output during the start phase of the boiler to the consumers (no output transfer into the heating water buffer cylinder via return)
- Accurate temperature stratification of the heating water buffer cylinder with the buffer cylinder control valve (accessories)
- With electric return temperature raising facility: use of the residual boiler heat after burnout
- Supporting auxiliary and service functions
- Control of a second heat source
- Protection against overheating through heat transfer to the heating water buffer cylinder, shutting down the flue gas fan and closing the primary air damper
- Convenient adjustment of the ignition timing for the ignition system (accessories)

Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	6 A
Safety category	I
IP rating	IP 20
	according to EN 60529
	Ensure through design/ installation

3.2 Accessories for Ecotronic

Information regarding room temperature hook-up (RS function) for remote control units

Never activate the RS function in the case of underfloor heating circuits (inertia).

In heating systems that have heating circuits with and without mixers, the RS function must only affect the heating circuits with mixers.

Information regarding Vitotrol 200A and 300A

One Vitotrol 200A or one Vitotrol 300A can be used for every heating circuit in a heating system.

The Vitotrol 300A can operate a max. of 3 heating circuits. Only one Vitotrol 300A can be connected to each Ecotronic control unit.

The Vitotrol 200A can only operate 1 heating circuit. Up to 2 Vitotrol 200A can be connected to the Ecotronic control unit.

Vitotrol 200A

Part no. Z008 341

KM BUS subscriber

- Indicators:
 - Room temperature
 - Outside temperature
 - Operating condition
- Settings:
 - Set room temperature for standard mode (normal room temperature)

Note

The set room temperature for reduced mode (reduced room temperature) is set at the control unit.

- Operating program
- Party and economy mode can be enabled via keys
- Integral room temperature sensor for room temperature hook-up (only for one heating circuit with mixer)

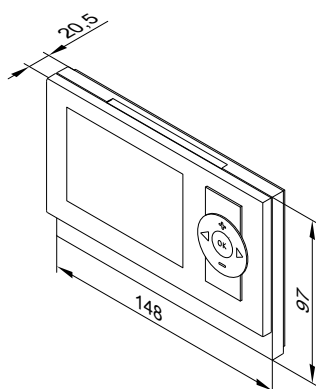
Installation site:

- Weather-compensated mode:
 - Installation anywhere in the building
 - Room temperature hook-up:
 - The integral room temperature sensor captures the actual room temperature and effects any necessary correction of the flow temperature.
- The captured room temperature depends on the installation site:
- Main living room on an internal wall opposite radiators
 - Not on shelves or in recesses
 - Never in the immediate vicinity of doors or close to heat sources (e.g. direct sunlight, fireplace, TV set, etc.)

Connection:

- 2-core lead, length max. 50 m (even if connecting several remote control units)
- Never route this lead immediately next to 230/400 V cables
- LV plug as standard delivery

Control unit (cont.)



Specification

Power supply via KM BUS	
Power consumption	0.2 W
Safety category	III
IP rating	IP 30 to EN 60529; ensure through design/installation
Permissible ambient temperature	
– Operation	0 to +40 °C
– Storage and transport	–20 to +65 °C
Setting range of the set room temperature for standard mode	3 to 37 °C

Vitotrol 300A

Part no. Z012 688

KM BUS subscriber.

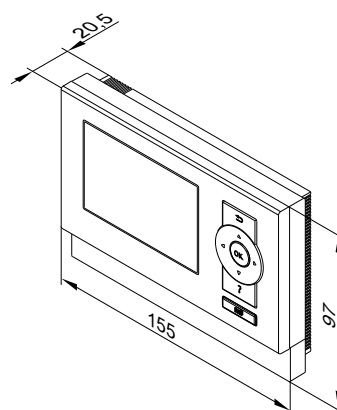
- Indicators:
 - Room temperature
 - Outdoor temperature
 - Operating program
 - Operating condition
 - Heat-up condition of the heating water buffer cylinder, ash box full, recharge fuel and heat-up (depending on boiler type).
- Settings:
 - Set room temperature for standard mode (normal room temperature) and reduced mode (reduced room temperature)
 - Set DHW temperature
 - Operating program, switching times for heating circuits, plus further settings via plain text menu on the display
- Party and economy mode can be enabled via the menu
- Integrated room temperature sensor for room temperature hook-up

Installation site:

- Weather-compensated mode:
 - Installation anywhere in the building.
 - Room temperature hook-up:
 - The integral room temperature sensor captures the actual room temperature and effects any necessary correction of the flow temperature.
- The captured room temperature depends on the installation site:
- Main living room on an internal wall opposite radiators.
 - Not on shelves or in recesses.
 - Never in the immediate vicinity of doors or close to heat sources (e.g. direct sunlight, fireplace, TV set, etc.).

Connection:

- 2-core lead, length max. 50 m (even if connecting several remote control units).
- Never route this cable immediately next to 230/400 V cables.
- LV plug included in standard delivery.



Specification

Power supply via KM BUS	
Power consumption	0.5 W
Safety category	III
IP rating	IP 30 to EN 60529 Ensure through design/installation
Permissible ambient temperature	
– During operation	0 to +40 °C
– During storage and transport	–20 to +65 °C
Setting range for set room temperature	3 to 37 °C

Vitotrol 350

CAN BUS subscriber

Control unit extension with touchscreen

The Vitotrol control unit extension is used for:

- Remote control of the boiler with all relevant setting options
- Display of all information pertinent to the boiler
- Charge indicator for the heating water buffer cylinder

- Expansion of the system to include up to 20 additional control unit extensions by CAN BUS (controller modules, data cable and controllers required)

Possible extensions include:

- Control of a heating circuit with 1 temperature sensor
- Control of DHW heating with 2 temperature sensors
- Control of a long-distance heat line with 1 temperature sensor (sub-distributor)

- Setting of parameters and control of all extensions connected via controller modules

Control unit (cont.)



Standard delivery:

- Programming unit with touchscreen
- Wall socket for wall mounting
- Fixing materials for wall mounting

Extensions and sensors that can be used by expanding the system with Vitotrol together with controller modules

	Vitotrol with 1 controller module	Vitotrol with 2 controller modules	Vitotrol with 3 controller modules	Vitotrol with 4 controller modules	Vitotrol with 5 controller modules
Max. number of extensions	4	8	12	16	20
Max. number of sensors	8	16	24	32	40

Accessories for Vitotrol 350

Controller module

Part no. 7453 165

- Up to 4 extensions per controller module
- 5 controller modules can be combined in series via CAN BUS
- Max. 20 extensions can be connected to Vitotrol 350

Standard delivery:

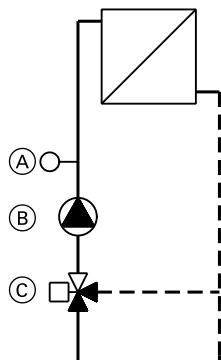
- Controller module in plastic casing (length 325 mm, height 195 mm, depth 75 mm)
- 4 contact temperature sensors Pt1000

Data line 10 m

Part no. 7522 616

CAN BUS data cable. Type of cable: LiYCY 2x2x0,34 mm², screened.

Each additional controller module requires a data cable.



- (A) Contact temperature sensor
- (B) Pump
- (C) Mixing valve

The total length of all CAN BUS cables must not exceed 200 m.

Heating circuit

Weather-compensated heating circuit control unit with digital time switch for setback mode according to individual day and seven-day program, with pump control unit, frost protection function, eco mode and limited flow temperature.

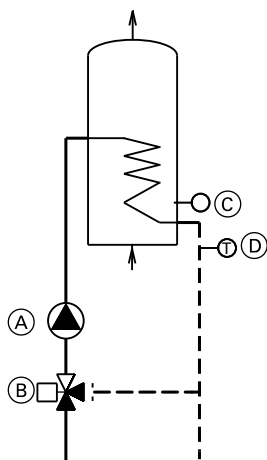
Note

The contact temperature sensor (A) is part of the standard delivery of the controller module.

Control unit (cont.)

DHW heating temperature sensor (DHW heating controller)

Part no. 7528 122



- (A) Pump
- (B) Control valve
- (C) Pt1000 temperature sensor
- (D) Contact temperature sensor

When the temperature at the cylinder temperature sensor falls below the set value, the circulation pump for cylinder heating starts and the DHW cylinder is heated.

The flow rate of the heating water is controlled via the return temperature (flow control). This results in optimum stratification of the buffer cylinder with sustained high temperature at the cylinder flow. The heating periods (individual day and seven-day program) can be adjusted via the integrated time switch.

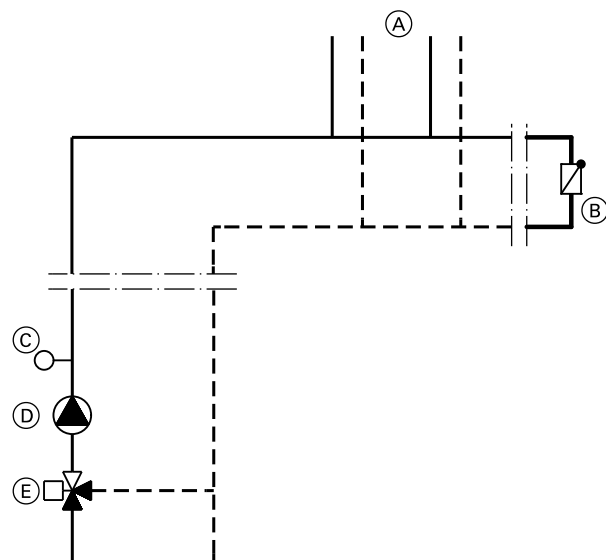
Standard delivery

- Pt1000 temperature sensor ($\varnothing$ 6 mm, L = 2000 mm) with sensor well

Note

The standard delivery does not include positions (A) and (B).

Long-distance heat line (sub-distributor)



- (A) Sub-distributor
- (B) Bypass
- (C) Contact temperature sensor
- (D) Pump
- (E) Control valve

Via a long-distance heat line, a building is supplied with separate heat distribution. The long-distance line is controlled upstream according to the demand of the heating circuits. The heating circuits of the separate heat distribution must be controlled via the Vitotrol 350.

Note

The contact temperature sensor (C) is part of the standard delivery of the controller module.

Note

The long-distance heat line can only be used if K b extensions are also being used in the sub-distributor.

Adjacent building

The line to the adjacent building is controlled with weather compensation via the heating circuit control unit.

An adjacent building line (long-distance heat line) can be implemented using a controller module for the adjacent building and the required controllers.

Mixer extension kit

The standard Ecotronic version can be customised with extension kits for heating circuits with mixers. Heat consumers or DHW cylinders can be incorporated into the control system.

Note for extension kits

For DHW heating, the following must be ordered separately:

Control unit (cont.)

For DHW heating, the temperature sensor with part no. 7438 702 is used as a cylinder temperature sensor (plug ) (sensor well to be ordered separately if required).

The contact temperature sensor, which is included as part of the standard delivery of the extension kit, is used as a return temperature sensor (plug .

Mixer extension kit with integral mixer motor

Part no. 7301 063

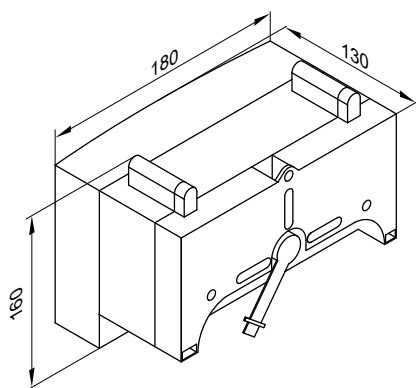
KM BUS subscriber

Components:

- Mixer PCB with mixer motor for Viessmann mixer DN 20 to 50 and R ½ to 1¼
- Flow temperature sensor (contact temperature sensor)
- Plug for connecting the heating circuit pump
- Power cable (3.0 m long) with plug
- BUS cable (3.0 m long) with plug

The mixer motor is mounted directly onto the Viessmann mixer DN 20 to 50 and R ½ to 1¼.

Mixer PCB with mixer motor

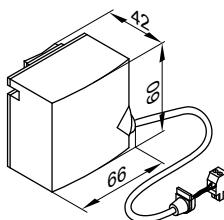


Specification

Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	5.5 W
IP rating	IP 32D to EN 60529 ensure through appropriate design/installation
Safety category	I

Permissible ambient temperature	
– during operation	0 to +40 °C
– during storage and transport	–20 to +65 °C
Rated breaking capacity of the relay output for heating circuit pump 	2(1) A 230 V~
Torque	3 Nm
Runtime for 90 ° <	120 s

Flow temperature sensor (contact temperature sensor)



Secured with a tie.

Specification

Lead length	2.0 m, fully wired
IP rating	IP 32D to EN 60529 ensure through appropriate design/installation
Sensor type	Viessmann NTC, 10 kΩ at 25 °C
Permissible ambient temperature	
– during operation	0 to +120 °C
– during storage and transport	–20 to +70 °C

Mixer extension kit for separate mixer motor

Part no. 7301 062

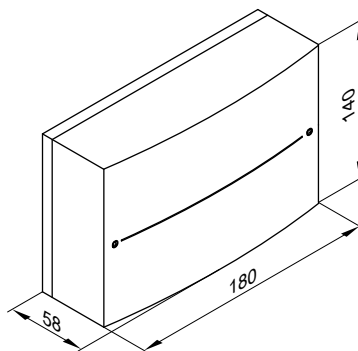
KM BUS subscriber

For the connection of a separate mixer motor.

Components:

- Mixer PCB for the connection of a separate mixer motor
- Flow temperature sensor (contact temperature sensor)
- Plug for connecting the heating circuit pump and the mixer motor
- Power cable (3.0 m long) with plug
- BUS cable (3.0 m long) with plug

Mixer PCB



Specification

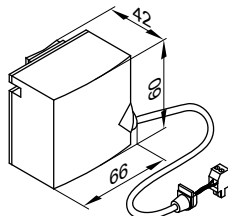
Rated voltage	230 V~
Rated frequency	50 Hz
Rated current	2 A
Power consumption	1.5 W
IP rating	IP 20D to EN 60529 Ensure through design/installation
Safety category	I
Permissible ambient temperature	
– During operation	0 to +40 °C
– During storage and transport	–20 to +65 °C
Rated relay output breaking capacity Heating circuit pump 	2(1) A 230 V~

Control unit (cont.)

Mixer motor 0.1 A 230 V~
 Required runtime of the mixer motor
 for 90 ° < approx. 120 s

Secured with a tie.

Flow temperature sensor (contact temperature sensor)



Specification

Cable length	5.8 m, fully wired
IP rating	IP 32D to EN 60529
	Ensure through design/installation
Sensor type	Viessmann NTC 10 kΩ at 25 °C
Permissible ambient temperature	
– During operation	0 to +120 °C
– During storage and transport	–20 to +70 °C

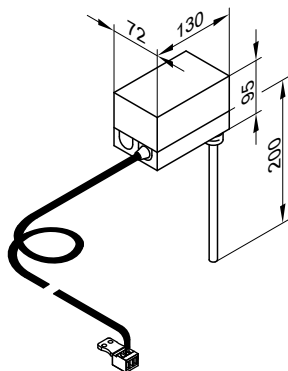
Temperature limiter to restrict the maximum temperature of underfloor heating systems

Immersion temperature controller

Part no. 7151 728

May be used as a maximum temperature limiter for underfloor heating systems.

The temperature limiter is installed into the heating flow and switches the heating circuit pump OFF if the flow temperature is too high.

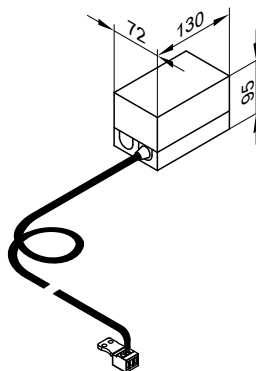


Contact temperature controller

Part no. 7151 729

May be used as a maximum temperature limiter for underfloor heating systems (only in conjunction with metal pipes).

The temperature limiter is installed into the heating flow and switches the heating circuit pump OFF if the flow temperature is too high.



Specification

Cable length	4.2 m, fully wired
Setting range	30 to 80 °C
Switching differential	max. 11 K
Breaking capacity	6(1.5) A 250 V~
Setting scale	inside the casing
Stainless steel sensor well	R ½ x 200 mm
DIN reg. no.	DIN TR 1168

Specification

Cable length	4.2 m, fully wired
Setting range	30 to 80 °C
Switching differential	max. 14 K
Breaking capacity	6(1.5) A, 250 V~
Setting scale	inside the casing
DIN reg. no.	DIN TR 1168

Plug 52 for mixer motor

Part no. 7415 057

3 pce

Required for mixer motors without a cable.

Temperature sensor

Immersion temperature sensor for DHW heating as a cylinder temperature sensor (to plug 17 of the extension kit). The contact temperature sensor, which is included as part of the standard delivery of the extension kit, is used as a return temperature sensor (to plug 2 of the extension kit).

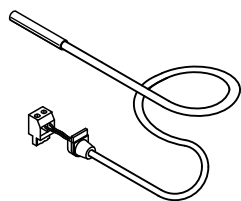
The sensor well is not included in the standard delivery and must be ordered separately.

Immersion temperature sensor

Part no. 7438 702

To capture the temperature in a sensor well.

Control unit (cont.)



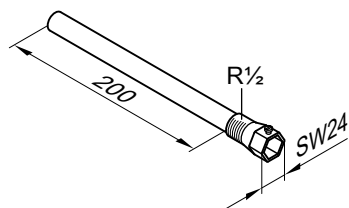
Specification

Cable length	5.8 m, fully wired
IP rating	IP 32 to EN 60529; ensure through design/installation
Sensor type	Viessmann NTC 10 kΩ, at 25 °C
Permissible ambient temperature	
– Operation	0 to +90 °C
– Storage and transport	-20 to +70 °C

Stainless steel sensor well

Part no. 7819 693

- For on-site DHW cylinders.
- Part of the standard delivery of Viessmann DHW cylinders.



External extension H5

Part no. 7199 249

Function extension inside the casing.

With plug [150] for the following functions:

- External demand and blocking

or

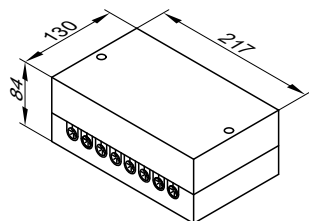
Connection of a flue gas damper

- Connection of additional safety equipment

Cable 2.0 m long with plugs "X12" and [41] for connection to the control unit.

Specification

Rated voltage	230 V–
Rated frequency	50 Hz
Rated current	6 A
Protection class	I
Protection	IP 20 to EN 60529; safeguard through appropriate design and installation
Permissible ambient temperature	
– during operation	0 to +40 °C
– during storage and transport	-20 to +65 °C



DHW cylinder and heating water buffer cylinder

4.1 Product description

Usable DHW cylinders and heating water buffer cylinders

DHW cylinder	Application	
Vitocell 100-V, type CVA	For DHW heating in conjunction with boilers and district heating systems, optionally with electric heater for 300 and 500 l capacity.	Page 18
Vitocell 300-V, type EVA	For DHW heating in conjunction with boilers, heated by a peripheral indirect coil	Page 24
Vitocell 300-V, type EVI	For DHW heating in conjunction with boilers, district heating systems and low temperature heating systems, optionally with immersion heater, internal indirect coils	Page 28
Vitocell 100-B, type CVB	For DHW heating in conjunction with boilers and solar collectors for dual mode operation.	Page 33
Vitocell 100-U, type CVUA	For DHW heating in conjunction with boilers and solar collectors for dual mode operation.	Page 38
Vitocell 300-B, type EVB	For DHW heating in conjunction with boilers and low temperature heating systems for dual mode operation	Page 42
Vitocell 100-E, type SVPA	For storing heating water in conjunction with solar collectors, heat pumps, solid fuel boilers and heat recovery.	Page 46
Vitocell 140-E, type SEIA	For central heating backup in conjunction with solar collectors, heat pumps, oil/gas boilers, solid fuel boilers and/or electric heating with an immersion heater.	Page 49
Vitocell 160-E, type SESA	For central heating backup in conjunction with solar collectors, heat pumps, oil/gas boilers, solid fuel boilers and/or electric heating with an immersion heater. With stratification facility for solar energy.	Page 49
Vitocell 340-M, type SVKA	For storing heating water and heating DHW in conjunction with solar collectors, heat pumps and solid fuel boilers.	Page 52
Vitocell 360-M, type SVSA	For storing heating water and heating DHW in conjunction with solar collectors, heat pumps and solid fuel boilers.	Page 52

4.2 Specification Vitocell 100-B, type CVA

For **DHW heating** in conjunction with boilers and district heating systems, as option with electric heater as accessory for DHW cylinders with 300 and 500 l capacity.

- Operating pressure on the **heating water side** up to **25 bar (2.5 MPa)**
- Operating pressure on the **DHW side** up to **10 bar (1.0 MPa)**

Suitable for the following systems:

- DHW temperatures up to **95 °C**
- Heating water flow temperature up to **160 °C**

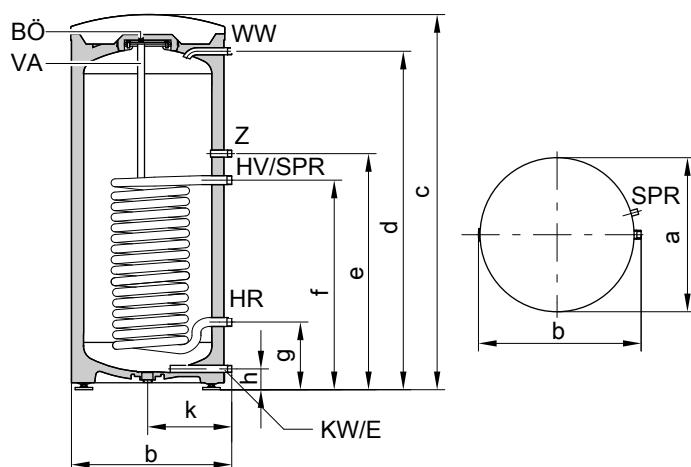
Cylinder capacity			I	160	200	300	500	750	1000
DIN registration number				9W241/11-13 MC/E					
Continuous output for DHW heating from 10 to 45 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C	kW		40	40	53	70	123	136
		l/h		982	982	1302	1720	3022	3341
	80 °C	kW		32	32	44	58	99	111
		l/h		786	786	1081	1425	2432	2725
	70 °C	kW		25	25	33	45	75	86
		l/h		614	614	811	1106	1843	2113
Continuous output for DHW heating from 10 to 60 °C and a heating water flow temperature of ... at the heating water flow rate stated below	60 °C	kW		17	17	23	32	53	59
		l/h		417	417	565	786	1302	1450
	50 °C	kW		9	9	18	24	28	33
		l/h		221	221	442	589	688	810
	90 °C	kW		36	36	45	53	102	121
		l/h		619	619	774	911	1754	2081
Continuous output for DHW heating from 10 to 60 °C and a heating water flow temperature of ... at the heating water flow rate stated below	80 °C	kW		28	28	34	44	77	91
		l/h		482	482	584	756	1324	1565
	70 °C	kW		19	19	23	33	53	61
		l/h		327	327	395	567	912	1050
Heating water flow rate for the stated continuous outputs			m ³ /h	3.0	3.0	3.0	3.0	5.0	5.0
Standby heat loss q _{BS} at a temp. differential of 45 K (actual values to DIN 4753-8).			kWh/24 h	1.50	1.70	2.20	2.50	3.50	3.90
Dimensions									
Length (∅)									
– Incl. thermal insulation	a	mm		581	581	633	859	960	1060
– Excl. thermal insulation		mm		—	—	—	650	750	850
Width									
– Incl. thermal insulation	b	mm		608	608	705	923	1045	1145
– Excl. thermal insulation		mm		—	—	—	837	947	1047
Height									
– Incl. thermal insulation	c	mm		1189	1409	1746	1948	2106	2166
– Excl. thermal insulation		mm		—	—	—	1844	2005	2060
Height when tilted									
– Incl. thermal insulation		mm		1260	1460	1792	—	—	—
– Excl. thermal insulation		mm		—	—	—	1860	2050	2100
Installation height			mm	—	—	—	2045	2190	2250
Weight incl. thermal insulation			kg	86	97	151	181	295	367
Heating water content			l	5.5	5.5	10.0	12.5	24.5	26.8
Heating surface			m ²	1.0	1.0	1.5	1.9	3.7	4.0
Connections (male thread)									
Heating water flow and return	R			1	1	1	1	1¼	1¼
Cold water, DHW	R			¾	¾	1	1¼	1¼	1¼
DHW circulation	R			¾	¾	1	1	1¼	1¼

Information regarding continuous output

When engineering systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is only achieved when the rated boiler heating output ≥ continuous output.

DHW cylinder and heating water buffer cylinder (cont.)

160 and 200 l capacity

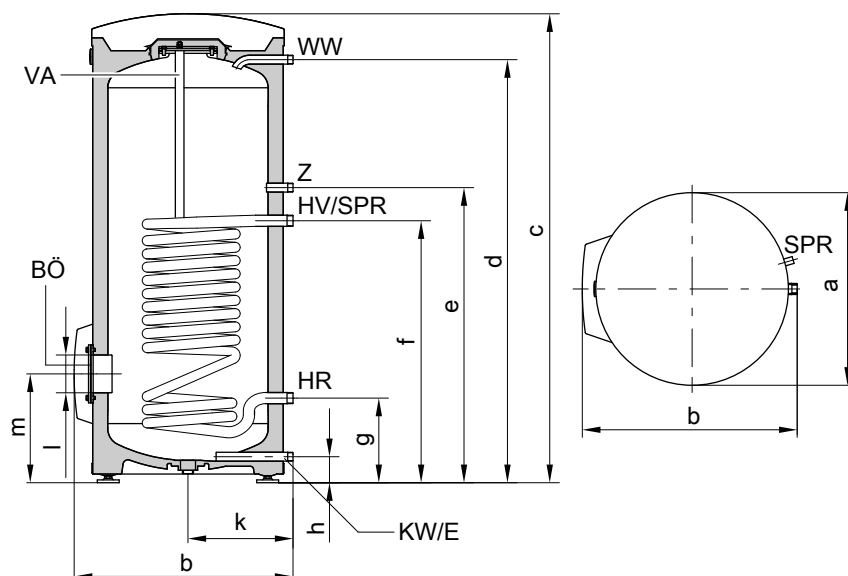


Bö Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow
KW Cold water

SPR Cylinder temperature sensor of the cylinder temperature controller or thermostat
VA Protective magnesium anode
WW DHW
Z DHW circulation

Cylinder capacity			160	200
Length (Ø)	a	mm	581	581
Width	b	mm	608	608
Height	c	mm	1189	1409
	d	mm	1050	1270
	e	mm	884	884
	f	mm	634	634
	g	mm	249	249
	h	mm	72	72
	k	mm	317	317

300 l capacity



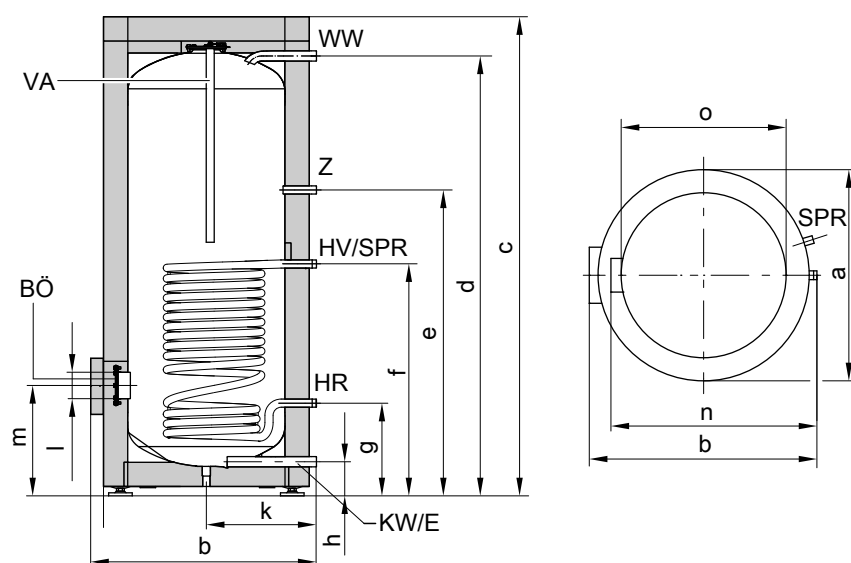
Bö Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow
KW Cold water

SPR Cylinder temperature sensor of the cylinder temperature controller or thermostat
VA Protective magnesium anode
WW DHW
Z DHW circulation

DHW cylinder and heating water buffer cylinder (cont.)

Cylinder capacity		l	300
Length (Ø)	a	mm	633
Width	b	mm	705
Height	c	mm	1746
	d	mm	1600
	e	mm	1115
	f	mm	875
	g	mm	260
	h	mm	76
	k	mm	343
	l	mm	Ø 100
	m	mm	333

500 l capacity



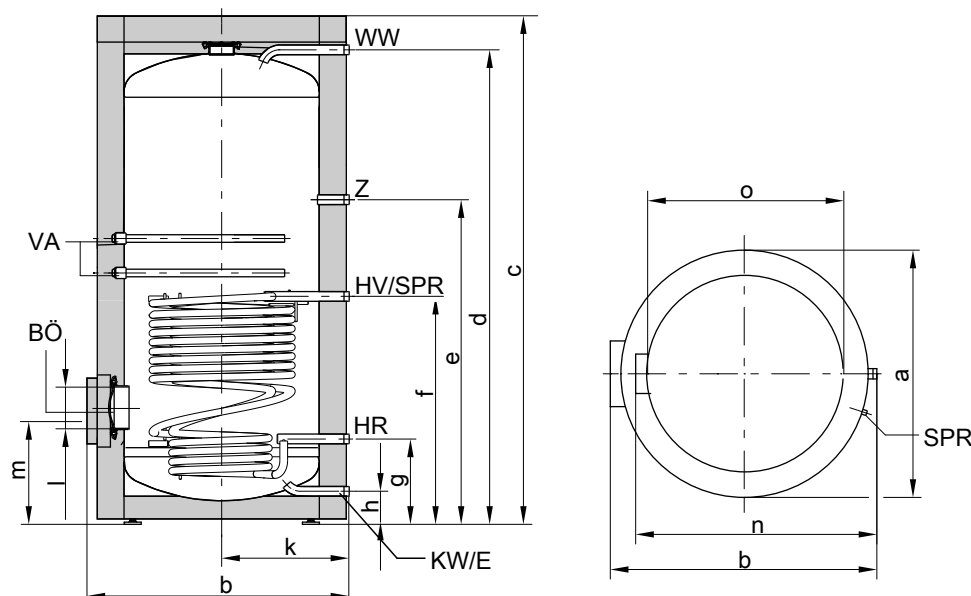
BÖ Inspection and cleaning aperture
 E Drain
 HR Heating water return
 HV Heating water flow
 KW Cold water

SPR Cylinder temperature sensor of the cylinder temperature controller or thermostat
 VA Protective magnesium anode
 WW DHW
 Z DHW circulation

Cylinder capacity		l	500
Length (Ø)	a	mm	859
Width	b	mm	923
Height	c	mm	1948
	d	mm	1784
	e	mm	1230
	f	mm	924
	g	mm	349
	h	mm	107
	k	mm	455
	l	mm	Ø 100
	m	mm	422
	n	mm	837
Excl. thermal insulation	o	mm	Ø 650

DHW cylinder and heating water buffer cylinder (cont.)

750 and 1000 l capacity



BÖ Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow
KW Cold water

SPR Cylinder temperature sensor of the cylinder temperature controller or thermostat
VA Protective magnesium anode
WW DHW
Z DHW circulation

Cylinder capacity			750	1000
Length (Ø)	a	mm	960	1060
Width	b	mm	1045	1145
Height	c	mm	2106	2166
	d	mm	1923	2025
	e	mm	1327	1373
	f	mm	901	952
	g	mm	321	332
	h	mm	104	104
	k	mm	505	555
	l	mm	Ø 180	Ø 180
	m	mm	457	468
	n	mm	947	1047
Excl. thermal insulation	o	mm	Ø 750	Ø 850

Performance factor N_L

To DIN 4708.

Cylinder storage temperature T_{cyl} = cold water inlet temperature + 50 K ^{+5 K/-0 K}

Cylinder capacity	160	200	300	500	750	1000
Performance factor N_L at heating water flow temperature						
90 °C	2.5	4.0	9.7	21.0	40.0	45.0
80 °C	2.4	3.7	9.3	19.0	34.0	43.0
70 °C	2.2	3.5	8.7	16.5	26.5	40.0

Information regarding performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl} .

Standard values

- $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$
- $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$
- $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$
- $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$

DHW cylinder and heating water buffer cylinder (cont.)

Peak output (over 10 minutes)

Relative to the performance factor N_L .

DHW heating from 10 to 45 °C.

Cylinder capacity	l	160	200	300	500	750	1000
Peak output (l/10 min) at heating water flow temperature							
90 °C		210	262	407	618	898	962
80 °C		207	252	399	583	814	939
70 °C		199	246	385	540	704	898

Max. draw-off rate (over 10 minutes)

Relative to the performance factor N_L .

With reheating.

DHW heating from 10 to 45 °C.

Cylinder capacity	l	160	200	300	500	750	1000
Max. draw-off rate (l/min) at heating water flow temperature							
90 °C		21	26	41	62	90	96
80 °C		21	25	40	58	81	94
70 °C		20	25	39	54	70	90

Drawable water volume

Cylinder content heated to 60 °C.

Without reheating.

Cylinder capacity	l	160	200	300	500	750	1000
Draw-off rate	l/min	10	10	15	15	20	20
Drawable water volume	l	120	145	240	420	615	835
Water at t = 60 °C (constant)							

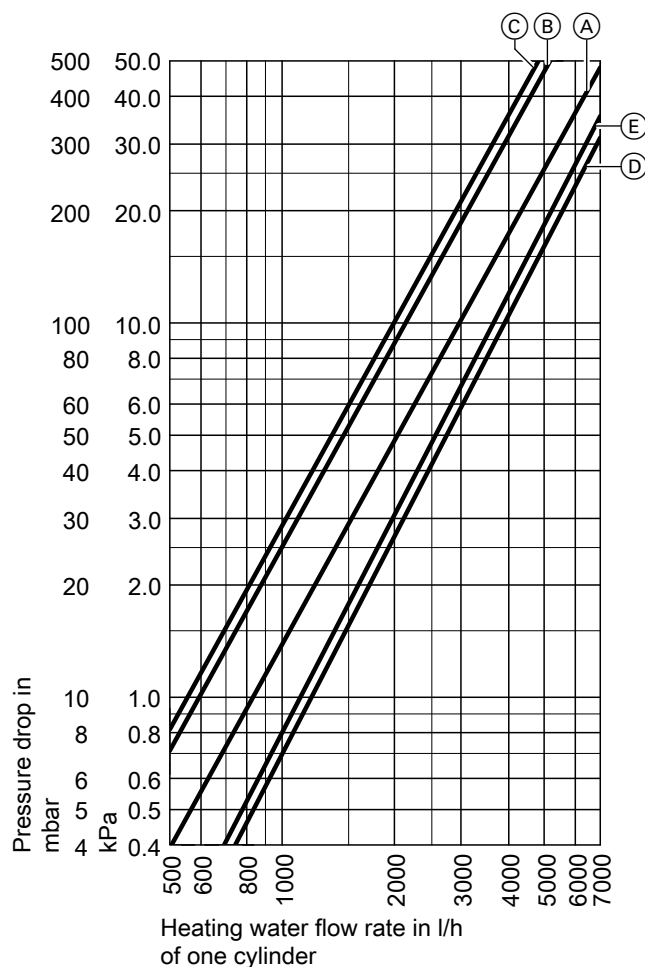
Heat-up time

The heat-up times will be achieved when the maximum continuous output of the DHW cylinder is made available at the relevant heating water flow temperature and when DHW is heated from 10 to 60 °C.

Cylinder capacity	l	160	200	300	500	750	1000
Heat-up time (min.) at heating water flow temperature							
90 °C		19	19	23	28	24	36
80 °C		24	24	31	36	33	46
70 °C		34	37	45	50	47	71

DHW cylinder and heating water buffer cylinder (cont.)

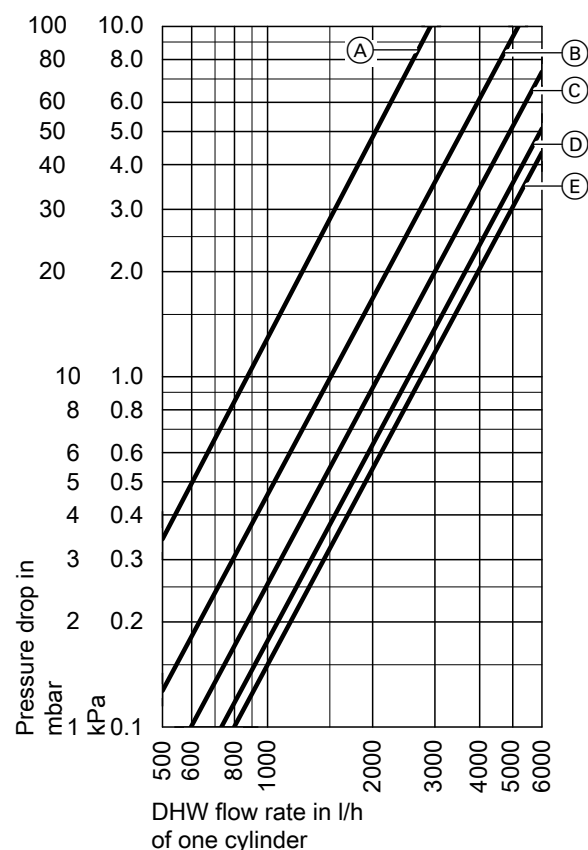
Pressure drops



Pressure drop on the heating water side

- (A) Cylinder capacity 160 and 200 l
- (B) Cylinder capacity 300 l

- (C) Cylinder capacity 500 l
- (D) Cylinder capacity 750 l
- (E) Cylinder capacity 1000 l



Pressure drop on the DHW side

- (A) Cylinder capacity 160 and 200 l
- (B) Cylinder capacity 300 l
- (C) Cylinder capacity 500 l
- (D) Cylinder capacity 750 l
- (E) Cylinder capacity 1000 l

4.3 Specification Vitocell 300-V, type EVA

For DHW heating in conjunction with boilers, heated by a peripheral indirect coil

Suitable for systems with

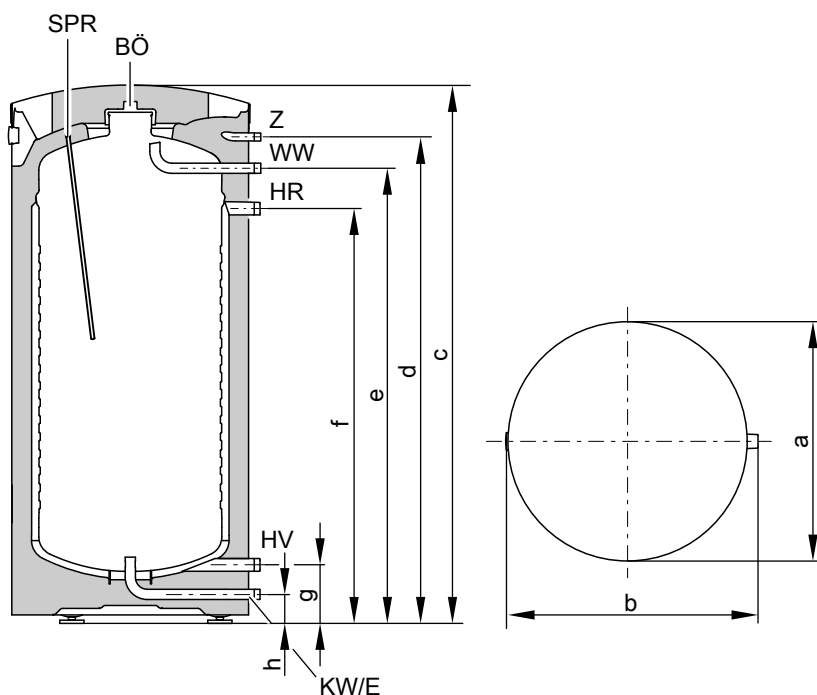
- Heating water flow temperature up to 110 °C
- Operating pressure on the heating water side up to 3 bar (0.3 MPa)
- Operating pressure on the DHW side up to 10 bar (1.0 MPa)

Cylinder capacity		I	130	160	200
DIN registration number			0166/09-10MC		
Continuous output for DHW heating from 10 to 45 °C and a heat- ing water flow temperature of ... at the heating water flow rate stated below	90 °C	kW	37	40	62
		l/h	909	982	1523
	80 °C	kW	30	32	49
		l/h	737	786	1024
	70 °C	kW	22	24	38
		l/h	540	589	933
	60 °C	kW	13	15	25
		l/h	319	368	614
	50 °C	kW	9	10	12
		l/h	221	245	294
Continuous output for DHW heating from 10 to 60 °C and a heat- ing water flow temperature of ... at the heating water flow rate stated below	90 °C	kW	32	36	57
		l/h	550	619	980
	80 °C	kW	25	28	43
		l/h	430	481	739
	70 °C	kW	16	19	25
		l/h	275	326	430
Heating water flow rate for the stated continuous outputs		m³/h	3.0	3.0	3.0
Standby heat loss q _{BS} at 45 K temperature dif- ferential (actual values to DIN 4753-8)		kWh/24 h	1.30	1.40	1.60
Dimensions					
Length (Ø) a	mm	633	633	633	
Width b	mm	667	667	667	
Height c	mm	1111	1203	1423	
Height when tilted	mm	1217	1297	1493	
Weight	kg	77	84	98	
DHW cylinder with thermal insulation					
Heating water content		l	25	28	35
Heating surface		m²	1.1	1.3	1.6
Connections (male thread)					
Heating water flow and return	R	1	1	1	
Cold water, DHW	R	¾	¾	¾	
DHW circulation	R	½	½	½	

Information regarding continuous output

When engineering systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is only achieved when the rated boiler heating output is ≥ the continuous output.

DHW cylinder and heating water buffer cylinder (cont.)



BÖ Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow

KW Cold water
SPR Sensor well for cylinder temperature sensor or thermostat
WW DHW
Z DHW circulation

Dimensions

Cylinder capacity	I	130	160	200
a	mm	633	633	633
b	mm	667	667	667
c	mm	1111	1203	1423
d	mm	975	1067	1287
e	mm	892	984	1204
f	mm	785	877	1097
g	mm	155	155	155
h	mm	77	77	77

Performance factor N_L

to DIN 4708

Cylinder storage temperature T_{cyl} = cold water inlet temperature +
50 K $+5\text{ K/-0 K}$

Cylinder capacity	I	130	160	200
Performance factor N_L at heating water flow temperature				
90 °C		2.4	3.3	6.8
80 °C		1.9	2.9	5.2
70 °C		1.4	2.0	3.2

Information regarding performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl} .

Standard values

- $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$
- $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$
- $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$
- $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$

Peak output (over 10 minutes)

Relative to performance factor N_L

DHW heating from 10 to 45 °C

DHW cylinder and heating water buffer cylinder (cont.)

Cylinder capacity	l	130	160	200
Peak output (l/10 min) at heating water flow temperature				
90 °C		207	240	340
80 °C		186	226	298
70 °C		164	190	236

Max. draw-off rate (over 10 minutes)

Relative to performance factor N_L

With reheating

DHW heating from 10 to 45 °C

Cylinder capacity	l	130	160	200
Max. draw-off rate (l/min) at heating water flow temperature				
90 °C		21	24	34
80 °C		19	23	30
70 °C		16	19	24

Drawable water volume

Cylinder content heated to 60 °C

Without reheating

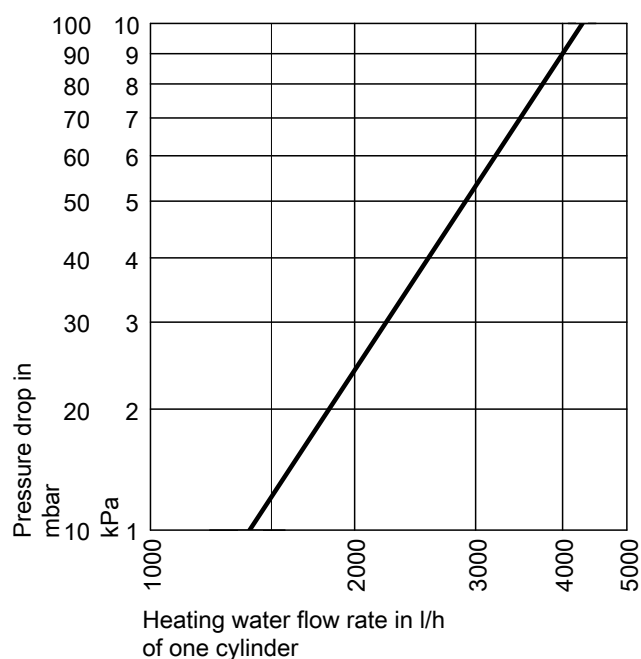
Cylinder capacity	l	130	160	200
Draw-off rate	l/min	10	10	10
Drawable water volume	l	103	120	150
Water at $t = 60$ °C (constant)				

Heat-up time

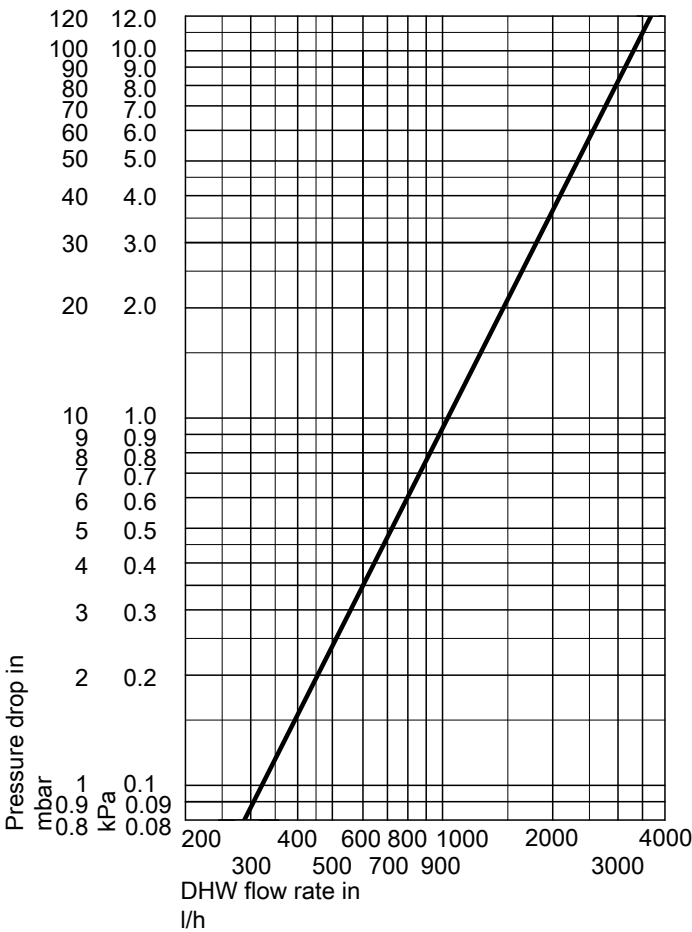
The specified heat-up times will be achieved when the maximum continuous output of the DHW cylinder is made available at the relevant flow temperature and when DHW is heated from 10 to 60 °C.

Cylinder capacity	l	130	160	200
Heat-up time (min) at heating water flow temperature				
90 °C		15	15	12
80 °C		19	19	16
70 °C		29	29	24

Pressure drops



Pressure drop on the heating water side



Pressure drop on the DHW side

4.4 Specification Vitocell 300-V, type EVI

For DHW heating in conjunction with boilers and district heating systems, optionally with electric heater as accessory.

Suitable for the following systems:

- DHW temperatures up to **95 °C**
- Heating water flow temperature up to **200 °C**
- Operating pressure on the **heating water side** up to **25 bar (2.5 MPa)**
- Operating pressure on the **DHW side** up to **10 bar (1.0 MPa)**

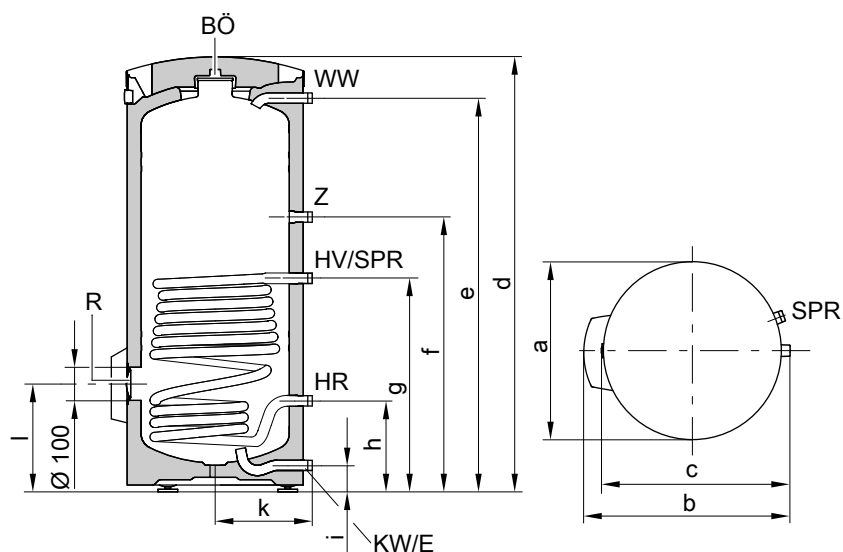
Cylinder capacity			I	200	300	500
DIN registration number				9W71-10 MC/E		
Continuous output for DHW heating from 10 to 45 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C	kW	71	93	96	
		l/h	1745	2285	2358	
	80 °C	kW	56	72	73	
		l/h	1376	1769	1793	
	70 °C	kW	44	52	56	
		l/h	1081	1277	1376	
	60 °C	kW	24	30	37	
		l/h	590	737	909	
	50 °C	kW	13	15	18	
		l/h	319	368	442	
Continuous output for DHW heating from 10 to 60 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C	kW	63	82	81	
		l/h	1084	1410	1393	
	80 °C	kW	48	59	62	
		l/h	826	1014	1066	
	70 °C	kW	29	41	43	
		l/h	499	705	739	
Heating water flow rate for the stated continuous out-puts		m³/h	5.0	5.0	6.5	
Standby heat loss q _{BS} at a temp. differential of 45 K (actual values to DIN 4753-8)		kWh/24 h	1.70	2.10	2.40	
Dimensions						
Length (Ø) a						
– Incl. thermal insulation	mm	581	633	925		
– Excl. thermal insulation	mm	–	–	715		
Width b						
– Incl. thermal insulation	mm	649	704	975		
– Excl. thermal insulation	mm	–	–	914		
Height d						
– Incl. thermal insulation	mm	1420	1779	1738		
– Excl. thermal insulation	mm	–	–	1667		
Height when tilted						
– Incl. thermal insulation	mm	1471	1821	–		
– Excl. thermal insulation	mm	–	–	1690		
Weight incl. thermal insulation		kg	76	100	111	
Heating water content		l	10	11	15	
Heating surface		m²	1.3	1.5	1.9	
Connections (male thread)						
Heating water flow and return		R	1	1	1¼	
Cold water, DHW		R	1	1	1¼	
DHW circulation		R	1	1	1½	

Information regarding continuous output

When engineering systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is only achieved when the rated boiler heating output ≥ continuous output.

DHW cylinder and heating water buffer cylinder (cont.)

200 and 300 litre capacity



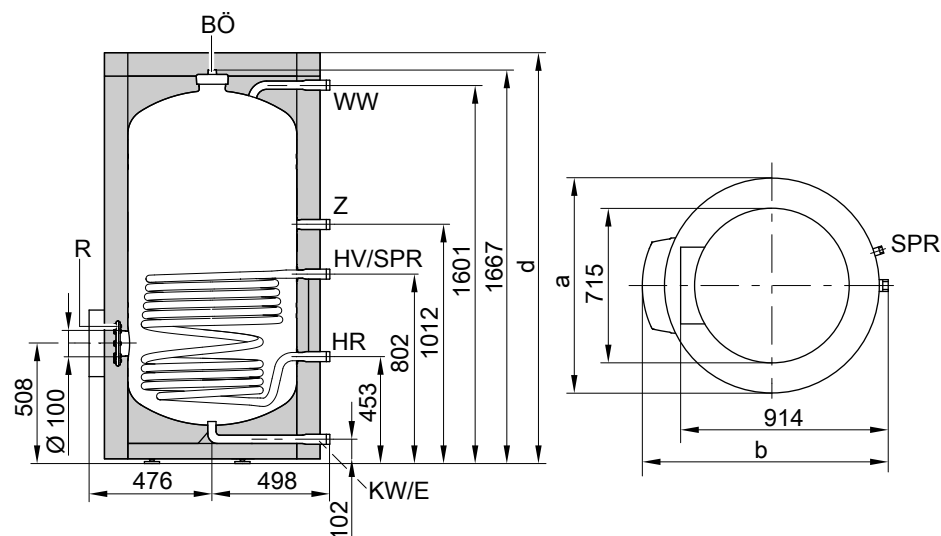
BÖ Inspection and cleaning aperture
 E Drain
 HR Heating water return
 HV Heating water flow
 KW Cold water
 R Additional cleaning aperture and/or immersion heater

SPR Cylinder temperature sensor of the cylinder temperature controller or thermostat
 (connector R 1 with reducer to R ½ for sensor well)
 WW DHW
 Z DHW circulation

Cylinder capacity	l	200	300
a	mm	581	633
b	mm	649	704
c	mm	614	665
d	mm	1420	1779
e	mm	1286	1640
f	mm	897	951
g	mm	697	751
h	mm	297	301
i	mm	87	87
k	mm	317	343
l	mm	353	357

DHW cylinder and heating water buffer cylinder (cont.)

500 l capacity



BÖ Inspection and cleaning aperture
E Drain
HR Heating water return
HV Heating water flow
KW Cold water
R Additional cleaning aperture and immersion heater

SPR Cylinder temperature sensor of the cylinder temperature controller and thermostat (connector R 1 with reducer to R ½ for sensor well)
WW DHW
Z DHW circulation

Cylinder capacity	l	500
a	mm	925
b	mm	975
d	mm	1738

Performance factor N_L

To DIN 4708.

Cylinder storage temperature T_{cyl} = cold water inlet temperature + 50 K ^{+5 K/-0 K}

Cylinder capacity	l	200	300	500
Performance factor N_L at heating water flow temperature				
90 °C		6.8	13.0	21.5
80 °C		6.0	10.0	21.5
70 °C		3.1	8.3	18.0

Information regarding performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl} .

Standard values

- $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$
- $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$
- $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$
- $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$

Peak output (over 10 minutes)

Relative to the performance factor N_L .

DHW heating from 10 to 45 °C.

Cylinder capacity	l	200	300	500
Peak output (l/10 min) at heating water flow temperature				
90 °C		340	475	627
80 °C		319	414	627
70 °C		233	375	566

DHW cylinder and heating water buffer cylinder (cont.)

Max. draw-off rate (over 10 minutes)

Relative to the performance factor N_L .

With reheating.

DHW heating from 10 to 45 °C.

Cylinder capacity	I	200	300	500
Max. draw-off rate (l/min) at heating water flow temperature				
90 °C		34	48	63
80 °C		32	42	63
70 °C		23	38	57

Drawable water volume

Cylinder content heated to 60 °C.

Without reheating.

Cylinder capacity	I	200	300	500
Draw-off rate	l/min	10	15	15
Drawable water volume	I	139	272	460
Water at t = 60 °C (constant)				

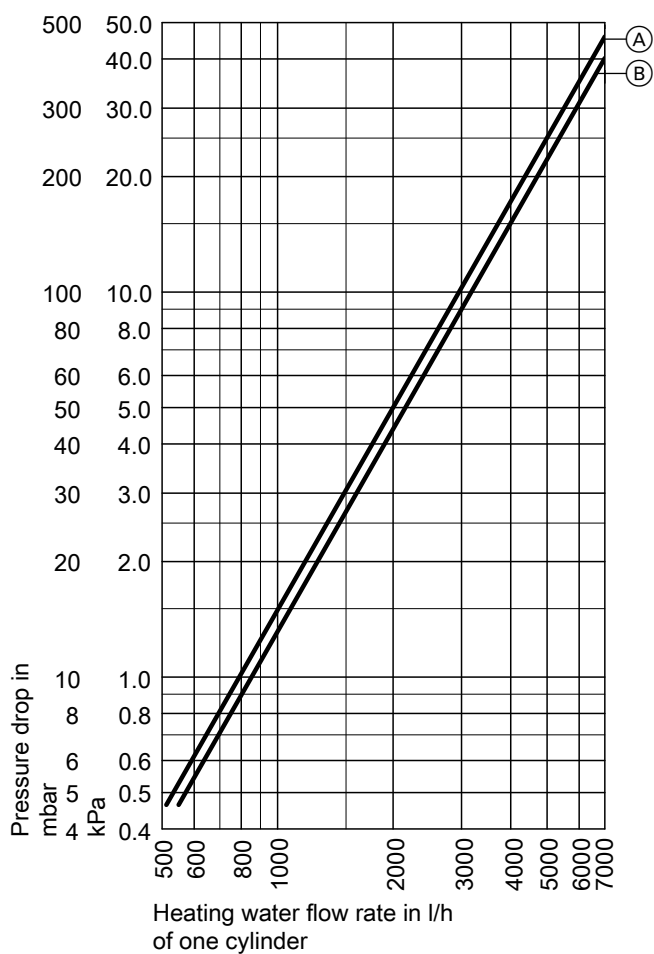
Heat-up time

The heat-up times specified will be achieved if the max. continuous output of the DHW cylinder is made available at the respective heating water flow temperature and when heating DHW from 10 to 60 °C.

Cylinder capacity	I	200	300	500
Heat-up time (min.) at heating water flow temperature				
90 °C		14.4	15.5	20.0
80 °C		15.0	21.5	24.0
70 °C		23.5	32.5	35.0

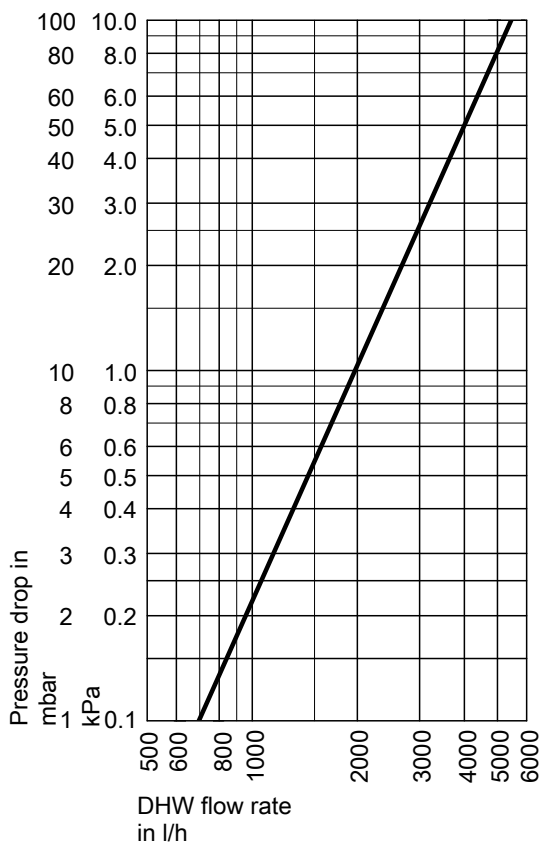
DHW cylinder and heating water buffer cylinder (cont.)

Pressure drops



Pressure drop on the heating water side

- (A) Cylinder capacity 300 and 500 l
- (B) Cylinder capacity 200 l



Pressure drop on the DHW side

4.5 Specification Vitocell 100-B, type CVB

For DHW heating in conjunction with boilers and solar collectors for dual mode operation.

Suitable for the following systems:

- DHW temperatures up to 95 °C
- Heating water flow temperature up to 160 °C

- Solar flow temperature up to 160 °C
- Operating pressure on the heating water side up to 10 bar (1.0 MPa)
- Operating pressure on the solar side up to 10 bar (1.0 MPa)
- Operating pressure on the DHW side up to 10 bar (1.0 MPa)

Cylinder capacity			300		400		500	
Indirect coil			upper	lower	upper	lower	upper	lower
DIN register no.			9W242/11-13 MC/E					
Continuous output for DHW heating from 10 to 45 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C	kW	31	53	42	63	47	70
		l/h	761	1302	1032	1548	1154	1720
	80 °C	kW	26	44	33	52	40	58
		l/h	638	1081	811	1278	982	1425
	70 °C	kW	20	33	25	39	30	45
		l/h	491	811	614	958	737	1106
Continuous output for DHW heating from 10 to 60 °C and a heating water flow temperature of ... at the heating water flow rate stated below	60 °C	kW	15	23	17	27	22	32
		l/h	368	565	418	663	540	786
	50 °C	kW	11	18	10	13	16	24
		l/h	270	442	246	319	393	589
	90 °C	kW	23	45	36	56	36	53
Continuous output for DHW heating from 10 to 60 °C and a heating water flow temperature of ... at the heating water flow rate stated below		l/h	395	774	619	963	619	911
	80 °C	kW	20	34	27	42	30	44
		l/h	344	584	464	722	516	756
	70 °C	kW	15	23	18	29	22	33
		l/h	258	395	310	499	378	567
Heating water flow rate for the stated continuous outputs		m³/h	3.0		3.0		3.0	
Max. connectable heat pump output at 55 °C heating water flow temperatures and 45 °C DHW temperatures for the specified heating water flow rate (both internal indirect coils connected in series)		kW	8		8		10	
Standby heat loss q_{BS} (standard parameter)		kWh/ 24 h	1.00		1.08		1.30	
Standby capacity V_{aux}		l	127		167		231	
Solar capacity V_{sol}		l	173		233		269	
Dimensions								
Length a (Ø)	– Incl. thermal insulation	mm	633		859		859	
	– Excl. thermal insulation	mm	–		650		650	
Total width b	– Incl. thermal insulation	mm	705		923		923	
	– Excl. thermal insulation	mm	–		881		881	
Height c	– Incl. thermal insulation	mm	1746		1624		1948	
	– Excl. thermal insulation	mm	–		1518		1844	
Height when tilted	– Incl. thermal insulation	mm	1792		–		–	
	– Excl. thermal insulation	mm	–		1550		1860	
Weight incl. thermal insulation		kg	160		167		205	
Total weight in operation with immersion heater		kg	462		569		707	
Heating water content		l	6		6.5		9	
Heating surface		m²	0.9		1.0		1.4	
Connections								
Indirect coils (male thread)		R	1		1		1	
Cold water, DHW (male thread)		R	1		1¼		1¼	
DHW circulation (male thread)		R	1		1		1	
Immersion heater (female thread)		Rp	1½		1½		1½	

Information regarding the upper indirect coil

The upper indirect coil is intended to be connected to a heat generator.

Information regarding the lower indirect coil

The lower indirect coil is designed for connection to solar collectors. To install the cylinder temperature sensor, use the threaded elbow with sensor well provided in the standard delivery.

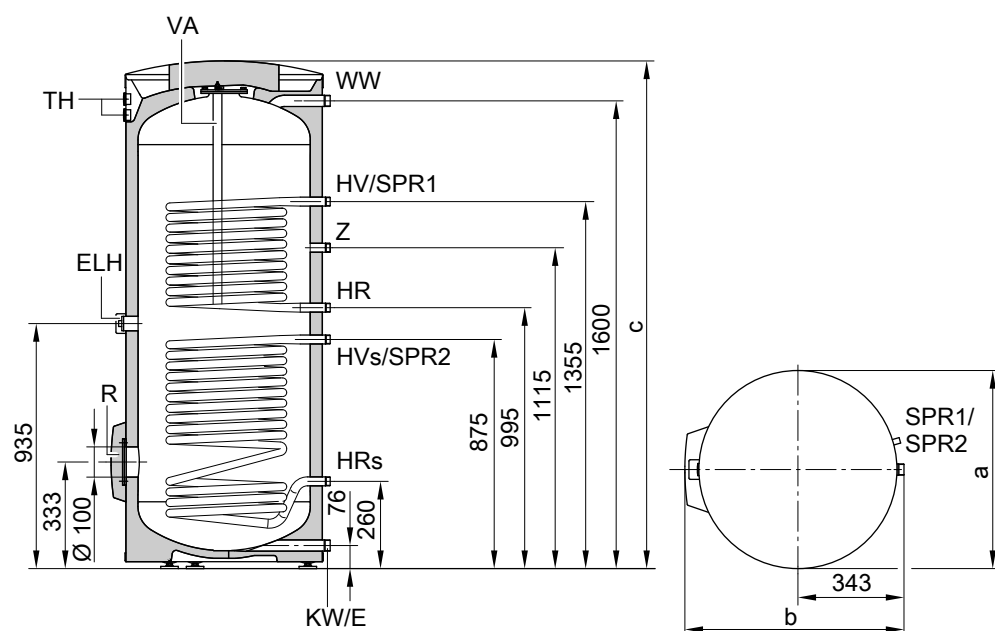
Information regarding continuous output

When engineering systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is only achieved when the rated boiler heating output ≥ continuous output.

The Vitocell 100-B with 300 and 400 l capacity is also available in white.

DHW cylinder and heating water buffer cylinder (cont.)

300 l capacity



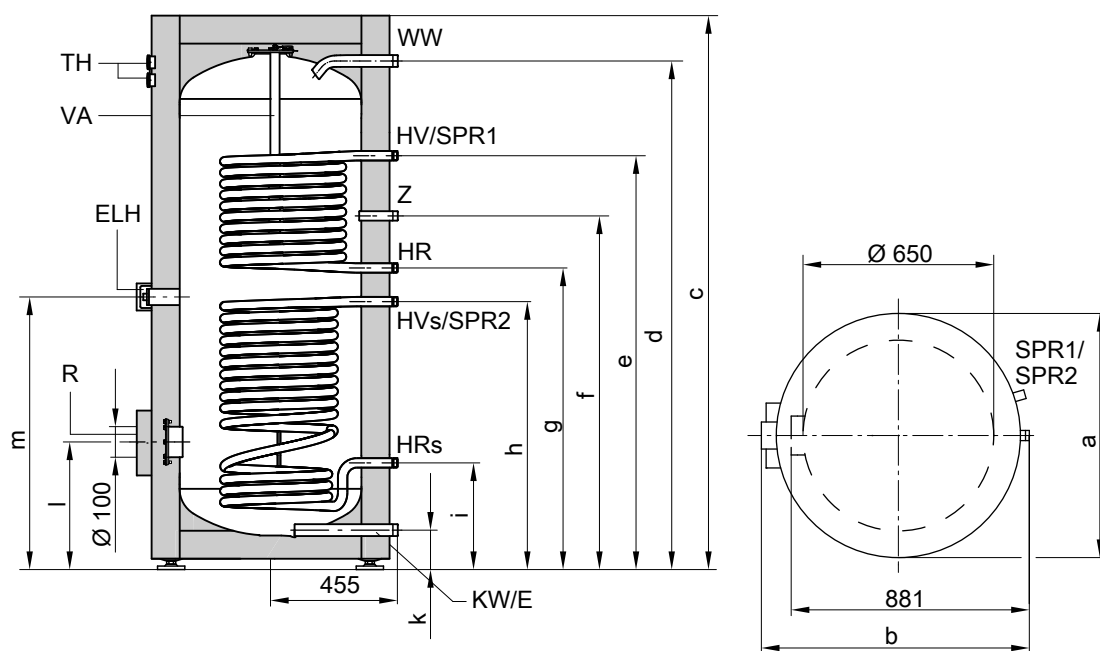
E	Drain
ELH	Immersion heater
HR	Heating water return
HR _s	Heating water return, solar thermal system
HV	Heating water flow
HV _s	Heating water flow, solar thermal system
KW	Cold water
R	Inspection and cleaning aperture with flange cover (also suitable for installation of an immersion heater)

SPR1	Cylinder temperature sensor of the cylinder temperature controller
SPR2	Temperature sensors/thermometer
TH	Thermometer (accessories)
VA	Protective magnesium anode
WW	DHW
Z	DHW circulation

Cylinder capacity	l	300
a	mm	633
b	mm	705
c	mm	1746

DHW cylinder and heating water buffer cylinder (cont.)

400 and 500 l capacity



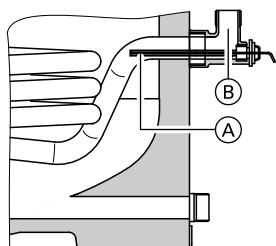
E	Drain
ELH	Immersion heater
HR	Heating water return
HR _s	Heating water return, solar thermal system
HV	Heating water flow
HV _s	Heating water flow, solar thermal system
KW	Cold water
R	Inspection and cleaning aperture with flange cover (also suitable for installation of an immersion heater)

SPR1	Cylinder temperature sensor of the cylinder temperature controller
SPR2	Temperature sensors/thermometer
TH	Thermometer (accessories)
VA	Protective magnesium anode
WW	DHW
Z	DHW circulation

Cylinder capacity	l	400	500
a	mm	859	859
b	mm	923	923
c	mm	1624	1948
d	mm	1458	1784
e	mm	1204	1444
f	mm	1044	1230
g	mm	924	1044
h	mm	804	924
i	mm	349	349
k	mm	107	107
l	mm	422	422
m	mm	864	984

DHW cylinder and heating water buffer cylinder (cont.)

Cylinder temperature sensor for solar operation



Arrangement of cylinder temperature sensor in the heating water return HR_s

- (A) Cylinder temperature sensor (standard delivery of solar control unit)
- (B) Threaded elbow with sensor well (standard delivery)

Performance factor N_L

To DIN 4708.

Upper indirect coil.

Cylinder storage temperature T_{cyl} = cold water inlet temperature

+ 50 K ^{+5 K/-0 K}

Cylinder capacity	I	300	400	500
Performance factor N_L at heating water flow temperature				
90 °C		1.6	3.0	6.0
80 °C		1.5	3.0	6.0
70 °C		1.4	2.5	5.0

Information regarding performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl} .

Standard values

- $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$
- $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$
- $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$
- $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$

Peak output (over 10 minutes)

Relative to the performance factor N_L .

DHW heating from 10 to 45 °C.

Cylinder capacity	I	300	400	500
Peak output (I/10 min) at heating water flow temperature				
90 °C		173	230	319
80 °C		168	230	319
70 °C		164	210	299

Max. draw-off rate (over 10 minutes)

Relative to the performance factor N_L .

With reheating.

DHW heating from 10 to 45 °C.

Cylinder capacity	I	300	400	500
Max. draw-off rate (l/min) at heating water flow temperature				
90 °C		17	23	32
80 °C		17	23	32
70 °C		16	21	30

Drawable water volume

Cylinder content heated to 60 °C.

Without reheating.

DHW cylinder and heating water buffer cylinder (cont.)

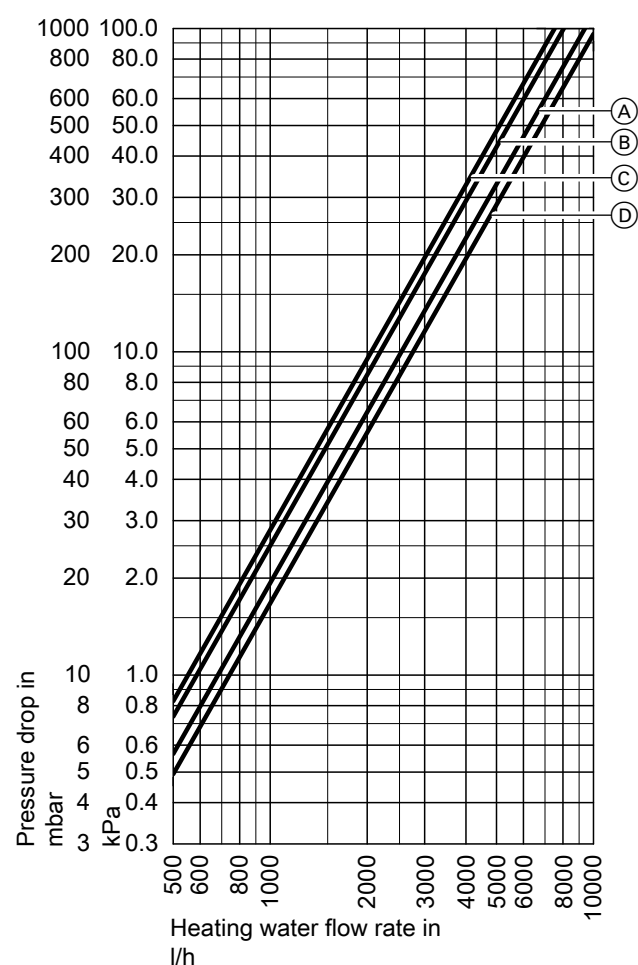
Cylinder capacity	l	300	400	500
Draw-off rate	l/min	15	15	15
Drawable water volume	l	110	120	220
Water at t = 60 °C (constant)				

Heat-up time

The heat-up times specified will be achieved if the max. continuous output of the DHW cylinder is made available at the respective heating water flow temperature and when heating DHW from 10 to 60 °C.

Cylinder capacity	l	300	400	500
Heat-up time (min.) at heating water flow temperature				
90 °C		16	17	19
80 °C		22	23	24
70 °C		30	36	37

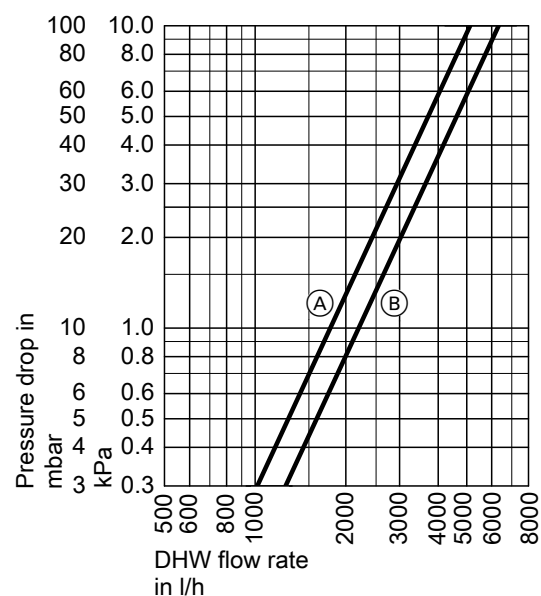
Pressure drops



Pressure drop on the heating water side

- (A) Cylinder capacity 300 l (upper indirect coil)
- (B) Cylinder capacity 300 l (lower indirect coil)
- (C) Cylinder capacity 400 and 500 l (upper indirect coil)
- (D) Cylinder capacity 400 and 500 l (lower indirect coil)

- (C) Cylinder capacity 500 l (lower indirect coil)
- (D) Cylinder capacity 400 l (lower indirect coil)



Pressure drop on the DHW side

- (A) Cylinder capacity 300 l
- (B) Cylinder capacity 400 and 500 l

4.6 Specification Vitocell 100-U, type CVUA

For DHW heating in conjunction with boilers and solar collectors.

Suitable for the following systems:

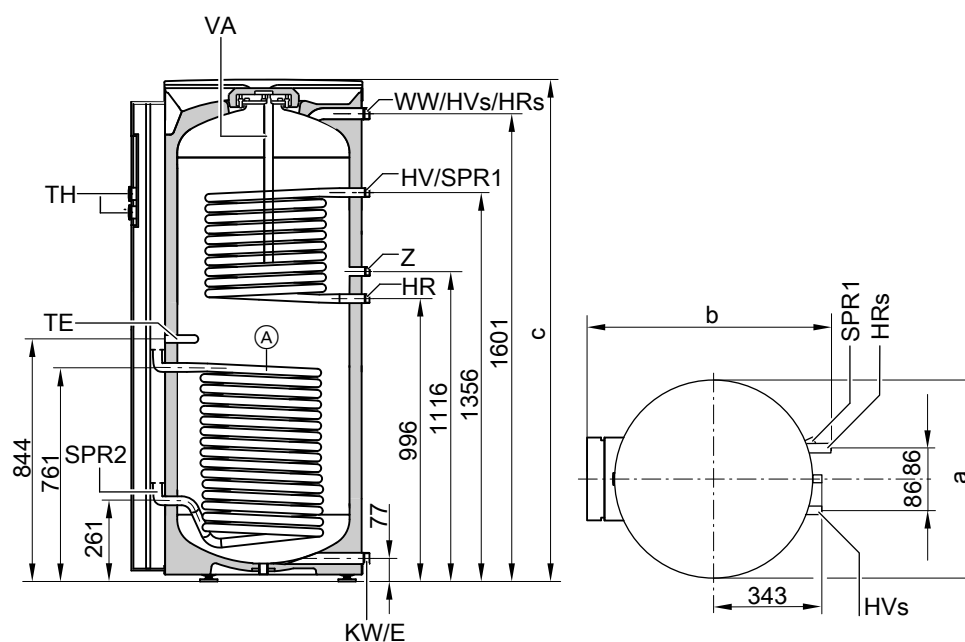
- DHW temperature up to **95 °C**
- Heating water flow temperature up to **160 °C**
- Solar flow temperature up to **110 °C**
- Operating pressure **on the heating water side** up to **10 bar (1.0 MPa)**
- Operating pressure **on the solar side** up to **10 bar (1.0 MPa)**
- Operating pressure **on the DHW side** up to **10 bar (1.0 MPa)**

Cylinder capacity	l	300
DIN register no.		0266/07-13MC/E
Continuous output, upper indirect coil		
For DHW heating from 10 to 45 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C kW l/h	31 761
	80 °C kW l/h	26 638
	70 °C kW l/h	20 491
	60 °C kW l/h	15 368
	50 °C kW l/h	11 270
Continuous output, upper indirect coil		
For DHW heating from 10 to 60 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C kW l/h	23 395
	80 °C kW l/h	20 344
	70 °C kW l/h	15 258
Heating water flow rate for the stated continuous outputs	m ³ /h	3.0
Draw-off rate	l/min	15
Drawable water volume	l	110
Without reheating Cylinder volume heated to 60 °C Water at t = 60 °C (constant)		
Thermal insulation		Rigid PUR foam
Standby heat loss q_{BS} (standard parameter)	kWh/24 h	1.00
Standby capacity V_{aux}	l	127
Solar capacity V_{sol}	l	173
Dimensions (incl. thermal insulation)		
Length a (Ø)	mm	631
Total width b	mm	780
Height c	mm	1705
Height when tilted	mm	1790
Weight incl. thermal insulation	kg	179
Total weight in operation	kg	481
Heating water content		
– Upper indirect coil	l	6
– Lower indirect coil	l	10
Heating surface		
– Upper indirect coil	m ²	0.9
– Lower indirect coil	m ²	1.5
Connections (male thread)		
Heating water flow and return	R	1
Cold water, DHW	R	1
DHW circulation	R	1

Information regarding continuous output of the upper indirect coil

When engineering systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is only achieved when the rated boiler heating output $\geq$ continuous output.

DHW cylinder and heating water buffer cylinder (cont.)

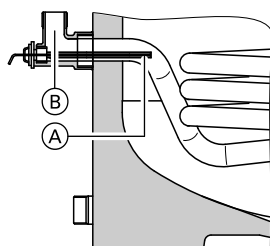


- Ⓐ Lower indirect coil (solar thermal system)
The connections HV_s and HR_s are located on the top of the DHW cylinder
- E Drain
- HR Heating water return
- HR_s Heating water return, solar thermal system
- HV Heating water flow
- HV_s Heating water flow, solar thermal system
- KW Cold water

- SPR1 Cylinder temperature sensor of the cylinder temperature controller
- SPR2 Cylinder temperature sensor of the solar thermal system
- TE Sensor well for lower thermometer
- TH Thermometer
- VA Protective magnesium anode
- WW DHW
- Z DHW circulation

Dimension	mm
a	631
b	780
c	1705

Cylinder temperature sensor for solar operation



Arrangement of cylinder temperature sensor in the heating water return HR_s

- Ⓐ Cylinder temperature sensor (standard delivery of solar control unit)
- Ⓑ Threaded elbow with sensor well (standard delivery)

Performance factor N_L

To DIN 4708.

Upper indirect coil.

Cylinder storage temperature T_{cyl} = cold water inlet temperature +50 K

+5 K/-0 K.

DHW cylinder and heating water buffer cylinder (cont.)

Performance factor N_L at heating water flow temperature

90 °C	1.6
80 °C	1.5
70 °C	1.4

Information regarding performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl} .

Standard values

- $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$
- $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$
- $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$
- $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$

Peak output (over 10 minutes)

Relative to the performance factor N_L .

DHW heating from 10 to 45 °C.

Peak output (l/10 min) at a heating water flow temperature of

90 °C	173
80 °C	168
70 °C	164

Max. draw-off rate (over 10 minutes)

Relative to the performance factor N_L .

With reheating.

DHW heating from 10 to 45 °C.

Max. draw-off rate (l/min) at heating water flow temperature

90 °C	17
80 °C	17
70 °C	16

Heat-up time

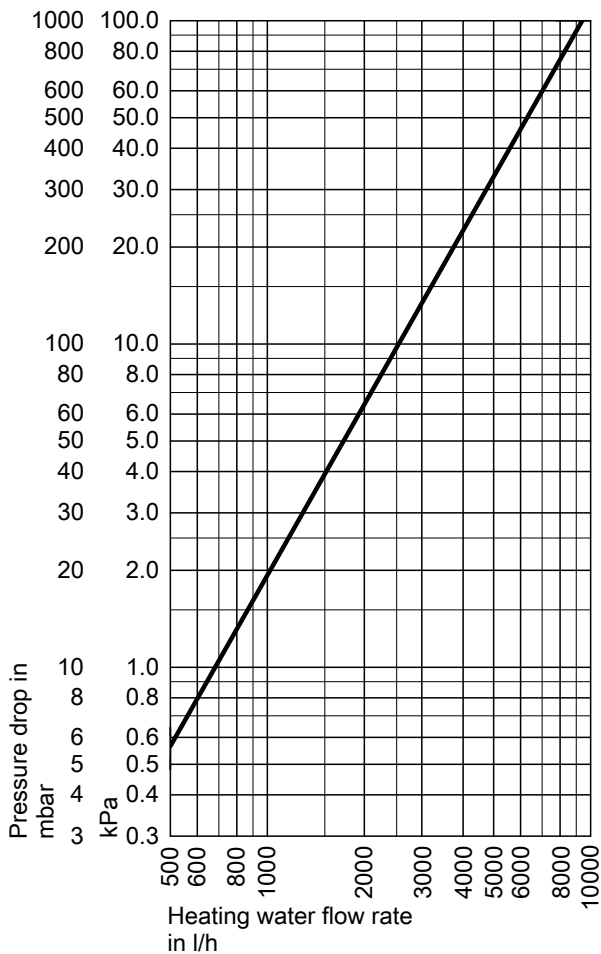
The specified heat-up times will be achieved subject to the maximum continuous output of the DHW cylinder being made available at the relevant heating water flow temperature and when DHW is heated from 10 to 60 °C.

Heat-up time (min.) at heating water flow temperature

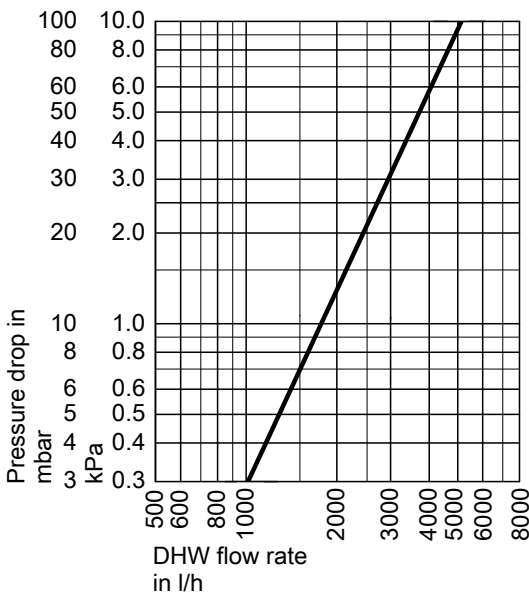
90 °C	16
80 °C	22
70 °C	30

DHW cylinder and heating water buffer cylinder (cont.)

Pressure drops



Pressure drop on the heating water side, upper indirect coil



Pressure drop on the DHW side

4.7 Specification Vitocell 300-B, type EVB

For DHW heating in conjunction with boilers and solar collectors for dual mode operation.

Suitable for the following systems:

- DHW temperature up to **95 °C**
- Heating water flow temperature up to **200 °C**
- Solar flow temperature up to **200 °C**
- Operating pressure **on the heating water side** up to **25 bar (2.5 MPa)**
- Operating pressure **on the solar side** up to **25 bar (2.5 MPa)**
- Operating pressure **on the DHW side** up to **10 bar (1.0 MPa)**

Cylinder capacity			300		500	
Indirect coil			upper	lower	upper	lower
DIN registration number			0100/08-10MC			
Continuous output For DHW heating from 10 to 45 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C	kW	80	93	80	96
		l/h	1965	2285	1965	2358
	80 °C	kW	64	72	64	73
		l/h	1572	1769	1572	1793
	70 °C	kW	45	52	45	56
		l/h	1106	1277	1106	1376
	60 °C	kW	28	30	28	37
		l/h	688	737	688	909
	50 °C	kW	15	15	15	18
		l/h	368	368	368	442
Continuous output For DHW heating from 10 to 60 °C and a heating water flow temperature of ... at the heating water flow rate stated below	90 °C	kW	74	82	74	81
		l/h	1273	1410	1273	1393
	80 °C	kW	54	59	54	62
		l/h	929	1014	929	1066
	70 °C	kW	35	41	35	43
		l/h	602	705	602	739
Heating water flow rate for the stated continuous flow rates			m ³ /h	5.0	5.0	5.0
Max. connectable heat pump output			kW	12		15
At a heating water flow temperature of 55 °C and a DHW temperature of 45 °C						
For the specified heating water flow rate (both indirect coils connected in series)						
Standby heat loss q_{BS}			kWh/24 h	1.17		1.37
(standard parameter)						
Standby capacity V_{aux}			l	149		245
Solar capacity V_{sol}			l	151		255
Dimensions						
Length a (Ø)	– Incl. thermal insulation	mm		633		925
	– Excl. thermal insulation	mm		–		715
Width b	– Incl. thermal insulation	mm		704		975
	– Excl. thermal insulation	mm		–		914
Height c	– Incl. thermal insulation	mm		1779		1738
	– Excl. thermal insulation	mm		–		1667
Height when tilted	– Incl. thermal insulation	mm		1821		–
	– Excl. thermal insulation	mm		–		1690
Weight incl. thermal insulation			kg	114		125
Heating water content			l	11	11	15
Heating surface			m ²	1.50	1.50	1.90
Connections (male thread)						
Indirect coils			R	1		1¼
Cold water, DHW			R	1		1¼
DHW circulation			R	1		1¼

Information regarding the upper indirect coil

The upper indirect coil is intended to be connected to a heat generator.

Information regarding the lower indirect coil

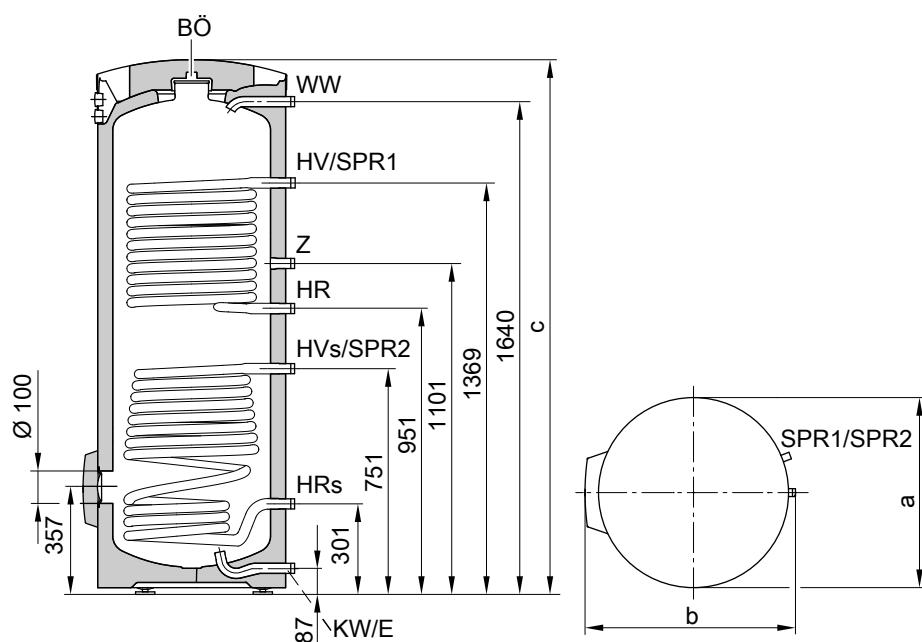
The lower indirect coil is designed for connection to solar collectors. To install the cylinder temperature sensor, use the threaded elbow with sensor well provided in the standard delivery.

Information regarding continuous output

When engineering systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is only achieved when the rated boiler heating output $\geq$ continuous output.

DHW cylinder and heating water buffer cylinder (cont.)

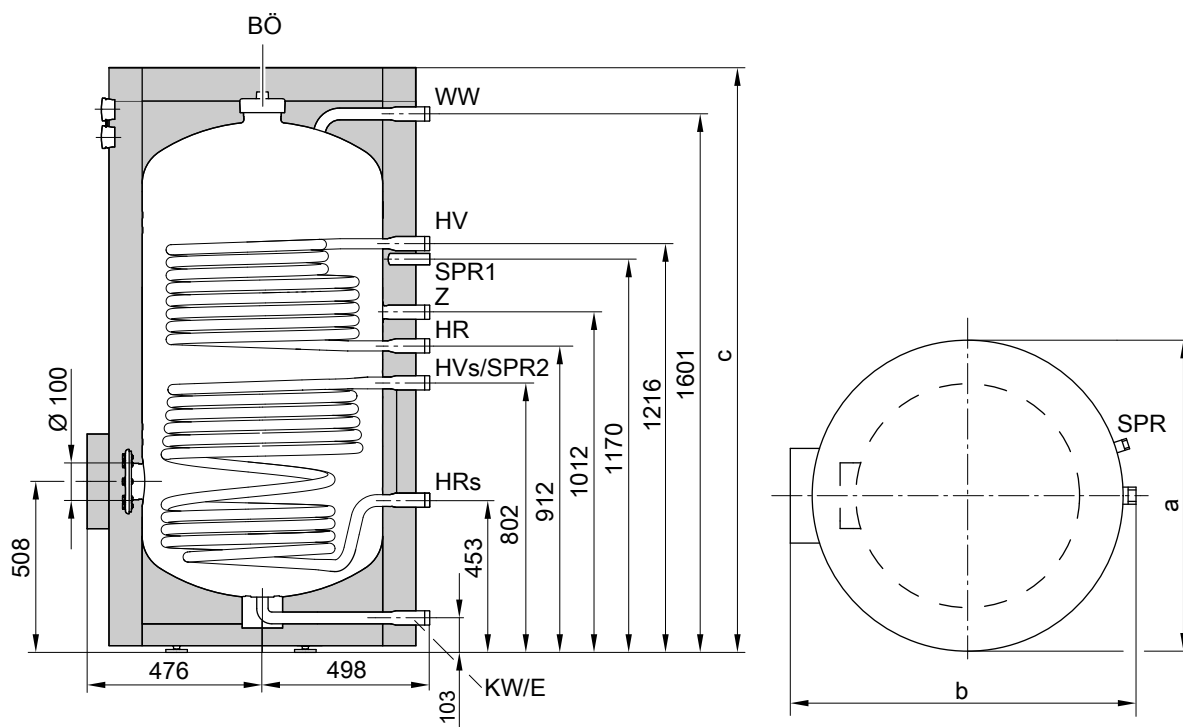
300 l capacity



BÖ Inspection and cleaning aperture
 E Drain outlet
 HR Heating water return
 HR_s Heating water return, solar thermal system
 HV Heating water flow
 HV_s Heating water flow, solar thermal system

KW Cold water
 SPR1 Cylinder temperature sensor of the cylinder temperature controller
 SPR2 Temperature sensors/thermometer
 WW DHW
 Z DHW circulation

500 l capacity



BÖ Inspection and cleaning aperture
 E Drain outlet
 HR Heating water return
 HR_s Heating water return, solar thermal system

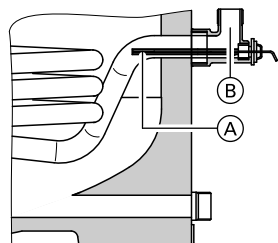
HV Heating water flow
 HV_s Heating water flow, solar thermal system
 KW Cold water

DHW cylinder and heating water buffer cylinder (cont.)

SPR1 Cylinder temperature sensor of the cylinder temperature controller
 SPR2 Temperature sensors/thermometer

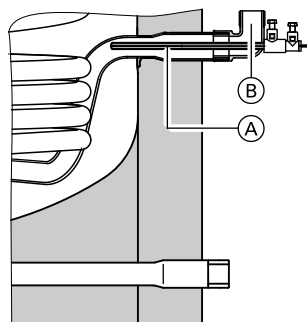
WW DHW
 Z DHW circulation

Cylinder temperature sensor for solar operation



Cylinder capacity 300 I, positioning of cylinder temperature sensor in the heating water return HR_s

- Ⓐ Cylinder temperature sensor (standard delivery of solar control unit)
- Ⓑ Threaded elbow with sensor well (standard delivery)



Cylinder capacity 500 I, positioning of cylinder temperature sensor in the heating water return HR_s

- Ⓐ Cylinder temperature sensor (standard delivery of solar control unit)
- Ⓑ Threaded elbow with sensor well (standard delivery)

Performance factor N_L

To DIN 4708.
 Upper indirect coil.

Cylinder storage temperature T_{cyl} = cold water inlet temperature
 + 50 K +5 K/-0 K/K

Cylinder capacity	I	300	500
Performance factor N_L at heating water flow temperature			
90 °C		4.0	6.8
80 °C		3.5	6.8
70 °C		2.0	5.6

Information regarding performance factor N_L

The performance factor N_L depends on the cylinder storage temperature T_{cyl} .

Standard values

- $T_{cyl} = 60\text{ °C} \rightarrow 1.0 \times N_L$
- $T_{cyl} = 55\text{ °C} \rightarrow 0.75 \times N_L$
- $T_{cyl} = 50\text{ °C} \rightarrow 0.55 \times N_L$
- $T_{cyl} = 45\text{ °C} \rightarrow 0.3 \times N_L$

Peak output (over 10 minutes)

Relative to the performance factor N_L .

DHW heating from 10 to 45 °C.

Cylinder capacity	I	300	500
Peak output (l/10 min) at heating water flow temperature			
90 °C		260	340
80 °C		250	340
70 °C		190	310

Max. draw-off rate (over 10 minutes)

Relative to the performance factor N_L .

With reheating.

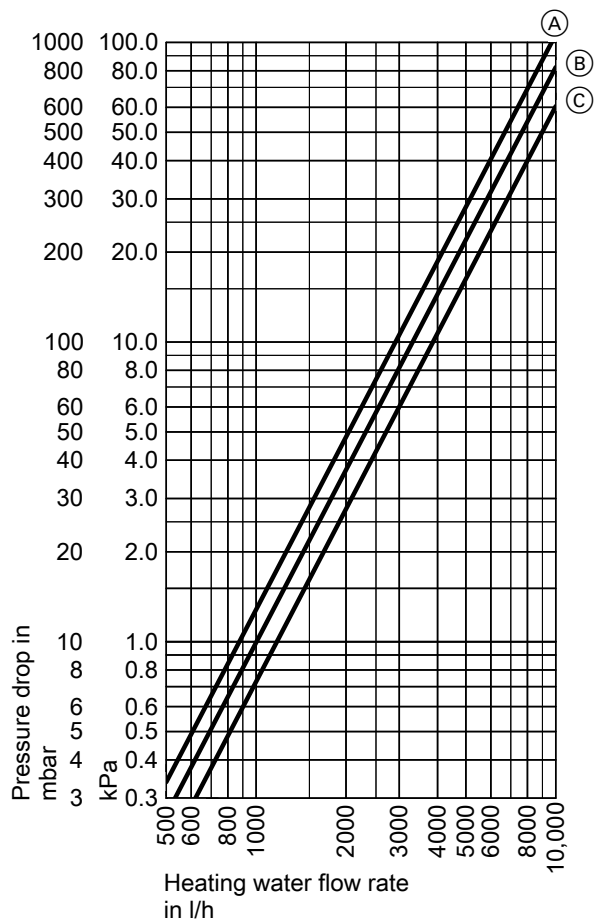
DHW heating from 10 to 45 °C.

Cylinder capacity	I	300	500
Max. draw-off rate (l/min) at heating water flow temperature			
90 °C		26	34
80 °C		25	34
70 °C		19	31

5614 839 GB

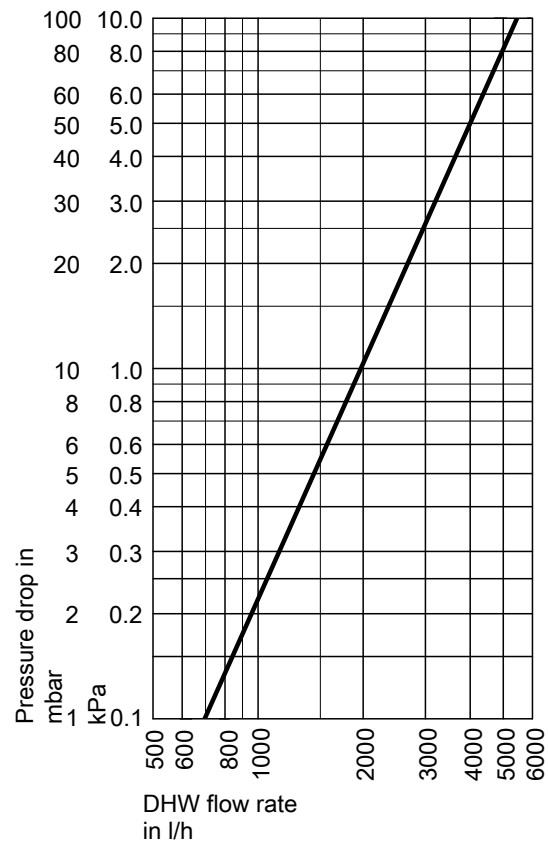
DHW cylinder and heating water buffer cylinder (cont.)

Pressure drops



Pressure drop on the heating water side

- (A) Cylinder capacity 500 l (lower indirect coil)
- (B) Cylinder capacity 300 l (lower indirect coil)
- (C) Cylinder capacity 300 and 500 l (upper indirect coil)



Pressure drop on the DHW side

4.8 Specification Vitocell 100-E, type SVPA

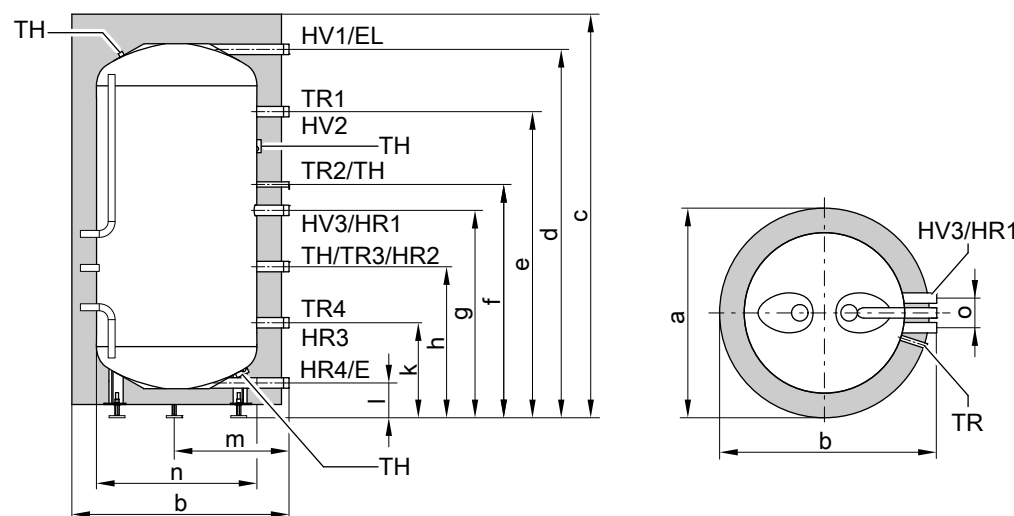
For storing heating water in conjunction with solar collectors, heat pumps and solid fuel boilers.

Suitable for the following systems:

- Heating water flow temperature up to 110 °C
- Operating pressure on the heating side up to 3 bar (0.3 MPa)

Vitocell 100-E (type SVPA, 750 and 950 litres)

Cylinder capacity	I	750	950
Dimensions			
Length (Ø)			
– Incl. thermal insulation	a	1004	1004
– Excl. thermal insulation		790	790
Width	b	1060	1060
Height			
– Incl. thermal insulation	c	1895	2195
– Excl. thermal insulation		1814	2120
Height when tilted excl. thermal insulation and adjustable feet		1890	2195
Weight			
– Incl. thermal insulation	kg	147	168
– Excl. thermal insulation	kg	125	143
Connections			
Heating water flow and return	R	2	2
Standby heat loss q_{BS} at 45 K temperature differential (actual value to DIN 4753-8)	kWh/24 h	3.4	3.9



Vitocell 100-E (type SVPA, 750 and 950 litres)

E Drain
EL Air vent valve
HR Heating water return
HV Heating water flow

TH Thermometer sensor retainer
TR Sensor well for cylinder temperature sensor or temperature controller

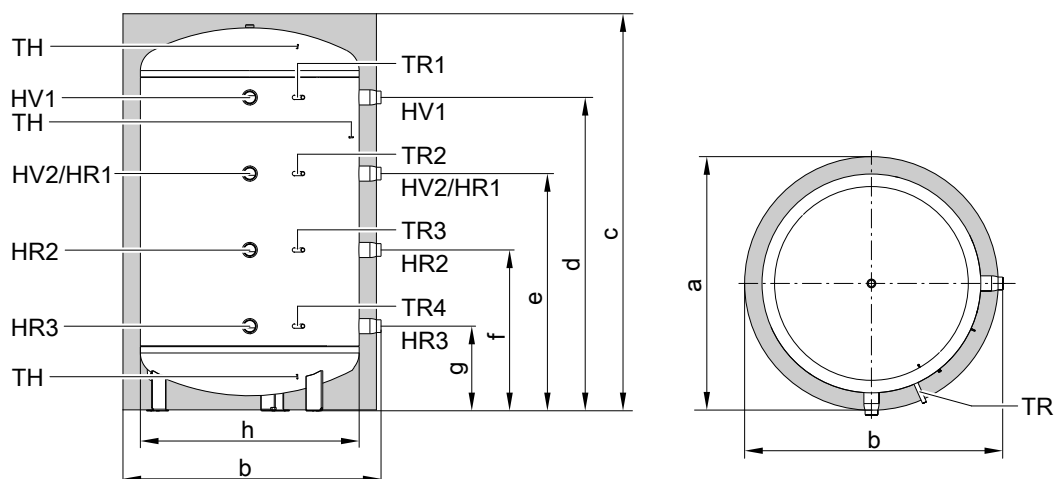
Cylinder capacity	I	750	950
Length (Ø)	a	1004	1004
Width	b	1060	1060
Height	c	1895	2195
	d	1777	2083
	e	1547	1853
	f	1067	1219

Cylinder capacity	I	750	950
	g	967	1119
	h	676	752
	k	386	386
	l	155	155
	m	535	535
Ø excl. thermal insulation	n	Ø 790	Ø 790
	o	140	140

DHW cylinder and heating water buffer cylinder (cont.)

Vitocell 100-E (type SVPA, 1500 and 2000 litres)

Cylinder capacity			1500		2000	
Thermal insulation			Standard (2-part)	Highly efficient (3-part)	Standard (2-part)	Highly efficient (3-part)
Dimensions						
Length (Ø)						
– Incl. thermal insulation	a	mm	1310	1370	1310	1370
– Excl. thermal insulation		mm	1100	1100	1100	1100
Width	b	mm	1345	1440	1345	1440
Height						
– Incl. thermal insulation	c	mm	2210	2210	2640	2640
– Excl. thermal insulation		mm	1939	1939	2378	2378
Height when tilted excl. thermal insulation and adjustable feet		mm	1967	1967	2402	2402
Weight						
– Incl. thermal insulation		kg	217	224	253	265
– Excl. thermal insulation		kg	170	170	201	201
Connections (male thread)						
Heating water flow and return	R/G		2	2	2	2
Standby heat loss q_{BS} to DIN EN 12897)						
		kWh/24 h	4.2	3.2	5.4	3.8



Vitocell 100-E (type SVPA, 1500 and 2000 litres)

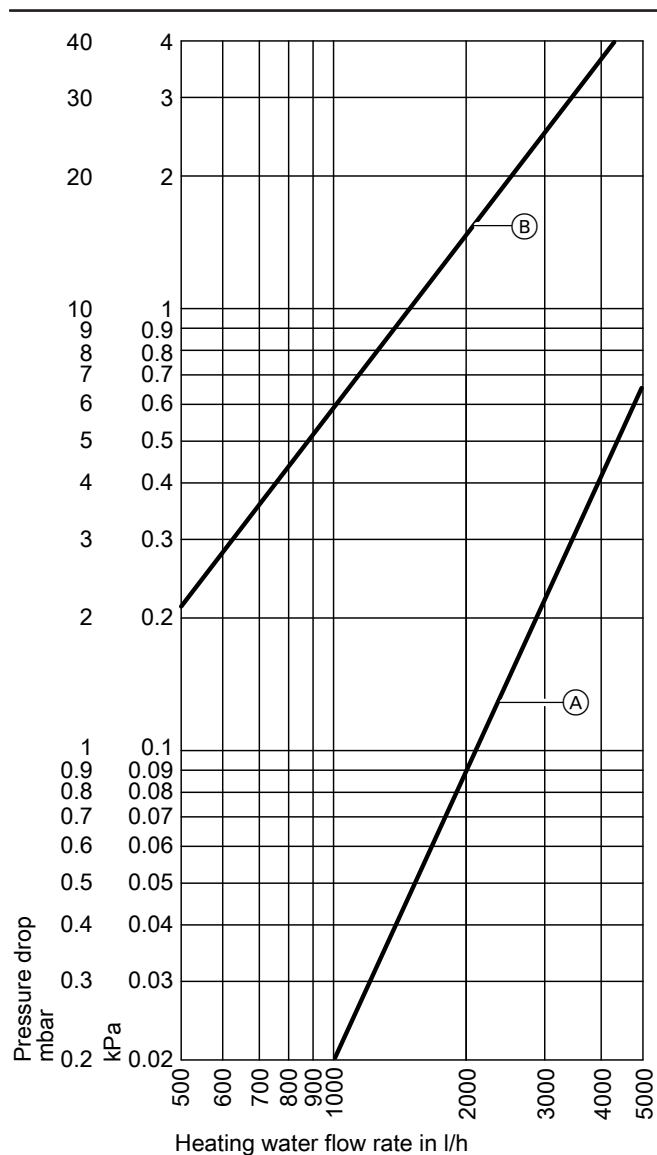
- HR Heating water return
 HV Heating water flow
 TH Retainer for securing the thermometer sensor or an additional sensor
 TR Sensor well for cylinder temperature sensor/temperature controller

Dimensions

Cylinder capacity			1500		2000	
Thermal insulation			Standard (2-part)	Highly efficient (3-part)	Standard (2-part)	Highly efficient (3-part)
Length (Ø)	a	mm	1310	1500	1310	1500
Width	b	mm	1345	1440	1345	1440
Height	c	mm	2210	2210	2640	2640
	d	mm	1513	1513	1953	1953
	e	mm	1165	1165	1460	1460
	f	mm	816	816	962	962
	g	mm	468	468	467	467
Ø excl. thermal insulation	h	mm	1100	1100	1100	1100

DHW cylinder and heating water buffer cylinder (cont.)

Pressure drop on the heating water side



Vitocell 100-E, type SVPA

- (A) 750 and 950 litre capacity
- (B) 1500 and 2000 litre capacity

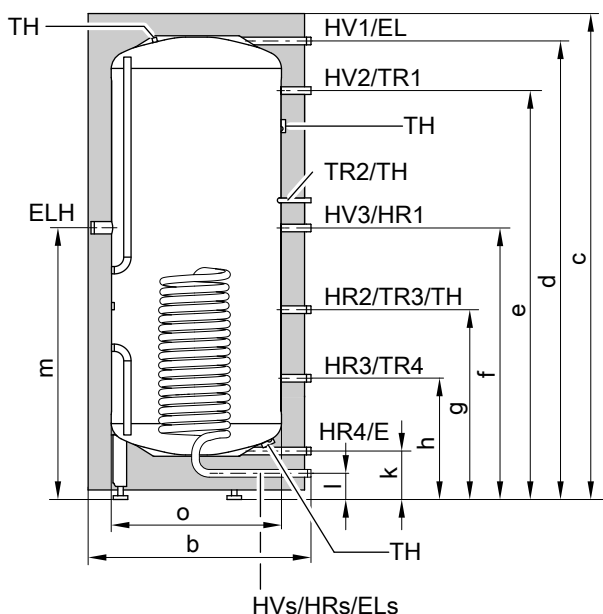
4.9 Specification Vitocell 140-E, type SEIA and 160-E, type SESA

For storing heating water in conjunction with solar collectors, heat pumps and solid fuel boilers.

Suitable for the following systems:

- Heating water flow temperature up to 110 °C
- Solar flow temperature up to 140 °C
- Operating pressure on the heating water side up to 3 bar (0.3 MPa)
- Operating pressure on the solar side up to 10 bar (1.0 MPa)

			Vitocell 140-E		Vitocell 160-E	
Cylinder capacity	I		750	950	750	950
DIN register no.				0264/07E		0265/07E
Solar indirect coil capacity	I		12	14	12	14
Dimensions						
Length (Ø)						
– Incl. thermal insulation	a	mm	1004	1004	1004	1004
– Excl. thermal insulation		mm	790	790	790	790
Width	b	mm	1059	1059	1059	1059
Height						
– Incl. thermal insulation	c	mm	1895	2195	1895	2195
– Excl. thermal insulation		mm	1814	2120	1814	2120
Height when tilted						
– Excl. thermal insulation and adjustable feet		mm	1890	2195	1890	2195
Weight						
– Incl. thermal insulation		kg	174	199	183	210
– Excl. thermal insulation		kg	152	174	161	185
Connections (male thread)						
Heating water flow and return	R		2	2	2	2
Heating water flow and return (solar)	G		1	1	1	1
Solar indirect coil						
Heating surface	m ²		1.8	2.1	1.8	2.1
Standby heat loss q_{BS} (standard parameter)	kWh/24 h		1.63	1.67	1.63	1.67
Standby capacity V_{aux}	I		380	453	380	453
Solar capacity V_{sol}	I		370	497	370	497



Vitocell 140-E (type SEIA, 750 and 950 litres capacity)

E Drain
EL Air vent valve

EL_s Solar indirect coil, air vent valve

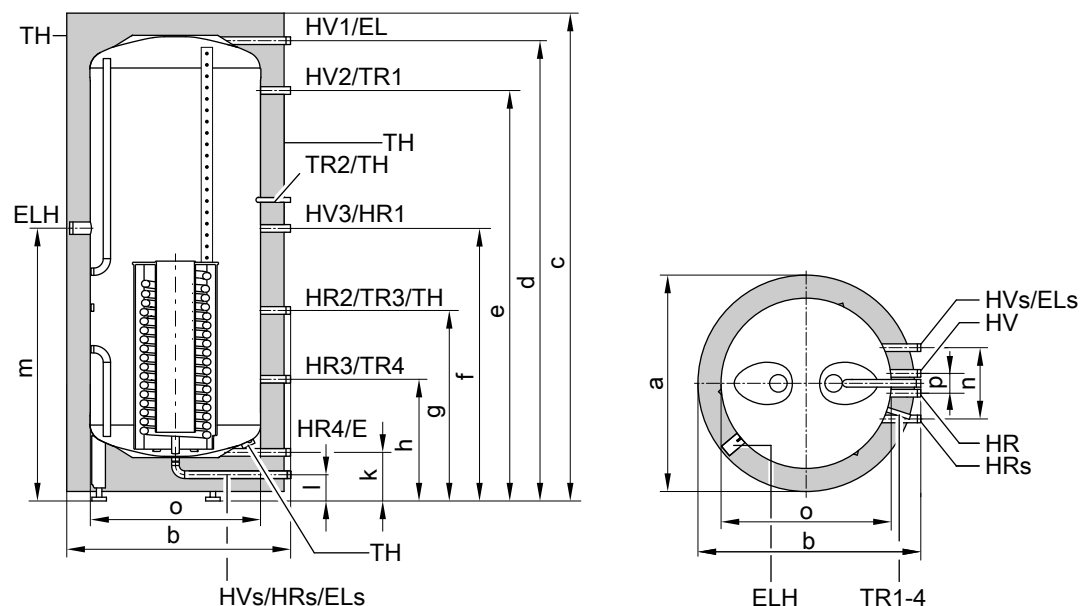
DHW cylinder and heating water buffer cylinder (cont.)

ELH Immersion heater
(female connection Rp 1½)
HR Heating water return
HR_s Heating water return, solar thermal system

HV Heating water flow
HV_s Heating water flow, solar thermal system
TH Retainer for thermometer sensor or additional sensor
TR Temperature sensor or temperature controller

Dimensions Vitocell 140-E

Cylinder capacity	I	750	950
Length (∅)	a mm	1004	1004
Width	b mm	1059	1059
Height	c mm	1895	2195
	d mm	1777	2083
	e mm	1547	1853
	f mm	967	1119
	g mm	676	752
	h mm	386	386
	k mm	155	155
	l mm	75	75
	m mm	991	1181
	n mm	370	370
Length (∅) excl. thermal insulation	o mm	790	790
	p mm	140	140



Vitocell 160-E (type SESA, 750 and 950 litres capacity)

E Drain
EL Air vent valve
EL_s Solar indirect coil, air vent valve
ELH Immersion heater
(female connection Rp 1½)
HR Heating water return

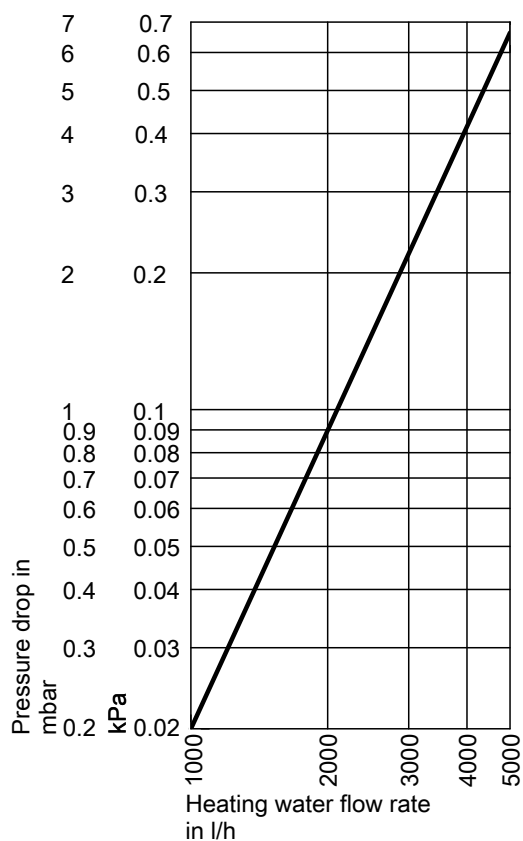
HR_s Heating water return, solar thermal system
HV Heating water flow
HV_s Heating water flow, solar thermal system
TH Retainer for thermometer sensor or additional sensor
TR Temperature sensor or temperature controller

DHW cylinder and heating water buffer cylinder (cont.)

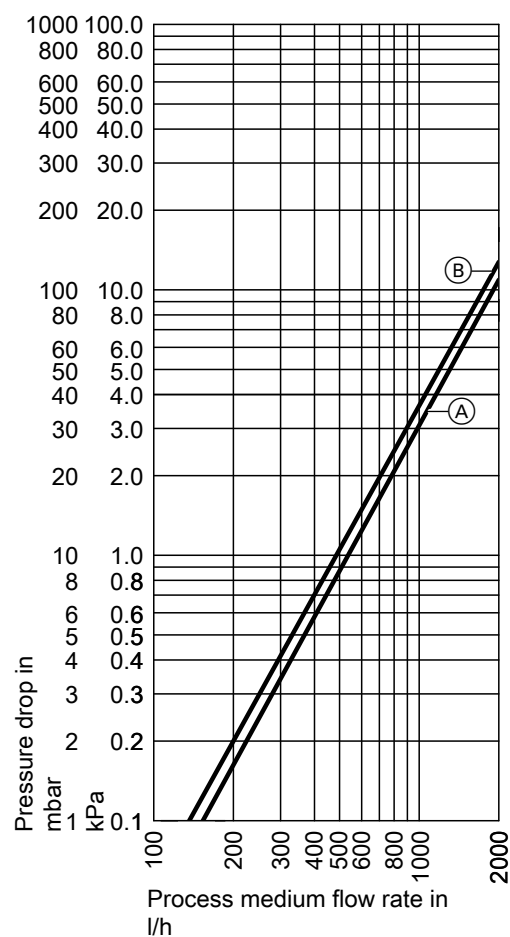
Dimensions Vitocell 160-E

Cylinder capacity	I	750	950
Length (Ø)	a mm	1004	1004
Width	b mm	1059	1059
Height	c mm	1895	2195
	d mm	1777	2083
	e mm	1547	1853
	f mm	967	1119
	g mm	676	752
	h mm	386	386
	k mm	155	155
	l mm	75	75
	m mm	991	1181
	n mm	370	370
Length (Ø) excl. thermal insulation	o mm	790	790
	p mm	140	140

Pressure drops



Pressure drop on the heating water side



Pressure drop on the solar side

- (A) Cylinder capacity 750 l
- (B) Cylinder capacity 950 l

4.10 Specification Vitocell 340-M, type SVKA and 360-M, type SVSA

For storing heating water and heating DHW in conjunction with solar collectors, heat pumps and solid fuel boilers

Suitable for the following systems:

■ DHW temperatures up to **95 °C**

■ Heating water flow temperature up to **110 °C**

■ Solar flow temperature up to **140 °C**

■ Operating pressure on the heating water side up to **3 bar (0.3 MPa)**

■ Operating pressure on the solar side up to **10 bar (1.0 MPa)**

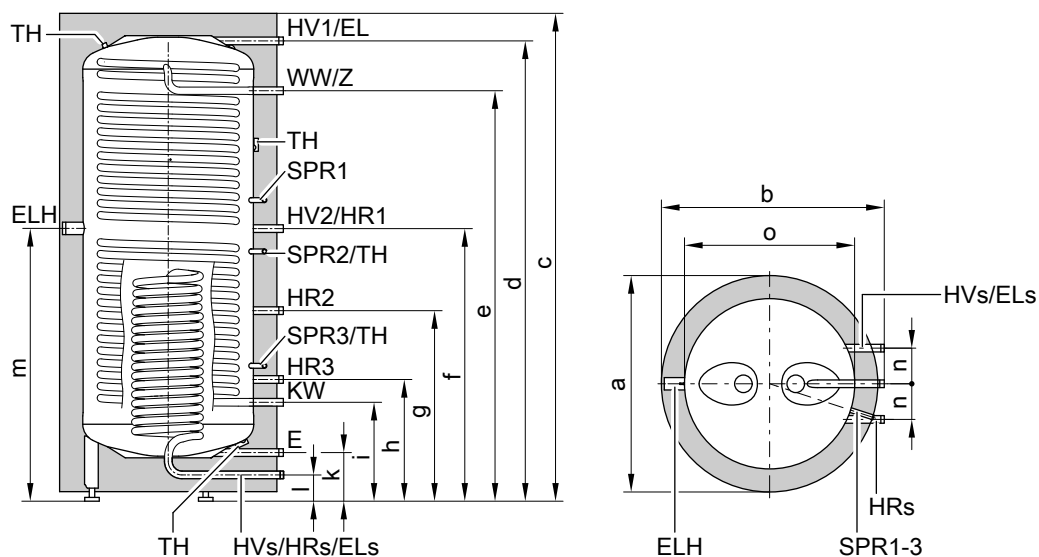
■ Operating pressure on the DHW side up to **10 bar (1.0 MPa)**

■ Total water hardness of up to **20 °dH (3.6 mol/m³)**

Cylinder capacity	l	750	950
Heating water content	l	708	906
DHW capacity	l	30	30
Solar indirect coil capacity	l	12	14
DIN registration number			
– Vitocell 340-M		9W262-10MC/E	
– Vitocell 360-M		9W263-10MC/E	
Dimensions			
Length (Ø)			
– Incl. thermal insulation	a mm	1004	1004
– Excl. thermal insulation	o mm	790	790
Width	b mm	1059	1059
Height			
– Incl. thermal insulation	c mm	1895	2195
– Excl. thermal insulation	mm	1815	2120
Height when tilted			
– Excl. thermal insulation and adjustable feet	mm	1890	2165
Weight of Vitocell 340-M			
– Incl. thermal insulation	kg	214	239
– Excl. thermal insulation	kg	192	214
Weight of Vitocell 360-M			
– Incl. thermal insulation	kg	223	248
– Excl. thermal insulation	kg	201	223
Connections (male thread)			
Heating water flow and return	R	1¼	1¼
Cold water, DHW	R	1	1
Heating water flow and return (solar)	G	1	1
Drain	R	1¼	1¼
Solar indirect coil			
Heating surface	m ²	1.8	2.1
DHW indirect coil			
Heating surface	m ²	6.7	6.7
Standby heat loss q_{BS} at 45 K temperature differential (standard parameter)	kWh/24 h	1.49	1.61
Standby capacity V_{aux}	l	346	435
Solar capacity V_{sol}	l	404	515

DHW cylinder and heating water buffer cylinder (cont.)

Vitocell 340-M, type SVKA



E Drain
EL Air vent valve
EL_s Solar indirect coil, air vent valve
ELH Immersion heater (female connection Rp 1½)
HR Heating water return
HR_s Heating water return, solar thermal system
HV Heating water flow

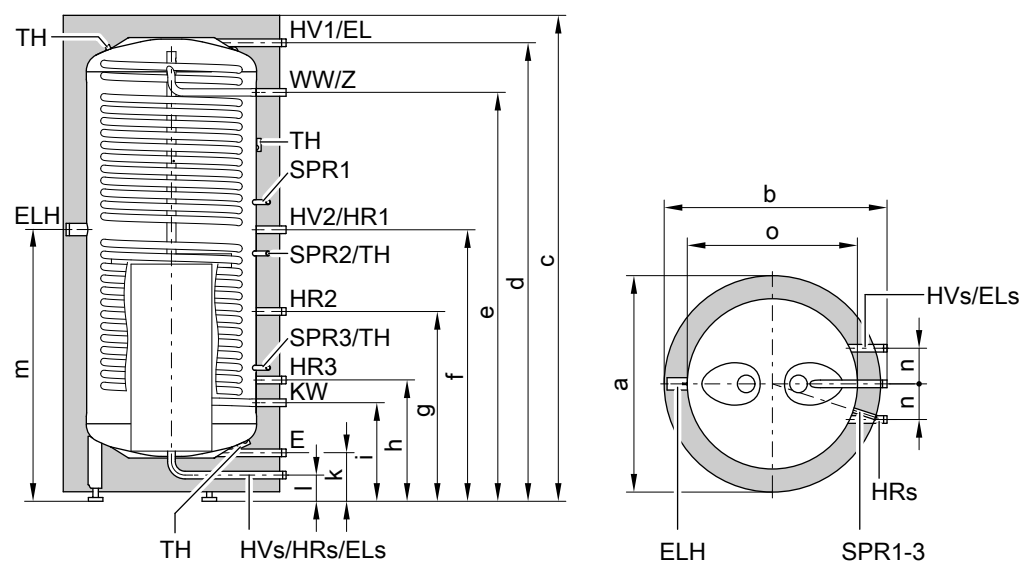
HV_s Heating water flow, solar thermal system
KW Cold water
TH Retainer for thermometer sensor or additional sensor
SPR Temperature sensor or temperature controller
WW DHW
Z DHW circulation (threaded DHW circulation fitting, accessories)

Dimensions

Cylinder capacity		I	750	950
Length (∅)	a	mm	1004	1004
Width	b	mm	1059	1059
Height	c	mm	1895	2195
	d	mm	1787	2093
	e	mm	1558	1863
	f	mm	1038	1158
	g	mm	850	850
	h	mm	483	483
	i	mm	383	383
	k	mm	145	145
	l	mm	75	75
	m	mm	1000	1135
	n	mm	185	185
Length excl. thermal insulation	o	mm	790	790

DHW cylinder and heating water buffer cylinder (cont.)

Vitocell 360-M, type SVSA



E	Drain
EL	Air vent valve
EL _s	Solar indirect coil, air vent valve
ELH	Immersion heater (female connection Rp 1½)
HR	Heating water return
HR _s	Heating water return, solar thermal system
HV	Heating water flow

HV _s	Heating water flow, solar thermal system
KW	Cold water
TH	Retainer for thermometer sensor or additional sensor
SPR	Temperature sensor or temperature controller
WW	DHW
Z	DHW circulation (threaded DHW circulation fitting, accessories)

Dimensions

Cylinder capacity		I	750	950
Length (Ø)	a	mm	1004	1004
Width	b	mm	1059	1059
Height	c	mm	1895	2195
	d	mm	1787	2093
	e	mm	1558	1863
	f	mm	1038	1158
	g	mm	850	850
	h	mm	483	483
	i	mm	383	383
	k	mm	145	145
	l	mm	75	75
	m	mm	1000	1135
	n	mm	185	185
Length excl. thermal insulation	o	mm	790	790

Continuous output

Continuous output	kW	15	22	33
for DHW heating from 10 to 45 °C and a heating water flow temperature of 70 °C at the heating water throughput stated below (tested at HV ₁ /HR ₁)	l/h	368	540	810
Heating water flow rate for the stated continuous outputs	l/h	252	378	610
Continuous output	kW	15	22	33
for DHW heating from 10 to 60 °C and a heating water flow temperature of 70 °C at the heating water throughput stated below (tested at HV ₁ /HR ₁)	l/h	258	378	567
Heating water flow rate for the stated continuous outputs	l/h	281	457	836

Information regarding continuous output

When engineering systems with the specified or calculated continuous output, select a matching circulation pump. The stated continuous output is only achieved when the rated boiler heating output ≥ the continuous output.

DHW cylinder and heating water buffer cylinder (cont.)

Performance factor N_L

To DIN 4708.

Cylinder storage temperature T_{cyl} = cold water inlet temperature

+50 K $+5 \text{ K}/-0 \text{ K}$ and 70 °C heating water flow temperature

Performance factor N_L subject to the heating output delivered by the boiler (Q_D)

Cylinder capacity Q_D in kW	I	750	950
N_L performance factor			
15		2.00	3.00
18		2.25	3.20
22		2.50	3.50
27		2.75	4.00
33		3.00	4.60

Information regarding performance factor

The performance factor N_L depends on the cylinder storage temperature T_{cyl} .

Standard values

- $T_{cyl} = 60 \text{ °C} \rightarrow 1.0 \times N_L$
- $T_{cyl} = 55 \text{ °C} \rightarrow 0.75 \times N_L$
- $T_{cyl} = 50 \text{ °C} \rightarrow 0.55 \times N_L$
- $T_{cyl} = 45 \text{ °C} \rightarrow 0.3 \times N_L$

Peak output (over 10 minutes)

Relative to the performance factor N_L .

DHW heating from 10 to 45 °C and 70 °C heating water flow temperature

Peak output (l/10 min) subject to the heating output delivered by the boiler (Q_D)

Cylinder capacity Q_D in kW	I	750	950
Peak output			
15		190	230
18		200	236
22		210	246
27		220	262
33		230	280

Max. draw-off rate (over 10 minutes)

Relative to the performance factor N_L .

With reheating.

DHW heating from 10 to 45 °C and 70 °C heating water flow temperature.

Max. draw-off rate (l/min) subject to the heating output delivered by the boiler (Q_D)

Cylinder capacity Q_D in kW	I	750	950
Max. draw-off rate			
15		19.0	23.0
18		20.0	23.6
22		21.0	24.6
27		22.0	26.2
33		23.0	28.0

Drawable water volume

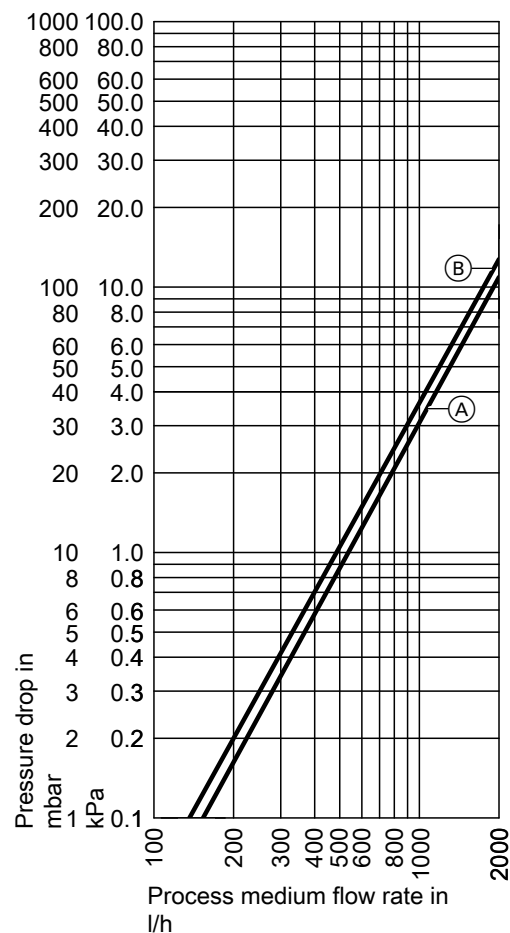
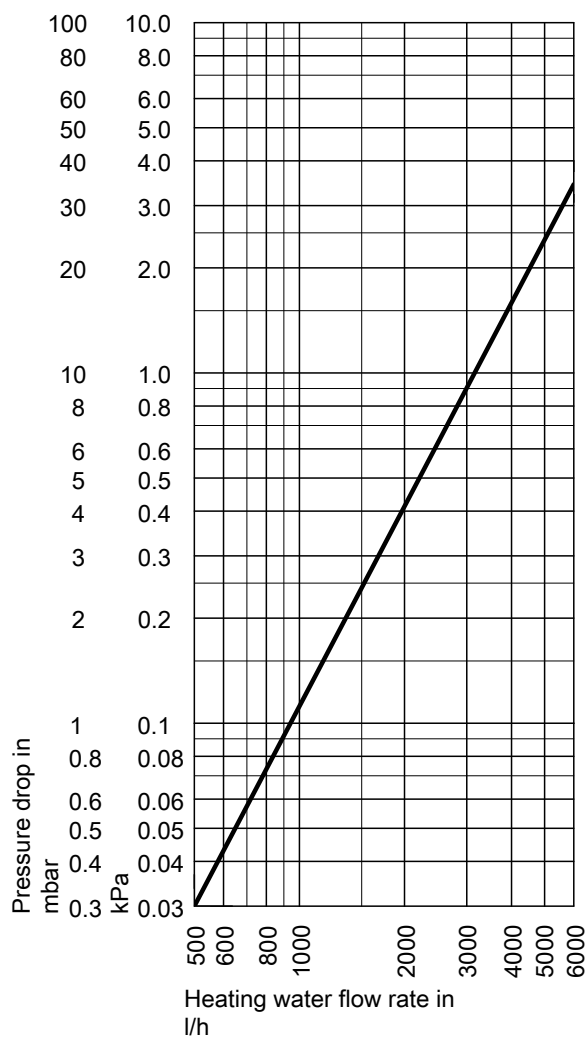
Cylinder content heated to 60 °C.

Without reheating.

Draw-off rate	l/min	10	20
Drawable water volume			
Water with $t = 45 \text{ °C}$ (mixed temperature)			
750 l		255	190
950 l		331	249

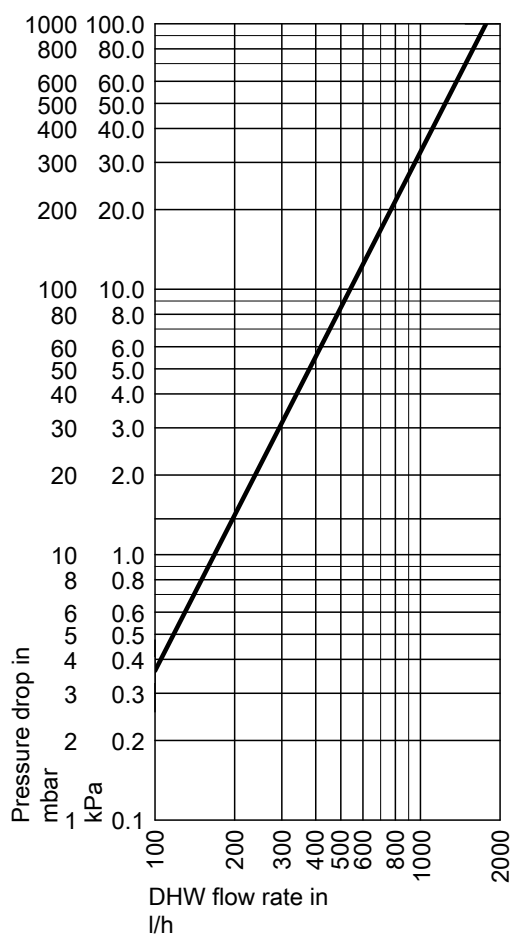
DHW cylinder and heating water buffer cylinder (cont.)

Pressure drops



Pressure drop on the solar side

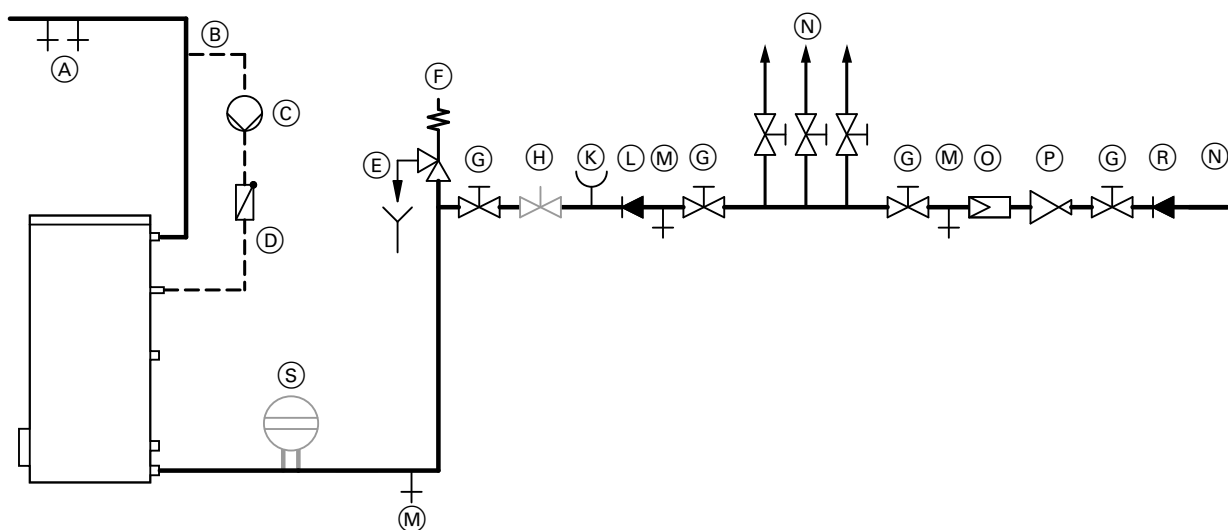
- (A) Cylinder capacity 750 l
- (B) Cylinder capacity 950 l



Pressure drop on the DHW side 750/950 l

4.11 DHW cylinder connection on the DHW side

Connection to DIN 1988



Example: Vitocell 100-V

- (A) DHW
- (B) DHW circulation pipe
- (C) DHW circulation pump

- (D) Spring-loaded check valve
- (E) Discharge pipe with a visible outlet point
- (F) Safety valve

DHW cylinder and heating water buffer cylinder (cont.)

- | | | | |
|---|---|---|---|
| Ⓔ | Shut-off valve | Ⓜ | Drain |
| Ⓕ | Flow regulating valve | Ⓝ | Cold water |
| | (Recommendation: We recommend installation and adjustment of the max. water flow rate in accordance with the 10-minute peak output of the DHW cylinder) | Ⓞ | Drinking water filter* ⁵ |
| Ⓚ | Pressure gauge connection | Ⓟ | Pressure reducer to DIN 1988-2, Dec. 1988 issue |
| Ⓛ | Non-return valve | Ⓡ | Non-return valve/pipe separator |
| | | Ⓢ | Diaphragm expansion vessel, suitable for DHW |

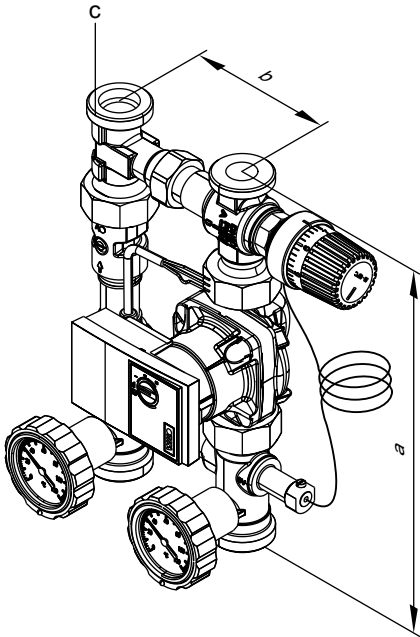
The safety valve must be installed.

Recommendation: Install the safety valve higher than the top edge of the cylinder. This protects the valve against contamination, scaling and high temperatures. The DHW cylinder must not be drained when working on the safety valve.

*⁵ According to DIN 1988-2, a drinking water filter should be installed in systems with metal pipework. In line with DIN 1988, when using plastic pipes Viessmann also recommends the installation of a drinking water filter to prevent contaminants entering the DHW system.

5.1 Accessories for the boiler

Thermal return temperature raising facility (fully pre-fitted)



For systems with heating water buffer cylinder.

Part no.	7172 808	7172 809
Nominal diameter	DN 25	DN 32
a	mm 322	420
b	mm 125	125
c	G 1½	G 2
External dimensions (incl. thermal insulation)	mm 365 x 250 x 200	475 x 250 x 200

Part no. 7172 808

For 20 and 30 kW boilers.

Comprising:

- 2 ball valves with thermometers
- Thermostatic control valve
- Thermal insulation
- Check valve
- High efficiency circulation pump Wilo Yonos PARA 25/6

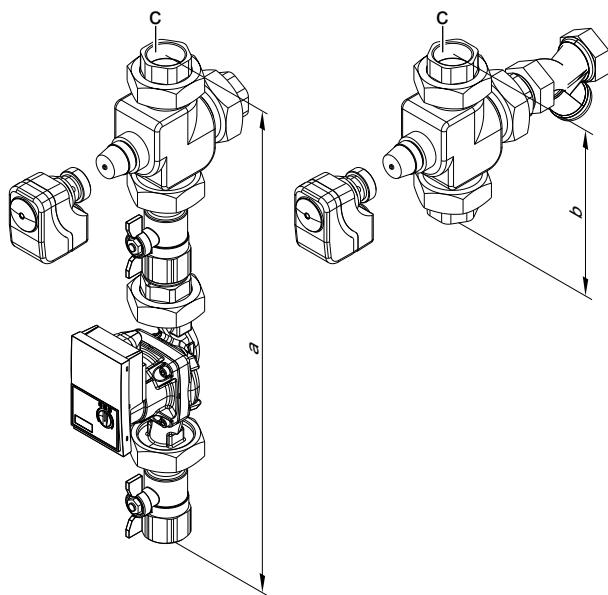
Part no. 7172 809

For 40 and 50 kW boilers.

Comprising:

- 2 ball valves with thermometers
- Thermostatic control valve
- Thermal insulation
- Check valve
- High efficiency circulation pump Wilo Yonos PARA 30/6

Electric return temperature raising facility (assemblies partially pre-assembled)



When using the control function, a control valve for the buffer cylinder must also be ordered.

Part no.	7172 983	7172 984
Nominal diameter	DN 25	DN 32
a	mm 509	587
b	mm 157	192
c	G 1½	G 2

Part no. 7172 983

DN 25

For 20 and 30 kW boilers.

Comprising:

- Buffer control valve
- Return temperature raising valve
- Actuators (2 pce)
- Cable set, connection accessories
- Variable speed high efficiency circulation pump Wilo Yonos PARA 25/6

Part no. 7172 984

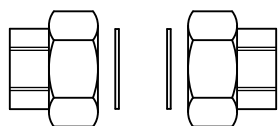
DN 32

For 40 and 50 kW boilers.

Comprising:

- Buffer control valve
- Return temperature raising valve
- Actuators (2 pce)
- Cable set, connection accessories
- Variable speed high efficiency circulation pump Wilo Yonos PARA 30/7.5

Pipe union



When using the control function, a control valve for the heating water buffer cylinder must also be ordered.

Part no. 7424 592

For 20 and 30 kW boilers.

For thermal return temperature raising facility, part no. 7172 808

1 set with 2 pce (2 sets required)

G 1½ x R 1

Part no. 7424 591

For 40 and 50 kW boilers.

For thermal return temperature raising facility, part no. 7172 809

1 set with 2 pce (2 sets required)

G 2 x R 1¼

Adaptor unit

Part no. 7159 411

To connect the return temperature raising facility to the Divicon.

Comprising:

- 2 adaptors R 1½ (with offset)
- Gaskets

Reducer

Part no. 7517 579

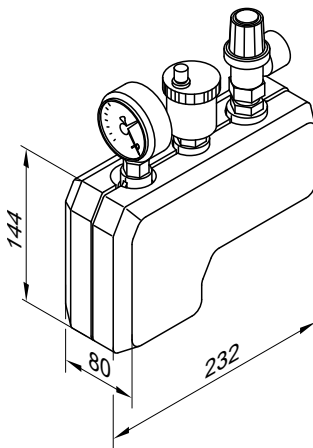
For 40 and 50 kW boilers.

G 2 x G 1½

For flow and return connection (2 pce required) **not** in conjunction with pipe union.

Installation accessories (cont.)

Safety equipment block



Part no. Z001 849

with

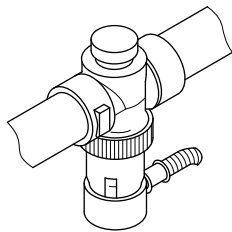
- Safety assembly with safety valve (3 bar)
- Thermal insulation
- Tee G 1 and pipe nipple connector R 1

For connecting directly to the boiler, use pipe union G 1½ x R 1.

Thermally activated safety valve

Part no. 7143 845

For connection to the safety heat exchanger of the boiler.



According to the requirements of EN 303-5 the boiler is equipped with a safety heat exchanger. To ensure emergency cooling of the boiler in the event of a fault, this must be connected to the water supply on site via a thermally activated safety valve.

Water level limiter

Only required in attic heating centres and in public buildings in Germany.



Part no. 9529 050

- Used as low water indicator
- For installation in the heating flow outside the boiler
- TÜV-HWB 97-232

Buffer cylinder connection unit

Part no. 7159 406

For incorporating the heating water buffer cylinder into the heating circuit **upstream** of the Divicon.

Comprising:

- 2 tees with union nuts
- Gaskets

Diverter valve connection unit

■ Connection R 1

Part no. 7159 407

■ Connection R 1¼ (with 2 reducers R 2)

Part no. 7159 408

For flow changeover in conjunction with oil/gas boilers

Installation accessories (cont.)

Comprising:

- 3-way diverter valve with actuator
- Tee R 1½
- 2 adaptors R 1½ (with offset)
- Union nuts
- Gaskets

Door interlock switch

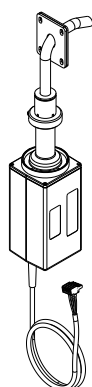
Part no. 7502 191

Complete for hopper door, ignition door and ash door in conjunction with oil/gas boilers (connected to a common chimney stack)

Electrical ignition system

Part no. ZK01 273

- With cable set
- With door interlock switch

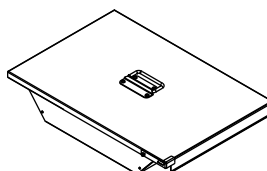


Ash box

Part no. 7467 076

To efficiently bring the ash to the waste container.

- 14 litres capacity
- Made from zinc-plated sheet steel
- With cover



3-way diverter valve

Part no. 7814 924

For boilers up to 32 kW in conjunction with Vitocell 340-M or 360-M.

- Electric drive
- Connection R 1 (female thread)

Motor two-way valve, DN 25, VVG 48.25/SSY 319

Part no. 7441 735

Used as control valve for flow rate control during DHW heating.

Standard delivery:

- Motor 2-way valve incl. gaskets and fittings.
- Valve drive SSY 319

Divicon heating circuit distributor

Design and function

- Available with R ¾, R 1 and R 1¼ connections.
- With heating circuit pump, check valve, ball valves with integral thermometers and 3-way mixer or without mixer.
- Quick and simple installation through pre-assembled unit and compact design.

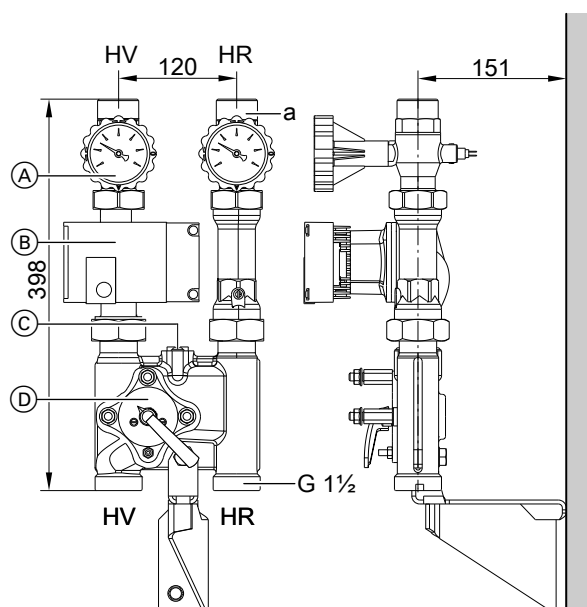
- Low radiation losses through all-round thermal insulation shells.
- Low electricity costs and precise control characteristics through the use of high efficiency pumps and optimised mixer curve.

Installation accessories (cont.)

- The bypass valve for hydraulic balancing of the heating system is available as an accessory as a threaded component for inserting into the prepared hole in the cast body.
- For direct connection to the boiler by means of a pipe assembly (single installation) or for wall mounting with a single, double or triple manifold.
- Also available as a kit. For further details, see the Viessmann pricelist.

For part numbers in conjunction with the different circulation pumps, see the Viessmann pricelist.

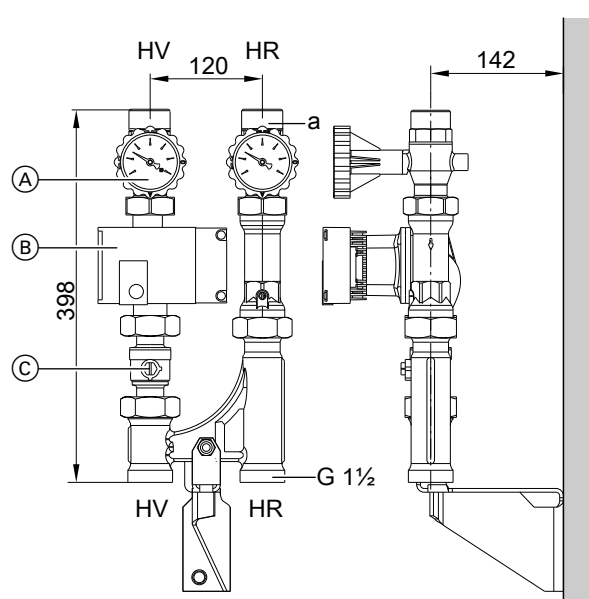
The dimensions of the heating circuit distributor are the same, with or without mixer.



Divicon with mixer (wall mounting, shown without thermal insulation or mixer drive extension kit)

- HR Heating return
HV Heating flow
(A) Ball valves with thermometer (as programming unit)
(B) Circulation pump
(C) Bypass valve (accessories)
(D) Mixer-3

Heating circuit connection	R	¾	1	1¼
Flow rate (max.)	m³/h	1.0	1.5	2.5
a (female)	Rp	¾	1	1¼
a (male)	G	1¼	1¼	2

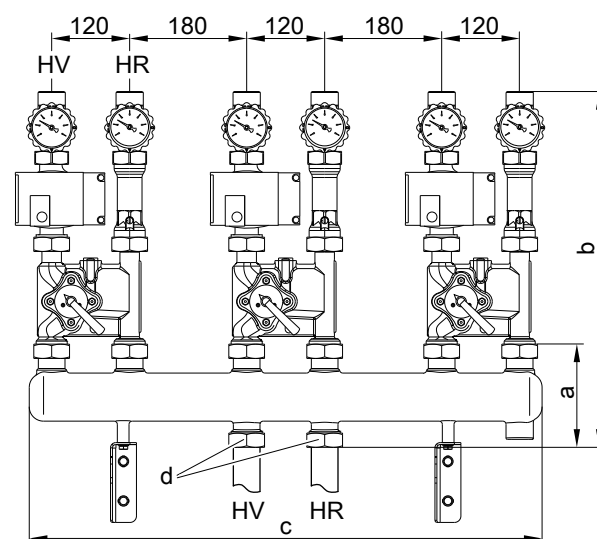


Divicon without mixer (wall mounting, shown without thermal insulation)

- HR Heating return
HV Heating flow
(A) Ball valves with thermometer (as programming unit)
(B) Circulation pump
(C) Ball valve

Heating circuit connection	R	¾	1	1¼
Flow rate (max.)	m³/h	1.0	1.5	2.5
a (female)	Rp	¾	1	1¼
a (male)	G	1¼	1¼	2

Installation example: Divicon with triple manifold



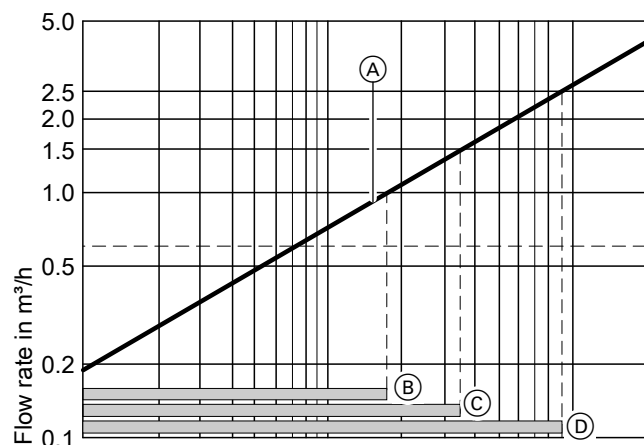
(shown without thermal insulation)

- HR Heating return
HV Heating flow

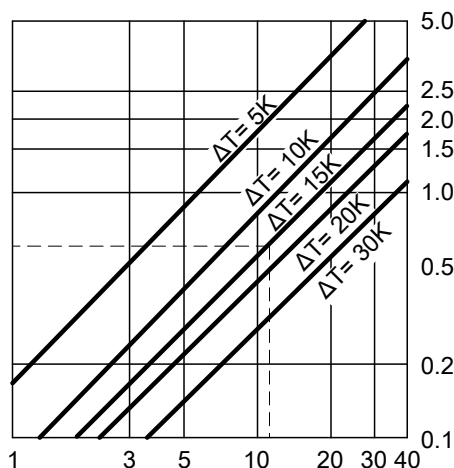
Installation accessories (cont.)

Dimensions	Manifold with heating circuit connection R ¾ and R 1	R 1¼
a	135	183
b	535	583
c	784	784
d	G 1¼	G 2

Determining the required nominal diameter



Mixer control characteristics



Heating circuit output
in kW

- Ⓐ Divicon with mixer-3
The operating ranges marked Ⓑ to Ⓓ provide optimum control characteristics with the Divicon mixer:
- Ⓑ Divicon with mixer-3 (R ¾)
Application range: 0 to 1.0 m³/h

- Ⓒ Divicon with mixer-3 (R 1)
Application range: 0 to 1.5 m³/h
- Ⓓ Divicon with mixer-3 (R 1¼)
Application range: 0 to 2.5 m³/h

Example:

Heating circuit for radiators with an heating output of $\dot{Q} = 11.6 \text{ kW}$
Heating system temperature 75/60 °C ($\Delta T = 15 \text{ K}$)

- c Specific thermal capacity
 $\dot{m}$ Mass flow rate
 $\dot{Q}$ Heating output
 $\dot{V}$ Flow rate

$$\dot{Q} = \dot{m} \cdot c \cdot \Delta T \quad c = 1.163 \frac{\text{Wh}}{\text{kg} \cdot \text{K}} \quad \dot{m} \triangleq \dot{V} \quad (1 \text{ kg} \approx 1 \text{ dm}^3)$$

$$\dot{V} = \frac{\dot{Q}}{c \cdot \Delta T} = \frac{11600 \text{ W} \cdot \text{kg} \cdot \text{K}}{1.163 \text{ Wh} \cdot (75-60) \text{ K}} = 665 \frac{\text{kg}}{\text{h}} \triangleq 0.665 \frac{\text{m}^3}{\text{h}}$$

Select the smallest possible mixer within the application limit with the value $\dot{V}$.

Result of this example: Divicon with mixer-3 (R ¾)

Circulation pump curves and pressure drop on the heating water side

The residual pump head results from the differential between the selected pump curve and the pressure drop curve of the respective heating circuit distributor or further components (pipe assembly, distributor etc.).

The following pump graphs show the pressure drop curves of the different Divicon heating circuit distributors.

Maximum flow rate for Divicon:

- with R ¾ = 1.0 m³/h
- with R 1 = 1.5 m³/h
- with R 1¼ = 2.5 m³/h

Example:

Flow rate $\dot{V} = 0.665 \text{ m}^3/\text{h}$

Selected:

- Divicon with mixer R ¾
- Wilo Yonos Para 25/6 circulation pump, variable differential pressure operating mode and set to maximum delivery head
- Pump rate 0.7 m³/h

Head of the relevant pump curve:

48 kPa

Divicon pressure drop:

3.5 kPa

Residual head:

48 kPa – 3.5 kPa = 44.5 kPa.

Note

For further components (pipe assembly, distributor, etc.) determine the pressure drop and deduct it from the residual head.

Differential pressure-dependent heating circuit pumps

According to the [German] Energy Saving Ordinance (EnEV), circulation pumps in central heating systems must be sized in accordance with current technical rules.

Ecodesign Directive 2009/125/EC requires high efficiency circulation pumps to be used throughout Europe from 1 January 2013, if the pumps are not installed in the heat source.

Installation accessories (cont.)

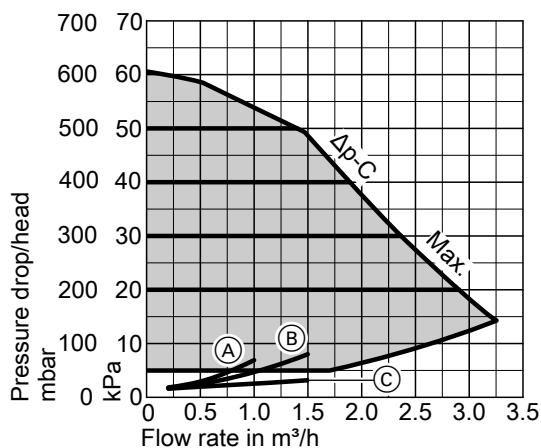
Design information

The use of differential pressure-dependent heating circuit pumps requires heating circuits with variable pump rates. These include, for example, single and twin line heating systems with thermostatic valves and underfloor heating systems with thermostatic or zone valves.

Wilo Yonos Para 25/6

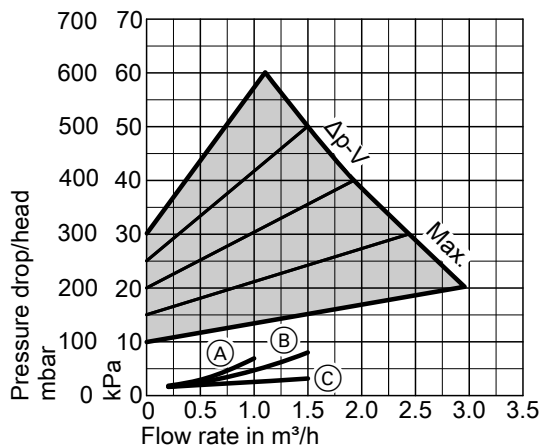
■ Very economical HE pump (compliant with Energy Label A)

Operating mode: Constant differential pressure



- (A) Divicon R ¾ with mixer
- (B) Divicon R 1 with mixer
- (C) Divicon R ¾ and R 1 without mixer

Operating mode: Variable differential pressure

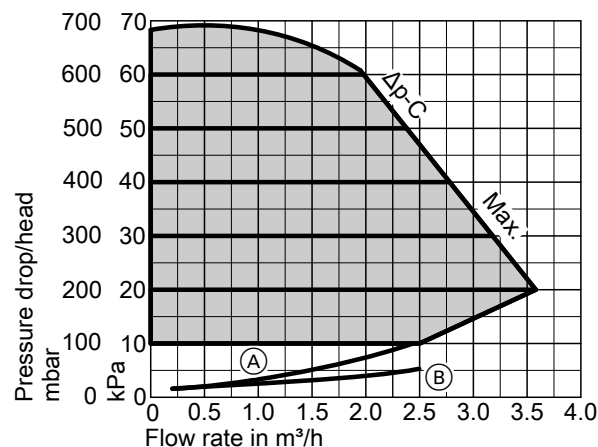


- (A) Divicon R ¾ with mixer
- (B) Divicon R 1 with mixer
- (C) Divicon R ¾ and R 1 without mixer

Wilo Stratos Para 25/1-7

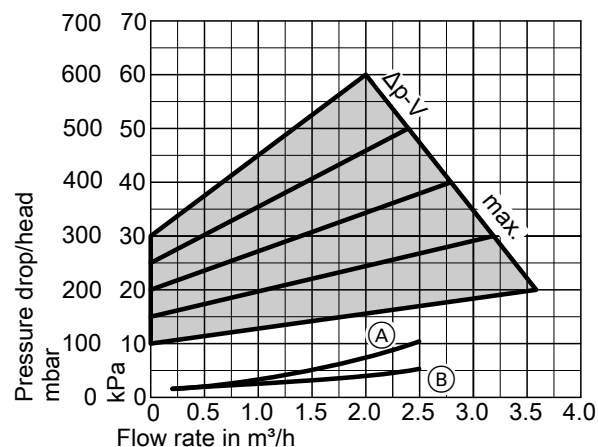
■ Very economical HE pump (compliant with Energy Label A)

Operating mode: Constant differential pressure



- (A) Divicon R 1¼ with mixer
- (B) Divicon R 1¼ without mixer

Operating mode: Variable differential pressure

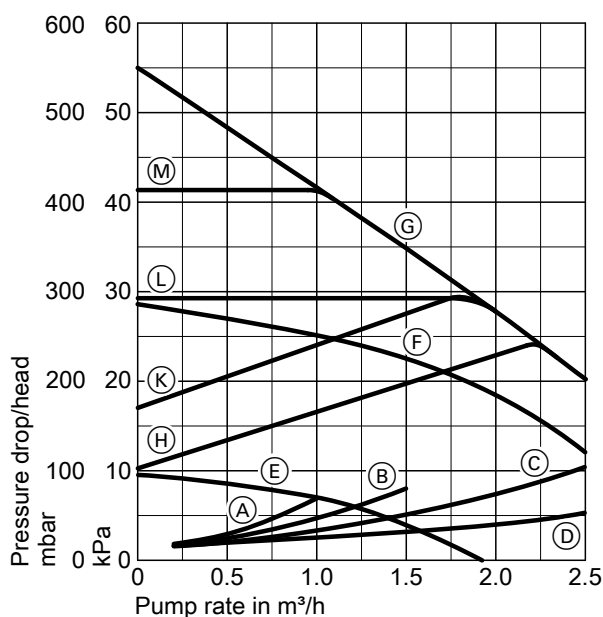


- (A) Divicon R 1¼ with mixer
- (B) Divicon R 1¼ without mixer

Grundfos Alpha 2-60

- Very economical HE pump (compliant with Energy Label A)
- With power consumption display
- With Autoadapt function (automatic matching to the pipework)
- With night setback function

Installation accessories (cont.)



- (C) Divicon R 1¼ with mixer
- (D) Divicon R ¾, R 1 and R 1¼ without mixer
- (E) Stage 1
- (F) Stage 2
- (G) Stage 3
- (H) Min. proportional pressure
- (K) Max. proportional pressure
- (L) Min. constant pressure
- (M) Max. constant pressure

Bypass valve

Part no. 7464 889

For hydraulic balancing of the heating circuit with mixer. To be inserted into the Divicon.

- (A) Divicon R ¾ with mixer
- (B) Divicon R 1 with mixer

Manifold

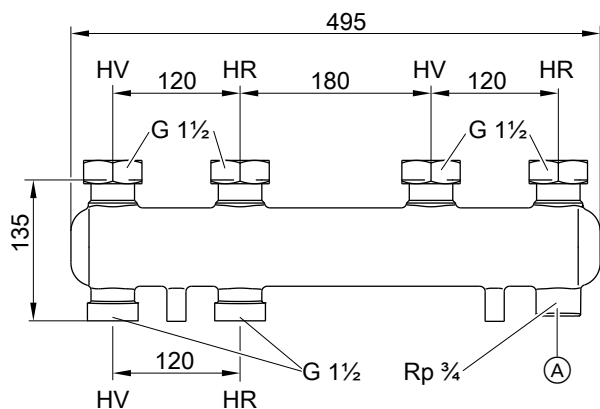
With thermal insulation

For wall mounting with separately ordered wall mounting bracket.

The connection between boiler and manifold must be made on site.

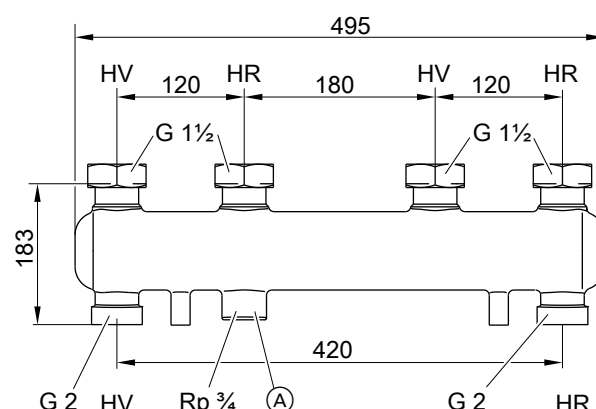
For 2 Divicon

Part no. 7460 638 for Divicon R ¾ and R 1



- (A) Connection option for expansion vessel
- HV Heating water flow
- HR Heating water return

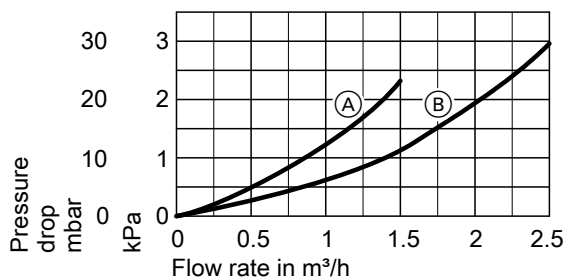
Part no. 7466 337 for Divicon R 1¼



- (A) Connection option for expansion vessel
- HV Heating water flow
- HR Heating water return

Installation accessories (cont.)

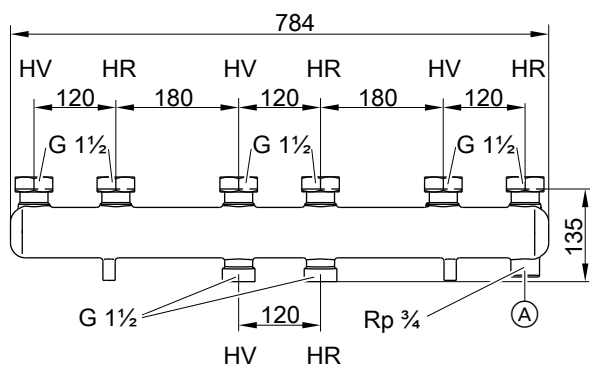
Pressure drop



- Ⓐ Manifold for Divicon R $\frac{3}{4}$ and R 1
 Ⓑ Manifold for Divicon R $1\frac{1}{4}$

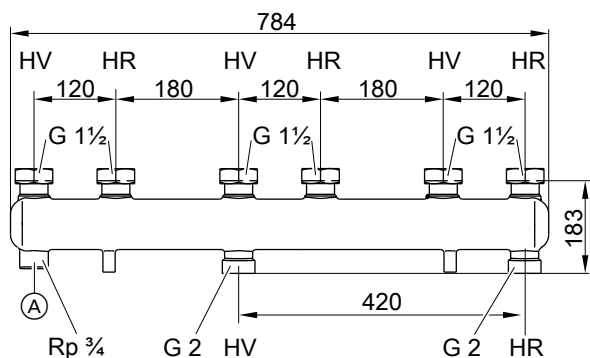
For 3 Divicon

Part no. 7460 643 for Divicon R $\frac{3}{4}$ and R 1



- Ⓐ Connection option for expansion vessel
 HV Heating water flow
 HR Heating water return

Part no. 7466 340 for Divicon R $1\frac{1}{4}$

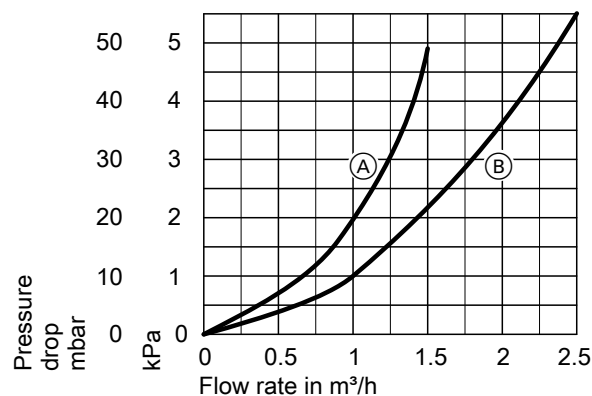


- Ⓐ Connection option for expansion vessel
 HV Heating water flow
 HR Heating water return

Note

The curves always refer to one pair of connectors only (HV/HR).

Pressure drop



- Ⓐ Manifold for Divicon R $\frac{3}{4}$ and R 1
 Ⓑ Manifold for Divicon R $1\frac{1}{4}$

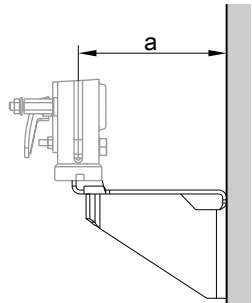
Note

The curves always refer to one pair of connectors only (HV/HR).

Installation accessories (cont.)

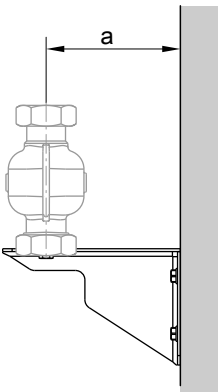
Wall mounting bracket
Part no. 7465 894 individual Divicon

With screws and rawl plugs.



For Divicon	With mixer	Without mixer
a mm	151	142

Part no. 7465 439 for manifolds
With screws and rawl plugs.



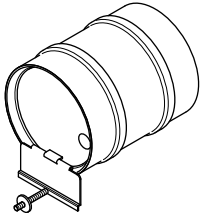
For Divicon	R ¾ and R 1	R 1 ¼
a mm	142	167

5.2 Flue system accessories

Draught stabiliser (draught limiter for installation in the chimney)

Part no. 7249 379

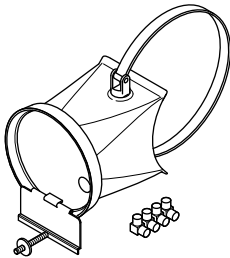
It is necessary to install the draught stabiliser to safeguard the specified draught characteristics within the flue system.



Draught stabiliser (draught limiter for installation in the connection piece)

Part no. 7264 701

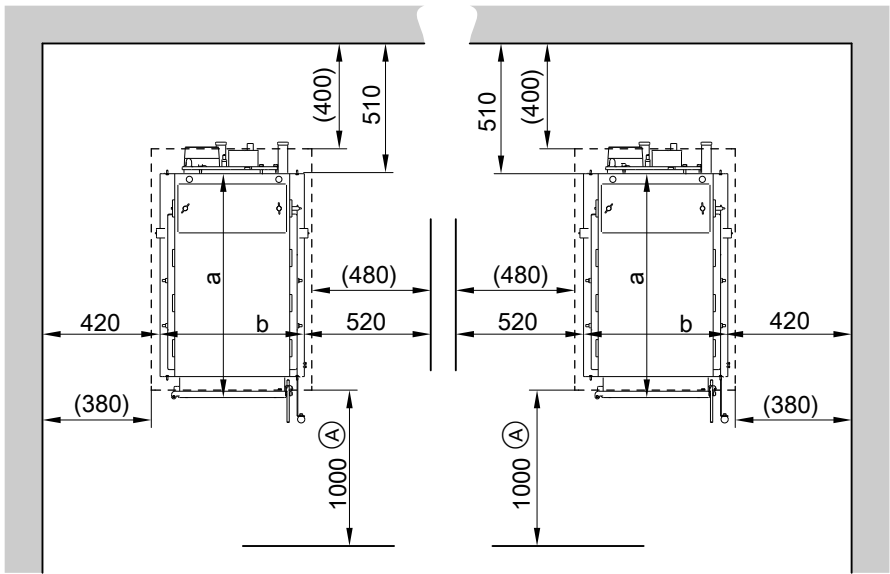
As an alternative to the draught stabiliser for installation in the chimney, this draught stabiliser can be used to safeguard the specified draught conditions.



Design information

6.1 Positioning

Minimum clearances



Ⓐ Required clearance for cleaning, heat-up and recharging

Rated heating output	kW	20/30	40/50
Dim. a	mm	1020	1020
Dim. b	mm	640	640

Design information (cont.)

Rated heating output	kW	20/30	40/50
Minimum room height* ⁶	mm	1800	2100
Recommended minimum room height* ⁷	mm	2300	2600

Dimensions in brackets: Boiler incl. thermal insulation

Note

The specified wall clearances are required for installation and maintenance work.

6.2 Installation room requirements

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

In rooms where **air contamination through halogenated hydrocarbons** may occur (e.g. hairdressing salons, printing shops, dry cleaning shops, laboratories), install the boiler only if adequate measures can be taken to supply uncontaminated combustion air.

If in doubt, please contact us.

If these instructions are not observed, any consequential boiler damage directly related to any of these causes is excluded from our warranty.

6.3 Information regarding the positioning of combustion equipment up to 50 kW

Generally, combustion equipment with an output up to 50 kW must not be positioned in stairwells, living areas, hallways or garages. Furthermore, positioning in rooms with ventilation systems, fans, extractor hoods, extraction systems (e.g. dryer with air expulsion to the outside) should be avoided. Ensure that a simultaneous operation is prevented by providing an interlock system, and that the flue gas routing is monitored by suitable safety equipment.

A distance of at least 0.4 m from combustible materials and fitted furniture should be observed, so that surface temperatures of more than 85 °C are not reached.

Maintain a clearance of at least 1 m towards the fuel storage room, or install a radiation panel.

The combustion equipment must not be operated on combustible floor surfaces. Non-combustible floor coverings must extend at least 50 cm forward and 30 cm to the sides of the opening of the combustion equipment.

Provide a combustion air supply from outside to the combustion equipment (min. aperture size 150 cm² or 2 x 75 cm²).

6.4 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.

The cost of a water treatment facility is always going to be less than that of repairing damage to your heating system.

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

The main water quality requirements are summarised below.

A chemical water treatment can be ordered from Viessmann for filling.

Heating systems with rated operating temperatures up to 100 °C (VDI 2035)

Water used in heating systems must meet the chemical levels of the Drinking Water Ordinance [Germany]. If well water or similar is used, it should be tested for suitability before filling the system.

Prevent excessive scale build-up (calcium carbonate) on the heating surfaces. For heating systems with operating temperatures up to 100 °C, the Directive VDI 2035 sheet 1 "Prevention of damage in water heating installations – Scale formation in domestic hot water supply installations and water heating installations" applies [in Germany; check local regulations] with the following standard values. For further information, see the annotations to Directive VDI 2035.

Total heating output in kW	> 50 to ≤ 200	> 200 to ≤ 600	> 600
Total alkaline earths in mol/m ³	≤ 2.0	≤ 1.5	< 0.02
Total hardness in °dH	≤ 11.2	≤ 8.4	< 0.11

The standard values assume the following:

- The total 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.

Soften 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.

*⁶ Inspection and maintenance only possible if more time is taken.

*⁷ Optimum height for inspection and maintenance work. No additional time on account of the restricted space is required.

Design information (cont.)

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.
- Install a water meter to record the amount of the 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 output (for multi boiler systems, apply the output of the smallest boiler), apply the requirements of the next highest 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 $\leq 0.02 \text{ mol/m}^3$.

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.

If limescale deposits have formed because of a failure to observe the requirements of directive VDI 2035 the service life of the installed heating appliances will in most cases already have been reduced. Removing the limescale deposits is one option for restoring operational viability. This must be carried out by Viessmann Industrieservice or a specialist company. 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 renewed formation of excessive scale deposits.

6.5 Frost protection

An antifreeze additive suitable for heating systems can be added to the fill water. The antifreeze manufacturer must verify its suitability, since otherwise damage to gaskets and diaphragms can occur as well as noise during heating operation. Viessmann accepts no liability for any resulting damage or consequential losses.

6.6 Connection on the flue gas side

Chimney

A chimney compliant with regulations relevant to the rated boiler heating output is required for efficient boiler operation.

Note that in its lower heating output range, the Vitoligno 200-S can create low flue gas temperatures (risk of the air temperature dropping below the dew point). Therefore, connect this combustion equipment to highly insulated chimney stacks (thermal resistance class I to DIN 18160 pt.1) or use suitable moisture-resistant flue systems, which have Building Regulation approval. The chimney must have a smooth inner surface with no cracks and no narrowings of the cross-section.

The installation of a secondary air device (draught limiter) is recommended for chimneys with draughts in excess of 0.15 mbar.

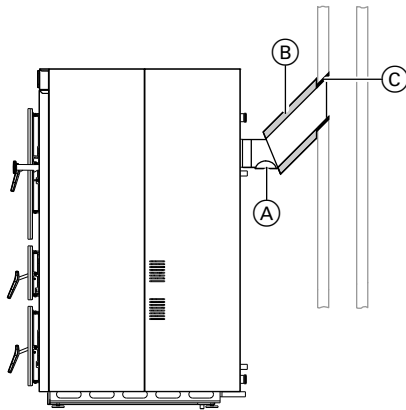
Specification:

Rated heating output	kW	20 and 30	40 and 50
Required draught	mbar	0.08	0.08
Minimum chimney height	m	6	7
Minimum cross-section ^{*8}	Ø mm	180 ^{*9}	180 ^{*9}
Ventilation aperture of the boiler room at least	cm ²	150	150
CO ₂ content	% by vol.	14	14

^{*8} To DIN 4759.

^{*9} Alternative cross-sections possible with calculation.

Flue pipe



- (A) Cleaning aperture
- (B) Thermal insulation
- (C) Flexible flue inlet into the chimney

Acoustic transmission may arise from the flue gas fan, which can lead to excessive noise. We therefore recommend the use of a flue silencer or a flexible chimney connection pipe.

Observe the following when connecting the flue pipe:

- Install the flue pipe rising to the chimney (with 45°) if possible. Max. flue length 3000 mm. A flue stretch with a slight inclination (up to 30°) or horizontal orientation may be a max. of 1000 mm long.
- Provide the flue pipe with thermal insulation of at least 50 mm thickness.
- Never push the flue pipe too far into the chimney.
- Ensure the entire flue gas path (including cleaning aperture) is gas-tight.
- Never insert the flue pipe into the brickwork of the chimney. Instead, use a flexible flue adaptor for connection to the chimney. Provide a cleaning aperture.

Connecting the Vitoligno 200-S and an oil/gas boiler to a common chimney in accordance with DIN 4759-1

If connecting to a common chimney, a safety device for provision of a mutual interlock system in accordance with DIN 4759-1 must be installed in consultation with the local flue gas inspector. A door interlock switch (see page 62) is available as an accessory for this purpose. When the Vitoligno 200-S is in operation, the burner of the oil/gas boiler remains off. If the hopper door, ignition door or ash door of the Vitoligno 200-S is opened, the door contact switch likewise interrupts the power supply to the burner. As soon as the Vitoligno 200-S goes into the burnout phase, the oil/gas boiler with pressure-jet burner is enabled, thus allowing operation to continue automatically.

If the optional electrical ignition system (see page 62) is ordered as an accessory, the door interlock switch set will already be included.

6.7 Hydraulic connection

Safety equipment to EN 12828

EN 12828 requires, amongst others, the following safety equipment to be installed:

- Sealed expansion vessel.
- A safety valve at the highest point of the boiler or on a pipe connected to this point. It must not be possible to shut off the connection line between the boiler and the safety valve. No pumps, fittings or constrictions may be present in this line. The discharge pipe must be designed in such a way that no pressure increase is possible. Any expelled heating water must be drained off safely. The outlet point of the discharge pipe must be arranged in such a way that any water expelled from the safety valve can be drained off safely and visibly.

- Thermometer and pressure gauge.
- A low water indicator is not required, except in attic heating centres, and in public buildings in Germany (water level limiter, available as an accessory).
- An automatic device for heat transfer, which prevents the maximum permissible operating temperature being exceeded. For this, connect a thermally activated safety valve (available as an accessory) to the integral heat exchanger.

Low water indicator

According to EN 12828, a low water indicator can be omitted for boilers up to 300 kW, as long as heating can be reliably prevented when there is a water shortage.

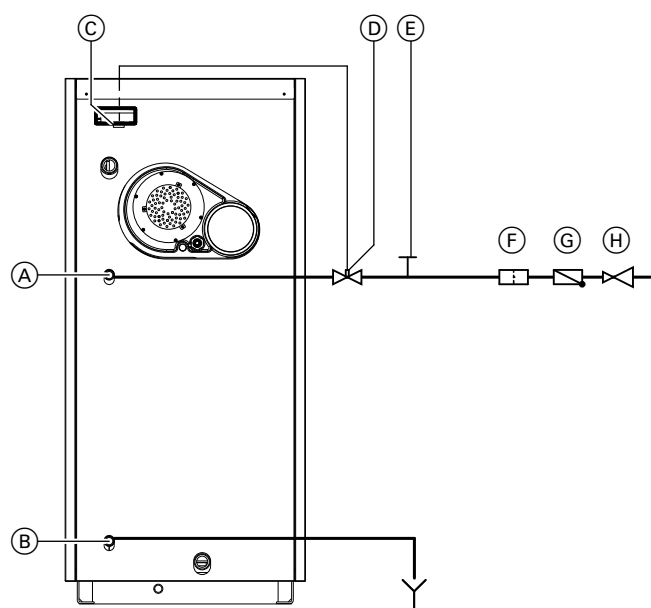
These boilers are equipped with type-tested control thermostats and high limit safety cut-outs. Tests have verified that in the event of water shortage due to a leak in the heating system and simultaneous fuel burnout in the combustion chamber, the boiler and the flue system do not reach unacceptably high temperatures.

Design information (cont.)

General design information

- When connecting several heating circuits, the total of the drawn heat should not exceed the rated boiler heating output. Line regulating valves may be installed to enable improved adjustment of the system. The estimated and actual heat loads are frequently far apart, because of a lack of thermal building insulation (new build, not yet rendered/plastered, etc.).
- All systems require a return temperature raising facility, a heating water buffer cylinder and a weather-compensated heating circuit control unit with 3-way mixer or 4-way mixer (min. boiler water temperature 60 °C).

Safety heat exchanger with thermally activated boiler protection



- (A) Cold water inlet R ¾ for thermally activated safety valve
- (B) DHW outlet R ¾ for thermally activated safety valve
- (C) Sensor for thermally activated safety valve
- (D) Thermally activated safety valve

- (E) Cleaning aperture
- (F) Drinking water filter
- (G) Non-return valve
- (H) Pressure reducing valve

The safety heat exchanger is factory-fitted and is designed to prevent overheating if the DHW circulation is interrupted (e.g. during power failure). Never use these for DHW heating.

Connect the thermally activated safety valve according to EN 12828 with an unrestricted drain to the heat exchanger. This connection must not be fitted with a manual shut-off device.

After the installation, the thermally activated safety valve and the cleaning aperture should still be freely accessible.

Minimum supply pressure

Safety heat exchanger:

3 - 6 bar

Permiss. operating pressure:

6 bar

Heating by the heating water buffer cylinders

If the boiler flow temperature falls below the set system temperature, then the heating for the heating circuit or DHW heating is drawn from the heating water buffer cylinders. For this, observe the function of the buffer cylinder control valve (see "System examples" in the technical guide).

Sizing the heating water buffer cylinder

The heating water buffer cylinder ensures rapid heating in the morning and adequate heat transfer under all operating conditions.

Calculate the required content of the heating water buffer cylinder using the following formula (design basis is EN 303-5):

$$V_{\text{cyl.}} = 15 \times T_B \times Q_N \times \left(1 - 0.3 \times \frac{Q_H}{Q_{\text{min}}} \right)$$

$V_{\text{cyl.}}$ Heating water buffer cylinder content in l

T_B Combustion duration at rated heating output in h

Q_N Rated boiler heating output in kW

Q_H Heat load of the building in kW

Q_{min} Lowest boiler heating output in kW

Design information (cont.)

Deduct rooms which are temporarily unheated (guest rooms, public rooms, weekend accommodation etc.) from the calculated heat load.

Note

According to the 1st BImSchV [Germany], cylinder volumes less than 55 l/kW rated boiler heating output and less than 12 l per litre fuel hopper should not be selected.

Combustion duration T_B subject to type of firewood and charge volume

Fuel	Charge volume in kWh For the Vitoligno 200-S with rated heating output		Max. possible combustion duration T_B in hours			
			At rated heating output for the Vitoligno 200-S with rated heating output		At partial load (50 %) for the Vitoligno 200-S with rated heating output	
	20 kW, 30 kW	40 kW, 50 kW	20 kW, 30 kW	40 kW, 50 kW	20 kW, 30 kW	40 kW, 50 kW
Beech – fully charged	180	252	5.5	5.5	11	11
Spruce – fully charged	120	168	4	4	8	8
Beech ½ charge	90	126	2.5	2.5	5.5	5.5
Spruce ½ charge	60	84	2	2	4	4

Example calculation for sizing a heating water buffer cylinder

Example 1 for a building heat load of 22 kW

Two-family house with a calculated building heat load of $Q_H = 22$ kW.

Fuel: Spruce (softwood), length 0.5 m, stored for 2 years (residual moisture = 25 %)

The system should be operated with a Vitoligno 200-S (rated heating output $Q_N = 30$ kW).

Sizing basis to EN 303-5:

$$V_{cyl.} = 15 \times T_B \times Q_N \times \left(1 - 0.3 \times \frac{Q_H}{Q_{min}} \right)$$

$T_B = 4$ h Combustion duration at rated heating output
 $Q_N = 30$ kW Rated heating output of the Vitoligno 200-S, 15 to 30 kW
 $Q_H = 22$ kW Calculated building heat load
 $Q_{min} = 13$ kW Min. heating output Vitoligno 200-S, 15 to 30 kW

Calculated heating water buffer cylinder content:

$$V_{cyl.} = 15 \times 4 \text{ h} \times 30 \text{ kW} \times \left(1 - 0.3 \times \frac{22 \text{ kW}}{13 \text{ kW}} \right) = 1008 \text{ l}$$

Example 2 for a building heat load of 33 kW

Agricultural building with a calculated building heat load of $Q_H = 33$ kW.

Fuel: Beech (hardwood), length 0.5 m, stored for 2 years (residual moisture 25 %)

The system should be operated with a Vitoligno 200-S (rated heating output $Q_N = 40$ kW).

Sizing basis to EN 303-5:

$$V_{cyl.} = 15 \times T_B \times Q_N \times \left(1 - 0.3 \times \frac{Q_H}{Q_{min}} \right)$$

$T_B = 5.5$ h Combustion duration at rated heating output
 $Q_N = 40$ kW Rated heating output of the Vitoligno 200-S, 20 to 40 kW
 $Q_H = 33$ kW Calculated building heat load
 $Q_{min} = 20$ kW Min. heating output Vitoligno 200-S, 20 to 40 kW

Calculated heating water buffer cylinder content:

$$V_{cyl.} = 15 \times 5.5 \text{ h} \times 40 \text{ kW} \times \left(1 - 0.3 \times \frac{33 \text{ kW}}{20 \text{ kW}} \right) = 1667 \text{ l}$$

6.8 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. It is only designed for the heating of water that is of potable water quality.

Intended usage presupposes that a fixed installation in conjunction with permissible, system-specific components has been carried out.

Commercial or industrial usage for a purpose other than heating the building or DHW does not comply with regulations.

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

Incorrect usage or operation of the appliance (e.g. the appliance being opened by the system user) is prohibited and results in an exclusion of liability. Incorrect usage also occurs if the components in the heating system are modified from their intended function (e.g. if the flue gas and ventilation air paths are sealed).

Appendix

7.1 Sizing the expansion vessel

In accordance with EN 12828, water heating systems must be equipped with a diaphragm expansion vessel. The size of the expansion vessel is subject to the heating system specification and should be checked in each case.

Quick selection table for calculating the vessel size V_n

Safety valve	bar	3.0			V_n litre
p_{sv} Pre-charge pressure	bar	1.0	1.5	1.8	
System volume V_A	litre	220	—	—	25
		340	200	—	35
		510	320	200	50
		840	440	260	80
		1050	540	330	100
		1470	760	460	140
		2100	1090	660	200
		2630	1360	820	250
		3150	1630	990	300
		4200	2180	1320	400
		5250	2720	1650	500

Selection example

Given:

p_{sv} = 3 bar (response pressure of the safety valve)
 H = 13 m (static head of the system)
 Q = 30 kW (rated heating output of the heat source)
 v = 8.5 l/kW (specific water capacity)
 Panel radiators 90/70°C
 V_{PH} = 2000 l (volume of buffer cylinder)

The specific water capacity v was determined as follows:

- Radiators: 13.5 l/kW
- Panel radiators: 8.5 l/kW
- Underfloor heating system: 20 l/kW

Calculation:

$V_A = Q \times v + V_{PH}$
 $V_A = 30 \text{ kW} \times 8.5 \text{ l/kW} + 2000 \text{ l}$
 $= 1255 \text{ l}$

If possible, when calculating the gas pre-charge pressure, select a supplement of 0.2 bar:

$p_0 \geq H/10 + 0.2 \text{ bar}$
 $p_0 \geq (13/10 + 0.2 \text{ bar}) = 1.5 \text{ bar}$

From the table:

With $p_{sv} = 3 \text{ bar}$, $p_0 = 1.5 \text{ bar}$, $V_A = 1255 \text{ l}$
 $V_n = 250 \text{ l}$ (for V_A max. 1360 l)

Selected:

2 x diaphragm expansion vessel N 250 (from Vitoset pricelist)

- All details relate to a flow temperature of **90 °C**.
- The tables have allowed for a hydraulic seal to DIN 4807-2.

Recommendations:

- Select a sufficiently high safety valve response pressure:
 $p_{sv} \geq p_0 + 1.5 \text{ bar}$
- For circulation pumps, due to the inlet pressure required, select at least 0.3 bar above the pre-charge pressure even for attic/roofspace installations: $p_0 \geq 1.5 \text{ bar}$
- Set the fill/starting pressure on the water side of vented systems in their cold state at least 0.3 bar above the pre-charge pressure:
 $p_F \geq p_0 + 0.3 \text{ bar}$

Conversion factor for flow temperatures other than 90 °C

Flow temperature °C	50	55	60	65	70	75	80	85	90	95	100
Conversion factor	3.03	2.50	2.13	1.82	1.59	1.39	1.24	1.11	1.00	0.90	0.82

Divide the vessel size found in accordance with the above tables by the conversion factor.

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Subject to technical modifications.

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