

[Air]

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Logamax plus GB172/GB172T

Wall mounted gas
condensing boiler

Power range
from 2.9 kW to 24 kW

Heat is our element

Buderus
Bosch Group

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1 Logamax plus GB172/GB172 T gas condensing boiler

1.1 Logamax plus GB172/GB172 T characteristics and applications

1.1.1 Special features

Benefits	Key features	
	Gas condensing boiler GB172-14/20/24, GB172-24 K, GB172-24 T50	Gas condensing compact heating centre GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S, GB172-14/20 T210SR
Preferred application range	<ul style="list-style-type: none"> Detached houses, two-family homes and terraced houses Buildings with low heat demand Floors and living areas 	<ul style="list-style-type: none"> Detached houses, two-family homes and terraced houses Buildings with low heat demand Floors and living areas
Preferred installation site	<ul style="list-style-type: none"> In basements or on the same floor Below the roof 	<ul style="list-style-type: none"> In the basement Inside the living area Below the roof
Output	<ul style="list-style-type: none"> Models with the following outputs: <ul style="list-style-type: none"> 14 kW, 20 kW and 24 kW as condensing boilers 24 kW as condensing combi boiler 24 kW compact condensing boiler with integral 48 l DHW cylinder Output modulates between 21 % and 100 % (on the 14 kW appliance) 	<ul style="list-style-type: none"> Models with the following outputs: <ul style="list-style-type: none"> 14 kW, 20 kW and 24 kW as compact condensing heating centre with integral DHW cylinder Output modulates between 21 % and 100 % (on the 14 kW appliance)
Emissions	<ul style="list-style-type: none"> Emissions performance better than the limits set by the “Blue Angel” certificate of environmental excellence 	
Standard efficiency	<ul style="list-style-type: none"> High standard seasonal efficiency [to DIN] of up to 109 % 	
Economic viability	<ul style="list-style-type: none"> Very low power consumption 	
Hydraulic system	<ul style="list-style-type: none"> Easy hydraulic connection Suitable for standard hydraulic solutions 	
Easy installation	<ul style="list-style-type: none"> All assemblies and electrical terminals accessible from the front 	
Quick installation, commissioning and maintenance	<ul style="list-style-type: none"> Reduced installation and maintenance effort Straight-forward replacement of older appliances by compatibility of hydraulic connections (connections identical with the Logamax U appliances and Logamax plus GB112 Linea, GB122, GB132, GB152) With universal flue sets Simplified commissioning and service through the service menu of the RC35 programming unit With universal connection accessories for Logalux WU120 W, WU160 W, H65 W, S120 W and SU...W DHW cylinders (flexible hoses) and flue sets 	<ul style="list-style-type: none"> Reduced installation and maintenance effort With universal flue sets Simplified commissioning and service through the service menu of the RC35 programming unit With connection accessories for optional connection on the left, right, top or back
Compatible connections for wall mounted appliances	<ul style="list-style-type: none"> Water and gas connections compatible with Junkers appliances without adaptor set Water and gas connections compatible with Vaillant appliances with adaptor set (accessory) 	–
Equipment (comprehensive equipment level)	<ul style="list-style-type: none"> Including drain & fill valve, safety valve and 3-way valve Expansion vessel <ul style="list-style-type: none"> Accessories; may be integrated on GB172 condensing boilers as an option (12 l) Factory-fitted on the GB172-24 K combi boiler (12 l) Factory-fitted on the GB172 T50 compact appliance (12 l) 	<ul style="list-style-type: none"> Including drain & fill valve, safety valve and 3-way valve Expansion vessel <ul style="list-style-type: none"> Part of the standard delivery for the GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S (18 l). Part of the standard delivery for the GB172-14/20 T210SR (12 l)

Table 1 Logamax plus GB172/GB172T characteristics and special key features

Benefits	Key features	
	Gas condensing boiler GB172-14/20/24, GB172-24 K, GB172-24 T50	Gas condensing compact heating centre GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S, GB172-14/20 T210SR
DHW heating	<ul style="list-style-type: none"> Logamax plus GB172-14/20/24 may be combined with a separate DHW cylinder Logalux WU120 W, WU160 W, H65 W, S120 W, SU160 W, SU200 W and SU300 W Logamax plus GB172-24 K and GB172-24 T50 with integral DHW heating; 30 kW booster function for DHW GB172-24 K: rapid DHW heating with regulated DHW outlet temperature GB172-24 T50 with integral 48 l internal indirect coil DHW cylinder for convenient DHW heating in locations where space is restricted 	<ul style="list-style-type: none"> GB172-14 T120, GB172-14/20 T150: compact heating centre with internal indirect coil DHW cylinder GB172-20 T100S, GB172-14/24 T150S: compact heating centre with stratification cylinder GB172-14/20 T210SR: compact heating centre with dual mode stratification cylinder for solar DHW heating
Heat exchanger	Integral cast aluminium-silicon heat exchanger	
Burner	Stainless steel linear radiant burner as premix gas burner for the cleanest combustion	

Table 1 Logamax plus GB172/GB172T characteristics and special key features

1.1.2 Selection aid

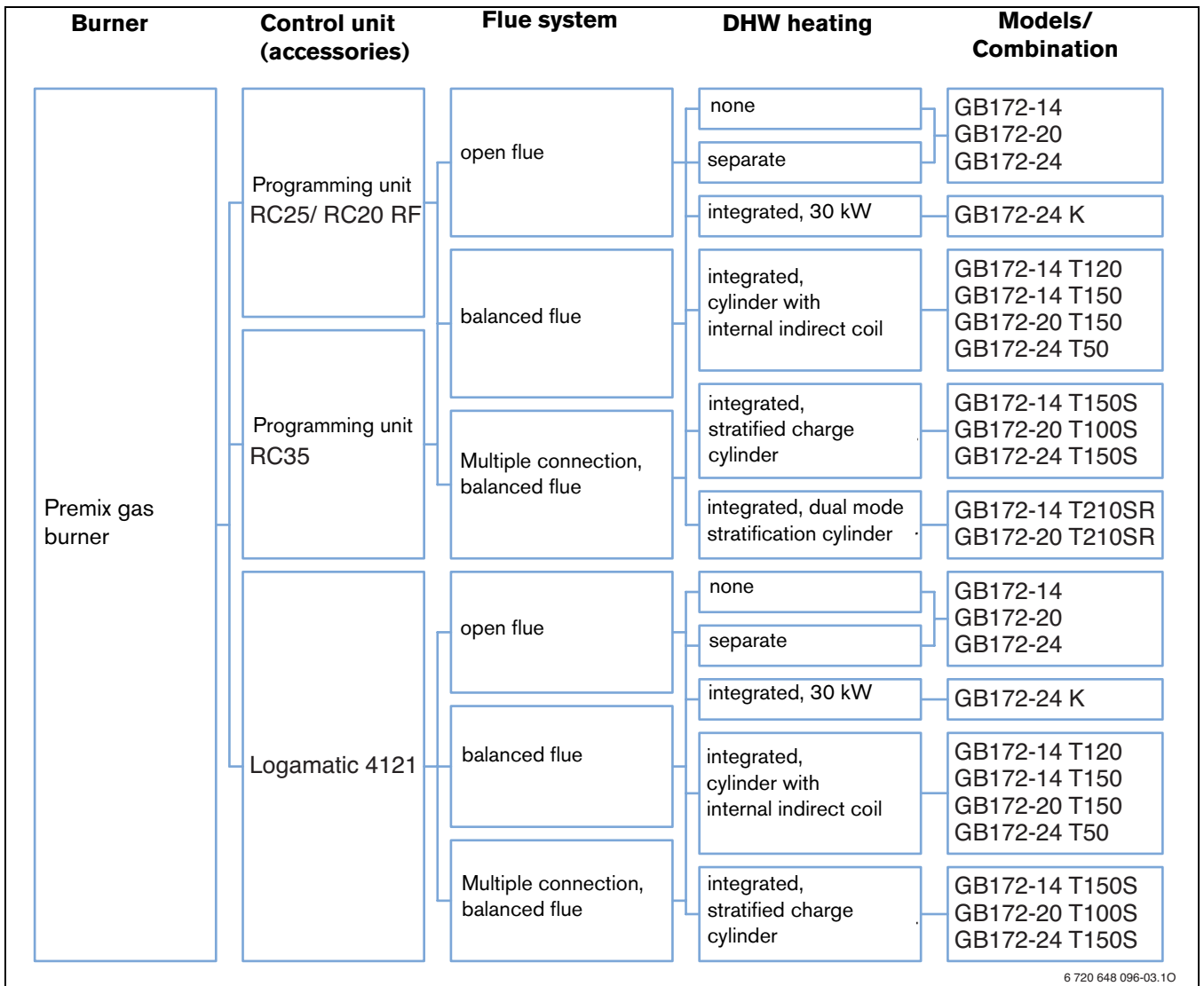


Fig. 1

1.2 Overview of boiler types Logamax plus GB172

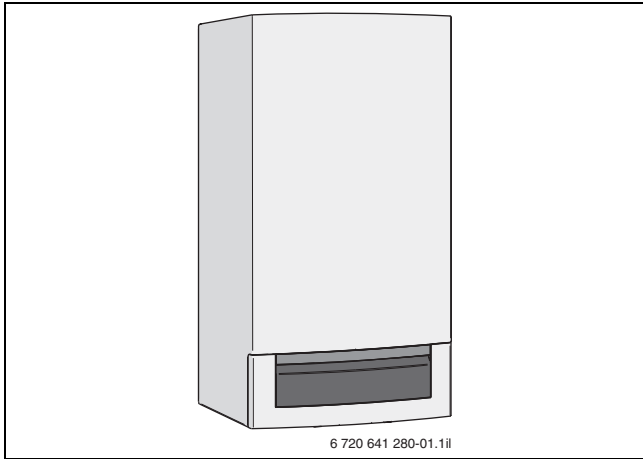


Fig. 2 Gas condensing boiler Logamax plus GB172-14/20/24 IK

Key	Explanation
Logamax plus	Umbrella term
GB172	Series
-14/-20/-24	Output in kW
K	Combi boiler (with integral DHW heating according to the instantaneous water heater principle)

Table 2

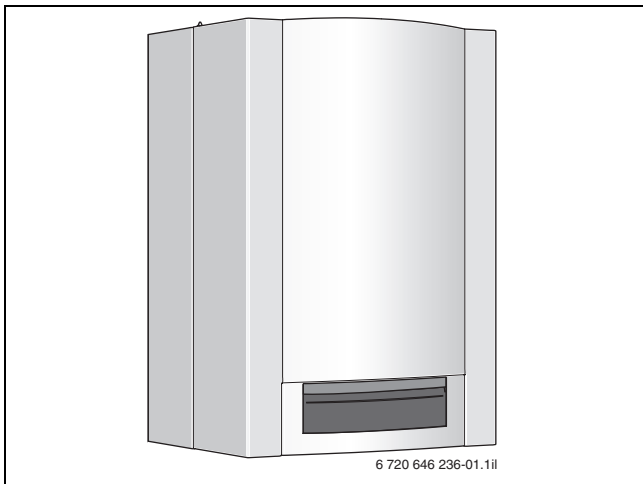


Fig. 3 Gas condensing boiler Logamax plus GB172-24 T50

Key	Explanation
Logamax plus	Umbrella term
GB172	Series
-24	Output in kW
T50	With integral 48 l DHW cylinder

Table 3

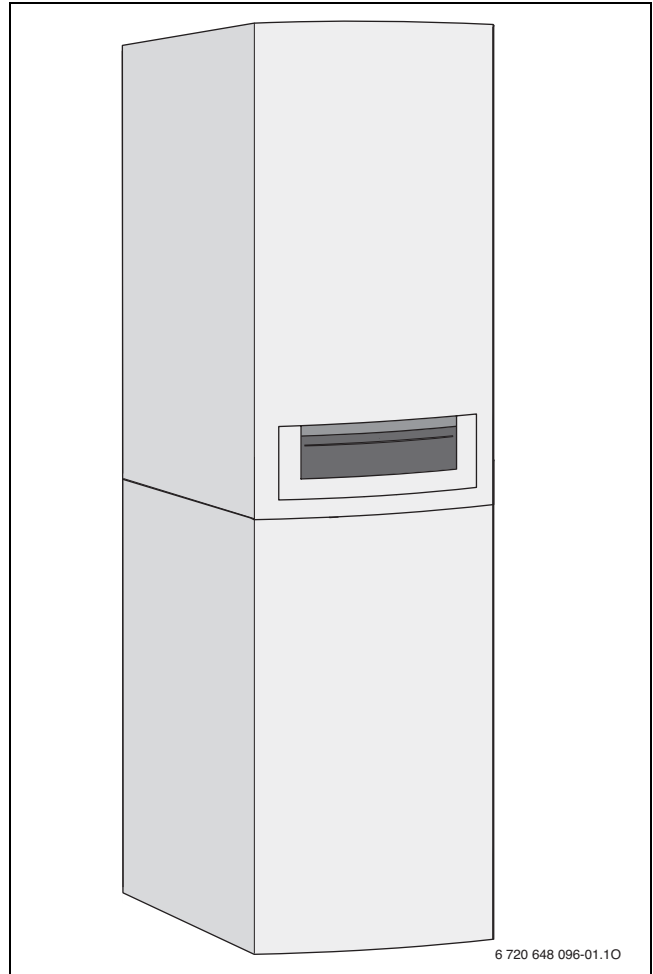


Fig. 4 Gas condensing compact heating centre Logamax plus GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S, GB172-14/20 T210SR

Key	Explanation
Logamax plus	Umbrella term
GB172	Series
-14/-20/-24	Output in kW
T	With integral DHW cylinder
100/120/150/210	Approximate capacity of the DHW cylinder
S	Stratification cylinder
R	Indirect coil for solar DHW heating

Table 4

Logamax plus	Rated output in kW	Equipped ex works for		LPG conversion kit Part no.
		Natural gas E (G20) Part no.	Natural gas LL (G25) Part no.	
Appliances without DHW cylinder				
GB172-14	14	7 716 010 416	7 716 010 613	8 737 600 365 0
GB172-20	20	7 716 010 417	7 716 010 614	8 737 600 366 0
GB172-24	24	7 716 010 418	7 716 010 615	8 737 600 367 0
GB172-24 K	24	7 716 010 415	7 716 010 612	8 737 600 368 0
Appliances with DHW cylinders with internal indirect coil				
GB172-24 T50	24	7 716 701 390	7 716 701 406	8 716 764 907 0
GB172-14 T120	14	7 736 615 651	7 736 615 652	8 737 600 337 0
GB172-14 T150	14	7 736 615 653	7 736 615 654	8 737 600 337 0
GB172-20 T150	20	7 736 615 655	7 736 615 656	8 737 600 341 0
Appliances with stratification cylinder				
GB172-14 T150S	14	7 736 615 657	7 736 615 658	8 737 600 338 0
GB172-14 T210SR	14	7 736 615 503	7 736 615 504	8 737 600 338 0
GB172-20 T100S	20	7 736 615 661	7 736 615 662	8 737 600 342 0
GB172-20 T210SR	20	7 736 615 505	7 736 615 506	8 737 600 342 0
GB172-24 T150S	24	7 736 615 659	7 736 615 660	8 737 600 340 0

Table 5 Logamax plus GB172 output sizes

2 Technical description

2.1 Logamax plus GB172/GB172T equipment level

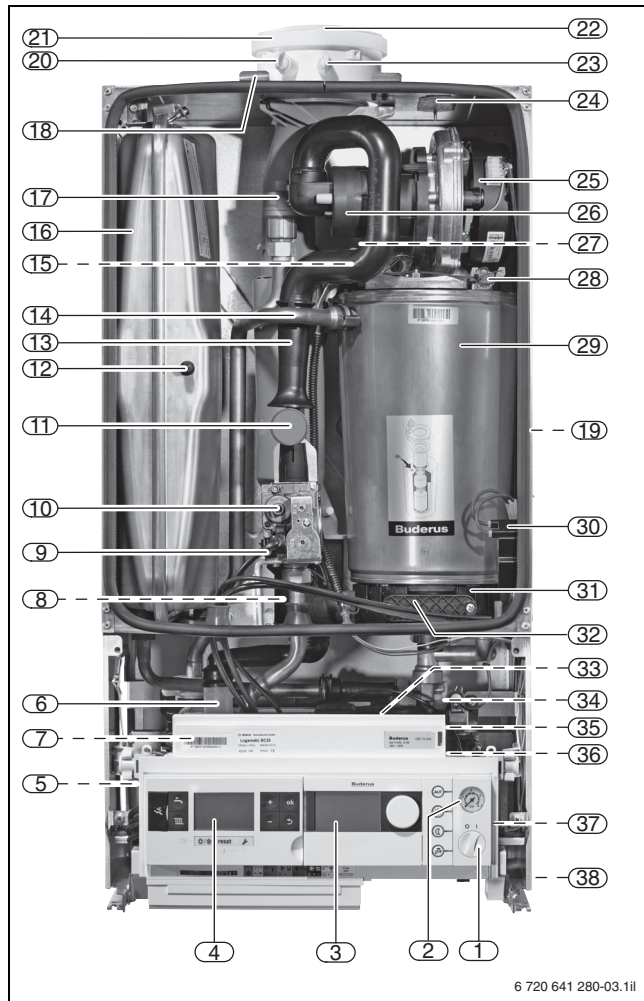


Fig. 5 Assemblies Logamax plus GB172
(example GB172-24 K)

- 1 ON/OFF switch
- 2 Pressure gauge
- 3 Logamatic RC35 programming unit
- 4 Base controller BC25
- 5 DHW temperature sensor (not shown) (only for GB172-24 K)
- 6 Condensate trap
- 7 DHW plate heat exchanger (only for GB172-24 K) (not shown)
- 8 Flue gas temperature limiter (not shown)
- 9 Test port for gas supply pressure
- 10 Adjusting screw, gas volume, lowest load
- 11 Gas restrictor, gas volume adjustment, full load
- 12 Valve for filling with nitrogen (expansion vessel, only for GB172-24 K)
- 13 Suction pipe
- 14 CH flow
- 15 Flow temperature sensor (not shown)
- 16 Expansion vessel (standard equipment only for GB172-24 K, otherwise accessory)
- 17 Automatic air vent valve
- 18 Bracket
- 19 Type plate (not shown)
- 20 Test port for flue gas
- 21 Combustion air inlet
- 22 Flue pipe
- 23 Test port for combustion air
- 24 Inspection aperture
- 25 Fan
- 26 Mixing facility with flue gas non-return device (diaphragm)
- 27 Electrode set (not shown)
- 28 Temperature limiter for heating block
- 29 Cast aluminium heat exchanger
- 30 Ignition transformer
- 31 Condensate tray
- 32 Inspection aperture cover
- 33 Heating circuit pump (not shown)
- 34 3-way valve (not shown)
- 35 Turbine (not shown) (only for GB172-24 K)
- 36 Safety valve heating circuit (not shown)
- 37 DHW safety valve (not shown) (only for GB172-24 K)
- 38 Drain & fill valve (not shown)

The wall mounted Logamax plus GB172 and GB172-24 K gas condensing boilers have been tested in compliance with the Gas Appliances Directive 90/396/EEC. The requirements of standards EN 483 and EN 677 were taken into consideration. These boilers, with an output of 14 kW, 20 kW and 24 kW, can be operated with natural gas and LPG in accordance with appliance category II₂ELL3P.

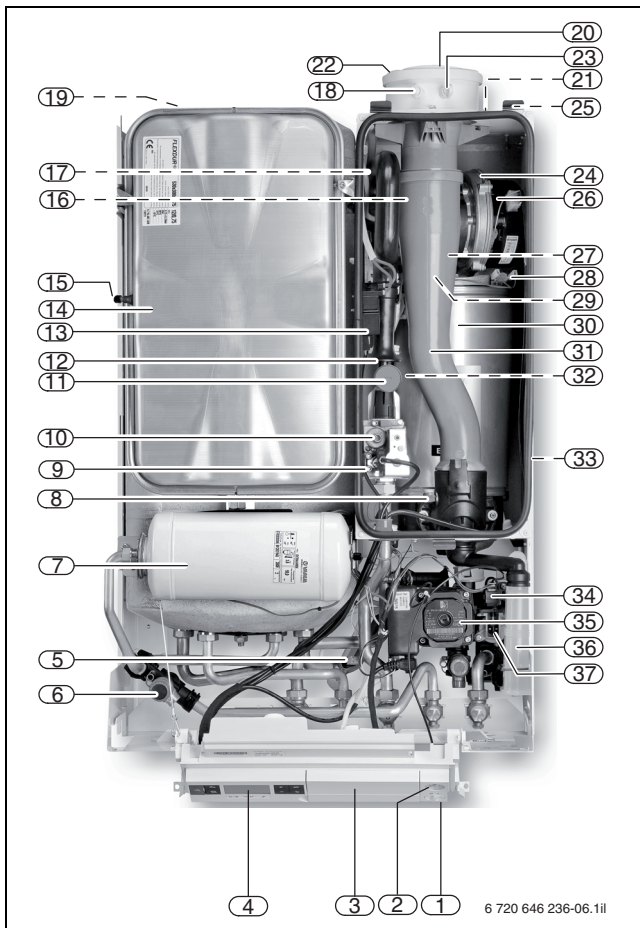
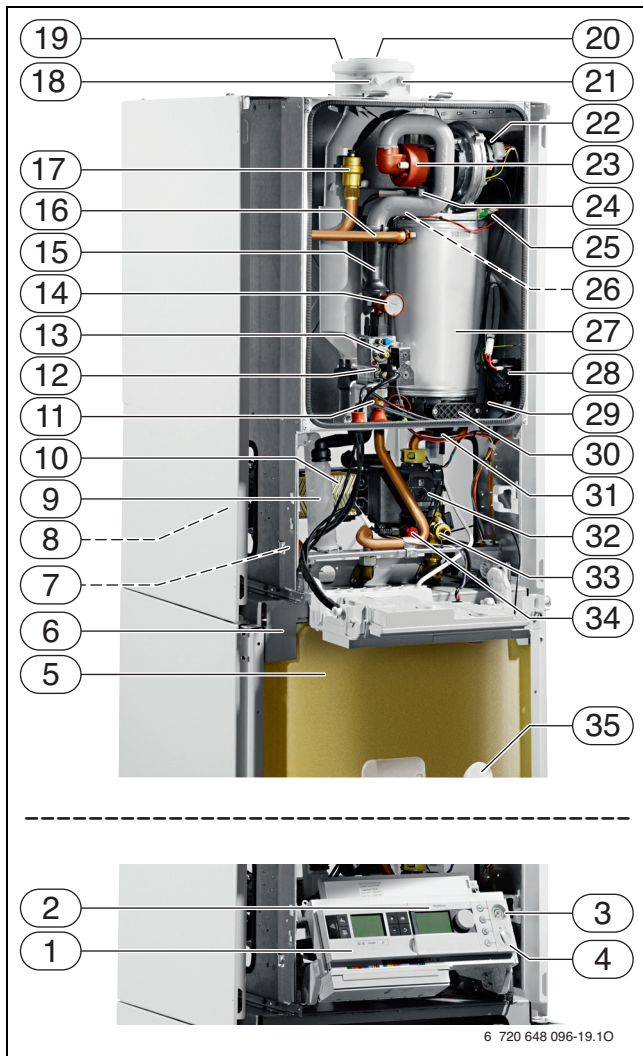


Fig. 6 Logamax plus GB172-24 T50 assemblies

- 1 ON/OFF switch
- 2 Pressure gauge
- 3 Slot for Logamatic RC35 programming unit
- 4 Base controller BC25
- 5 Temperature sensor at the cylinder return
- 6 Safety valve (DHW)
- 7 Expansion vessel (DHW, 2 litre), accessory
- 8 Flue gas temperature limiter
- 9 Test port for gas supply pressure
- 10 Adjusting screw, gas volume, lowest load
- 11 Gas restrictor, gas volume adjustment, full load
- 12 Suction pipe
- 13 Ignition transformer
- 14 Expansion vessel (central heating)
- 15 Valve for charging with nitrogen
- 16 Automatic air vent valve (not shown)
- 17 Test port, control pressure (not shown)
- 18 Test port for flue gas
- 19 DHW cylinder (not shown)
- 20 Flue pipe
- 21 Test port (not shown)
- 22 Combustion air inlet
- 23 Test port for combustion air
- 24 Mixing facility (not shown) with flue gas non-return device (diaphragm)
- 25 Clip (not shown)
- 26 Fan
- 27 Electrode set (not shown)
- 28 Temperature limiter for heating block
- 29 Flow temperature sensor
- 30 CH heat exchanger
- 31 Flue pipe
- 32 Heating flow (not shown)
- 33 Type plate (not shown)
- 34 3-way valve (not shown)
- 35 Heating circuit pump
- 36 Condensate trap
- 37 Safety valve (heating circuit)



- 1 Base controller BC25
- 2 Logamatic RC35 programming unit (accessory)
- 3 Pressure gauge
- 4 ON/OFF switch
- 5 DHW cylinder
- 6 Type plate
- 7 DHW temperature sensor (not shown)
- 8 Cylinder primary pump (not shown)
- 9 Condensate trap
- 10 Plate heat exchanger
- 11 Flue gas temperature limiter
- 12 Test port for gas supply pressure
- 13 Adjusting screw, gas volume, lowest load
- 14 Gas restrictor, gas volume adjustment, full load
- 15 Suction pipe
- 16 CH flow
- 17 Automatic air vent valve
- 18 Test port for flue gas
- 19 Combustion air inlet
- 20 Flue pipe
- 21 Test port for combustion air
- 22 Fan
- 23 Mixing facility with flue gas non-return device (diaphragm)
- 24 Set of electrodes
- 25 Temperature limiter for heating block
- 26 Flow temperature sensor (not shown)
- 27 CH heat exchanger
- 28 Ignition transformer
- 29 Condensate tray
- 30 Inspection aperture cover
- 31 3-way valve
- 32 Heating circuit pump
- 33 Drain & fill valve (DFV)
- 34 Safety valve (heating circuit)
- 35 Protective anode
- 38 Drain tap

Fig. 7 Assemblies Logamax plus GB172 T
(example GB172-20 T100S)

Boiler block, burner and heat exchanger

- Internal sealed combustion chamber
- Stainless steel premix burner
- Cast aluminium:silicon heat exchanger
- Gas combination valve with adjustable gas appliance pressure regulator and gas solenoid valves
- Flame monitoring system
- Cyclic ignition via ignition electrode

Hydraulic components

- Integral high efficiency heating circuit pump (energy efficiency category A)
 - As an option, either output-dependent or differential pressure-dependent control for every appliance version of the Logamax plus GB172 range (standard equipment)
- Integral 3-way diverter valve
- Expansion vessel
 - May be integrated for the GB172-14/20/24 (accessory)
 - Factory-fitted for the GB172-24 K, GB172-24 T50 (12 l): 0.75 bar pre-charge pressure
 - Part of the standard delivery for the GB172-14/20 T210SR (12 l), 0.75 bar pre-charge pressure
 - Part of the standard delivery for the GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S (18 l), 1.9 bar pre-charge pressure
- Automatic air vent valve
- Safety valve (response pressure 3.0 bar)
- For the GB172-24 K and GB172-24 T50: DHW safety valve (response pressure 10 bar)
- Analogue pressure gauge

DHW heating

- Separate DHW heating is only possible with the Logamax plus GB172 via an indirectly heated DHW cylinder to DIN 4753-3
- Integral DHW heating with the Logamax plus GB172-24 K via a plate heat exchanger with warm start option for rapid availability of DHW at the selected temperature
- Integral DHW heating for the Logamax plus GB172-24 T50 by means of the 48 l DHW cylinder with internal indirect coil, for high DHW convenience on the smallest footprint
- Integral DHW heating for the Logamax plus GB172-14 T120, GB172-14/20 T150 by means of an internal DHW cylinder below with internal indirect coil providing 115 l or 143 l capacity
- Integral DHW heating for the Logamax plus GB172-20 T100S, GB172-14/24 T150S by means of an internal stratification cylinder below with internal indirect coil providing 101 l or 148 l capacity
- Integral DHW heating for the Logamax plus GB172-14/20 T210SR by means of an internal dual mode stratification cylinder below with internal indirect coil providing 204 l capacity

Control components

- Logamatic BC25 base controller with integral burner control unit

2.2 Logamax plus GB172/GB172T function principle

2.2.1 Heat exchanger and gas burner unit

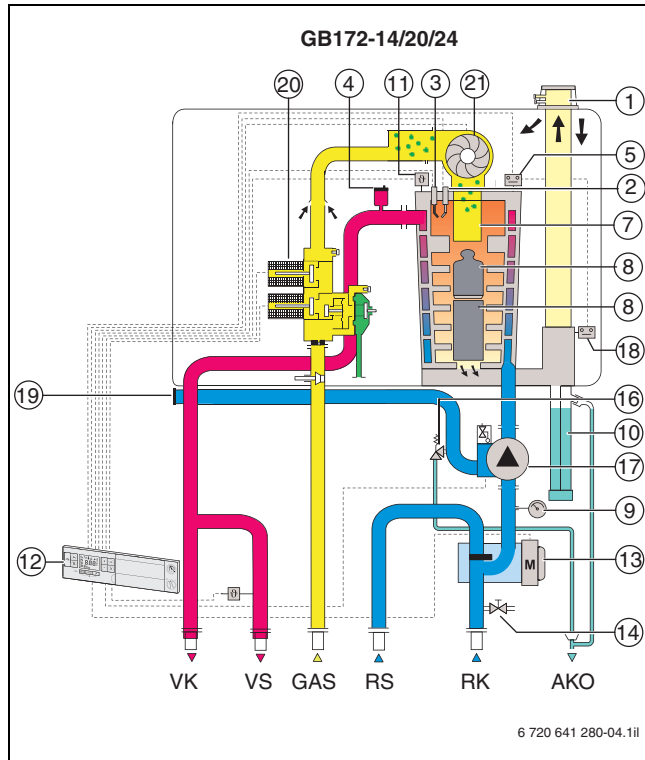


Fig. 8 Function diagram
Logamax plus GB172-14/20/24

- AKO** Condensate drain
- GAS** Gas connection
- RK** Boiler return
- RS** Cylinder return
- VK** Boiler flow
- VS** Cylinder flow
- 1** Air/flue gas connection
- 2** Ignition electrode
- 3** Monitoring electrode
- 4** Automatic air vent valve
- 5** High limit safety cut-out
- 7** Stainless steel linear radiant burner
- 8** Displacer
- 9** Pressure gauge
- 10** Siphon
- 11** Flow temperature sensor
- 12** Logamatic BC25 base controller
- 13** Three-way diverter valve
- 14** Drain & fill valve (DFV)
- 16** Safety valve
- 17** Heating circuit pump
- 18** Flue gas temperature limiter
- 19** Connection for external expansion vessel
- 20** Gas valve
- 21** Fan

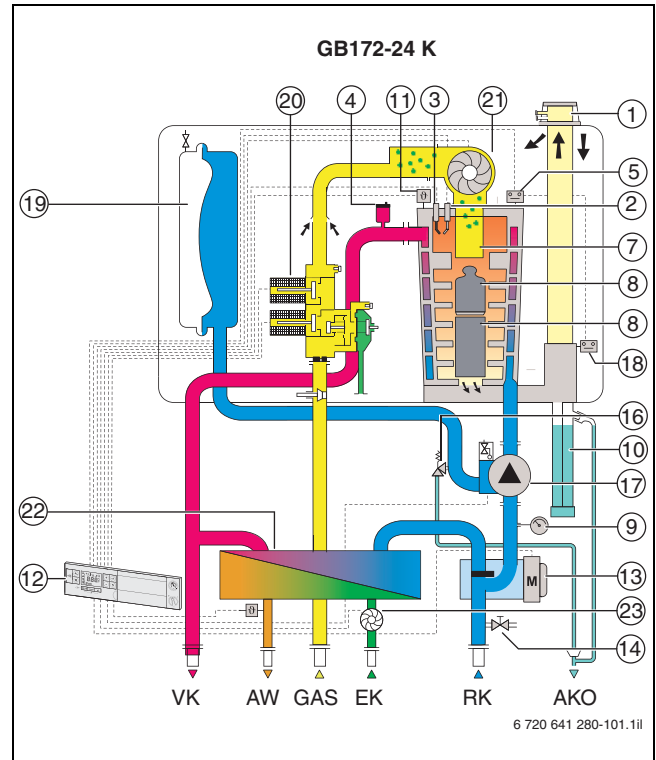


Fig. 9 Function diagram
Logamax plus GB172-24 K

- AKO** Condensate drain
- AW** DHW outlet
- EK** Cold water inlet
- GAS** Gas connection
- RK** Boiler return
- VK** Boiler flow
- 1** Air/flue gas connection
- 2** Ignition electrode
- 3** Monitoring electrode
- 4** Automatic air vent valve
- 5** High limit safety cut-out
- 7** Stainless steel linear radiant burner
- 8** Displacer
- 9** Pressure gauge
- 10** Siphon
- 11** Flow temperature sensor
- 12** Logamatic BC25 base controller
- 13** Three-way diverter valve
- 14** Drain & fill valve (DFV)
- 16** Safety valve
- 17** Heating circuit pump
- 18** Flue gas temperature limiter
- 19** 12 l expansion vessel (factory-fitted)
- 20** Gas valve
- 21** Fan
- 22** DHW heat exchanger
- 23** Turbine

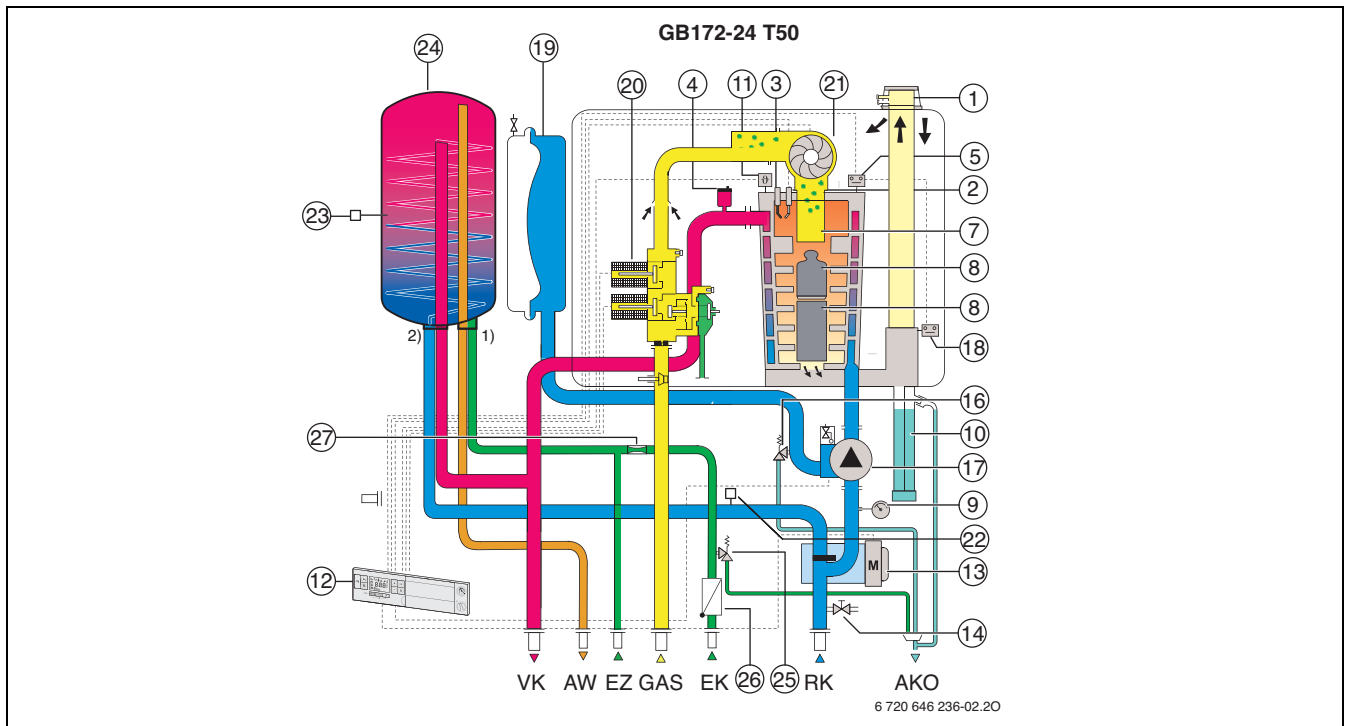


Fig. 10 Function diagram Logamax plus GB172-24 T50

- AKO** Condensate drain
 - AW** DHW outlet
 - EK** Cold water inlet
 - EZ** DHW circulation inlet
 - GAS** Gas connection
 - RK** Boiler return
 - VK** Boiler flow
 - 1** Air/flue gas connection
 - 2** Ignition electrode
 - 3** Monitoring electrode
 - 4** Automatic air vent valve
 - 5** High limit safety cut-out
 - 7** Stainless steel linear radiant burner
 - 8** Displacer
 - 9** Pressure gauge
 - 10** Siphon
 - 11** Flow temperature sensor
 - 12** Logamatic BC25 base controller
 - 13** Three-way diverter valve
 - 14** Drain & fill valve (DFV)
 - 16** Safety valve
 - 17** Heating circuit pump
 - 18** Flue gas temperature limiter
 - 19** 12 l expansion vessel (factory-fitted)
 - 20** Gas valve
 - 21** Fan
 - 22** DHW return sensor
 - 23** DHW sensor
 - 24** DHW cylinder with internal indirect coil
 - 25** Safety valve, cold water
 - 26** Check valve
 - 27** Flow limiter
- 1) Cold water inlet (not shown)
 2) Cylinder flow (not shown)

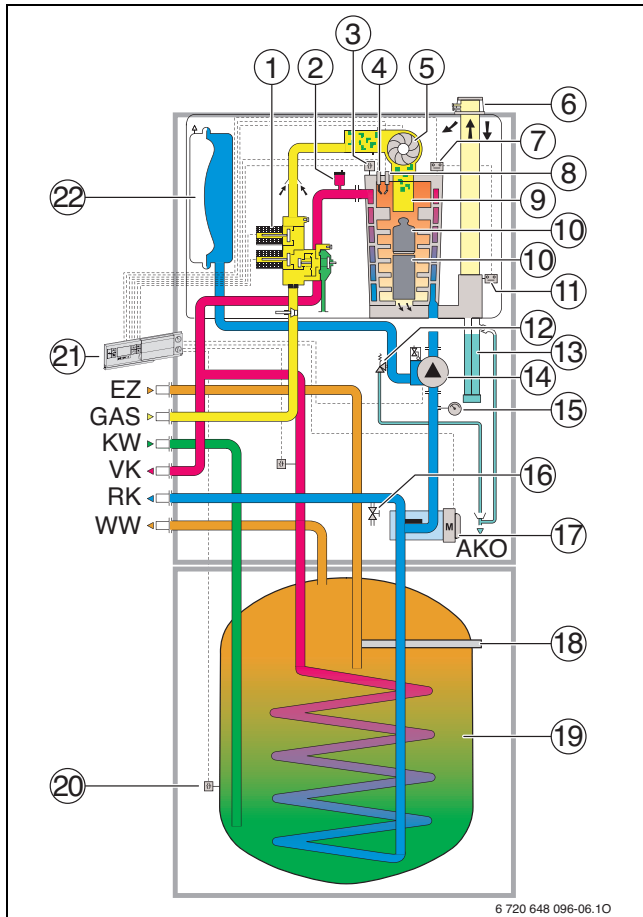


Fig. 11 Function diagram Logamax plus
GB172-14 T120, GB172-14/20 T150

- AKO** Condensate drain
- AW** DHW outlet
- EK** Cold water inlet
- GAS** Gas connection
- RK** Boiler return
- VK** Boiler flow
- 1** Gas valve
- 2** Automatic air vent valve
- 3** Flow temperature sensor
- 4** Monitoring electrode
- 5** Fan
- 6** Air/flue gas connection
- 7** High limit safety cut-out
- 8** Ignition electrode
- 9** Stainless steel linear radiant burner
- 10** Displacer
- 11** Flue gas temperature limiter
- 12** Safety valve
- 13** Siphon
- 14** Heating circuit pump
- 15** Pressure gauge
- 16** Drain & fill valve (DFV)
- 17** Three-way diverter valve
- 18** Magnesium anode
- 19** DHW cylinder with internal indirect coil
- 20** Cylinder temperature sensor
- 21** Logomatic BC25 base controller
- 22** 18 l expansion vessel (part of the standard delivery)

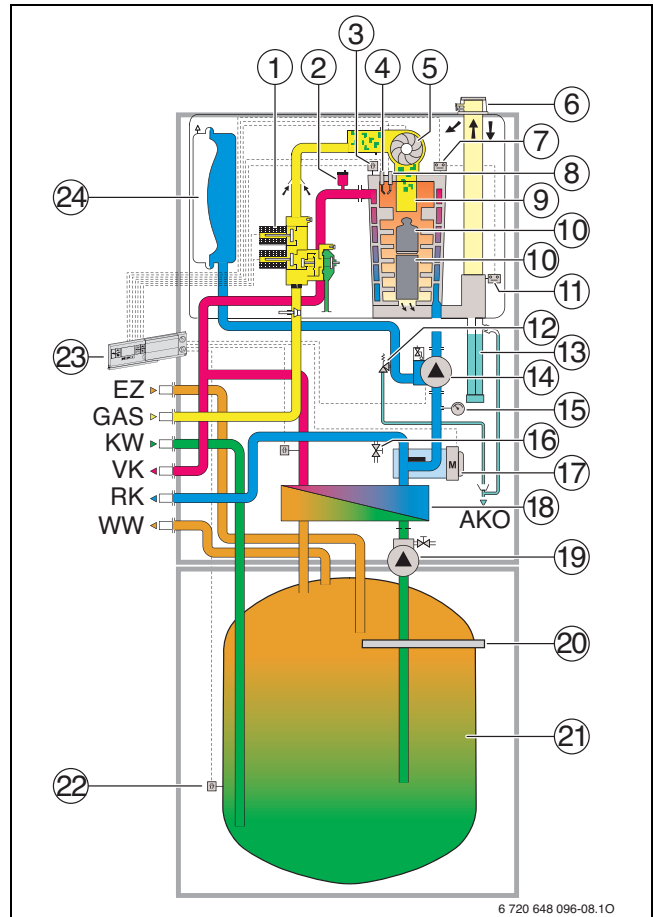


Fig. 12 Function diagram Logamax plus
GB172-20 T100S, GB172-14/24 T150S

- AKO** Condensate drain
- AW** DHW outlet
- EK** Cold water inlet
- GAS** Gas connection
- RK** Boiler return
- VK** Boiler flow
- 1** Gas valve
- 2** Automatic air vent valve
- 3** Flow temperature sensor
- 4** Monitoring electrode
- 5** Fan
- 6** Air/flue gas connection
- 7** High limit safety cut-out
- 8** Ignition electrode
- 9** Stainless steel linear radiant burner
- 10** Displacer
- 11** Flue gas temperature limiter
- 12** Safety valve
- 13** Siphon
- 14** Heating circuit pump
- 15** Pressure gauge
- 16** Drain & fill valve (DFV)
- 17** Three-way diverter valve
- 18** DHW heat exchanger
- 19** Cylinder primary pump with automatic air vent valve
- 20** Magnesium anode
- 21** Stratification cylinder
- 22** Cylinder temperature sensor
- 23** Logomatic BC25 base controller
- 24** 18 l expansion vessel (part of the standard delivery)

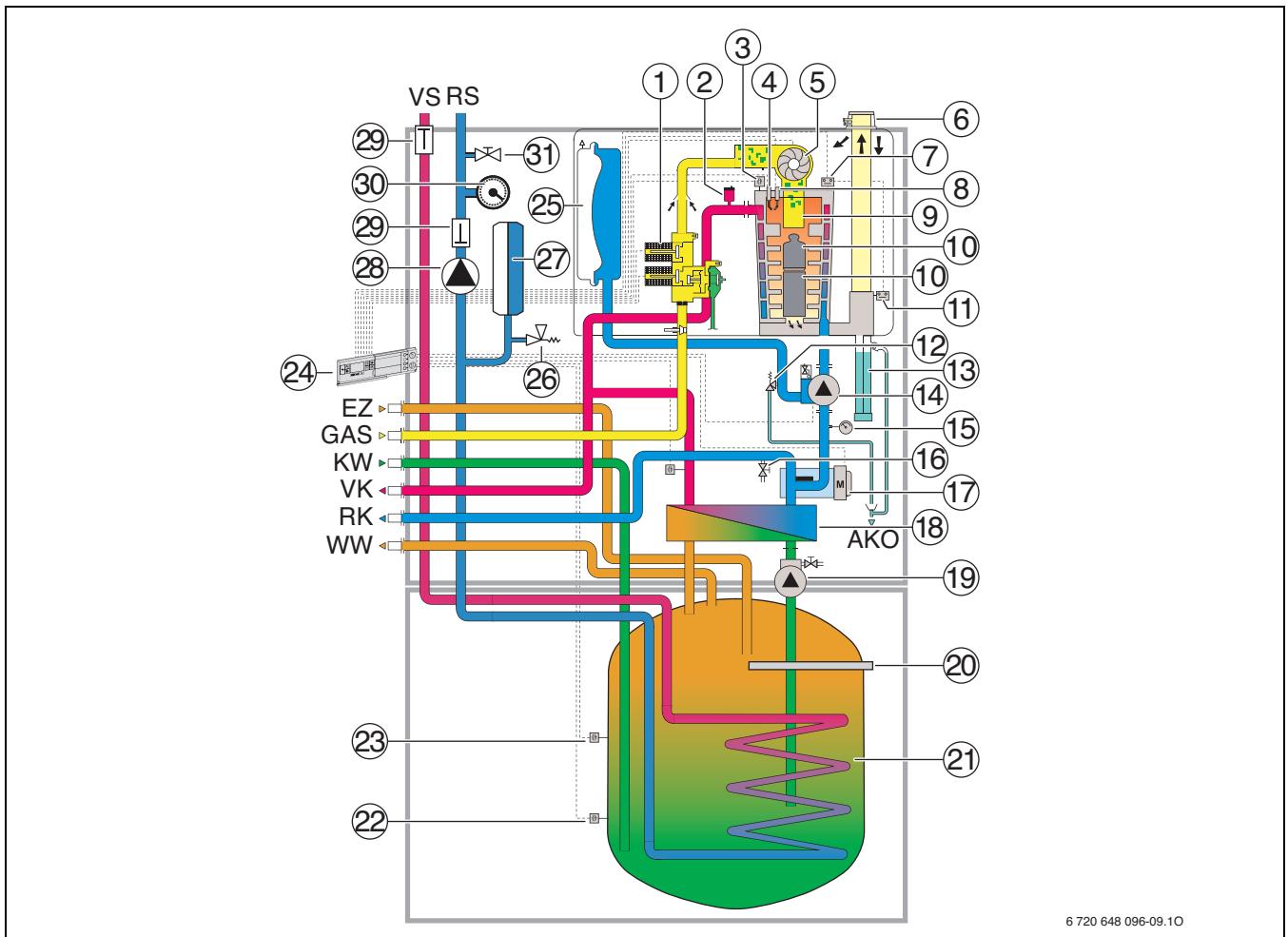


Fig. 13 Function diagram Logamax plus GB172-14/20 T210SR

- | | |
|---|---|
| AKO Condensate drain | 21 Stratification cylinder |
| AW DHW outlet | 22 Cylinder temperature sensor, solar |
| EK Cold water inlet | 23 Cylinder temperature sensor |
| GAS Gas connection | 24 Logamatic BC25 base controller with RC35 programming unit |
| RK Boiler return | 25 12 l expansion vessel (part of the standard delivery) |
| RS Solar circuit return | 26 Solar circuit safety valve |
| VK Boiler flow | 27 Solar expansion vessel |
| VS Solar circuit flow | 28 Solar circuit pump |
| 1 Gas valve | 29 Gravity brake |
| 2 Automatic air vent valve | 30 Solar circuit pressure gauge |
| 3 Flow temperature sensor | 31 Solar circuit drain & fill valve (DFV) |
| 4 Monitoring electrode | |
| 5 Fan | |
| 6 Air/flue gas connection | |
| 7 High limit safety cut-out | |
| 8 Ignition electrode | |
| 9 Stainless steel linear radiant burner | |
| 10 Displacer | |
| 11 Flue gas temperature limiter | |
| 12 Safety valve | |
| 13 Siphon | |
| 14 Heating circuit pump | |
| 15 Pressure gauge | |
| 16 Drain & fill valve (DFV) | |
| 17 Three-way diverter valve | |
| 18 DHW heat exchanger | |
| 19 Cylinder primary pump with automatic air vent valve | |
| 20 Magnesium anode | |

The Logamax plus GB172/GB172T is equipped with a sand-cast heat exchanger made from an aluminium-silicon alloy. Heating water and flue gases are routed in countercurrent.

This concept offers the following benefits:

- Compact dimensions
- Easy service and maintenance
- Excellent standard seasonal efficiency [to DIN] of up to 109 %

The stainless steel linear radiant burner of the Logamax plus GB172/GB172T is arranged inside the heat exchanger.

2.2.2 Burner ignition and flame monitoring

Burner ignition

The Logamax plus GB172/GB172T is equipped with cyclic ignition that takes the form of an ignition electrode.

Flame monitoring system

Should the burner fail to ignite or the flame go out, the Logamatic BC25 base controller receives no flame signal from the monitoring electrode (→ Fig. 8 and Fig. 9, pos. 3). The BC25 then immediately interrupts the gas supply to the gas valve, switches the burner off and issues a fault message.

2.2.3 Heating circuit pump and hydraulics

The Logamax plus GB172/GB172T gas condensing boiler incorporates a modulating high efficiency (HE) pump (energy efficiency category A) that operates with output or differential pressure-dependent control, thereby ensuring quiet system operation.

2.2.4 Combustion air supply and flue gas routing

The fan (→ Fig. 8 and Fig. 9, pos. 21) draws in the combustion air required for the combustion process. The positive combustion air pressure transports the flue gas created during combustion into the flue system.

The gas:air mixing device throttles back the gas supply or shuts it off completely if the fan stops working or if either the combustion air or flue path are blocked. If the gas flame goes out, the Logamax plus GB172/GB172T gas condensing boiler will be shut down by the integral flame monitor, and the Logamatic BC25 issues a fault message.



For information regarding the operating and fault messages at the Logamatic BC25
→ page 45 f. base controller.

2.2.5 Gas:air control

Gas:air mixing unit

For the Logamax plus GB172/GB172T, the gas:air mixing unit comprises a fan, gas valve and venturi nozzle. Subject to the fan speed and the resulting air flow rate, a specific negative pressure is created inside the venturi nozzle. The required gas volume is metered through this negative pressure. The gas and combustion air are fully mixed inside the fan.

The result of the gas-air mixture control is a constantly high CO₂ content in the flue gas across the entire burner modulation range.

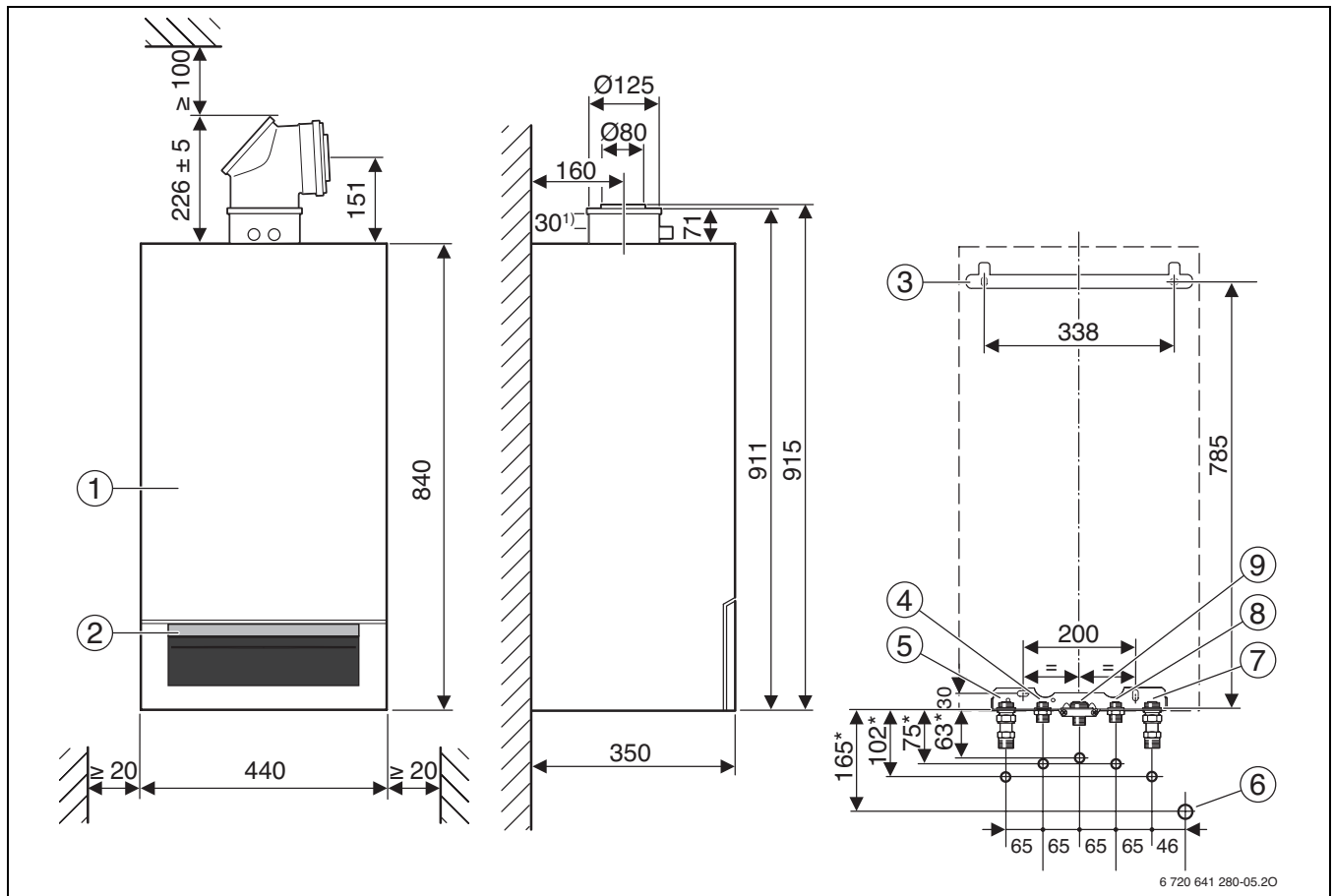
Control sequence

Subject to the outside temperature and the heating curve, the controller calculates a set flow temperature. This is transferred to the BC25 base controller and compared with the actual temperature captured by the flow temperature sensor. Output is modulated if this comparison results in a differential, the so-called control deviation.

2.3 Logamax plus GB172/GB172T dimensions and specification

2.3.1 Dimensions and connections

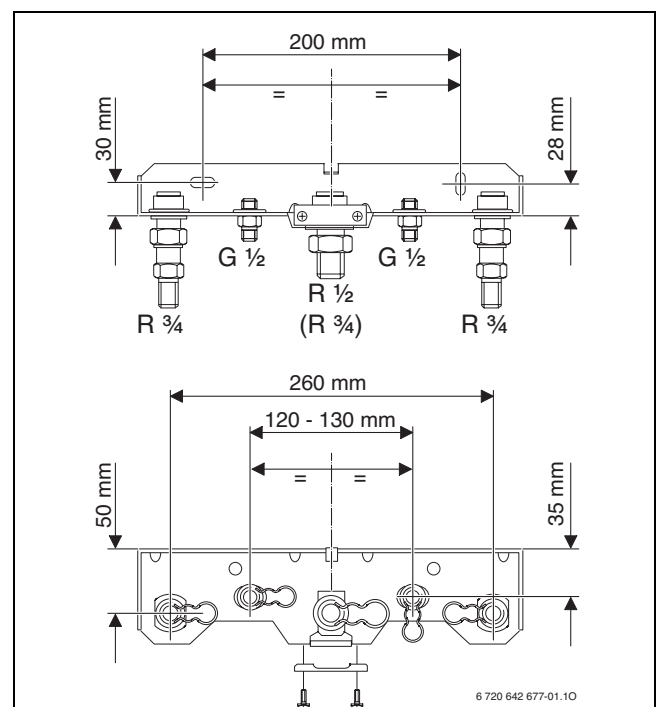
Logamax plus GB172



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Fig. 14 Logamax plus GB172 dimensions and connections (dim. in mm)

- 1 Casing
 - 2 Fascia
 - 3 Mounting rail
 - 4 Cylinder flow/DHW (appliance G 1/2 , accessory R 1/2)
 - 5 Heating flow (appliance G 3/4 , accessory R 3/4)
 - 6 Connection DN 40 siphon (accessory)
 - 7 Heating return (appliance G 3/4 , accessory R 3/4)
 - 8 Cylinder return/cold water (appliance G 1/2 , accessory R 1/2)
 - 9 Gas (appliance G 1, accessories either R 1/2 or R 3/4)
- 1) Plug-in depth for flue components
 * Dimensions apply when using accessories U-MA and AS6-UP.



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Fig. 15 Dimensions, U-MA mounting plate

GB172-24 T50

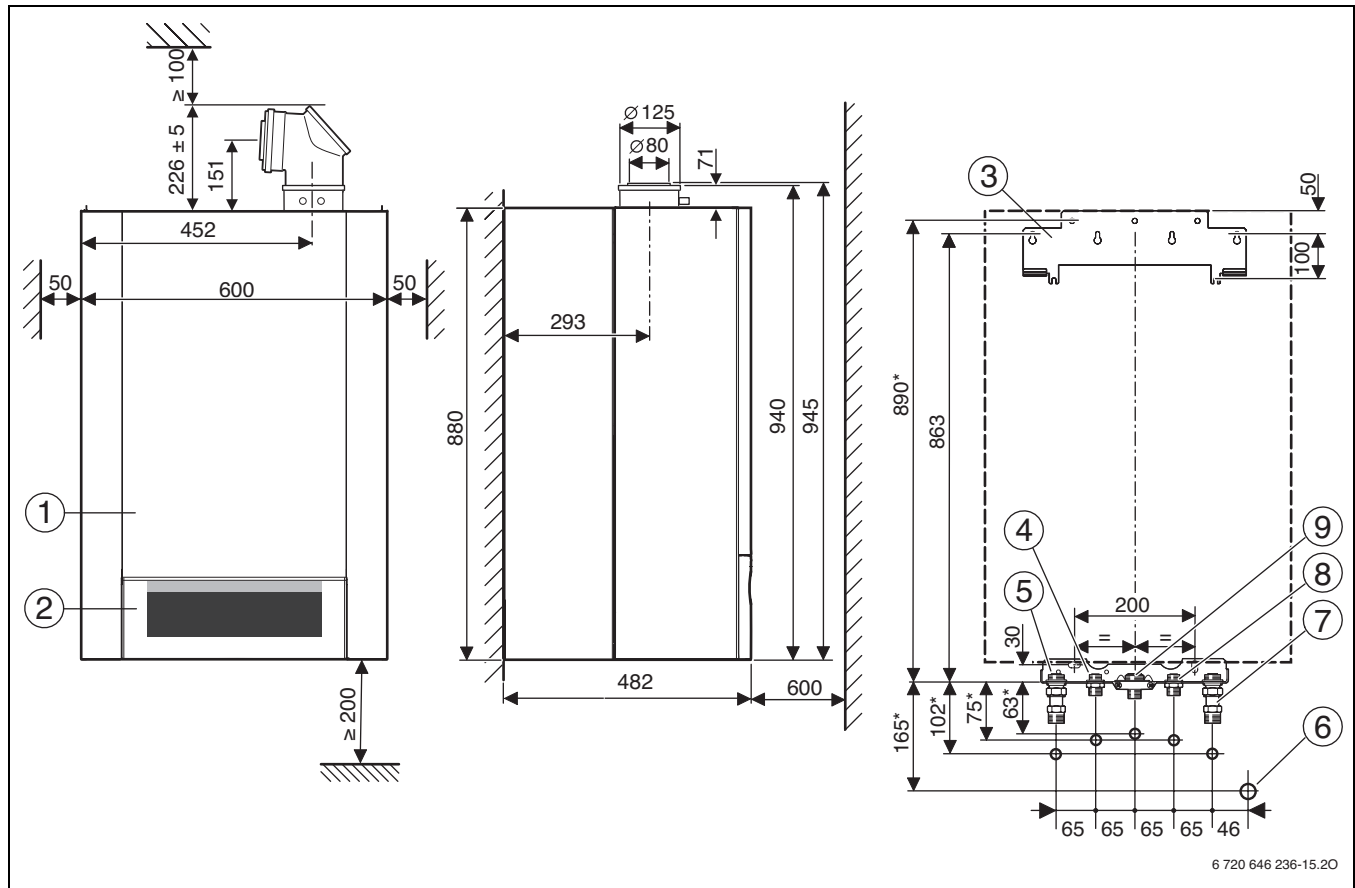


Fig. 16 Logamax plus GB172-24 T50 dimensions and connections (dim. in mm)

- 1 Casing
- 2 Fascia
- 3 Mounting rail
- 4 DHW (appliance G 1/2 , accessory R 1/2)
- 5 Heating flow (appliance G 3/4 , accessory R 3/4)
- 6 Connection DN 40 siphon (accessory)
- 7 Heating return (appliance G 3/4 , accessory R 3/4)
- 8 Cold water (appliance G 1/2 , accessory R 1/2)
- 9 Gas (appliance G 1, accessories either R 1/2 or R 3/4)
- * Dimensions apply when using accessories U-MA and AS6-UP

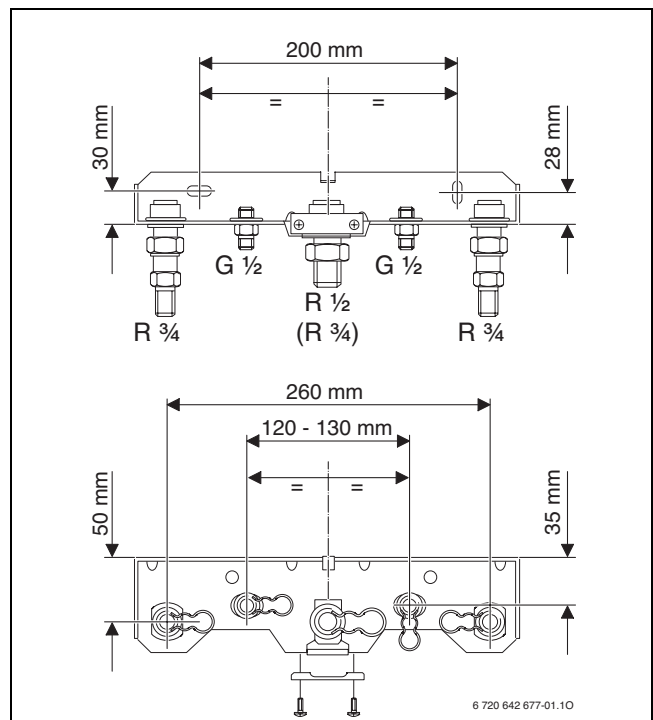


Fig. 17 Dimensions, U-MA mounting plate

GB172-.. T120/T150 and GB172-.. T100S/T150S

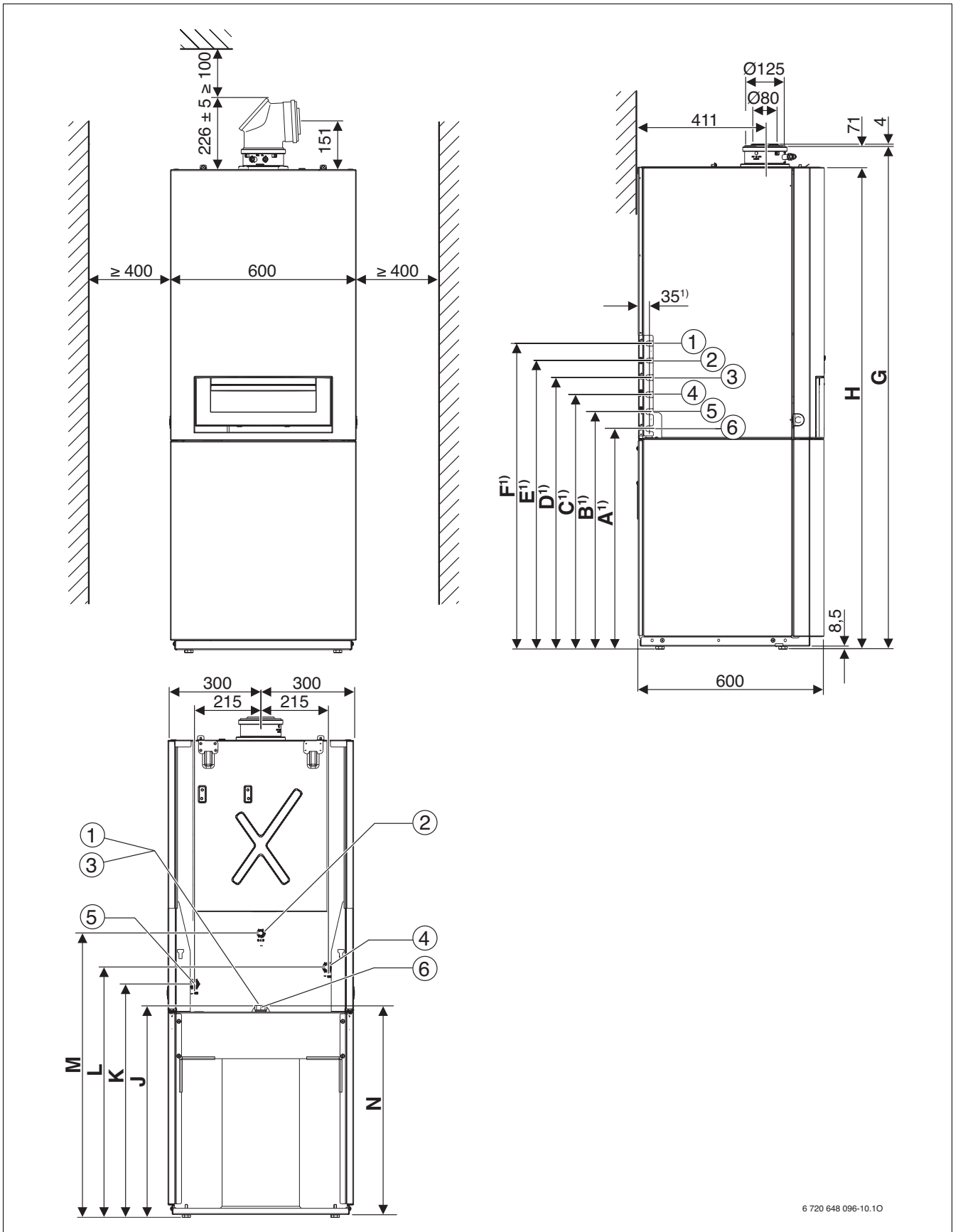


Fig. 18 Dimensions and connections for the GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S, (dim. in mm)

¹⁾ Dimensions only in connection with the side connection set (accessory)

Key to Fig. 18:

- 1 DHW circulation G 1/2
- 2 Gas G 1/2
- 3 Cold water G 3/4
- 4 Heating flow G 3/4
- 5 Heating return G 3/4
- 6 DHW G 3/4

	A	B	C	D	E	F	G
GB172-20 T100S	668	723	778	883	888	943	1590
GB172-14 T120	775	830	885	940	995	1050	1695
GB172-14/20 T150	925	980	1035	1090	1145	1200	1845
GB172-14/24 T150S	928	985	1039	1091	1149	1203	1843

	H	J	K	L	M	N
GB172-20 T100S	1515	684	723	778	888	693
GB172-14 T120	1620	791	830	885	995	800
GB172-14/20 T150	1770	941	980	1035	1145	950
GB172-14/24 T150S	1774	982	985	1039	1149	972

Table 6 Dimensions Logamax plus GB172-20 T100S, GB172-14 T120, GB172-14/20 T150, GB172-14/24 T150S (dim. in mm)

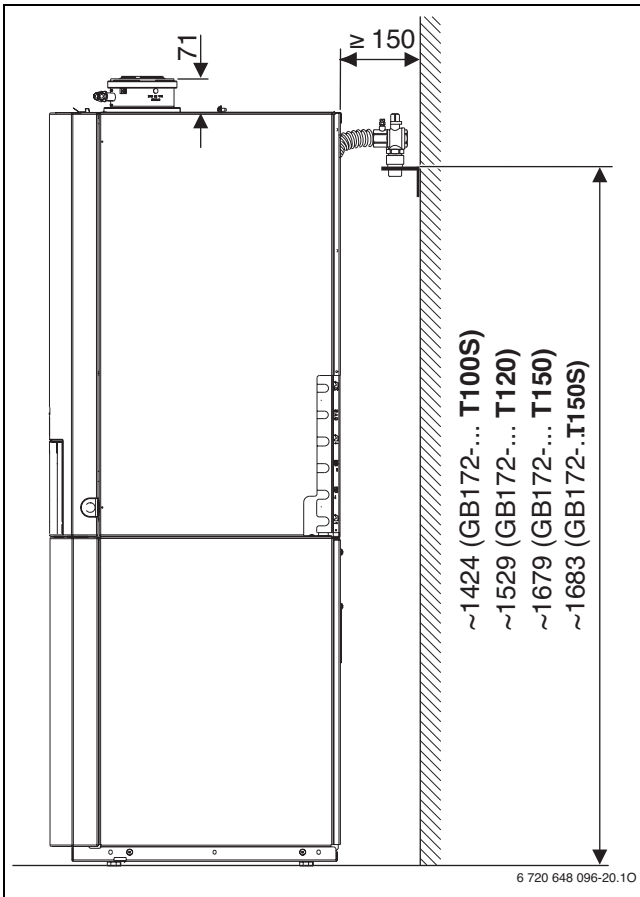


Fig. 19 Connections for the GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S (dim. in mm) in connection with the rear connection set (accessory)

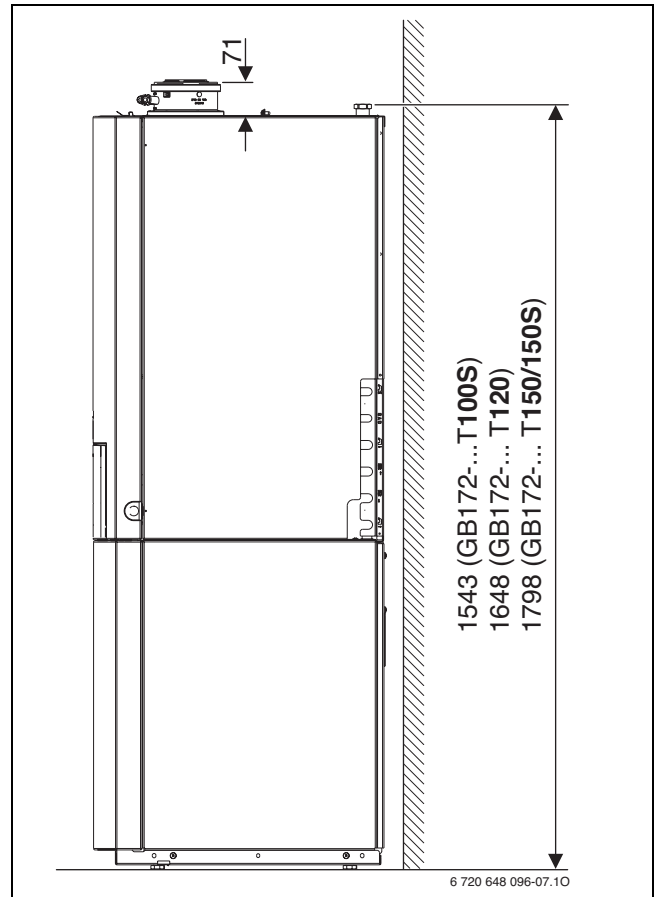


Fig. 21 Connections for the GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S (dim. in mm) in connection with the top connection set (accessory)

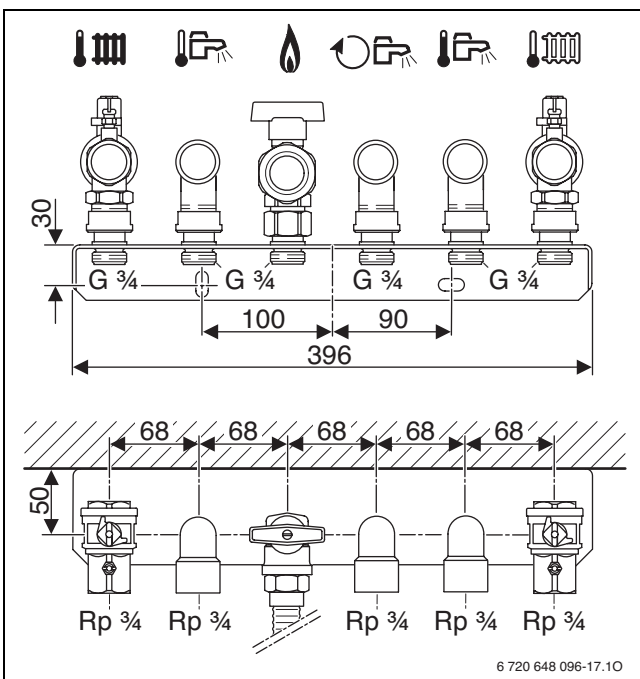


Fig. 20 Dimension for the rear connection set (accessory)

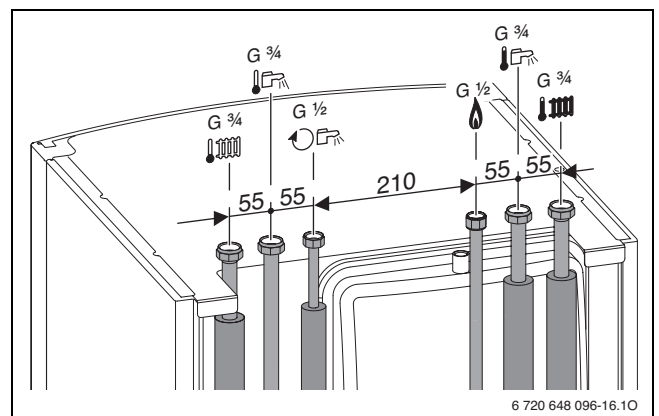


Fig. 22 Dimension for the top connection set (accessory)

GB172-14/20 T210SR

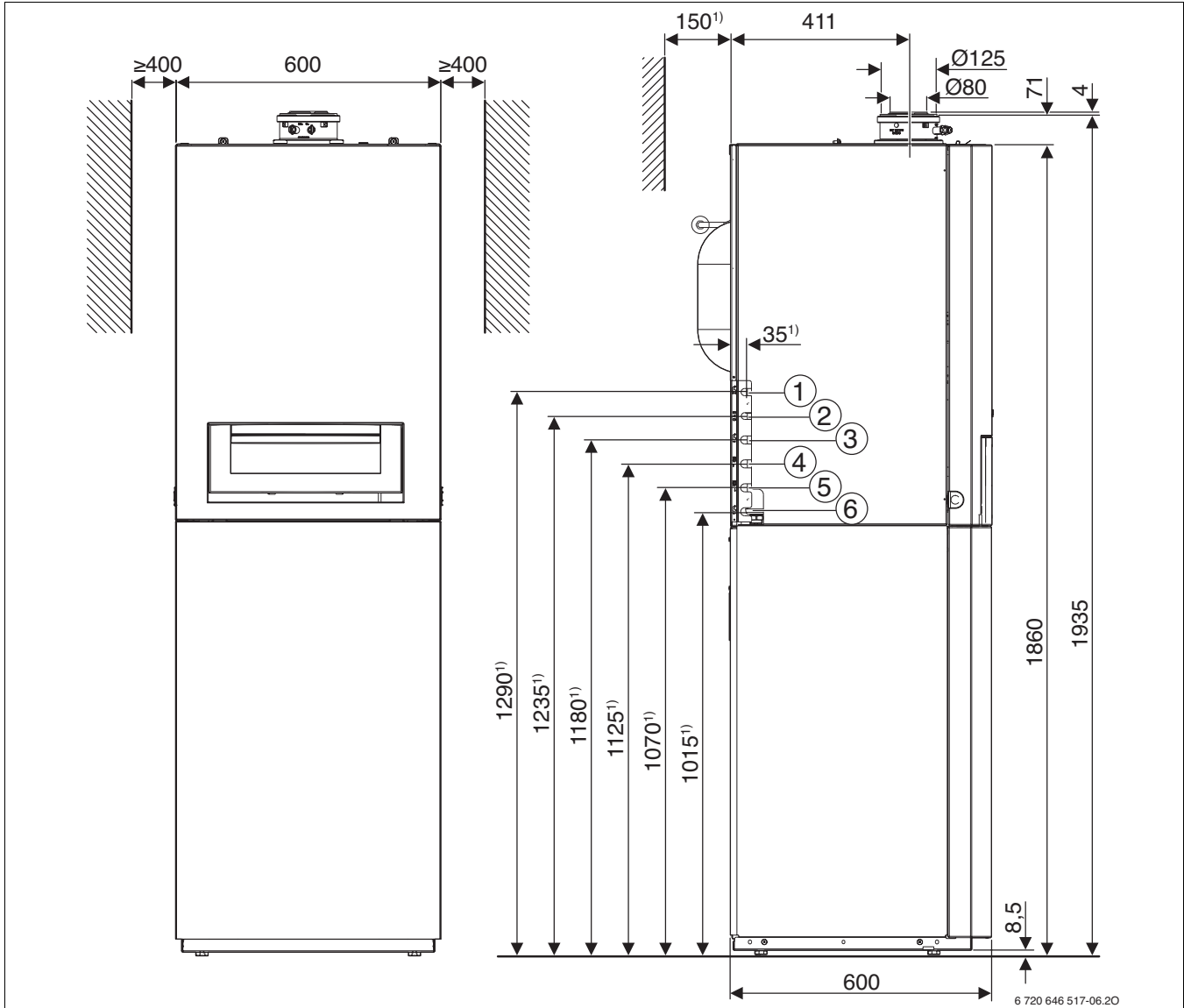


Fig. 23 Dimensions and connections for the GB172-14/20 T210SR (dim. in mm)

- 1 DHW circulation G 1/2
- 2 Gas G 1/2
- 3 Cold water G 3/4
- 4 Heating flow G 3/4
- 5 Heating return G 3/4
- 6 DHW G 3/4

1) Dimensions only in connection with side connection set (accessory)

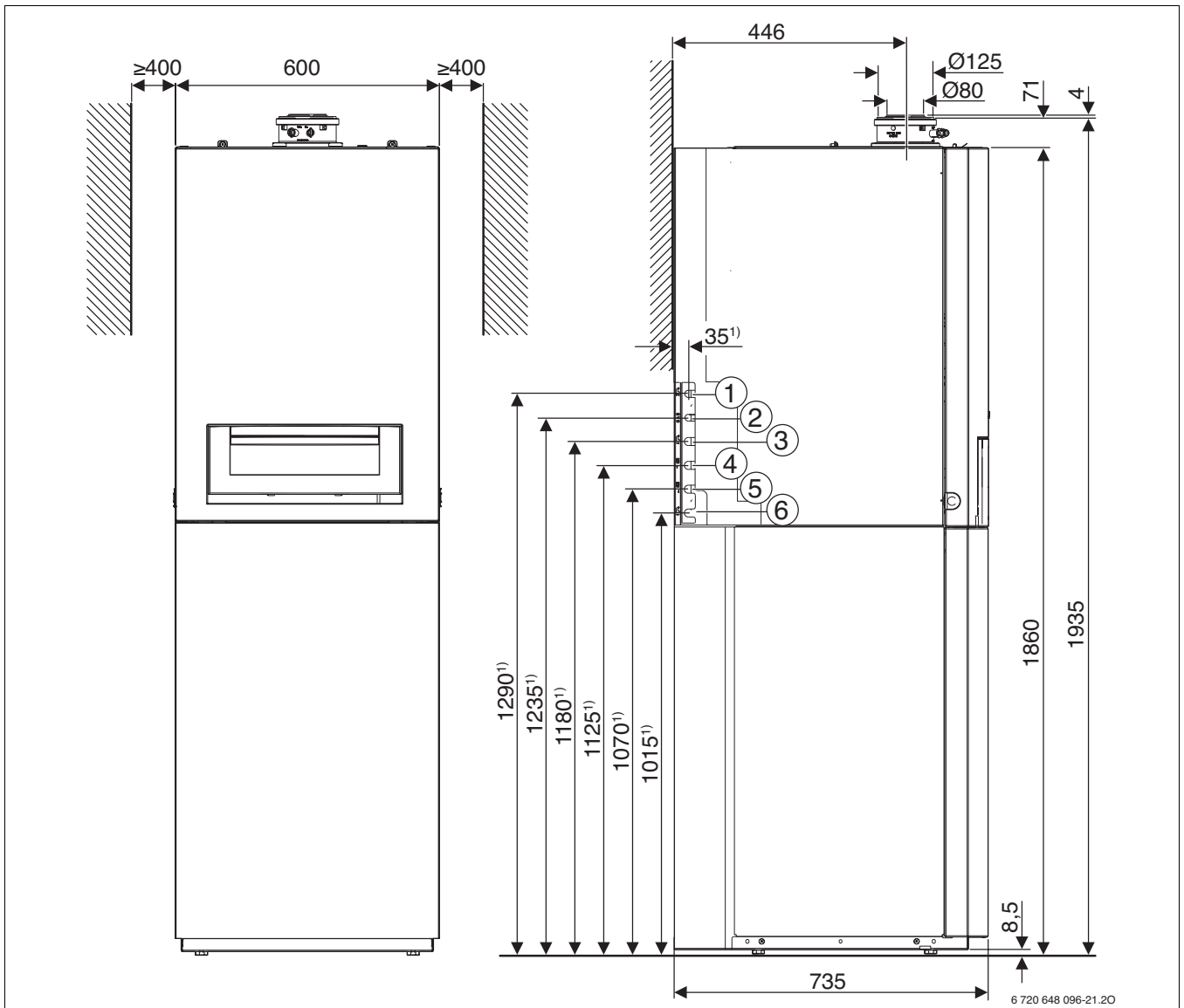


Fig. 24 Dimensions and connections for the GB172-14/20 T210SR (dim. in mm) with rear side panel (accessory, incl. long side connection set)

- 1 DHW circulation G 1/2
 - 2 Gas G 1/2
 - 3 Cold water G 3/4
 - 4 Heating flow G 3/4
 - 5 Heating return G 3/4
 - 6 DHW G 3/4
- 1) Dimensions only in connection with rear side connection set (accessory incl. long side connection set)

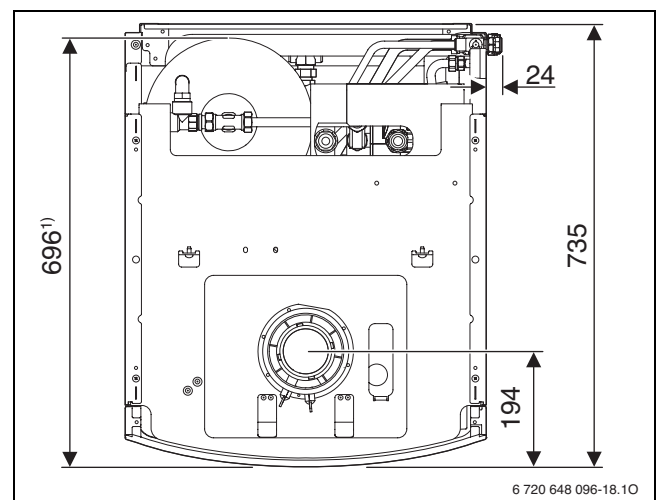


Fig. 25

- 1) Relevant depth dimension without side panels

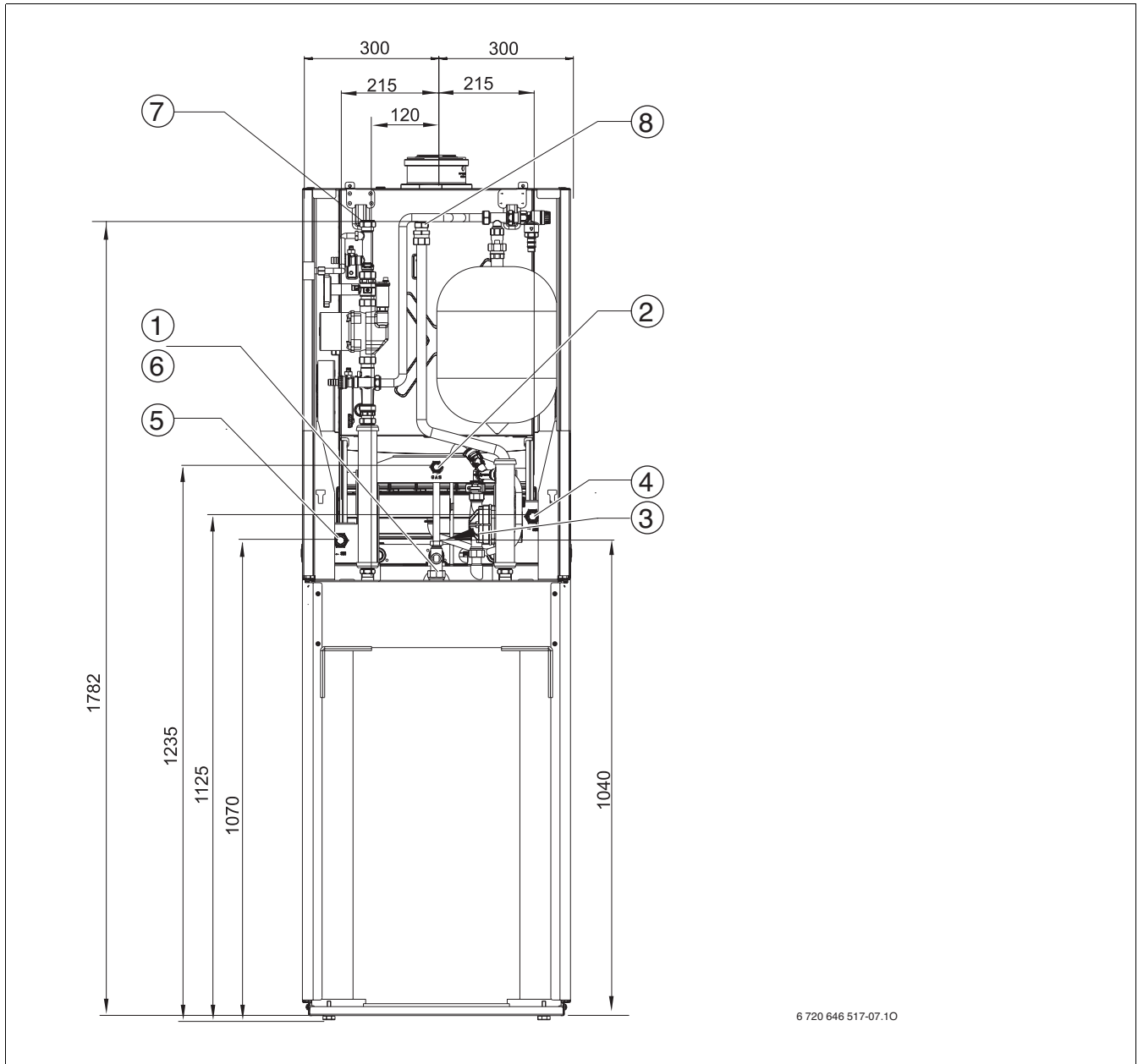


Fig. 26 Rear view: Dimensions and connections for the GB172-14/20 T210SR (dim. in mm)

- 1 DHW circulation G 1/2
- 2 Gas G 1/2
- 3 Cold water G 3/4
- 4 Heating flow G 3/4
- 5 Heating return G 3/4
- 6 DHW G 3/4
- 7 Solar return (15 mm locking ring fitting)
- 8 Solar flow (15 mm locking ring fitting)

2.3.2 Specification

Logamax plus	Unit	GB172-14	GB172-20	GB172-24	GB172-24 K	GB172-24 T50
Output						
Maximum rated output (P_{max}) 40/30 °C	kW	14.2	20.6	23.8	23.8	23.8
Maximum rated output (P_{max}) 50/30 °C	kW	14.0	20.4	23.6	23.6	23.6
Maximum rated output (P_{max}) 80/60 °C	kW	13.0	19.5	22.5	22.5	22.5
Maximum rated heat input (\dot{Q}_{max}) heating	kW	13.3	20.0	23.1	23.1	23.1
Minimum rated output (P_{min}) 40/30 °C	kW	3.3	5.2	7.3	7.3	7.3
Minimum rated output (P_{min}) 50/30 °C	kW	3.2	5.1	7.3	7.3	7.3
Minimum rated output (P_{min}) 80/60 °C	kW	2.9	4.7	6.6	6.6	6.6
Minimum rated heat input (\dot{Q}_{min}) heating	kW	3.0	4.8	6.8	6.8	6.8
Maximum rated heat output (P_{nW}), DHW	kW	15.1	23.8	29.7	29.7	29.7
Maximum rated heat input (\dot{Q}_{nW}) DHW	kW	14.4	24.0	30.0	30.0	30.0
Appliance efficiency, max. output, heating curve 80/60 °C	%	97.5	97.5	97.5	97.5	97.5
Appliance efficiency, max. output, heating curve 50/30 °C	%	105.5	102.2	102.2	102.2	102.2
Standard seasonal efficiency [to DIN], heating curve 75/60 °C	%	105	104	104	104	104
Standard seasonal efficiency [to DIN], heating curve 40/30 °C	%	109	109	109	109	109
Standby heat loss (incl. electrical losses)	%	0.63	0.42	0.36	0.36	0.71
Gas supply rate						
Natural gas LL ($H_{i(15)}$ °C = 8.1 kWh/m ³)	m ³ /h	0.37–1.77	0.59–2.95	0.84–3.70	0.84–3.70	0.84–3.70
Natural gas E ($H_{i(15)}$ °C = 9.5 kWh/m ³)	m ³ /h	0.32–1.52	0.51–2.53	0.72–3.18	0.72–3.18	0.72–3.18
LPG (H_i = 12.9 kWh/kg)						
Propane	kg/h	0.35–1.09	0.36–1.82	0.56–2.27	0.56–2.27	0.56–2.27
Butane	kg/h	0.41–1.25	0.41–2.07	0.66–2.62	0.66–2.62	0.66–2.62
Permissible gas supply pressure						
Natural gas LL and natural gas E	mbar	17–25	17–25	17–25	17–25	17–25
LPG	mbar	42.5–57.5	42.5–57.5	42.5–57.5	42.5–57.5	42.5–57.5
Expansion vessel						
Pre-charge pressure	bar	–	–	–	0.75	0.75
Total capacity	l	–	–	–	12	12
Condensate						
Max. condensate quantity (T_R = 30 °C)	l/h	1.4	2.2	2.6	2.6	2.6
pH level, approx.	–	4.8	4.8	4.8	4.8	4.8
Calculation values for calculating cross-section to EN 13384						
Flue gas connection to EN 483	–	$B_{23} / B_{33} / C_{13x} / C_{33x} / C_{43x} / C_{53x} / C_{63x} / C_{83x} / C_{93x}$				
Flue gas mass flow rate at max./min. rated output	g/s	6.3/1.4	10.5/2.3	13.1/3.2	13.1/3.2	13.1/3.2
Flue gas temperature 80/60 °C max./min. rated heating output	°C	65/58	75/58	90/57	90/57	90/57
Flue gas temperature 40/30 °C max./min. rated heating output	°C	49/30	58/36	60/32	60/32	60/32
Standard CO emissions factor	mg/kWh	≤ 10	≤ 20	≤ 15	≤ 15	≤ 15
Standard NO _x emissions factor	mg/kWh	≤ 35	≤ 35	≤ 35	≤ 35	≤ 35
Available fan draught	Pa	80	80	80	80	80
CO ₂ at max. rated heating output	%	9.4	9.4	9.4	9.4	9.4
CO ₂ at min. rated heating output	%	8.6	8.6	8.6	8.6	8.6

Table 7 Logamax plus GB172 specification

Logamax plus	Unit	GB172-14	GB172-20	GB172-24	GB172-24 K	GB172-24 T50
Flue gas rating group to G 636/G 635	–	G ₆₁ /G ₆₂	G ₆₁ /G ₆₂	G ₆₁ /G ₆₂	G ₆₁ /G ₆₂	G ₆₁ /G ₆₂
NO _x class	–	5	5	5	5	5
DHW						
Cylinder capacity	l	–	–	–	–	48
Coefficient of performance	N _L	–	–	–	–	0.8
Constant DHW output at 80/45/10 °C	l/h	–	–	–	–	690
Maximum amount of DHW	l/min	–	–	–	9	14
Outlet temperature range	°C	–	–	–	40-60	40-60
Maximum cold water inlet temperature	°C	–	–	–	60	65
Maximum permissible DHW pressure	bar	–	–	–	10	10
Minimum cold water supply pressure	bar	–	–	–	0.2	0.2
Specific throughput to EN 625 (D)	l/min	–	–	–	14.1	16.6
Standby energy losses (24 h) to DIN 4753-8 ¹⁾	kWh/d	–	–	–	–	1.8
General data						
Voltage	V AC	230	230	230	230	230
Frequency	Hz	50	50	50	50	50
Max. power consumption (central heating mode)	W	65	67	75	75	75
Power consumption, partial load	W	21	21	21.5	21.5	21.5
EMC limit class	–	B	B	B	B	B
Noise output level	dB(A)	≤ 36	≤ 36	≤ 36	≤ 36	≤ 36
Appliance enclosure rating	IP	X4D	X4D	X4D	X4D	X4D
Maximum flow temperature	°C	82	82	82	82	82
Maximum permissible operating pressure (P _{MS}), central heating	bar	3	3	3	3	3
Permissible ambient temperature	°C	0–50	0–50	0–50	0–50	0–50
Water content (central heating)	l	7.0	7.0	7.0	7.0	7.0
Weight (excluding packaging)	kg	43	43	43	44	78
Dimensions, W x H x D	mm	440 x 840 x 350	440 x 840 x 350	440 x 840 x 350	440 x 840 x 350	600 x 880 x 482

Table 7 Logamax plus GB172 specification

1) Distribution losses outside the cylinder have not been taken into consideration.

Logamax plus	Unit	GB172-14 T...	GB172-20 T...	GB172-24 T...
Output				
Maximum rated output (P _{max}) 40/30 °C	kW	14.2	20.6	23.8
Maximum rated output (P _{max}) 50/30 °C	kW	14.0	20.4	23.6
Maximum rated output (P _{max}) 80/60 °C	kW	13.0	19.5	22.5
Maximum rated heat input (Q̇ _{max}) heating	kW	13.3	20.0	23.1
Minimum rated output (P _{min}) 40/30 °C	kW	3.3	5.2	7.3
Minimum rated output (P _{min}) 50/30 °C	kW	3.2	5.1	7.3
Minimum rated output (P _{min}) 80/60 °C	kW	2.9	4.7	6.6
Minimum rated heat input (Q̇ _{min}) heating	kW	3.0	4.8	6.8
Maximum rated heat output (P _{nW}), DHW	kW	15.1	23.8	29.7
Maximum rated heat input (Q̇ _{nW}) DHW	kW	14.4	24.0	30.0
Appliance efficiency, max. output, heating curve 80/60 °C	%	97.5	97.5	97.5
Appliance efficiency, max. output, heating curve 50/30 °C	%	105.5	102.2	102.2

Table 8 Logamax plus GB172 specification

Logamax plus	Unit	GB172-14 T...	GB172-20 T...	GB172-24 T...
Standard seasonal efficiency [to DIN], heating curve 75/60 °C	%	105	104	104
Standard seasonal efficiency [to DIN], heating curve 40/30 °C	%	109	109	109
Standby heat loss (incl. electrical losses)	%	0.63	0.42	0.36
Gas supply rate				
Natural gas LL ($H_{i(15)} \text{ °C} = 8.1 \text{ kWh/m}^3$)	m ³ /h	0.37 - 1.77	0.59 - 2.95	0.84 - 3.70
Natural gas E ($H_{i(15)} \text{ °C} = 9.5 \text{ kWh/m}^3$)	m ³ /h	0.32 - 1.52	0.51 - 2.53	0.72 - 3.18
LPG ($H_i = 12.9 \text{ kWh/kg}$)				
Propane	kg/h	0.35 - 1.09	0.36 - 1.82	0.56 - 2.27
Butane	kg/h	0.41 - 1.25	0.41 - 2.07	0.66 - 2.62
Permissible gas supply pressure				
Natural gas LL and natural gas E	mbar	17 - 25	17 - 25	17 - 25
LPG	mbar	42.5 - 57.5	42.5 - 57.5	42.5 - 57.5
Expansion vessel				
Pre-charge pressure	bar	1.9	1.9	1.9
Total capacity	l	18	18	18
Condensate				
Max. condensate quantity ($T_R = 30 \text{ °C}$)	l/h	1.2	1.7	1.7
pH level, approx.	–	4.8	4.8	4.8
Calculation values for calculating cross-section to EN 13384				
Flue gas connection to EN 483	–	$B_{23} / B_{33} / C_{13x} / C_{33x} / C_{43x} / C_{53x} / C_{63x} / C_{83x} / C_{93x}$		
Flue gas mass flow rate at max./min. rated output	g/s	6.3/1.4	10.5/2.3	13.1/3.2
Flue gas temperature 80/60 °C max./min. rated heating output	°C	65/58	75/58	90/57
Flue gas temperature 40/30 °C max./min. rated heating output	°C	49/30	58/36	60/32
Standard CO emissions factor	mg/kWh	≤ 10	≤ 20	≤ 15
Standard NO _x emissions factor	mg/kWh	≤ 35	≤ 35	≤ 35
Available fan draught	Pa	80	80	80
CO ₂ at max. rated heating output	%	9.4	9.4	9.4
CO ₂ at min. rated heating output	%	8.6	8.6	8.6
Flue gas rating group to G 636/G 635	–	G_{61} / G_{62}	G_{61} / G_{62}	G_{61} / G_{62}
NO _x class	–	5	5	5
DHW				
→ Table 14, page 35 and table 15, page 36				
General data				
Voltage	V AC	230	230	230
Frequency	Hz	50	50	50
Max. power consumption (central heating mode)	W	65	63	61
Maximum power consumption, cylinder operation	W	106	106	112
EMC limit class	–	B	B	B
Noise output level	dB(A)	≤ 36	≤ 36	≤ 36
Appliance enclosure rating	IP	X4D	X4D	X4D
Maximum flow temperature	°C	82	82	82
Maximum permissible operating pressure (P_{MS}), central heating	bar	3	3	3
Permissible ambient temperature	°C	0 - 50	0 - 50	0 - 50
Water content (central heating)	l	7.0	7.0	7.0
Weight (excluding packaging)	kg	→ Table 14, page 35 and table 15, page 36		123
Dimensions, W x H x D	mm	→ Table 6 page 20		

Table 8 Logamax plus GB172 specification

2.3.3 Parameters for calculation to EnEV [Germany]

For assigning burners, all models are categorised as “premix gas burners with fan gas:air mixing unit”.

Boiler size in kW	\dot{Q}_n 50/30 in kW	\dot{Q}_n 80/60 in kW	η 100% in %	η 30% in %	$q_{B 70}$ in %	q_{BS} in kWh/d	$P_{HE100\%}$ in W	$P_{HE30\%}$ in W
GB172-14	14.0	13.0	97.5	108.0	0.63	–	65 ¹⁾	21 ¹⁾
GB172-20	20.0	19.0	97.5	107.0	0.42	–	65 ¹⁾	21 ¹⁾
GB172-24	23.6	22.5	97.5	107.0	0.36	–	75 ¹⁾	22 ¹⁾
GB172-24 K	23.6	22.5	97.5	107.0	0.36	3.00	75 ¹⁾	22 ¹⁾
GB172-24 T50	23.6	22.5	97.5	107.0	0.71	1.90	75 ¹⁾	22 ¹⁾
GB172-14 T120	14.0	13.0	97.5	108.0	0.63	1.47	65 ¹⁾	21 ¹⁾
GB172-14 T150	14.0	13.0	97.5	108.0	0.63	1.65	65 ¹⁾	21 ¹⁾
GB172-20 T150	20.0	19.0	97.5	107.0	0.42	1.65	65 ¹⁾	21 ¹⁾
GB172-20 T100S	20.0	19.0	97.5	107.0	0.42	1.22	65 ¹⁾	21 ¹⁾
GB172-14 T150S	14.0	13.0	97.5	108.0	0.63	1.22	65 ¹⁾	21 ¹⁾
GB172-24 T150S	23.6	22.5	97.5	107.0	0.36	1.22	75 ¹⁾	22 ¹⁾
GB172-14 T210SR	14.0	13.0	97.5	108.0	0.63	2.22 ^{2)/0.51³⁾}	65 ¹⁾	21 ¹⁾
GB172-20 T210SR	20.0	19.0	97.5	107.0	0.42	2.22 ^{2)/0.51³⁾}	65 ¹⁾	21 ¹⁾

Table 9

1) Power consumption with integral pump

2) to DIN 4753-8 or EN 12897 (actual value at 45 K temperature differential, total cylinder content heated up)

3) to DIN V4701-10 (value calculated in accordance with the standard)

- $P_{HE30\%}$** Power consumption at 30 % partial load operation
 $P_{HE100\%}$ Power consumption at rated output
 $q_{B 70}$ Standby loss at an average boiler temperature of 70 °C
 q_{BS} Standby loss of the DHW cylinder
 \dot{Q}_n 50/30 Rated output at 50/30 °C
 \dot{Q}_n 80/60 Rated output at 80/60 °C
 $\eta_{30\%}$ Efficiency at 30 % partial load operation
 $\eta_{100\%}$ Efficiency at rated output

2.4 Dimensions and specification of DHW cylinders

2.4.1 Logalux H65 W DHW cylinders

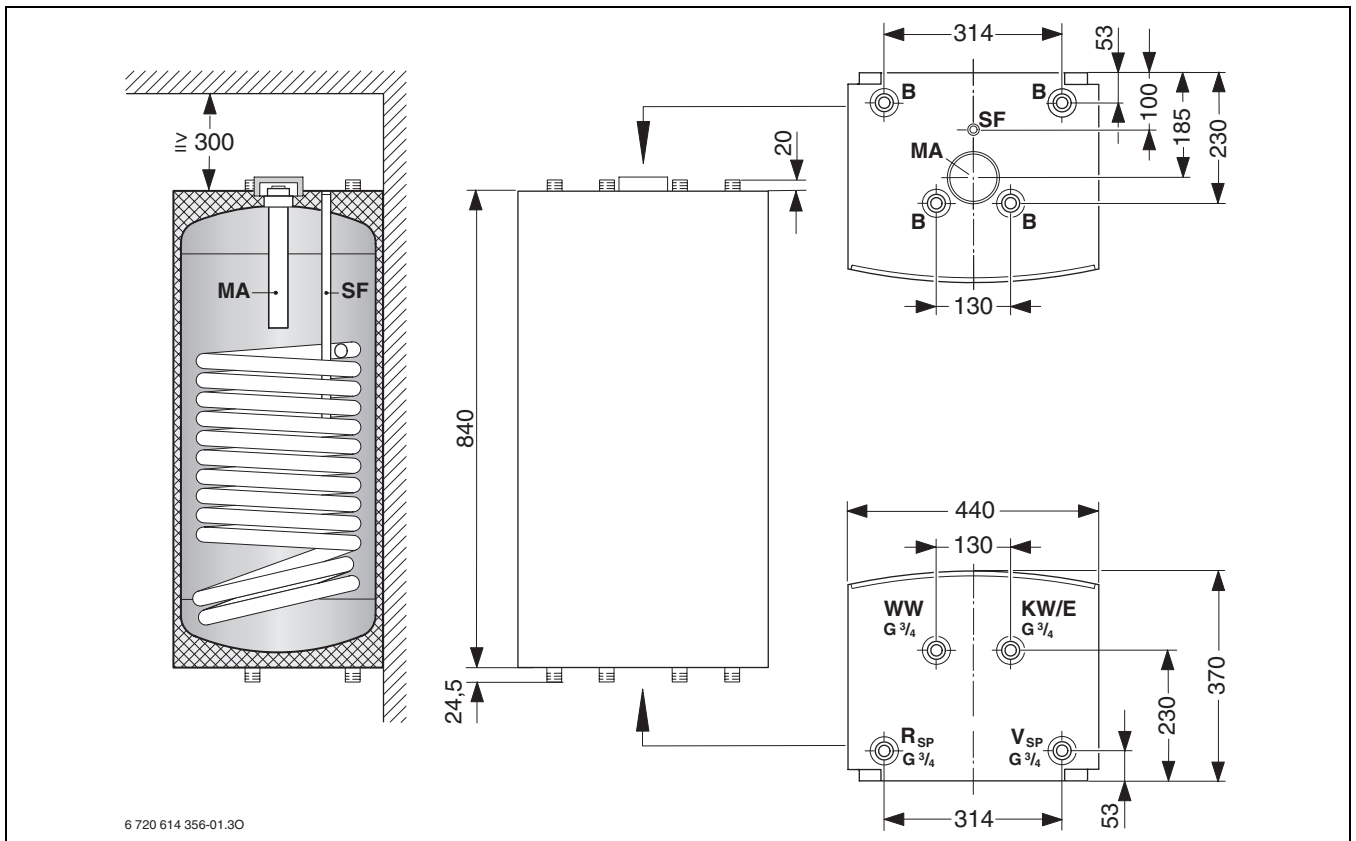


Fig. 27 Dimensions and connections of the Logalux H65 W DHW cylinder (dim. in mm)

- B** Dummy connector
(fit cap prior to filling the cylinder)
- E** Drain
- KW** Cold water connection G $\frac{3}{4}$ (male thread)
- MA** Magnesium anode
- R_{SP}** Cylinder return G $\frac{3}{4}$ (male thread)
- SF** Cylinder temperature sensor (NTC)
- V_{SP}** Cylinder flow G $\frac{3}{4}$ (male thread)
- WW** DHW outlet G $\frac{3}{4}$ (male thread)

DHW cylinder Logalux	Unit	H65 W
Internal indirect coil		
Number of coils	–	12
Heating water content	l	3.9
Heating surface	m ²	0.8
Maximum heating water temperature	°C	110
Max. operating pressure, heat exchanger	bar	4
Maximum heat transfer rate at: $T_V = 90\text{ °C}$ and $T_{Sp} = 45\text{ °C}$ to DIN 4708	kW	25.0
$T_V = 80\text{ °C}$ and $T_{Sp} = 60\text{ °C}$	kW	17.7
Maximum constant output at: $T_V = 90\text{ °C}$ and $T_{Sp} = 45\text{ °C}$ to DIN 4708	l/h	614
$T_V = 85\text{ °C}$ and $T_{Sp} = 60\text{ °C}$	l/h	230
Flow rate taken into account	l/h	765
Performance factor N_L ¹⁾ to DIN 4708 at $T_V = 90\text{ °C}$ (maximum cylinder heat input)	–	0.5
Minimum heat-up time from $T_K = 10\text{ °C}$ to $T_{Sp} = 60\text{ °C}$ with $T_V = 85\text{ °C}$ at: GB172-20 and GB172-24	min	17
GB172-14	min	21
Cylinder capacity		
Available capacity	l	63
Available amount of DHW (without reheating) ²⁾ $T_{Sp} = 60\text{ °C}$ and $T_Z = 45\text{ °C}$	l	76.5
$T_Z = 40\text{ °C}$	l	89.2
Maximum flow rate	l/min	10
Maximum operating pressure, water	bar	10
Minimum safety valve size (accessory)		DN 15
Further details		
Standby energy losses (24 h) to DIN 4753-8 ²⁾	kWh/d	1.8
Dry weight (excl. packaging)	kg	47

Table 10 Specification of the Logalux H65 W DHW cylinder

- 1) The performance factor N_L corresponds to the number of residential units to be supplied, each with 3.5 occupants, one standard bath tub and two further draw-off points. N_L was determined according to DIN 4708 at $T_{Sp} = 60\text{ °C}$, $T_Z = 45\text{ °C}$, $T_K = 10\text{ °C}$ and at maximum heating surface output. In the case of reduced cylinder heat input and lower flow rate, N_L reduces accordingly.
- 2) Distribution losses outside the cylinder have not been taken into account

T_K Cold water inlet temperature
 T_{Sp} Cylinder temperature
 T_V Flow temperature
 T_Z DHW outlet temperature

2.4.2 Logalux WU120 W and WU160 W DHW cylinders

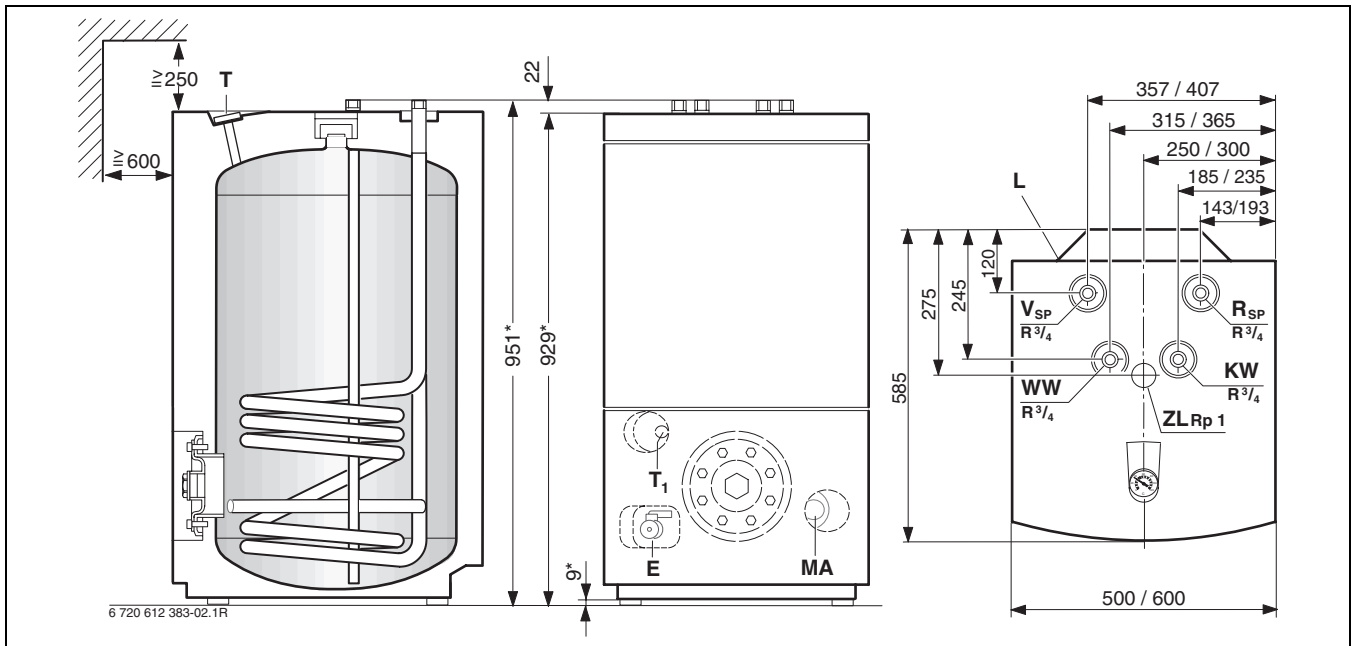


Fig. 28 Dimensions and connections of the Logalux WU120 W and WU160 W DHW cylinders (dim. in mm)

- E** Drain
- KW** Cold water connection R $\frac{3}{4}$ (male thread)
- L** Lead entry, cylinder temperature sensor (NTC)
- MA** Magnesium anode
- R_{SP}** Cylinder return R $\frac{3}{4}$ (male thread)
- T** Contact thermometer for temperature display
- T₁** Cylinder temperature sensor (NTC contact sensor)
- V_{SP}** Cylinder flow R $\frac{3}{4}$ (male thread)
- WW** DHW outlet R $\frac{3}{4}$ (male thread)
- ZL** DHW circulation connection Rp 1 (female thread)

* The dimensions given refer to the delivered condition (adjustable feet fully turned in). Turning the adjustable feet can increase this dimension by up to 16 mm.

DHW cylinder Logalux	Unit	WU120 W	WU160 W
Internal indirect coil			
Number of coils	–	5	5
Heating water content	l	4.4	4.4
Heating surface	m ²	0.63	0.63
Maximum heating water temperature	°C	110	110
Max. operating pressure, heat exchanger	bar	4	4
Maximum heat transfer rate at: T _V = 90 °C and T _{Sp} = 45 °C to DIN 4708	kW	25.1	25.1
T _V = 85 °C and T _{Sp} = 60 °C	kW	13.9	13.9
Maximum constant output at: T _V = 90 °C and T _{Sp} = 45 °C to DIN 4708	l/h	590	590
T _V = 85 °C and T _{Sp} = 60 °C	l/h	237	237
Flow rate taken into account	l/h	1300	1300
Performance factor N _L ¹⁾ to DIN 4708 at T _V = 90 °C (maximum cylinder heat input)	–	1.3	2.0
Minimum heat-up time from T _K = 10 °C to T _{Sp} = 60 °C with T _V = 85 °C at: 24 kW Speicherladeleistung	min	20	26
18 kW cylinder heat input	min	25	32
Cylinder capacity			
Available capacity	l	115	149
Available amount of DHW (without reheating) ²⁾ T _{Sp} = 60 °C and T _Z = 45 °C	l	145	190
T _Z = 40 °C	l	170	222
Maximum flow rate	l/min	12	16
Max. operating pressure, water	bar	6	6
Minimum safety valve size (accessory)	–	DN 15	DN 15
Further details			
Standby energy losses (24 h) to DIN 4753-8 ²⁾	kWh/d	1.2	1.4
Dry weight (excl. packaging)	kg	50	60

Table 11 Specification of the Logalux WU120 W and WU160 W DHW cylinders

- 1) The performance factor N_L corresponds to the number of residential units to be supplied, each with 3.5 occupants, one standard bath tub and two further draw-off points. N_L was determined according to DIN 4708 at T_{Sp} = 60 °C, T_Z = 45 °C, T_K = 10 °C and at maximum heating surface output. In the case of reduced cylinder heat input and lower flow rate, N_L reduces accordingly
- 2) Distribution losses outside the cylinder have not been taken into account

T_K Cold water inlet temperature
T_{Sp} Cylinder temperature
T_V Flow temperature
T_Z DHW outlet temperature

2.4.3 Logalux S120 W, SU160 W, SU200 W and SU300 W DHW cylinders

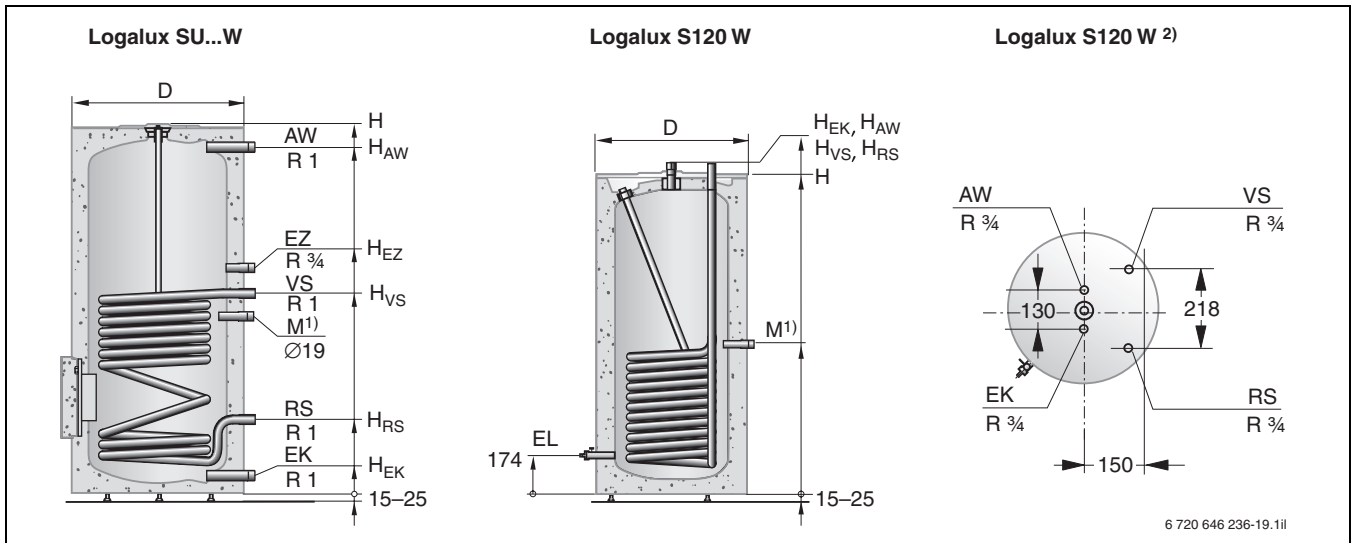


Fig. 29 Dimensions and connections of the Logalux S120 W, SU160 W, SU200 W and SU300 W DHW cylinders (dim. in mm)

- AW** DHW outlet R 3/4 (male thread)
- EL** Drain
- EK** Cold water inlet R 3/4 (male thread)
- EZ** DHW circulation inlet
- RS** Cylinder return R 3/4 (male thread)
- VS** Cylinder flow R 3/4 (male thread)

- 1) Sensor well for DHW temperature sensor
- 2) Top view

Dimensions	Unit	S120 W	SU160 W	SU200 W	SU300 W
Ø D	mm	512	556	556	672
H	mm	956	1188	1448	1465
Installation room height ¹⁾	mm	1460	1718	2053	1845
H _V	mm	975	644	644	682
H _R	mm	975	238	238	297
Ø EK	inch	R 3/4	R 1	R 1	R 1/4
H _E	mm	980	57	57	60
H _E	mm	- ²⁾	724	724	762
H _A	mm	980	1111	1371	1326

Table 12 Dimensions Logalux S120 W, SU160 W, SU200 W and SU300 W

- 1) Minimum room height for the replacement of the magnesium anode
- 2) For the Logalux S120 W, we recommend connecting the DHW circulation line to the cold water inlet

- T_K** Cold water inlet temperature
- T_{Sp}** Cylinder temperature
- T_V** Flow temperature
- T_Z** DHW outlet temperature

DHW cylinder Logalux	Unit	S120 W	SU160 W	SU200 W	SU300 W
Internal indirect coil					
Heating water content, smooth tube internal indirect coil	l	5	4.5	4.5	8
Max. operating temperature, heating water side	°C	110	160	160	160
Max. operating pressure, heating water side	bar	6	16	16	16
Constant DHW output at : $T_V = 80\text{ °C}$, $T_Z = 45\text{ °C}$, $T_K = 10\text{ °C}$ with GB172-14	l/h	370	370	370	370
with GB172-20	l/h	490	526	526	526
with GB172-24	l/h	490	526	526	526
Performance factor N_L ¹⁾ to DIN 4708 with GB172-14	–	1.2	2.2	3.7	7.2
with GB172-20		1.3	2.3	4.0	8.7
with GB172-24		1.4	2.3	4.0	8.7
Cylinder capacity					
Cylinder capacity	l	120	160	200	300
Max. operating temperature, DHW side	°C	95	95	95	95
Max. operating pressure, DHW side	bar	10	10	10	10
Further details					
Standby energy loss ²⁾ (24 h) to DIN 4753-8	kWh/d	1.68	1.8	2.0	2.1
Dry weight (excl. packaging)	kg	72	98	110	145
Certificate no. acc. to Pressure Equipment Directive		Z-DDK-MUC-02-318302-11		P-DDK-MUC-02-318302-15	
Part number		7 747 011 041	7 747 003 781	7 747 003 782	7 747 003 783

Table 13 Specification of the Logalux S120 W, SU160 W, SU200 W and SU300 W DHW cylinders

- 1) The performance factor N_L corresponds to the number of residential units to be supplied, each with 3.5 occupants, one standard bath tub and two further draw-off points. N_L was determined according to DIN 4708 at $T_{Sp} = 60\text{ °C}$, $T_Z = 45\text{ °C}$, $T_K = 10\text{ °C}$ and at maximum heating surface output. In the case of reduced cylinder heat input and lower flow rate, N_L reduces accordingly
- 2) At $T_{Sp} 65\text{ °C}$ and room temperature 20 °C

T_K Cold water inlet temperature
 T_{Sp} Cylinder temperature
 T_V Flow temperature
 T_Z DHW outlet temperature

2.4.4 Cylinder in compact heating centres Logamax plus GB172-14 T120, GB172-14 T150, GB172-14 T150S and GB172-14 T210SR

	Unit	GB172-14 T120	GB172-14 T150	GB172-14 T150S	GB172-14 T210 SR
Available capacity	l	115	143	148	204
Solar contribution	l	–	–	–	154
Outlet temperature range	°C	40 - 70	40 - 70	40 - 70	40 - 70
Maximum flow rate	l/min	13.0	16.5	16.5	12.0
Maximum power consumption (cylinder heating)	W	84	84	106	182
Specific throughput to EN 625 (D)	l/min	17.9	17.0	22.6	20.7
Standby energy consumption (24 h) to DIN 4753 part 8 ¹⁾	kWh/d	1.65	1.65	1.22	2.2
Maximum operating pressure (P_{MW})	bar	10	10	10	10
Maximum continuous output at: - $T_V = 75\text{ °C}$ and $T_{Sp} = 45\text{ °C}$ to DIN 4708	l/h	352	352	–	–
- $T_V = 75\text{ °C}$ and $T_{Sp} = 60\text{ °C}$	l/h	248	248	248	248
Minimum heat-up time of $T_K = 10\text{ °C}$ to $T_{Sp} = 60\text{ °C}$ with $T_V = 75\text{ °C}$	min.	30	38	45	31
Performance factor N_L ²⁾ to DIN 4708 at $T_V = 75\text{ °C}$ (maximum cylinder heat input)	–	1.4	2.1	3.0	1.8
Weight (excluding packaging)	kg	115	123	123	166

Table 14

- 1) Standard comparison values; excluding distribution losses outside the cylinder.
 2) The performance factor N_L corresponds to the number of residential units to be supplied, each with 3.5 occupants, one standard bath tub and two further draw-off points. N_L was determined to DIN 4708 at $T_{Sp} = 60\text{ °C}$, $T_Z = 45\text{ °C}$, $T_K = 10\text{ °C}$ and at maximum heat transfer rate.

T_V = Flow temperature
 T_{Sp} = Cylinder temperature
 T_K = Cold water inlet temperature
 T_Z = DHW outlet temperature

2.4.5 Cylinder in compact heating centres Logamax plus GB172-20 T100S, GB172-20 T150, GB172-24 T150S and GB172-20 T210SR

	Unit	GB172-20 T100S	GB172-20 T150	GB172-20 T210SR	GB172-24 T150S
Available capacity	l	101	143	204	148
Solar contribution	l	–	–	154	–
Outlet temperature range	°C	40 - 70	40 - 70	40 - 70	40 - 70
Maximum flow rate	l/min	13.0	16.5	12.0	16.5
Maximum power consumption (cylinder heating)	W	106	106	182	113
Specific throughput to EN 625 (D)	l/min	22.0	22.9	24.11	31.6
Standby energy consumption (24 h) to DIN 4753 part 8 ¹⁾	kWh/d	1.22	1.65	2.2	1.22
Maximum operating pressure (P_{MW})	bar	10	10	10	10
Maximum continuous output at: - $T_V = 75\text{ °C}$ and $T_{Sp} = 45\text{ °C}$ to DIN 4708	l/h	–	586	–	–
- $T_V = 75\text{ °C}$ and $T_{Sp} = 60\text{ °C}$	l/h	413	413	413	516
Minimum heat-up time from $T_K = 10\text{ °C}$ to $T_{Sp} = 60\text{ °C}$ with $T_V = 75\text{ °C}$	min.	22	29	20	23
Performance factor N_L ²⁾ to DIN 4708 at $T_V = 75\text{ °C}$ (maximum cylinder heat input)	–	2.2	2.3	2.3	4.6
Weight (excluding packaging)	kg	108	123	166	123

Table 15

- 1) Standard comparison values; excluding distribution losses outside the cylinder.
 2) The performance factor N_L corresponds to the number of residential units to be supplied, each with 3.5 occupants, one standard bath tub and two further draw-off points. N_L was determined to DIN 4708 at $T_{Sp} = 60\text{ °C}$, $T_Z = 45\text{ °C}$, $T_K = 10\text{ °C}$ and at maximum heat transfer rate.

T_V = Flow temperature
 T_{Sp} = Cylinder temperature
 T_K = Cold water inlet temperature
 T_Z = DHW outlet temperature

2.5 Installation dimensions Logamax plus GB172

2.5.1 Logamax plus GB172 installation dimensions excluding DHW cylinder

To make the installation on the gas supply and water side easier, a special mounting frame is available as an accessory for the Logamax plus GB172 (part no.: 7 736 995 014). This mounting frame is unsuitable for the GB172-24 T50. The mounting frame is supplied separately and can be preinstalled without the appliance.

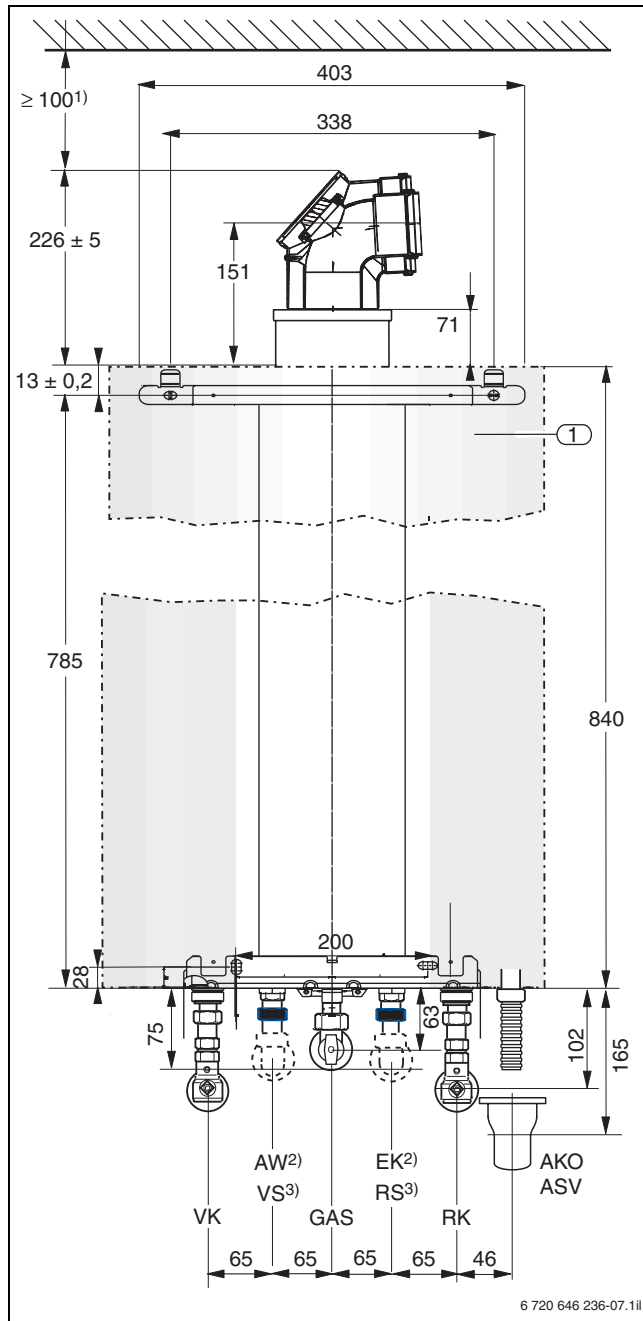
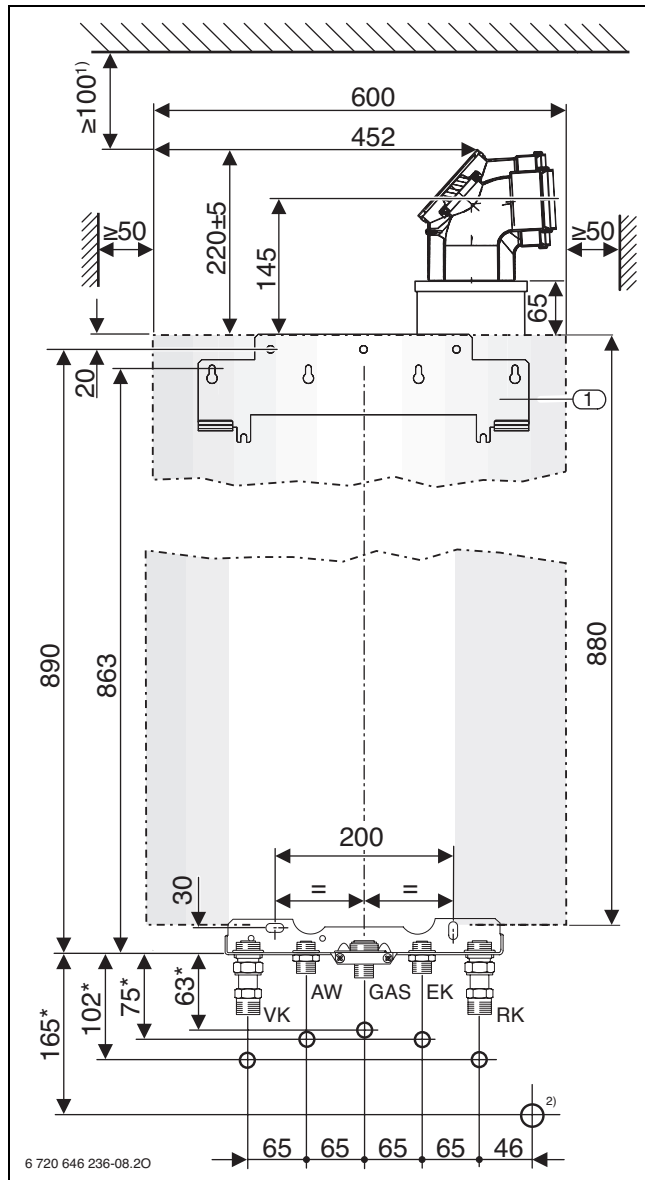


Fig. 30 Installation dimensions for connection assembly (unfinished walls) for the Logamax plus GB172 (dim. in mm)

AKO Condensate drain
ASV Safety valve outlet
AW DHW outlet (appliance G 1/2, accessory R 1/2)
EK Cold water inlet (appliance G 1/2, accessory R 1/2)
GAS Gas connection (appliance G 1, accessories either R 1/2 or R 3/4)
RK Boiler return (appliance G 3/4, accessories R 3/4)
RS Cylinder return G 1/2
VK Boiler flow (appliance G 3/4, accessories R 3/4)
VS Cylinder flow G 1/2
1 Mounting frame for Logamax plus GB172 (accessory in place of the mounting rail supplied and the mounting plate available as an accessory); not suitable for the GB172-24 T50

- 1) 100 mm are recommended for installation. For the Logamax plus GB172 with single wall flue, maintain clearances ≥ 50 mm. No other minimum clearances are specified by DVGW-TRGI 2008.
- 2) AW and EK only fitted to Logamax plus GB172-24 K with integral DHW heating
- 3) VS and RS connection as standard for Logamax plus GB172-14, GB172-20 and GB172-24
 If no DHW cylinder is connected, the DHW caps 1/2" are required (accessories → page 96 ff.).

2.5.2 Installed dimensions Logamax plus GB172-24 T50 with integral DHW cylinder



- AW** DHW outlet (appliance G 1/2 , accessory R 1/2)
- EK** Cold water inlet (appliance G 1/2 , accessory R 1/2)
- GAS** Gas connection (appliance G 1, accessories either R 1/2 or R 3/4)
- RK** Boiler return (appliance G 3/4 , accessories R 3/4)
- VK** Boiler flow (appliance G 3/4 , accessories R 3/4)

1 Mounting Bracket

- 1) 100 mm are recommended for installation. For the Logamax plus GB172 with single wall flue, maintain clearances ≥ 50 mm. No other minimum clearances are specified by DVGW-TRGI 2008.
- 2) Connection DN 40 siphon (accessory)

Fig. 31 Installation dimensions for connection assembly (unfinished walls) for the Logamax plus GB172-24 T50 (dim. in mm)

2.5.3 Installation dimensions Logamax plus GB172 with DHW cylinder below the gas condensing boiler

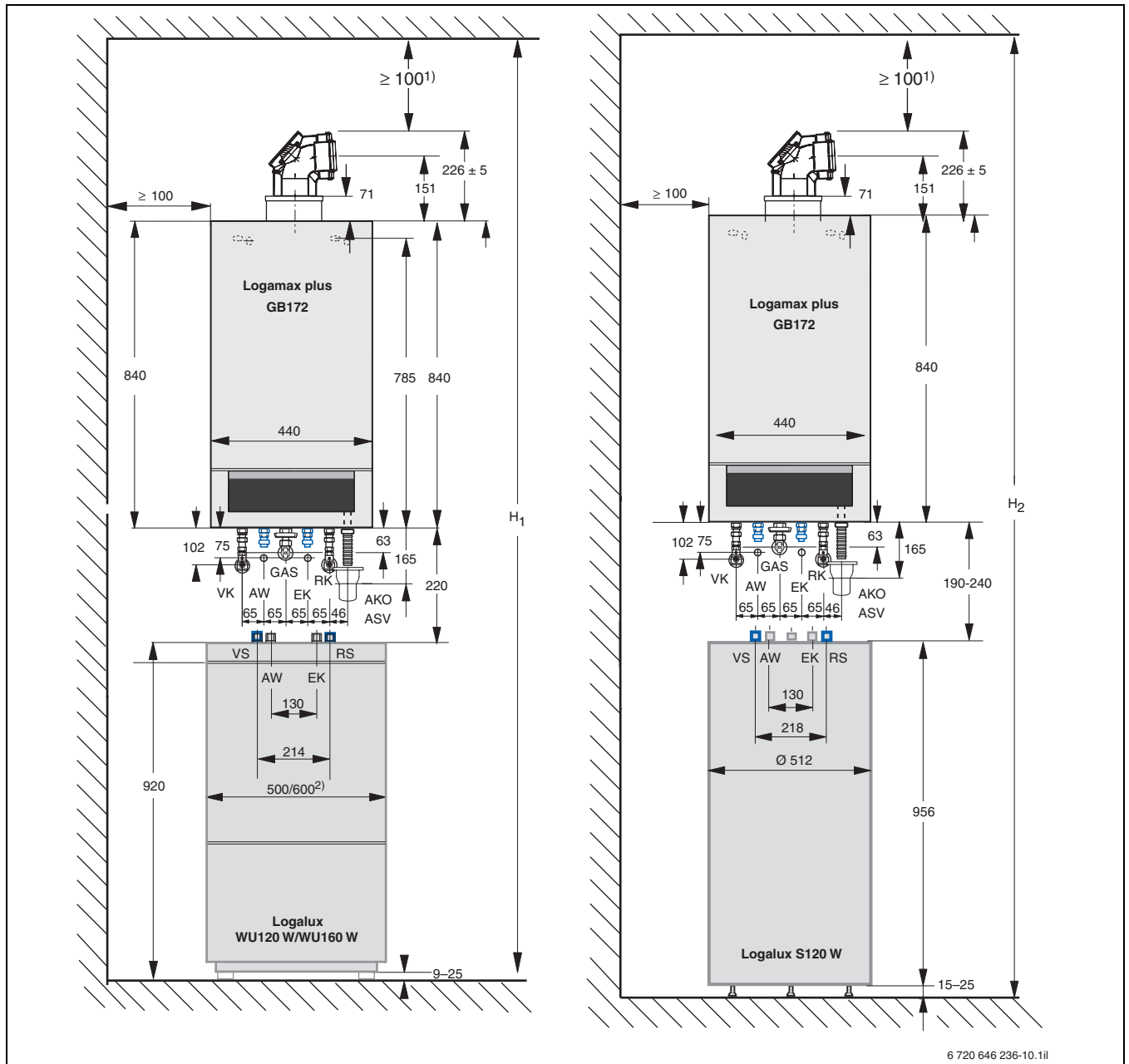


Fig. 32 Installed dimensions of the pipework when using the accessory sets for installation on unfinished walls (accessories → page 96 ff.) and arrangement of the Logalux WU120 W, WU160 W or S120 W DHW cylinders below the Logamax plus GB172 (dim. in mm)

- AKO** Condensate drain
- ASV** Safety valve outlet (siphon G 3/4)
- AW** DHW outlet G 1/2
- EK** Cold water inlet G 1/2
- GAS** Gas connection R 1
- RK** Boiler return G 3/4
- RS** Cylinder return R 3/4 (S120 W) or R 3/4 (WU120 W/WU160 W) (male thread)
- VK** Boiler flow G 3/4
- VS** Cylinder flow R 3/4 (S120 W) or R 3/4 (WU120 W/WU160 W) (male thread)

- 1) 100 mm recommended for installation. For the Logamax plus GB172 with single wall flue, maintain clearances of at least ≥ 50 mm. No other minimum clearances are specified by DVGW-TRGI 2008.
- 2) Dimensions after the slash refer to the next largest cylinder version.

Flue system	H ₁ in mm	H ₂ in mm
Single wall (Ø 80 mm)	2411	2437
Concentric (Ø 80/125 mm)	2361	2387

Table 16 Minimum room height

2.5.4 Installation dimensions Logamax plus GB172 with DHW cylinder adjacent to the gas condensing boiler

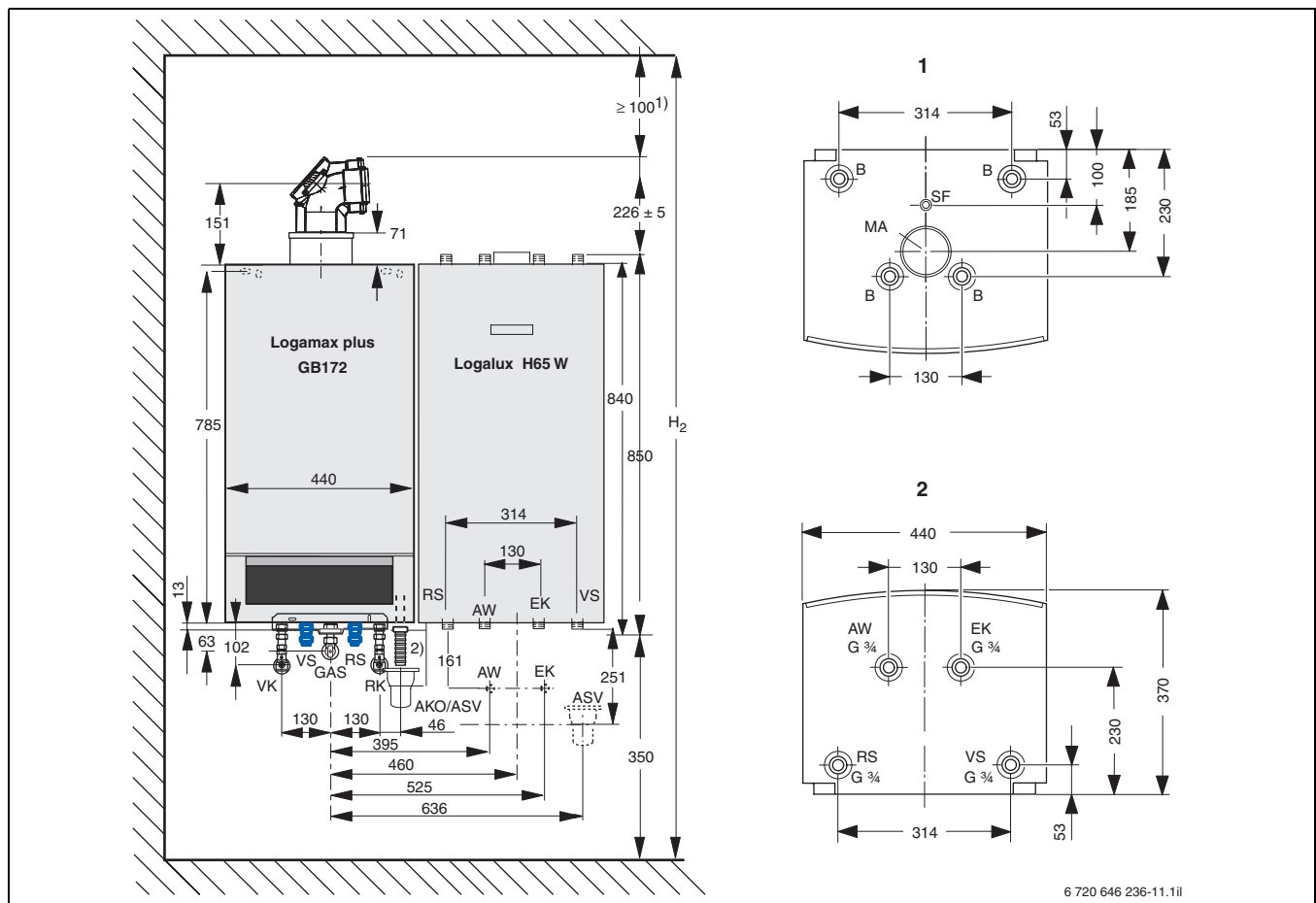


Fig. 33 Installed dimensions of the pipework when using the accessory sets for installation on unfinished walls (accessory → page 96 ff.) and arrangement of the Logalux H65 W DHW cylinder adjacent to the Logamax plus GB172 (dim. in mm)

- AKO** Condensate drain
- ASV** Safety valve outlet (siphon G 3/4)
- AW** DHW outlet
- B** Dummy connector (fit caps prior to filling the cylinder)
- EK** Cold water inlet
- GAS** Gas connection R 1
- MA** Magnesium anode
- RK** Boiler return G 3/4
- RS** Cylinder return
- SF** Cylinder temperature sensor (NTC)
- VK** Boiler flow G 3/4
- VS** Cylinder flow
- 1** Top view
- 2** Bottom view

- 1) 100 mm recommended for installation. For the Logamax plus GB172 with single wall flue, maintain clearances of at least ≥ 50 mm. No other minimum clearances are specified by DVGW-TRGI 2008.
- 2) 165 mm

Flue system	H ₂ in mm
Single wall (Ø 80 mm)	1566
Concentric (Ø 80/125 mm)	1516

Table 17 Minimum room height



No clearance is required between the GB172 and the cylinder. The cylinder is supplied with a common mounting rail for mounting the cylinder to the left, right or separately below.

2.5.5 Installation dimensions Logamax plus GB172 with DHW cylinder
Logalux SU160 W, SU200 W and SU300 W

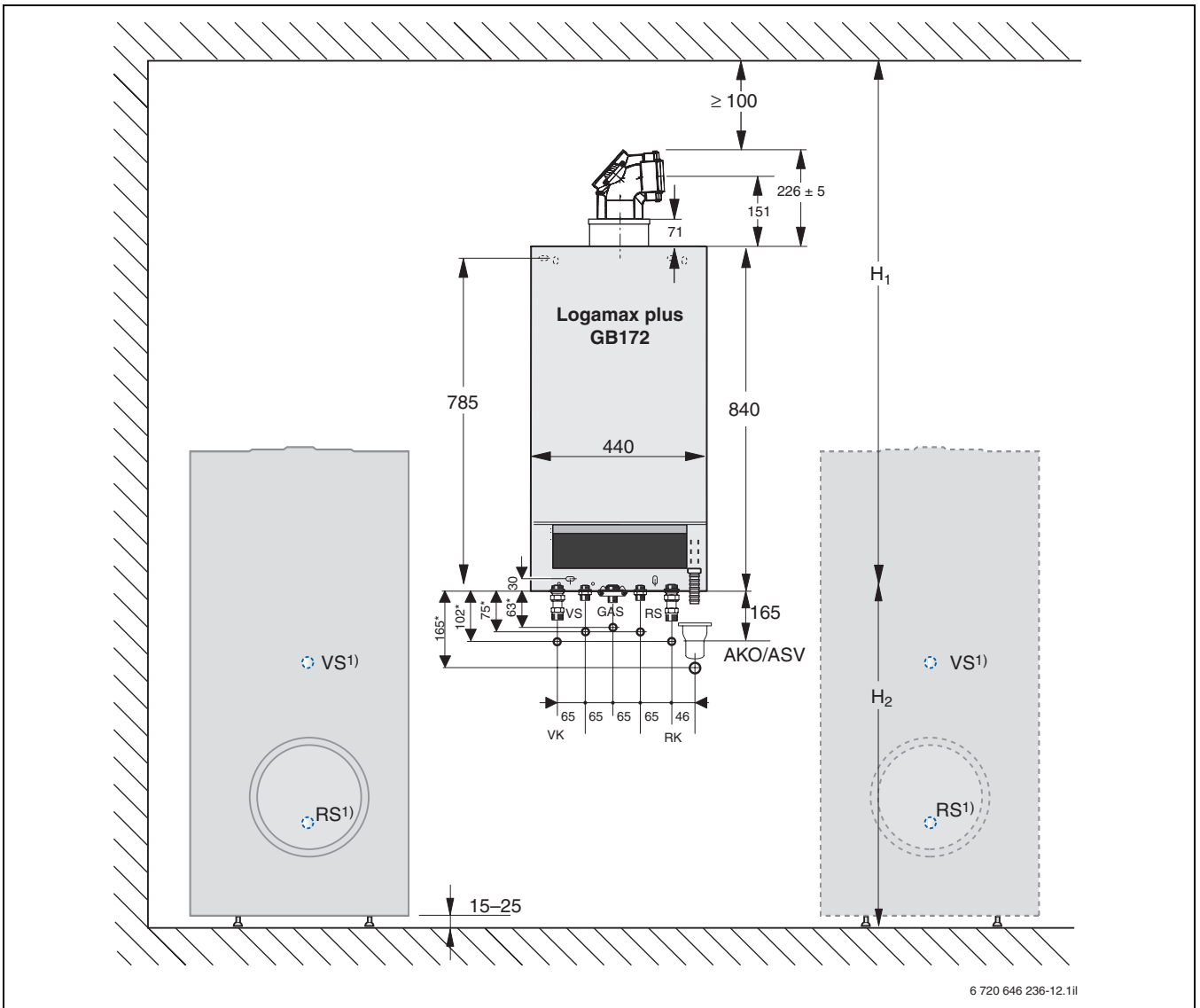


Fig. 34 Installed dimensions of the pipework when using the accessory sets for installation on finished walls (accessory → page 96 ff.) and arrangement of the Logalux SU160 W, SU200 W and SU300 W DHW cylinder adjacent to the right or left of the Logamax plus GB172 (dim. in mm)

- AKO** Condensate drain
- ASV** Safety valve outlet (siphon G 3/4)
- AW** DHW outlet G 1/2
- GAS** Gas connection G 1
- RK** Boiler return G 3/4
- RS** Cylinder return G 1/2 (boiler) or G 1 (DHW cylinder)
- VK** Boiler flow G 3/4
- VS** Cylinder flow G 1/2 (boiler) or G 1 (DHW cylinder)

- 1) Connections at the back of the cylinder (→ Fig. 29, page 33); required clearance for the cylinder connections at the back 100 mm
 - 2) 100 mm recommended for installation. For the Logamax plus GB172 with single wall flue, maintain clearances ≥ 50 mm.
- * Dimensions apply when using accessories U-MA and AS5-UP.

Logamax plus GB172 with DHW cylinder	H ₁ in mm	H ₂ in mm	
		min.	max.
Logalux SU...W	1166	559	1154

Table 18 Minimum room height

Dimension H₂ takes account of the minimum and maximum lengths of the corrugated hoses from the N-Flex connection accessories (accessories → page 96 ff.).

3 Regulations and operating conditions

3.1 Extracts from the regulations

The Logamax plus GB172/GB172T gas condensing boilers comply with the standard regulations of the Gas Appliances Directive 90/396/EEC. The requirements of standards EN 483 and EN 677 were taken into consideration.

When installing and operating the system, observe the following:

- Technical building regulations
- Legal regulations
- Local regulations

Installation, gas and flue gas connections, commissioning, power supply as well as maintenance and repair work must only be carried out by authorised contractors.

Permits

The installation of a gas condensing boiler may need to be notified to and approved by the relevant gas supply utility.

Gas condensing boilers may only be operated with a flue gas system that has been designed for the specific boiler type and that has been approved according to relevant building regulations. If the boiler is to be installed in a room designated for constant occupation, a flue system that has been approved for such locations must be allowed for.

Where required, inform your local flue gas inspector and water board prior to installation. Regional approvals with regard to the flue system and the introduction of condensate into the public sewer system may be required.

Maintenance

According to paragraph 10 of the Energy Savings Order (EnEV) [Germany], the system must be correctly operated, maintained and repaired.

We recommend system users enter into a maintenance contract with their local heating contractor covering an annual inspection and any required maintenance. A regular inspection and maintenance are prerequisites for reliable and economical operation.

3.2 Operating requirements

The operating conditions listed in table 19 are part of the **warranty conditions** for Logamax plus GB172 gas condensing boilers.

These operating conditions are safeguarded through an appropriate hydraulic circuit and boiler circuit control (hydraulic integration → chapter 6, page 61 ff.).

Logamax plus	Maximum flow temperature	Operating conditions (warranty conditions)				
		Minimum boiler water flow rate	Minimum boiler water temperature	Operating interruption (total boiler shutdown)	Heating circuit control with mixer ¹⁾	Minimum return temperature
GB172 GB172T	At full output 82 °C may be reached					No requirements

Table 19 Operating conditions Logamax plus GB172

1) Heating circuit control with mixer improves the control characteristics; particularly recommended for systems with several heating circuits

4 Heating controls

4.1 Aims of the Logamatic control system

The Logamatic control system was specifically developed for the control requirements of advanced heating systems in detached houses and two-family homes.

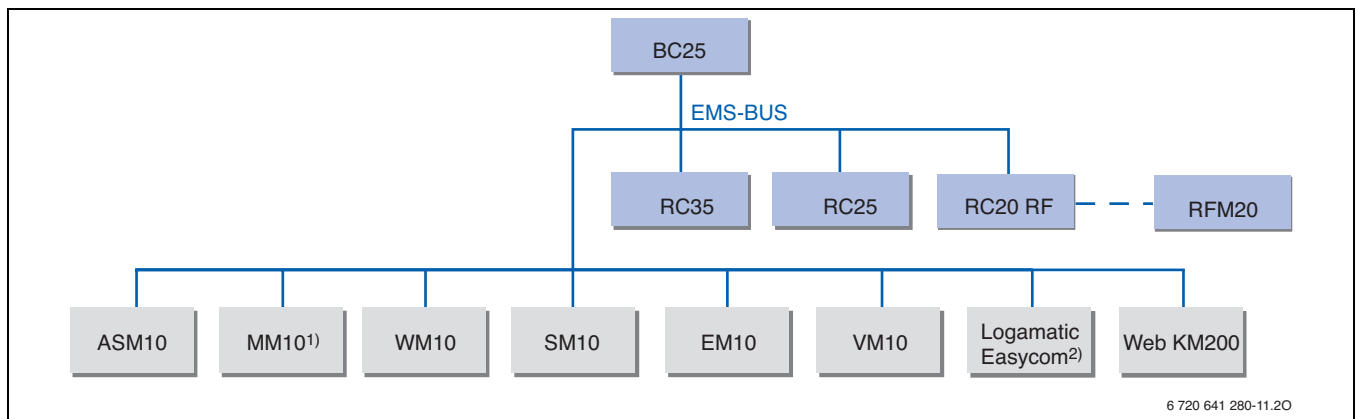
System configurations that exceed the range of functions offered by the Logamatic EMS can be covered by the wider range of functions offered by the Logamatic 4000 control system.

The fundamental aims of this new control concept are as follows:

- The optimum utilisation of fossil fuels and electric energy.
- The use of identical control components for wall mounted and floor standing boilers.
- Uniform operation

Maintenance and service are further priorities. Some components in the Logamatic control system are designed to monitor themselves and to issue messages automatically in the case of faults or irregularities. Service functions that are integrated into the programming unit as standard make commissioning, maintenance and troubleshooting easy.

A service tool for connection to a laptop is available and enables extensive service tasks.



6 720 641 280-11.20

Fig. 35 Overview of the Logamatic control system

ASM10	Connection module
BC25	Base controller
EM10	Fault message module
MM10	Mixer module
RC25	Programming unit
RC20 RF	Wireless programming unit
RC35	Programming unit
RFM20	Wireless module

SM10	Solar module
VM10	Function module
Web KM200	Interface for controlling the heating system via iPhone, iPod touch or iPad
WM10	Low loss header module

- 1) Up to 3 pce with RC35
- 2) Telecontrol modem

4.2 Logamatic EMS control concept

At the core of the Logamatic EMS control system is the digital base controller BC25 with integral burner control unit, that not only controls and monitors the burner but also takes care of the boiler safety functions. This covers several standard control functions (→ page 45 f.).

The EMS-BUS provides a second means of communication. Control components and modules without boiler-specific functions are connected to this BUS via a 2-core cable (→ Table 24, page 55). These components include the RC35 and RC25/RC20 RF plus the function modules (mixer, low loss header and solar modules).

No modules can be fitted into the Logamax plus GB172/GB172T as condensing boilers. They can only be wall mounted (→ page 49). Alternatively, heating circuit quick installation sets with integral EMS modules (EMS Inside) can be used.

Activating, adjusting and setting of parameters for the function modules of the Logamatic EMS control system always require the RC35 programming unit (→ Table 24 page 55).

The Logamatic EMS control system enables room temperature-dependent and weather-compensated control.

The Logamatic EMS control system is tailored to standard systems and offers a fixed range of functions (system examples → page 72 ff.). This range of functions cannot and must not be exceeded.

4.3 Types of controls

4.3.1 Room temperature-dependent control

With room temperature-dependent control, the heating system or the heating circuit is regulated subject to the temperature in a reference room. For this kind of control, the RC25/RC20 RF or RC35 programming units are suitable; these have an integral room temperature sensor. For that reason, the RC25/RC20 RF and RC35 programming units are installed in the reference room to provide room temperature-dependent control (→ Fig. 36).

An external room temperature sensor can also be connected to the RC35 programming unit if it cannot be installed in the reference room in a position that would be both favourable to capturing the room temperature and still be in a convenient position for the user.

Position of the Room temperature sensor

Install the room temperature sensor in the reference room so that negative influences are prevented.

- **Not** on an outside wall
- **Not** close to windows or doors
- **Not** near to thermal bridges
- **Not** in “dead spots”
- **Not** above radiators
- **Not** in direct sunlight
- **Not** in the path of direct heat radiation from electrical appliances or similar

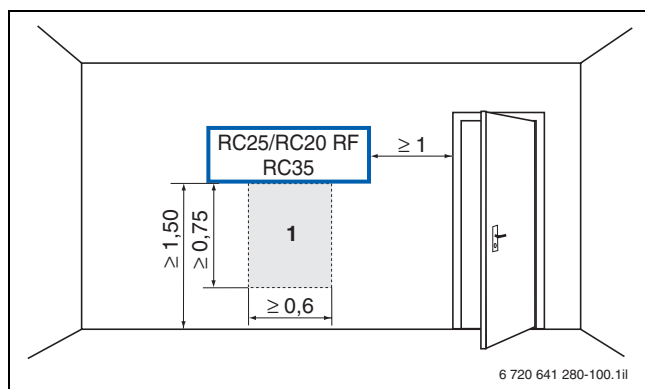


Fig. 36 Position of the RC25/RC20 RF or RC35 programming unit or the external room temperature sensor in the reference room (dim. in m)

1 Required clearance below the RC25, RC20 RF or RC35

4.3.2 Weather-compensated control

With weather-compensated control, the heating system is regulated subject to the outside temperature.

This method of control requires a RC35 programming unit. The RC35 programming unit can be installed in the boiler and is supplied, if required, with the necessary outside temperature sensor.

Position of the outside temperature sensor

Install the outside temperature sensor so that it captures the outside temperature without extraneous influences (→ Fig. 37). Therefore always install it on the north side of the building.

For optimum temperature capture, avoid the following temperature sensor positions:

- **Not** above windows, doors or vents
- **Not** underneath awnings, balconies or below the roof

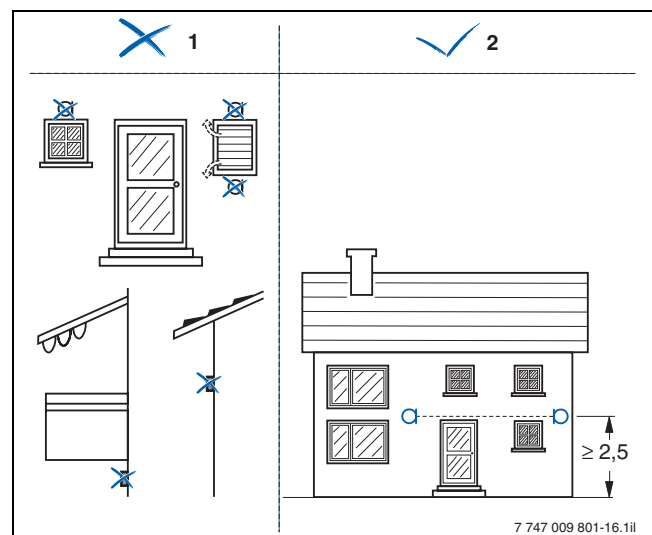


Fig. 37 Arrangement of the outside temperature sensor (dim. in mm)

- 1 Incorrect arrangement
- 2 Correct arrangement

4.3.3 Weather-compensated control with room temperature hook-up

The weather-compensated control with room temperature hook-up combines the benefits of both previously mentioned kinds of control.

This kind of control requires the installation of the RC35 programming unit, an external room temperature sensor, or an additional RC25/RC20 RF programming unit inside the reference room (→ Fig 36).

4.4 Boiler and control components in the Logamatic EMS control system

4.4.1 Logamatic BC25 base controller with integral burner control unit

The Logamatic BC25 base controller (→ Fig. 38, pos. 1) is the standard programming unit of the GB172 gas condensing boilers with the Logamatic EMS control system. The Logamatic BC25 contains all required elements to make all standard settings on the heating system.

In addition, the Logamatic BC25 base controller offers a slot for the RC35 programming unit, which makes further functions available for convenient control.

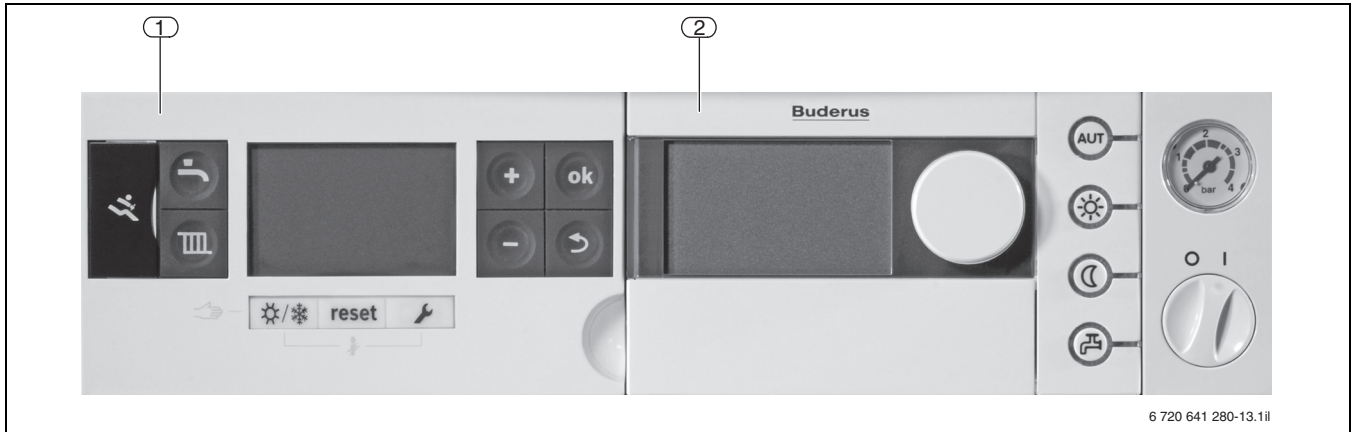


Fig. 38 Logamatic BC25 base controller with clipped-in RC35 programming unit

- 1 Logamatic BC25 base controller
- 2 RC35 programming unit (→ page 48)

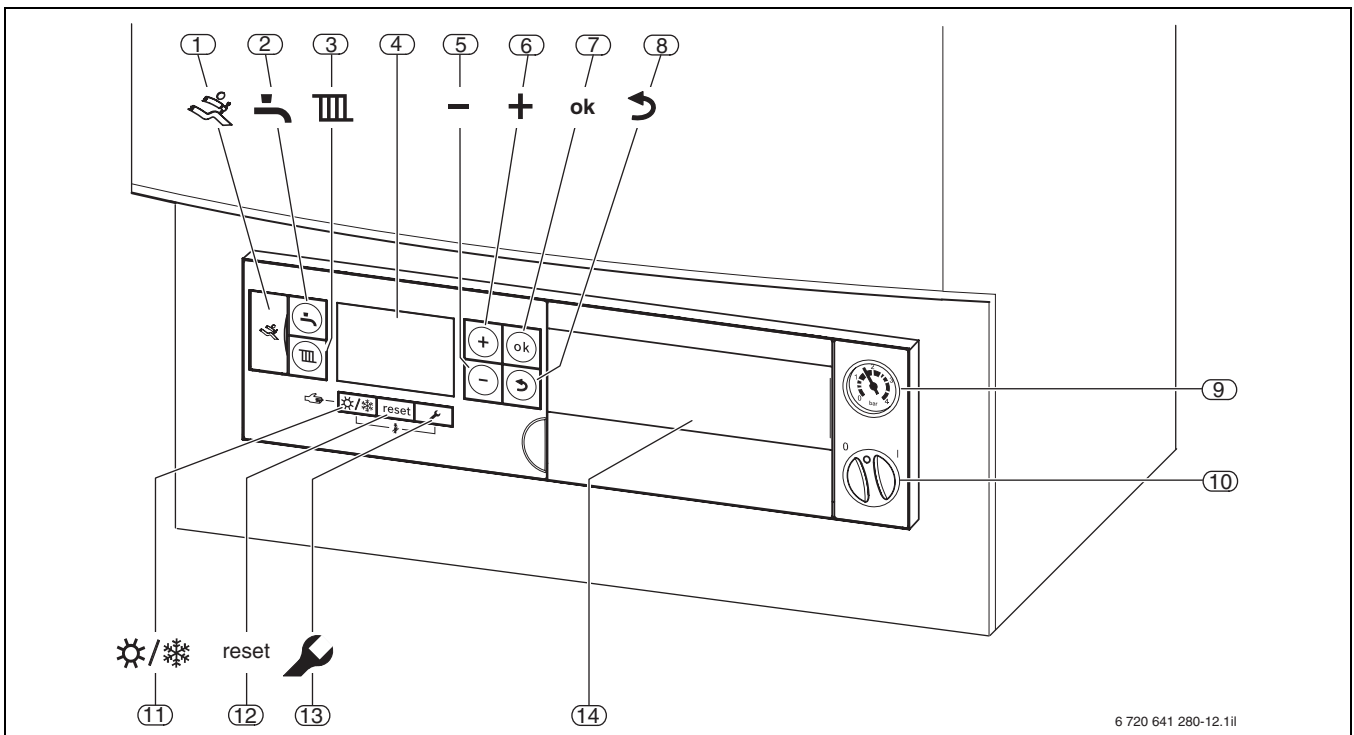


Fig. 39 Display, indicators and controls on the Logamatic BC25 base controller

- | | | | |
|---|-----------------------|----|--------------------------|
| 1 | Diagnostic interface | 8 | "Back" key |
| 2 | "DHW" key | 9 | Pressure gauge |
| 3 | "Central heating" key | 10 | ON/OFF switch |
| 4 | Display (→ Fig. 40) | 11 | "Summer/Winter" mode key |
| 5 | "-" key | 12 | "Reset" key |
| 6 | "+" key | 13 | "Service" key |
| 7 | "OK" key | 14 | Slot for RC35 |

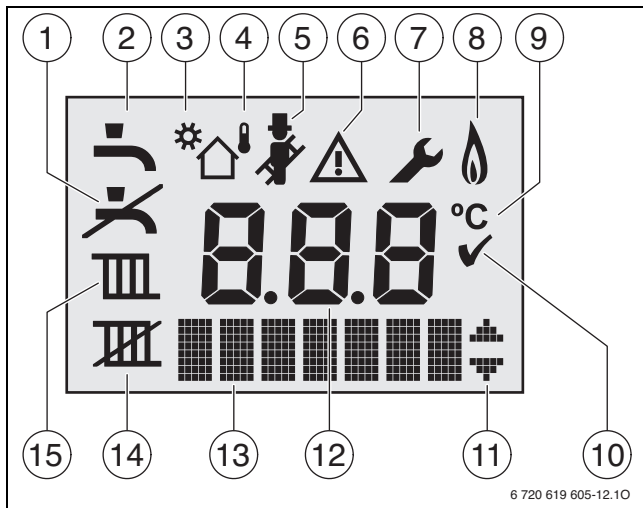


Fig. 40 Logamatic BC25 display

- 1 No DHW mode
- 2 DHW mode
- 3 Solar mode
- 4 Weather-compensated mode
(control system with outside temperature sensor)
- 5 Emissions test mode
- 6 Fault (combined with key 7: service mode)
- 7 Service mode (combined with key 6: service mode)
- 8 Burner operation
- 9 Temperature unit °C
- 10 Saved successfully
- 11 Display of further submenus/service functions;
scroll with + and – keys
- 12 Alphanumeric display (e.g. temperature)
- 13 Text line
- 14 No heating mode
- 15 Heating Mode

Functions and controls on the Logamatic BC25 base controller

- Microprocessor-controlled digital monitoring and control of all electronic components of the appliance via the integral burner control unit
- ON/OFF switch for starting and shutting down the boiler and all connected modules (→ Fig. 39, pos. 11)
- Starting and stopping heating mode
- Setting the maximum boiler flow temperature for heating mode (between 30 °C and 82 °C)
- Starting and stopping DHW mode and DHW circulation
- Selecting the set DHW temperature (maximum 60 °C)
- Thermal disinfection either controlled by the RC35 programming unit (automatic start in regular intervals) or by the BC25 base controller (manual start)

- DHW temperature setting – appliances with DHW cylinder
 - DHW mode
The DHW cylinder is reheated up to the selected temperature when the temperature inside the DHW cylinder drops by more than 5 K (°C) below the selected temperature. The appliance then enters heating mode.
 - Economy mode
The DHW cylinder is reheated up to the selected temperature when the temperature inside the DHW cylinder drops by more than 10 K (°C) below the selected temperature. The appliance then enters heating mode.
- DHW temperature setting – GB172-24 K (appliance with integral plate heat exchanger for DHW heating according to the instantaneous water heater principle)
 - DHW mode
The appliance is permanently kept at the selected temperature. Consequently, DHW draw-offs are not subject to long delays. The appliance still starts even if no DHW is being drawn off.
 - Economy mode
The cylinder contents are only heated to the selected temperature if DHW is being drawn off.
- DHW circulation pump
- “Summer/Winter mode” changeover key (→ Fig. 39, pos. 12)
- Frost protection
- Manual mode
- Every time the pump is switched off, a timer starts to briefly switch on the heating circuit pump and the 3-way valve at regular intervals (anti-seizing protection).
- Where a low loss header is required, the low loss header sensor can be installed either at the boiler (BC25) or via a WM10 module. Use the version with an additional WM10 if there is a heating circuit without mixer (can be regulated via a WM10) or if four heating circuits are required (3x MM10 modules, 1x WM10 module)
- The venting function can be activated after servicing by means of the venting program.
- The siphon fill program ensures that the condensate siphon is filled following installation or after the appliance has been out of use for some time.
- Display of current set and actual boiler values (monitoring function)
- Boiler relay test
- Emissions test function (flue gas test)
- Central heating delay to enable DHW heating (solar mode, for the GB172-24 K)
- Selecting the set DHW value
- DHW priority
- Service interval (in months)

4.4.2 RC25 programming unit

The RC25 (→ Fig. 41) programming unit is connected to the Logamatic EMS and supplied with power via a 2-core BUS cable. It may be used either as a base controller or as a remote control. A wall mounting bracket for securing the RC25 programming unit inside the living space is part of the standard delivery.

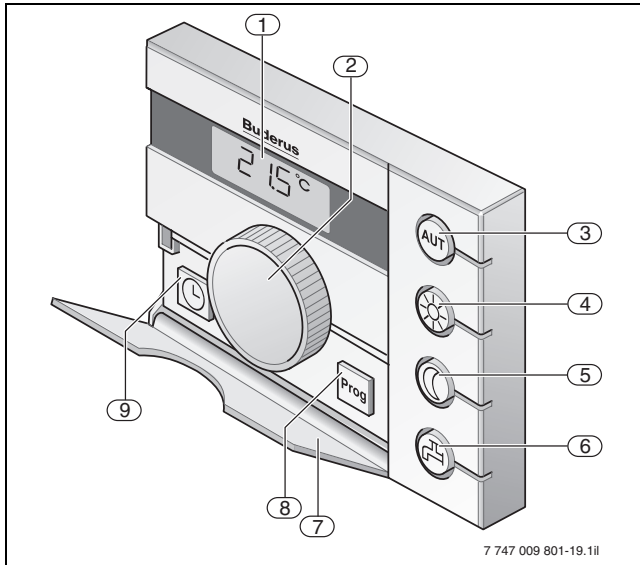


Fig. 41 Displays and controls of the RC25 programming unit

- 1 LCD for showing the selected values and temperatures (permanent display: actual room temperature)
- 2 Rotary selector for adjusting values that are shown after pressing a key in the display or for switching between the service level menus
- 3 Operating mode selector key with LED for automatic heating mode in accordance with a time switch
- 4 Operating mode selector key with LED for standard heating mode (day mode - "Constant heating")
- 5 Operating mode selector key with LED for setback heating mode (night mode - "Constant setback")
- 6 Key with LED for activating once only DHW heating or for selecting the DHW temperature
- 7 Flap to cover the second control level
- 8 Key for selecting the heating program
- 9 Key for adjusting the time and the day of the week

A system with room temperature-dependent control of a downstream heating circuit without mixer can only be achieved with the RC25 programming unit. The room temperature sensor is integrated into the RC25. In addition, the RC25 programming unit can regulate a DHW circuit with thermal disinfection and DHW circulation pump, as well as a 7-day time switch with standard programs.

If the RC25 programming unit acts as a remote control, then the RC35 programming unit takes over control of the heating circuits and the gas condensing boiler in the Logamatic EMS control system. In that case, the RC25 programming unit supplies the necessary information from the room and regarding the operating mode.

In both applications, the LCD indicates the captured room temperature (→ page 41, pos. 1). The LCD also shows the time and the day of the week.

Selector keys (→ Fig. 41, pos. 3 to 5) enable the selection of the heating operation modes "Automatic", "Constant heating" and "Constant setback". The integral LED signals the current operating mode.

The functions of the RC25 programming unit are accessible at two operating levels that are called up in accordance with the simple and proven "Push & Turn" operating concept. If required, a calibration function for the room temperature is available at the service level; this is activated via a recessed key in the side of the unit. Heating contractors can set various system parameters at the service level, e.g. activating DHW heating with permanent control of a DHW circulation pump, or defining the thermal disinfection function.

4.4.3 Wireless RC20 RF programming unit with RFM20 wireless module

The RC20 RF wireless programming unit offers the same functions as the RC25 programming unit (→ Fig. 41). Wireless communication between the RC20 RF wireless programming unit installed in the living area and the Logamatic EMS control system installed in the cellar requires the RFM20 wireless module (→ Fig. 42). To achieve the best possible wireless reception, we recommend installing the module on the wall immediately next to the EMS control system.

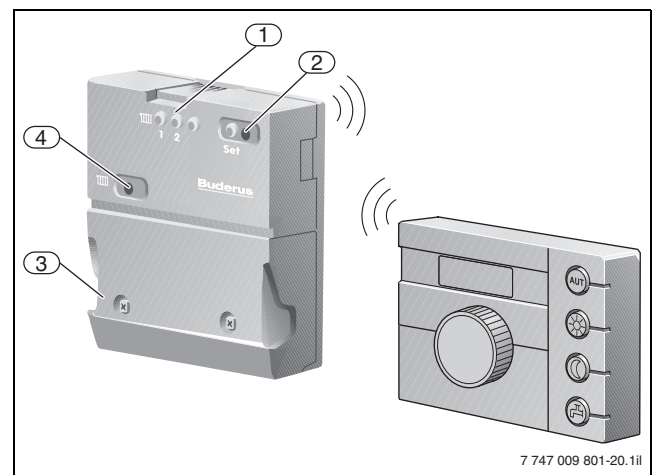


Fig. 42 Displays, indicators and controls of the RFM20 wireless module (shown with the RC20 RF wireless programming unit)

- 1 LED indicators for the heating circuit channel
- 2 Key with LED "Learn function of the RC20 RF"
- 3 Terminal cover
- 4 "Heating circuit channel selection" key

The RFM20 wireless module is required only once per EMS control system for the control of up to three heating circuits. Communication and power supply of the module are provided by a 2-core BUS cable from the control system. Transmissions occur at 1-minute intervals at a transmission strength of 10 mW and a duration of 150 ms, which is comparable to a mobile phone.

4.4.4 RC35 programming unit

The RC35 programming unit (→ Fig. 43) is connected to the Logamatic EMS control system and is supplied with power via a 2-core BUS cable. The RC35 programming unit can either be clipped into the Logamatic BC25 base controller in the boiler or installed on a wall mounting bracket inside the living space. Installed in the living space, the programming unit RC35 is also suitable as a convenient room temperature-dependent controller. The RC35 programming unit must be software version 1.15 or higher in order to guarantee full compatibility.

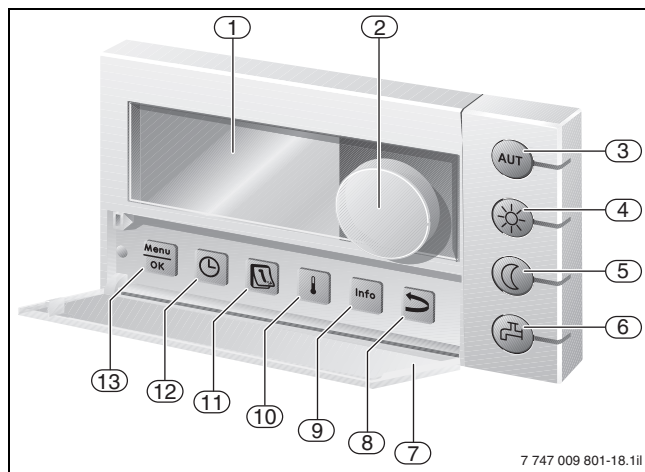


Fig. 43 Displays, indicators and controls of the RC35 programming unit

- 1 LCD for showing the selected values and temperatures (permanent display: actual room temperature)
- 2 Rotary selector for adjusting values that are shown after pressing a key in the display or for switching between the service level menus
- 3 Operating mode selector key with LED for automatic heating mode in accordance with a time switch (automatic changeover between day and night room temperature)
- 4 Operating mode selector key with LED for standard heating mode (day mode - "Constant heating") summer mode interruption
- 5 Operating mode selector key with LED for setback heating mode (night mode "Constant setback")
- 6 Key with LED for activating once only DHW heating or for selecting the DHW temperature
- 7 Flap to cover the second control level
- 8 Key for changing menus or control levels
- 9 Key for info menu (scanning values)
- 10 Key for adjusting the room temperature
- 11 Key for adjusting the day of the week
- 12 Key for adjusting the time
- 13 Key for the control menu

With the RC35 programming unit in its standard version, one heating circuit without mixer can be controlled in the operating modes room temperature-dependent, weather-compensated or weather-compensated with room temperature hook-up. For room temperature-dependent control or for room temperature hook-up, install the RC35 programming unit in the reference room. If the reference room is not the location where the RC35 programming unit is installed, an external room temperature sensor can be connected at the unit's wall mounting base.

The RC35 programming unit is equipped with a programmable 6-channel digital time switch with eight standard programs for the graphic display of the switching cycles and the outside temperature (with integral "Weather station"). Individual programs can also be created for each heating circuit in conjunction with the Logamatic EMS control system and/or the MM10 module. An individual time channel is available for DHW heating including control of a DHW circulation pump. The standard functions also include thermal disinfection, which can be adjusted as required, and once only DHW heating. All important information regarding the heating system, including fault displays, room temperature, time and day of the week can be captured with the RC35 programming unit and displayed "in plain text" on the backlit LCD with graphic capabilities (→ Fig 43, pos. 1).

Selector keys (→ Fig. 43, pos. 3 to 5) enable the selection of the heating operation modes "Automatic, Constant heating" and "Constant setback". The integral LED signals the current operating mode.

The Logamatic EMS control system, together with the RC35, regulates the low loss header and three additional heating circuits in conjunction with the MM10 mixer modules as well as the solar DHW heating in conjunction with the SM10 solar module (system example → page 90).

The RC35 programming unit also includes some special functions, e.g. a "Holiday function" for the entire system or, in conjunction with the MM10 module, for each individual heating circuit.

In addition, several service functions can be used, e.g. "Monitor function", "Function test", "LCD test", "Fault monitoring", "Fault indication", "Scanning the heating curve".

The functions of the RC35 programming unit are accessible at several levels that are called up in accordance with the simple and proven "Push & Turn" concept. There are two control levels for users, segregated into standard functions and extended functions. At the service level, contractors can make adjustments, e.g. for the heating circuits or DHW heating.

4.5 Function modules for extending the Logamatic EMS control system

4.5.1 Modules for Logamax plus GB172/GB172T

All delivered modules are equipped with a BUS cable, mains plug and a wall mounting base (including rawl plugs and screws). This enables a straight-forward installation outside the boiler.

Quick installation sets for heating circuits without integral modules

The following heating circuit quick installation sets including high efficiency pump, efficiency category A, are available:

- Quick installation sets for heating circuits with mixer
 - HSM 15 E-plus
 - HSM 20 E-plus
 - HSM 25 E-plus
 - HSM 32 E-plus
- Quick installation sets for heating circuits without mixer
 - HS 25 E-plus
 - HS 32 E-plus

Quick installation sets for heating circuits with integral modules

The following heating circuit quick installation sets with integral modules are available:

- Quick installation sets for heating circuits with low loss header module
 - HS 25 E-plus (EMS Inside)
 - HS 32 E-plus (EMS Inside)
- Quick installation sets for heating circuits with mixer module
 - HSM 15 E-plus (EMS Inside)
 - HSM 20 E-plus (EMS Inside)
 - HSM 25 E-plus (EMS Inside)
 - HSM 32 E-plus (EMS Inside)

The modules are prewired at the factory. For commissioning, the modules must be connected to a 230 V power supply.

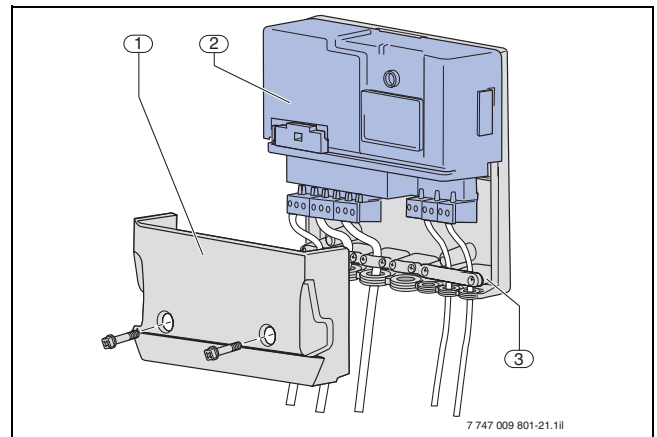


Fig. 44 Function module for wall mounting mode

- 1 Terminal cover
- 2 Base module
- 3 Wall mounting bracket with strain relief for connecting cables

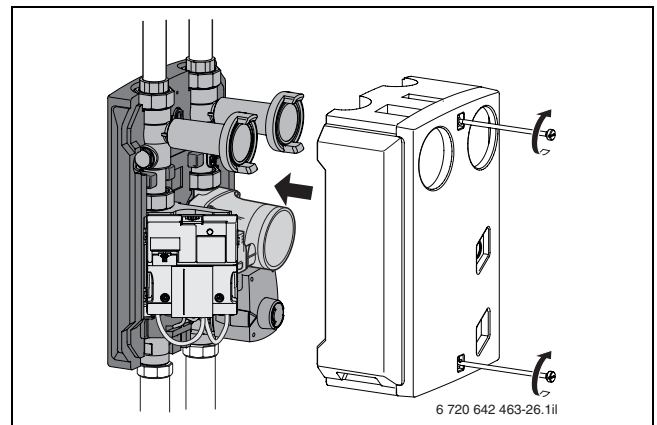


Fig. 45 Heating circuit quick installation set with high efficiency pump, efficiency category A (with integral EMS module)

4.5.2 ASM10 connection module

The ASM10 connection module is a BUS distributor that represents an extension of the EMS-BUS with several subscribers, e.g. MM10 mixer module or RC25/RC20 RF programming unit, to which six BUS subscribers can be connected. It is used in the Logamatic EMS control system and is wall mounted.

The module also features the following:

- 1 EMS-BUS input and 5 EMS-BUS outputs
- Encoded and colour-coded connection plugs
- Internal communication via EMS databus
- Wall mounting base into which the EMS system module is clipped
- Strain relief for all connecting cables
- Terminal cover
- Module IP rating inside the wall mounting set: IP 40
- Including installation materials
- Number of modules per system subject to demand

4.5.3 MM10 mixer module

The MM10 mixer module extends the Logamatic EMS control system by heating circuits with mixer. Up to three modules can be used with the RC35 programming unit. It can only be used if the gas condensing boiler is hydraulically separated by means of a low loss header and one heating circuit distributor for two heating circuits (system example → page 88). For heating circuits 2, 3 and 4, the heating systems “Radiator”, “Convactor” or “Underfloor” can be selected at the service level of the RC35 programming unit. These circuits can be operated in weather-compensated or in room temperature-dependent mode. If the “Underfloor” heating system has been selected for the heating circuits, the “Screed drying” function can also be regulated. In addition, these heating circuits can be operated purely under room control.

A programming unit is required in the reference room if a heating circuit is regulated in room temperature-dependent mode (→ Fig. 36, page 44). It may be directly connected to the MM10 mixer module. In this case, the RC35 or RC25/RC20 RF programming unit acts as a remote control.

4.5.4 SM10 solar module

The SM10 solar module enables the integration of solar DHW heating into the Logamatic EMS control system (system example → page 90).

The SM10 solar module not only offers a temperature differential control, it also includes a function that enables the control of the solar circuit pump to deliver a variable flow rate. This High-Flow/Low-Flow operation enables demand-optimised DHW heating. When the system is still cold, the system initially produces DHW quickly from the solar yield for “optimum convenience.” When sufficient hot water is available, the system switches over to “yield optimisation”.

In addition, the SM10 solar module includes a function to optimise reheating. This clearly highlights the intelligent linking of boiler and solar control unit. This control function suppresses reheating by the gas condensing boiler, subject to the heat input capacity of the DHW cylinder if the solar yield is adequate. This allows an optimisation of the solar yield and up to 10 % primary energy can be saved.

To enable solar DHW heating, the heating circuit “Solar thermal system” should be selected at the service level of the RC35 programming unit.

4.5.5 WM10 low loss header module

The WM10 low loss header module regulates the hydraulic separation between the boiler and the consumer circuits. This hydraulic separation can be achieved with a low loss header or via a heat exchanger. In addition, the WM10 low loss header module can actuate the secondary pump for the heating circuit without mixer (heating circuit 1) (system examples → chapter 6.4.4, page 88 f.).

In systems with Logamax plus GB172/GB172T gas condensing boilers, hydraulic separation is generally required if two heating circuits with individual pumps are to be connected.

Provide a mixer module for every heating circuit if only heating circuits with mixers are used in the heating system (e.g. system example → 6.4.3, page 86 f.). In that case, no low loss header module is required. The low loss header module can be connected directly to the Logamatic BC25. However, if there is one heating circuit without mixer, the heating circuit pump of that circuit can be switched by means of the auxiliary function of the low loss header module. In that case, the low loss header sensor is connected to the low loss header module.

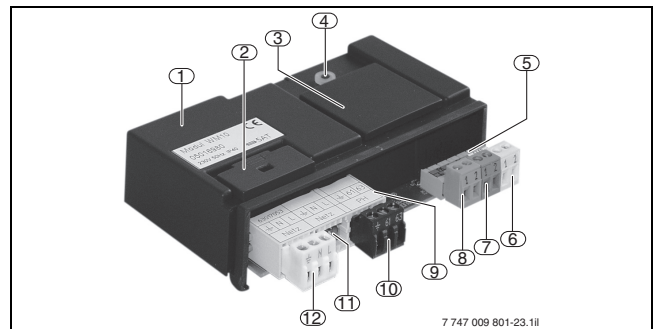


Fig. 46 Low loss header module WM10 (base module)

- 1 Base module
- 2 Appliance fuse
- 3 Access to the spare fuse
- 4 LED operating and fault displays
- 5 Plug-in strip for control voltage
- 6 Plugs for additional components in the Logamatic EMS via EMS-BUS
- 7 Plugs for RC... programming unit
- 8 Plug for the flow temperature sensor (here temperature sensor for low loss header)
- 9 Plug-in strip for mains voltage
- 10 Plug for heating circuit pump
- 11 Slot for the power supply of additional function modules (mains output)
- 12 Plug for 230 V AC, 50 Hz power supply

4.5.6 Logamatic web KM200 communication module

The web KM200 communication module is used as an interface between the heating system and a network (LAN). It enables the operation and remote monitoring of the heating system via iPhone, iPod touch or iPad.

- Intuitive operation of the heating system by means of the EasyControl App in a local WLAN network and via the internet
- Checking and changing system parameters (e.g. operating mode changeover, set temperatures for day and night, time switches for all heating circuits) and the configuration of the web KM200 communication module
- Compatible with iPhone, iPod touch or iPad
- Display of fault and service messages in the App
- Easy module installation through Plug & Work
- Security through password protection

Standard delivery:

- Wall mounted module
- 230 V power supply
- Technical documentation

System requirements

- Programming unit series RC... manufactured from 2003 with EMS-BUS interface, e.g. RC25
- All modules in the RC...series manufactured from 2003 e.g. MM10
- Heat source with EMS-BUS interface
- iOS version 3 or higher
- Existing LAN network (router). Additional costs may arise for the internet connection. We recommend a flat rate internet connection.

Dimensions	151 × 184 × 61 mm (W × H × D)
Rated voltages	BUS: 12 V to 15 V DC (protected against polarity reversal) Module: 230V AC/7.5 V DC, 700 mA)
Interfaces	EMS-BUS LAN: 10/100 MBit/s (RJ45)
IP rating	IP20

Table 20

4.5.7 Logamatic Easycom telecontrol modem

In the form of the Logamatic Easycom, Buderus offers an affordable telecontrol modem for remote monitoring and setting of parameters in small and medium-sized heating systems. It is available as the module version EM including programming software and cable.

The following are the essential features of the telecontrol modem:

- May be connected to any control unit of the Logamatic 2000, 4000 or EMS systems; with BUS-capability for the subscribers of a BUS system; with an additional potential-free message input
- Connection via an analogue telephone connection or, with an adaptor, via an ISDN system; high
- data transfer speed (56 kBit/s)
- Complete remote scanning and setting of parameters of the connected system via PC software Logamatic ECO-SOFT with operating mode changeover via telephone (holiday home function)
- Remote monitoring of the connected system with automatic fault message to any 3 selectable recipients; possible recipients are fax, mobile phones (SMS via D1, D2 or E-Plus), PC call centres (with PC software ECO MASTERSOFT) or email addresses
- Prepared for firmware updates via software download

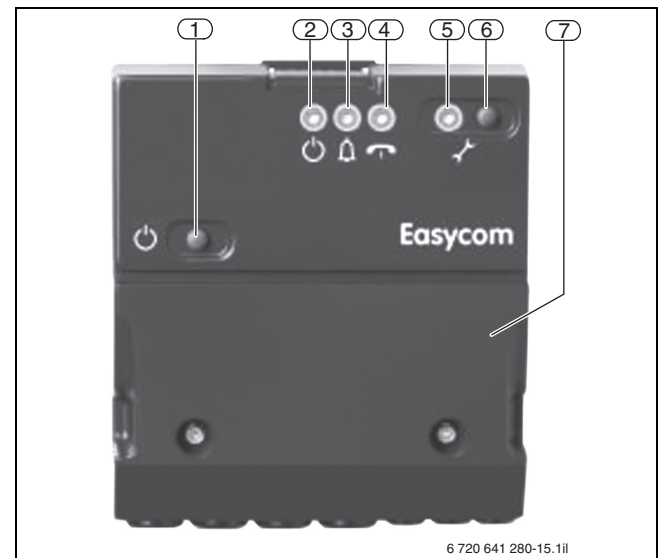


Fig. 47 Logamatic Easycom telecontrol modem (EM module version)

- 1 Operating mode selector (ON/OFF)
- 2 Standby display
- 3 "Message" display
- 4 "Telephone line busy" display
- 5 "Service" display
- 6 "Service" or "Restart" key
- 7 Terminal cover for EM module version

4.5.8 EM10 fault message module

The EM10 fault message module can be used as an interface between the boiler and, for example, a building management system.

A 0–10 V DC signal enables control over the flow temperature or the output (→ Fig. 48).

In combination with the Logamax plus GB172/GB172T, the EM10 fault message module provides two standard functions:

- Output of a fault indication with a 230 V signal (with potential) (buzzer, signal indicator, max. 1 A) and a floating contact for LV signals. A fault indication is generated under the following circumstances:
 - The boiler has suffered a lockout fault
 - The water pressure in the system is too low
 - Communication with the boiler has been interrupted for longer than five minutes
- Switching the boiler with an external 0-10 V DC signal. A flow temperature is specified to the boiler via the 0-10 V DC signal (→ Fig. 48).

Only one of the two fundamental functions can be used.

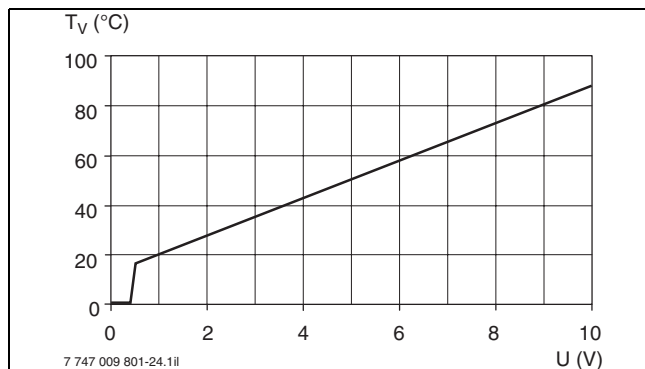


Fig. 48 Curve, EM10 fault message module (set values)

T_v Flow temperature
U Input voltage

Control via the flow temperature

The EM10 module transmits the 0–10 V signal from the building management system to a set flow temperature point. This is a linear ratio.

Input voltage in V	Set flow temperature point (boiler) in °C	Boiler state
0	0	OUT
0.5	0	OUT
0.6	± 15	ON
5	± 50	ON
10	± 90	ON/maximum

Table 21 Control via the flow temperature

Control via the output

The EM10 module transmits the 0–10 V signal from the building management system to a set output. This is a linear ratio.

Input voltage in V	Set flow temperature point (boiler) in °C	Boiler state
0	0	OUT
0.5	0	OUT
0.6	± 6	Low load ¹⁾
5	± 50	Partial load
10	± 100	Full load

Table 22 Control via the output

1) The output at low load depends on the appliance type. If the low load of the appliance is, for example, 20 % and the control signal 1 V (= 10 %), then the set output is lower than the low load. In that case, the appliance will deliver 10 % at low load through an ON/OFF cycle. In this example, the boiler enters constant operation from a set point of 2 V.

4.5.9 VM10 function module for an external solenoid valve

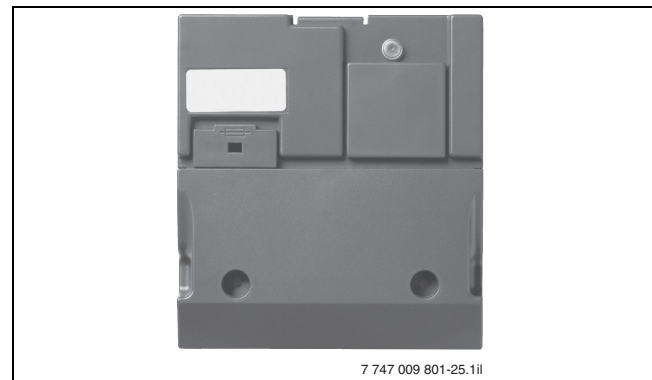


Fig. 49 VM10 function module

When combined with the Logamax plus GB172/GB172T, the VM10 function module takes over the switching and power supply of an external solenoid valve for the operation of appliances below ground level with LPG.

When the boiler receives a heat demand, the external solenoid valve is opened two seconds ahead of the gas valve of the appliance.

The external solenoid valve remains closed when there is no heat demand for the boiler. The external solenoid valve remains closed if the appliance has developed a fault.

4.6 Selection aid for possible equipment levels using the components of the Logamatic EMS control system

Control components and their functions	Logamax plus	
	GB172	GB172-24 K/ GB172T
Boiler components		
Logamatic BC25 base controller	●	●
RC25/RC20 RF programming unit		
As weather-compensated control	□	□
As room temperature-dependent control	□	□
As a remote control in conjunction with the RC35 programming unit ¹⁾	□	□
RC35 programming unit²⁾		
As weather-compensated control	□	□
As a room temperature-dependent control unit ³⁾	□	□
Connection of an external room temperature sensor	□	□
As remote control ³⁾	□	□
Cylinder connection set AS-E ⁴⁾	□	● ⁵⁾
Function modules		
WM10 low loss header module	□ ⁷⁾	□ ⁷⁾
MM10 mixer module ⁶⁾	□ ⁷⁾	□ ⁷⁾
SM10 ²⁾ solar module ⁸⁾	□ ⁷⁾	□ ⁷⁾
Logamatic Easycom telecontrol modem	□ ⁷⁾	□ ⁷⁾
Web KM 200 communication module	□ ⁷⁾	□ ⁷⁾
Control system extension options		
External interlock (floating contact)	●	●
External heat demand (floating contact)	●	●
External heat demand 0-10 V (EM10 fault message module)	□	□
Central fault message (EM10 fault message module)	□	□
Remote monitoring	□	□
Remote configuration	□	□
Second solenoid valve, e.g. for LPG (VM10 function module)	□	□

Table 23 Selection aid for the possible equipment level of the Logamax plus GB172/GB172T with components of the Logamatic EMS control system

- 1) As a remote control for heating circuit 1, if the RC35 programming unit is installed inside the boiler or as a remote control for heating circuit 2.
- 2) Part of the standard delivery of the GB172-14/20 T210SR
- 3) Only one RC35 programming unit per system: If the RC35 programming unit is installed in the boiler or a second heating circuit is planned, then an additional RC25/RC20 RF programming unit per heating circuit as a remote control is required.
- 4) AS-E includes DHW temperature sensors for DHW heating with plugs and dummy segments.
- 5) Integral DHW temperature sensor, connected at the factory
- 6) In conjunction with the RC35 programming unit, three function modules can be used in each system.
- 7) The modules can only be installed outside the boiler on the GB172/GB172T models.
- 8) Function module for solar thermal systems for one consumer (solar DHW heating with yield optimisation). The SM10 solar module can only be used once per system. SM10 is an integral part of the solar GB172-14/20 T210SR compact heating centres.

- Standard equipment
- Option
- Not possible

4.7 Logamatic 4121 and 4122 control units

Logamatic 4121 control unit

The Logamatic 4121 control unit is part of the modular Logamatic 4000 control system. In its standard version, it includes the CM431 controller module, the MEC2 programming unit and the ZM424 central module. The Logamatic 4000 must be software version 8.720 or higher in order to guarantee full compatibility.

- Logamatic 4121 (part no. 7 747 011 916)

The following components can be controlled:

- One gas condensing boiler with modulating burner operation
- One heating circuit with actuator
- Selection function (only one function can be selected)
 - A second heating circuit without actuator and DHW temperature control via a cylinder primary pump incl. switching the DHW circulation pump via the Logamatic 4000
 - or**
 - A second heating circuit with actuator and DHW temperature control via EMS (with 3-way diverter valve) or cylinder primary pump and DHW circulation pump

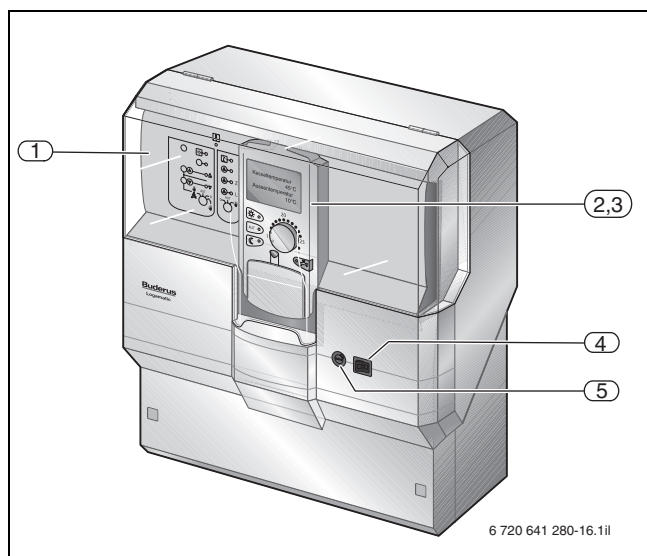


Fig. 50 Logamatic 4121 control unit with standard equipment level

- 1 Central module ZM424
- 2 CM431 controller module
- 3 MEC2 programming unit
- 4 Control unit ON/OFF switch
- 5 Fuse

Logamatic 4122 control unit

In its standard version, the Logamatic 4122 control unit includes only the CM431 controller module and the MEC2 programming unit (→ Fig. 51). Some functions are not included. The functionality of the control unit is dictated by the various modules (→ Table 24).

- Logamatic 4122 with MEC2 (part no. 7 747 011 918)
- Logamatic 4122 with display (part no. 7 747 011 922)

The following are alternative applications:

- Logamatic 4122 combined with the function modules FM441, FM442, FM443, FM444, FM445, FM446 and FM448 to extend the control functions (up to 56 heating circuits)

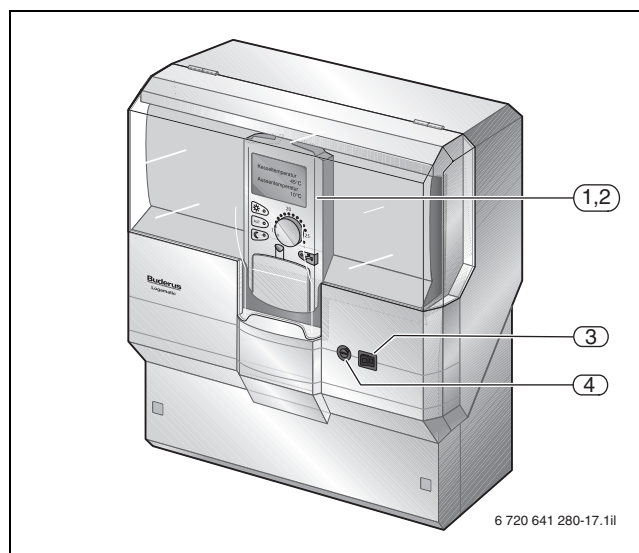


Fig. 51 Logamatic 4122 control unit as standard version with MEC2 programming unit; as an option with a display

- 1 CM431 controller module
- 2 MEC2 programming unit
- 3 Control unit ON/OFF switch
- 4 Fuse

Control options, Logamatic 4122 control unit

Control unit	Slots	Possible function modules	Control options
Logamatic 4121 (master device)	1	ZM424 (standard equipment level)	Heating circuits 1 and 2, DHW heating, boiler
	1	FM442	Heating circuits 3 and 4
		FM443	Solar thermal system with one or two consumers
		FM444	Module for connecting an alternative heat source or buffer cylinder
		FM445 ¹⁾	DHW heating via the cylinder primary system with external heat exchanger
		FM446	EIB interface (European Installation BUS)
		FM448	Central fault message
		FM456 KSE2 (FM457 KSE4)	Not currently possible in combination with the GB172/GB172T
Logamatic 4122 (extension for master device)	2	FM441	1 additional heating circuit, DHW heating
		FM442	2 additional heating circuits (up to 56 heating circuits with 14 Logamatic 4122 substations)
		FM443	Solar thermal system with one or two consumers
		FM445 (alternative to the FM441)	DHW heating via the cylinder primary system with external heat exchanger
		FM446	EIB interface (European Installation BUS)
		FM448	Central fault message
		FM456 KSE2 (FM457 KSE4)	Not currently possible in combination with the GB172/GB172T
Logamatic 4122 (master device)	1	FM441	Heating circuit 1, DHW heating
		FM442	Heating circuits 1 and 2
		FM443	Solar thermal system with one or two consumers
		FM445 (alternative to the FM441)	DHW heating via the cylinder primary system with external heat exchanger
		FM446	EIB interface (European Installation BUS)
		FM448	Central fault message
		FM456 KSE2 (FM457 KSE4)	Not currently possible in combination with the GB172/GB172T

Table 24 Control and extension options for the Logamatic 4121 and 4122 control units

1) When using the FM445 function module, DHW heating through the ZM424 central module will be disabled.

Communication-enabled MEC2 programming unit

All important parameters of the Logamatic 4121 and 4122 control units are managed by the digital MEC2 programming unit (→ Fig. 52). The control concept is based on the easy and proven “Push & Turn” principle. For this, the user prompts prevent contradictory settings of parameters, thereby largely preventing faults during commissioning. All available information can be displayed in “plain text”. One room temperature sensor and a radio clock receiver are integrated as standard.

The MEC2 programming unit can be located either at the control unit, in an online set at the boiler casing or with the room installation set in the living space. A simple 2-core cable connects the wall mounting bracket of the room installation set with the Logamatic 4121 or 4122 control unit.

If the MEC2 programming unit with the room installation set functions as a remote control in the living area, use a boiler display unit inside the control unit in its place. In that case, this operating display shows the system flow.

- Room installation set with wall mounting bracket and boiler display (part no. 5 720 812)



For further details, see the technical guide concerning the “Modular Logamatic 4000 control system”.

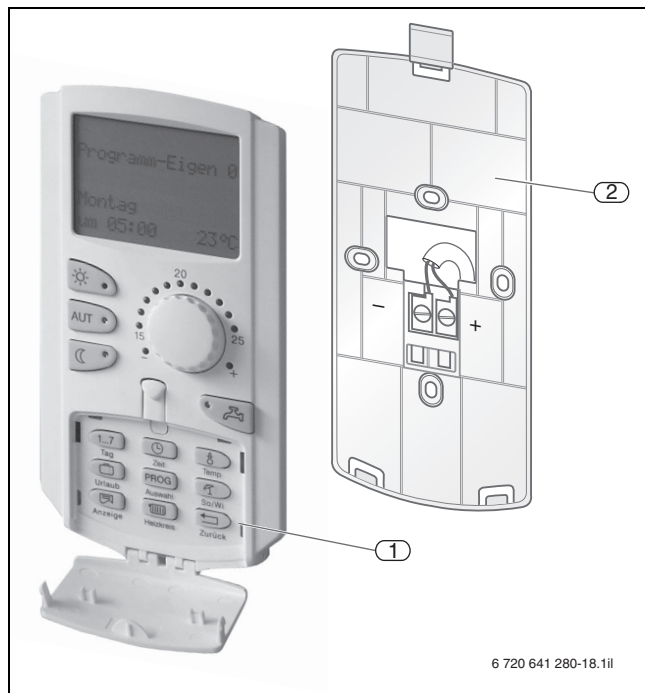


Fig. 52 MEC2 programming unit with integral room temperature sensor and wall mounting bracket

- 1 MEC2 programming unit including integral room temperature sensor and radio clock receiver
- 2 Wall mounting bracket for the MEC programming unit

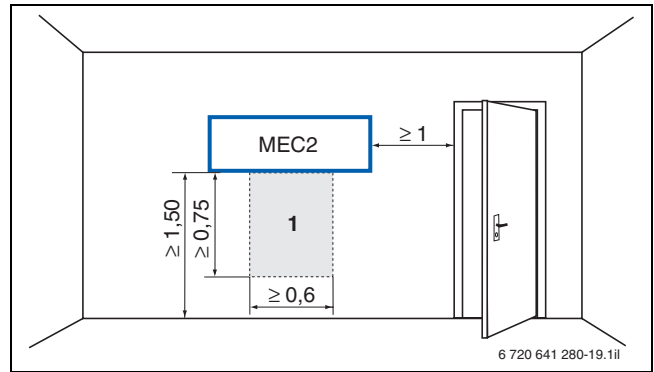


Fig. 53 Position of the wall mounting bracket for the MEC2 programming unit in the reference room (dim. in mm)

- 1 Required clearance below the MEC2

5 DHW heating

5.1 Selection aids for selecting integral or separate DHW heating

Gas condensing boilers have very high efficiency. Therefore, heating DHW with the Logamax plus GB172/GB172T is recommended, both from an energy consumption and an ecological viewpoint. Individual demands can also be met with the GB172/GB172T gas condensing boilers. This boiler type is suitable both for integral direct DHW heating (GB172-24 combi boiler, → page 58) as well as for a combination with separate DHW cylinders (GB172, selection aids → page 59 f) or as a GB172T compact heating centre.

When planning heating systems and making a decision on integral or separate DHW heating, various factors should be taken into account:

- Simultaneous use of different draw-off points
- DHW demand and convenience
- Line length (with or without DHW circulation line)
- Availability of space
- Costs
- Replacement of system components

Planning criteria	Possible versions	Logamax plus			
		GB172 with separate DHW cylinder	GB172-24 K combi boiler	GB172-24 T50 with integral DHW cylinder	GB172T compact heating centre
Use of the draw-off points	Only one main draw-off point	●	+	+	●
	Several main draw-off points, but not simultaneously	+	+	+	+
	Several main draw-off points simultaneously	+	-	●	+
DHW demand	Single person household (central DHW heating for one residential unit)	●	+	+	●
	Four-person household (central DHW heating for one residential unit or one detached house)	+	●	●	+
	Many users (central DHW heating for an apartment building)	+	-	-	+
Line length	Up to eight metres (without DHW circulation line)	+	+	+	+
	In excess of eight metres (with DHW circulation line)	+	-	+	+
Availability of space	Small	-/● ¹⁾	+	+	●
	Medium	●	+	+	+
	Generous	+	+	+	+
Costs	Affordable solution	●	+	+	●
Replacement	Combi boiler available	+	+	+	-
	Cylinder available	+	-	-	+

Table 25 Selection aids for the selection of integral or separate DHW heating

1) In the case of adequate room height, recommended with the Logalux H65 W wall mounted DHW cylinder (below or adjacent) or Logalux WU120 W, WU160 W or S120 W (floor standing below)

- + Recommended
- Limited recommendation
- Not recommended

5.2 Application limits Stratification cylinder with the GB172-20 T100S, GB172-14/24 T150S and GB172-14/20 T210SR

At a total hardness of the potable water of 15 °dH to 20 °dH, we recommend that the cylinder temperature is set to ≤ 55 °C. In the case of a dual-mode solar stratification cylinder, also limit the cylinder temperature at the solar controller to 55 °C. As an alternative, a water treatment system can also be used.

From an overall hardness level of 21 °dH upwards, a dislodging of scale inside the plate heat exchanger must be expected. We recommend either the use of a cylinder with internal indirect coil or, as an alternative, the use of a water treatment system.

5.3 Integral DHW heating with a plate heat exchanger in the Logamax plus GB172-24 K

Suitable for

- Several draw-off points that are not used simultaneously
- Small number of users
- DHW lines shorter than 8 m
- Total water harness below 21° dH
- Copper DHW pipework
Connected DHW lines must be made from material that is compatible with copper.

Function

- Immediate availability of DHW without delay through hot start option in summer mode
- Temperature maintaining function with adjustable DHW outlet temperature between 40 °C and 60 °C (→ Fig. 56) in summer mode
- Adjustable cold start function for hard water areas or for maximum energy savings
- Maximum DHW draw-off rate of 7.9 l/min at a DHW outlet temperature of 60 °C
- DHW priority mode with the aid of a powerful heat exchanger in accordance with the instantaneous water heater principle (→ Fig. 54)
- Control of the DHW outlet temperature
- DHW draw-off rate defined via flow rate limiter (9 l/min)
- High constant DHW output (→ Fig. 55) of 29.7 kW

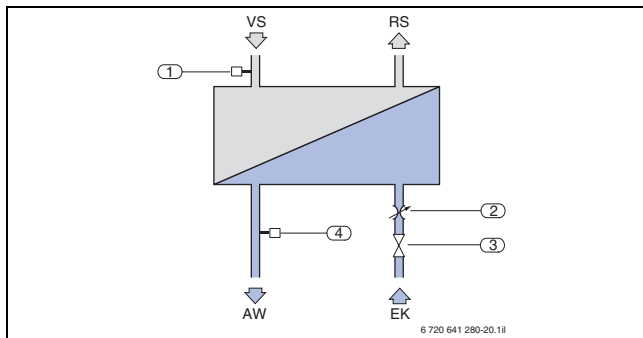


Fig. 54 Integral plate heat exchanger according to the instantaneous water heater principle

- AW** DHW outlet
- EK** Cold water inlet
- RS** Cylinder return
- VS** Cylinder flow
- 1** Flow temperature sensor
- 2** Flow sensor
- 3** Flow limiter 9 l/min
- 4** DHW temperature sensor

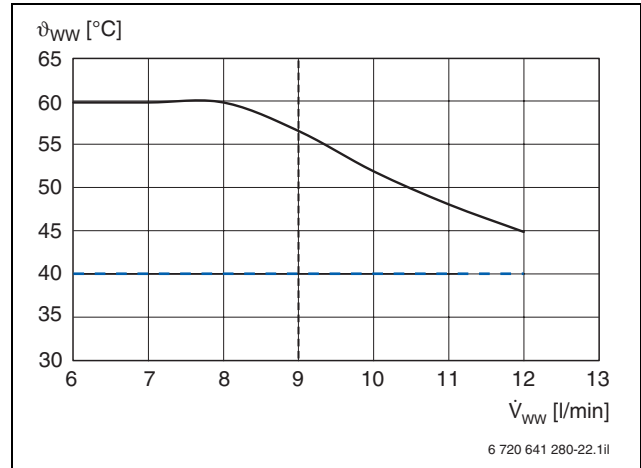


Fig. 55 Constant DHW output at a cold water inlet temperature of 10 °C

- ϑ_{ww} DHW outlet temperature
- \dot{V}_{ww} DHW flow rate

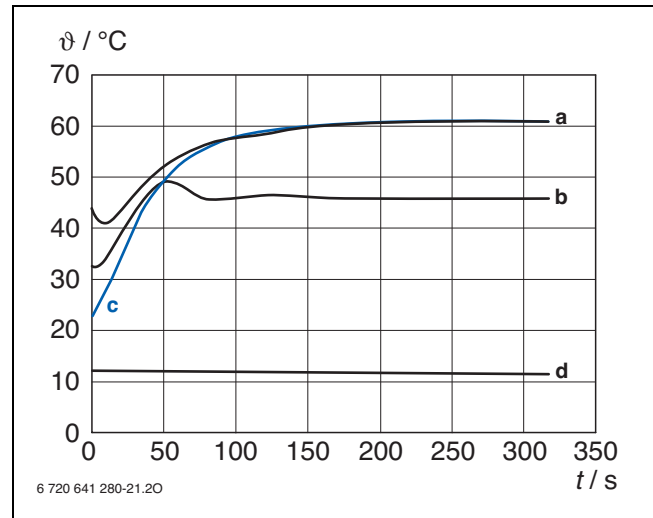


Fig. 56 DHW outlet temperature and DHW temperature maintaining level subject to the setting at the BC25 controller

- ϑ DHW temperature
- t** Time
- a** Hot start at 60 °C DHW outlet temperature
- b** Hot start at 45 °C DHW outlet temperature
- c** ECO with 60 °C DHW outlet temperature
- d** Cold water inlet temperature

5.4 Selection of a suitable DHW cylinder

The size of the required DHW cylinder depends on the DHW demand. The following selection takes into account residential units with up to three or four occupants.

A DHW cylinder with internal indirect coil and 48 l, 115 l or 143 l capacity, one stratification cylinder with 101 l or

148 l capacity or a dual mode solar stratification cylinder with 204 l capacity is already integrated into the Logamax plus GB172T.

Separate DHW cylinders with the same functions can be connected to the Logamax plus GB172.

Draw-off point	Bath tub 200 l	Bath 140 l (10 min)	Bath 160 l (10 min)	Economy shower (6 min, 40 l)	Standard shower (6 min, 90 l)	Basin (3 min, 18 l)
Bath tub 200 l	SU200 W SU160 W WU160 W	1)	1)	SU200 W	SU200 W	SU200 W
Bath 140 l (10 min)	1)	S120 W/ WU120 W	1)	SU160 W/ WU160 W	SU200 W	S120 W/ WU120 W
Bath 160 l (10 min)	1)	1)	SU160 W/ WU160 W S120 W/ WU120 W	SU160 W/ WU160 W	SU200 W	SU160 W/ WU160 W
Economy shower (6 min, 40 l)	SU200 W	SU160 W/ WU160 W	SU160 W/ WU160 W	H65 W H65 W/ T50	S120 W/ WU120 W	H65 W
Standard shower (6 min, 90 l)	SU200 W	SU160 W/ WU160 W	SU200 W	T50/ S120 W/ WU120 W	S120 W/ WU120 W	S120 W/ WU120 W
Basin (3 min, 18 l)	SU160 W/ WU160 W	S120 W/ WU120 W	SU160 W/ WU160 W	H65 W T50	S120 W/ WU120 W	H65 W H65 W T50

Table 26 Selection of a suitable DHW cylinder

1) Unusual combination

	Suitable for ≥ 20 kW boiler output
	Suitable for ≤ 14 kW boiler output
	Suitable for both boiler output ranges

Table 27 Explanation of the colour coding in table 26

General conditions:

- Cylinder temperature 60 °C.
- Only one consumer is taken into consideration in the case of two identical consumers.
- If dual mode cylinders are used, take their standby volume into account.

5.5 DHW circulation line for DHW cylinder

Every DHW circulation line is a heat consumer. Long, poorly designed or insufficiently insulated pipework can result in substantial heat losses. Therefore, short DHW lines without DHW circulation lines should be installed.

However, if a DHW line length is longer than approx. eight metres, the connection of a DHW circulation line is recommended.

Where a DHW circulation line cannot be avoided, observe the following rules:

- The DHW circulation connection can be installed in the cold water inlet of the Logalux S120 W DHW cylinders.
- Minimise the amount of circulating water. This requires a pressure drop calculation for the pipework or sizing of the pump. Temperature differentials from 5 K between the DHW outlet and the DHW circulation inlet must be reduced.
- EnEV [Germany] specifies the use of conventional timers or other automatic devices for shutting down the DHW circulation pump. The RC35 programming unit within the Energy Management System (EMS) provides its own time channel for DHW heating. Consequently, the DHW circulation pump can also be programmed for different operating modes.

It is generally adequate if the DHW circulation pump is operated for approx. three minutes in the morning, midday and in the evening.

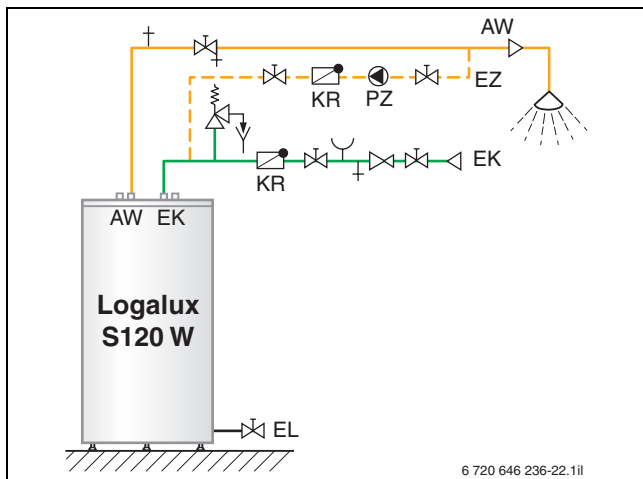


Fig. 57 Version of a DHW circulation line for the Logalux S120 W DHW cylinder

Key to Fig. 57 to Fig. 60:

- AW** DHW outlet
- EK** Cold water inlet
- EL** Drain
- EZ** DHW circulation inlet
- KR** Check valve
- PZ** DHW circulation pump

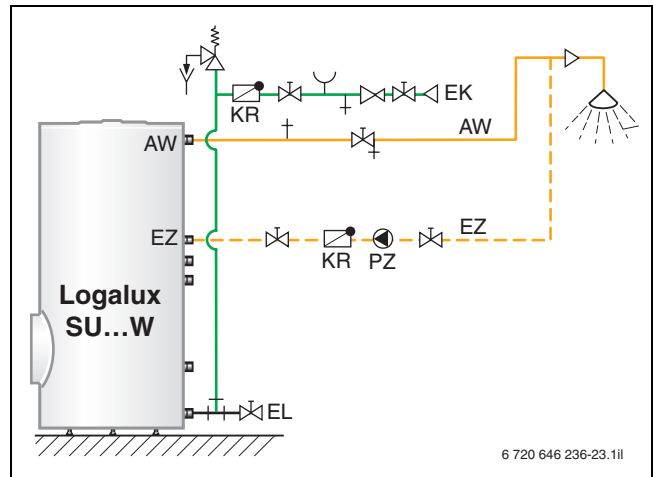


Fig. 58 Version of a DHW circulation line for the Logalux SU...W DHW cylinder

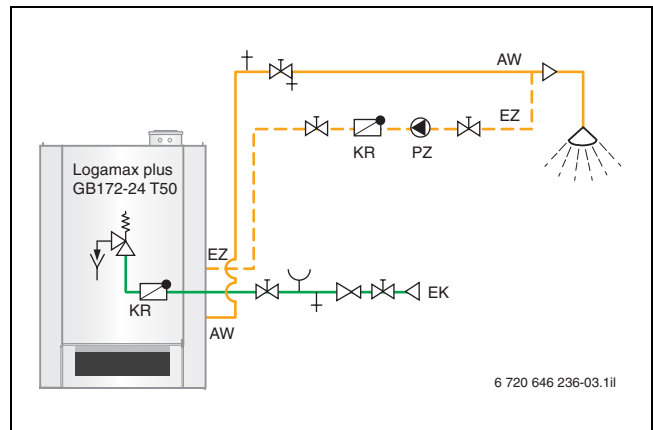


Fig. 59 Version of a DHW circulation line for a DHW cylinder with internal indirect coils inside the Logamax plus GB172-24 T50

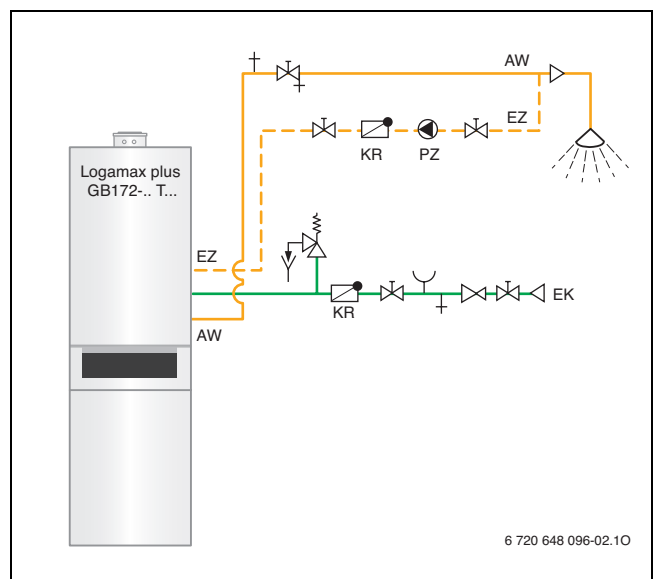


Fig. 60 Version of a DHW circulation line for a DHW cylinder inside the Logamax plus GB172T

6 System examples

6.1 Information regarding all system examples

The system examples in this chapter provide information regarding the standard systems that are feasible with the Logamatic EMS control system. All systems that go beyond this configuration are currently not compatible with Logamax plus GB172/GB172T gas condensing boilers controlled by the Logamatic EMS.

The practical implementation is subject to currently applicable technical rules. Install safety equipment in accordance with local regulations.

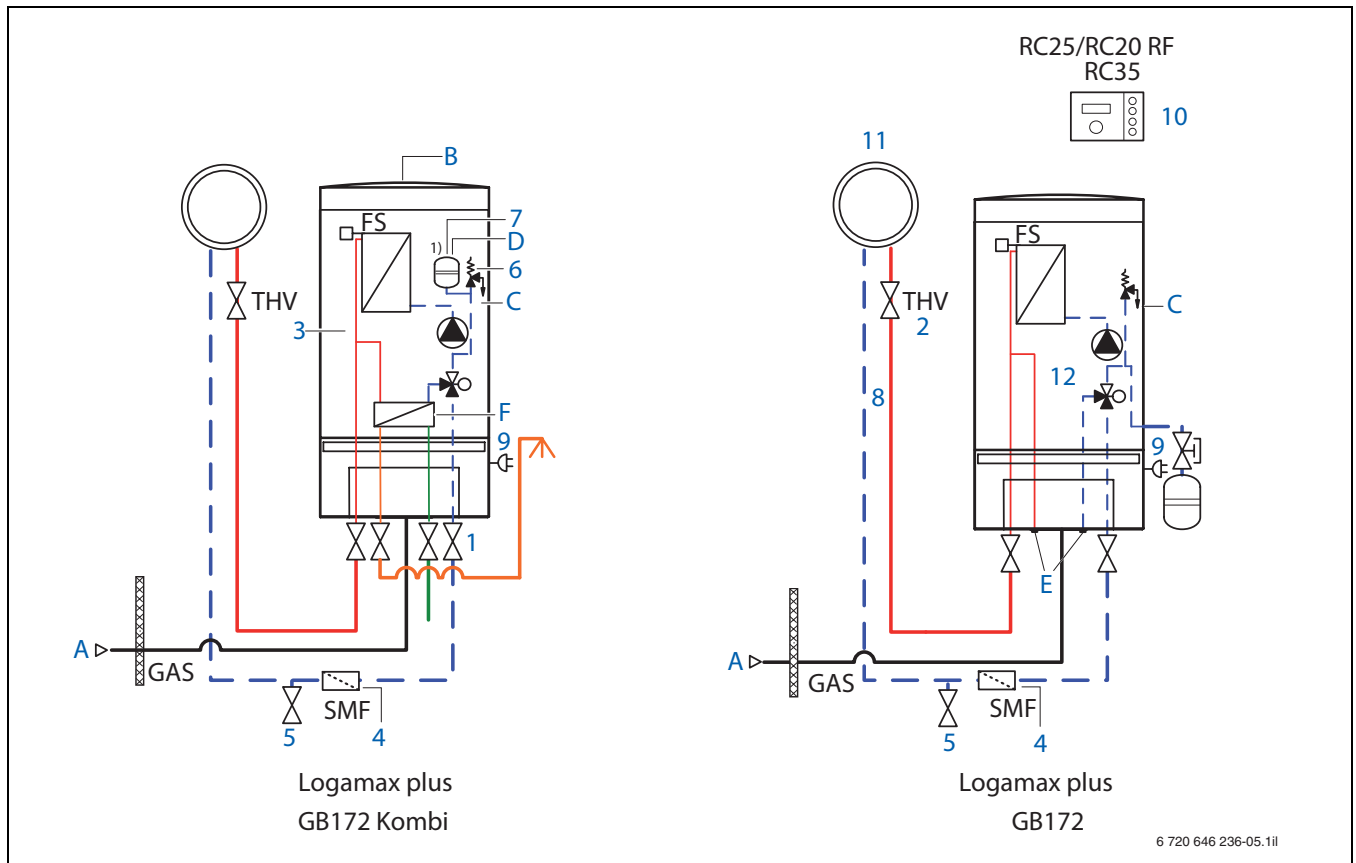


Fig. 61 Hydraulics for the Logamax plus GB172-24 K (combi boiler) and the GB172-14/20/24 (technical information → Table 28, page 64 f.)

FS Safety temperature sensor
GAS Gas connection
SMF Dirt filter
THV Thermostatic valve

1) 12 l expansion vessel (factory-fitted on the GB172-24 K)

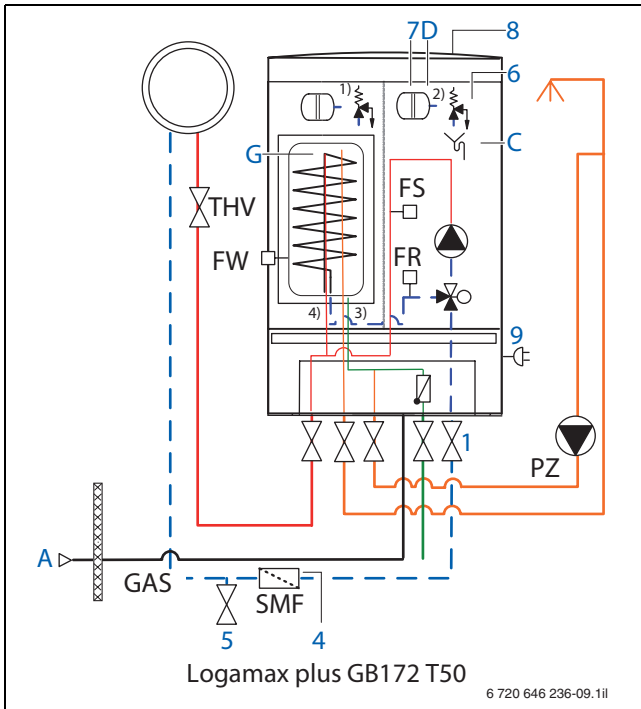


Fig. 62 Hydraulics of the Logamax plus GB172-24 T50
(technical information → Table 28, page 64 f.)

- FR** Cylinder return temperature sensor
- FS** Safety temperature sensor
- FW** DHW temperature sensor
- GAS** Gas connection
- SMF** Dirt filter
- PZ** DHW circulation pump

- 1) DHW expansion vessel (accessory)
- 2) 12 l central heating expansion vessel (factory-fitted on the GB172 T50 K)
- 3) Cold water inlet (not shown)
- 4) Cylinder flow (not shown)

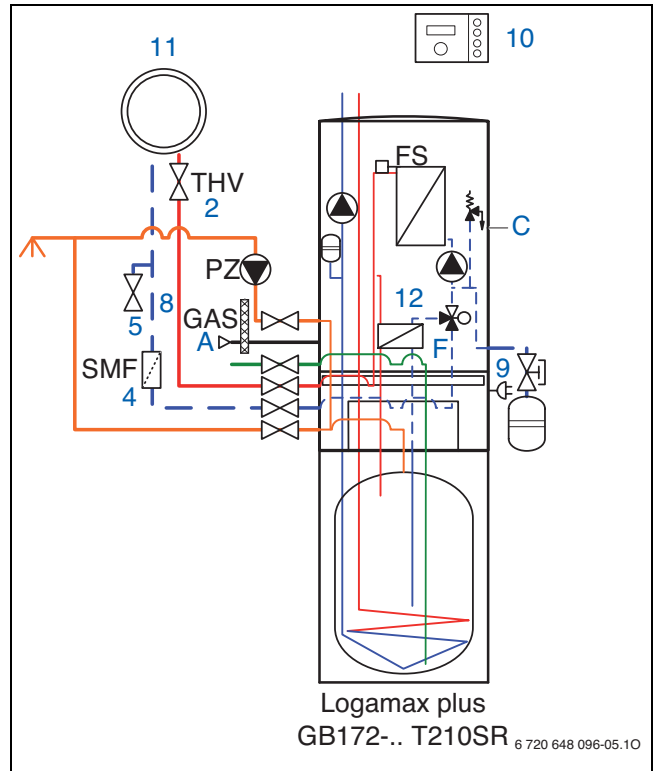


Fig. 63 Hydraulics of the Logamax plus GB172-14/20 T210SR
(technical information → Table 28, page 64 f.)

- FR** Cylinder return temperature sensor
- FS** Safety temperature sensor
- FW** DHW temperature sensor
- GAS** Gas connection
- SMF** Dirt filter
- PZ** DHW circulation pump

- 1) DHW expansion vessel (accessory)
- 2) 12 l central heating expansion vessel (part of the standard delivery of the GB172-14/20 T210SR)
- 3) Cold water inlet (not shown)
- 4) Cylinder flow (not shown)

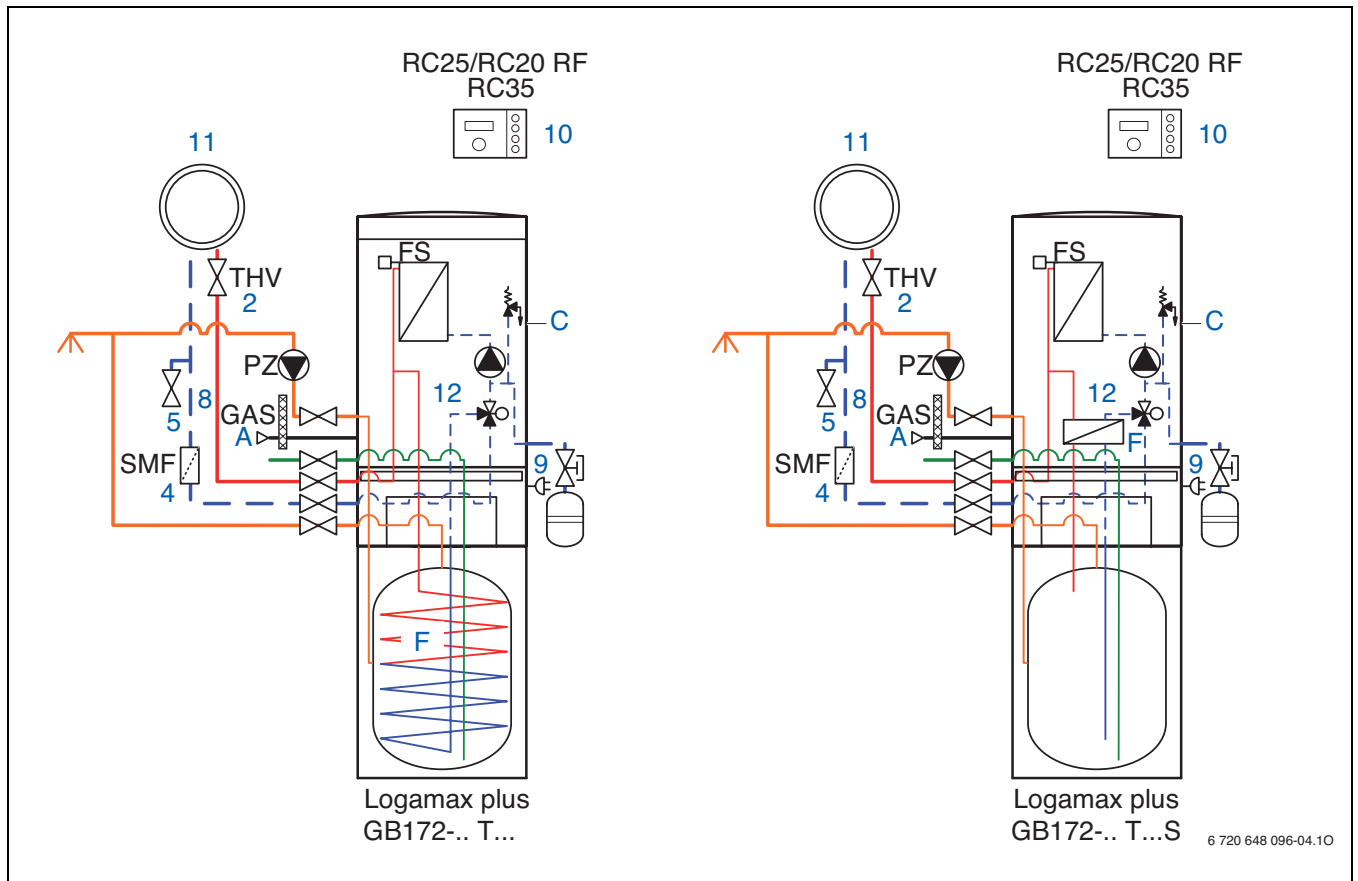


Fig. 64 Hydraulics of the Logamax plus GB172-14 T120, GB172-14/20 T150 and Logamax plus GB172-20 T100S, GB172-14/24 T150S
(technical information → Table 28, page 64 f.)

FR Cylinder return temperature sensor
FS Safety temperature sensor
FW DHW temperature sensor
GAS Gas connection
SMF Dirt filter
PZ DHW circulation pump

- 1) DHW expansion vessel (accessory)
- 2) 18 l central heating expansion vessel (part of the standard delivery)
- 3) Cold water inlet (not shown)
- 4) Cylinder flow (not shown)

Pos.	General design information on hydraulics and control	Further information
A	Observe all building regulations applicable to installation rooms (DVGW-TRGI 2008 [Germany]). Make the gas connection in line with the technical rules applicable to gas installations. Take any DHW booster heating functions of the appliances into account when sizing the gas flow limiter. The gas connection must only be made by authorised gas fitters. In addition, the installation of a gas filter to DIN 3386 in the gas line is also recommended.	Page 42 Page 119 ff.
B	Operation in occupied rooms is possible with an air/flue gas system or, under certain conditions, with the concentric open flue system GA-X.	Page 119 Page 120 f.
C	When draining condensate, observe all relevant local waste water ordinances. Frequently installations follow the ATV-DVWK A251 [Germany].	Page 94
D	Only operate the Logamax plus GB172/GB172T gas condensing boilers in sealed unvented heating systems. Convert open vented systems in accordance with DIN-EN 12828.	Page 42 Page 66
E	Seal the connections at the cylinder flow (VS) and cylinder return (RS) if no separate DHW cylinder is connected to the Logamax plus GB172/GB172T gas condensing boilers.	
F	<p>Extremely hard drinking water (high lime content) can result in increased maintenance requirements on combi boilers. From an overall hardness level of 21 °dH upwards, it is therefore recommended to allow for separate DHW cylinders with internal indirect coils (e.g. model GB172-24 T50) or for a softening system for potable water.</p> <p>The Logamax plus GB172-24 K as well as the GB172-20 T100S and GB172-14/24 T150S appliances feature DHW lines or heat exchangers made from copper. To prevent corrosion damage, only use connection lines and fittings that are compatible with copper. Implement the installation in accordance with DIN 1988 and DIN 4753 (as well as DIN-EN 1717) [or local regulations]. Observe any ordinances concerning potable water.</p> <p>The GB172-24 T50 as well as the GB172-14 T120 and GB172-14/20 T150 appliances include drinking water lines made from stainless steel, whilst the internal drinking water pipework is implemented free from copper. Consequently, water pipework made from zinc-plated/galvanised pipes may also be connected.</p> <p>When connecting the Logamax plus GB172 to plastic cold water or DHW lines, observe the methods of connection with other materials recommended by the manufacturer of the plastic pipes.</p>	
G	48 l cylinder with internal indirect coil (integrated in the GB172-24 T50) with Thermoglaze as corrosion protection plus integral magnesium anode	
1	An extensive range of accessories is available for all Logamax plus GB172/GB172T gas condensing boilers. There are suitable pipe assemblies to connect the Logamax plus GB172 gas condensing boilers with the Logalux S120 W, Logalux SU160 W to SU300 W, Logalux H65 W as well as the Logalux WU120 W and WU160 W DHW cylinders.	Page 96 ff.
2	For room temperature-dependent or weather-compensated control with room temperature hook-up, install a room temperature sensor in the reference room of the residential unit. The room temperature sensor is part of the RC35 and RC25/RC20 RF programming unit. Open thermostatic radiator valves fully in the reference room.	Page 44 Page 47 Page 48
3	A low water indicator is not required when installing the Logamax plus GB172/GB172T gas condensing boilers as attic heating centres. The function of a thermostatically controlled low water indicator is safeguarded with a temperature sensor inside the appliance and is verified through type testing in accordance with DIN-EN 12828.	Page 8 ff.
4	A dirt trap is not required if a new system is thoroughly flushed prior to commissioning (loose particles), as a result of which oxygen corrosion can be prevented. Older systems must always be flushed; the installation of a dirt trap is also highly recommended.	Page 66
5	A drain & fill valve (DFV) is integrated in the Logamax plus GB172/GB172T. It is generally recommended to install a drain facility at the lowest point of the heating system.	Page 96 ff.

Table 28 Information on the sample circuit diagram (→ Fig. 61, page 61) for all systems with Logamax plus GB172GB172T

Pos.	General design information on hydraulics and control	Further information
6	<p>Design the discharge pipes from safety valves in accordance with DIN-EN 12828 so that any escaping heating water can be drained off safely. The required drain outlet with siphon is available as a connection accessory.</p> <p>The discharge pipes from safety valves of separate DHW cylinders must also be connected with the sewer system via a drain outlet with siphon.</p>	<p>Page 37 ff.</p> <p>Page 96 ff.</p>
7	<p>Check the sizing of the expansion vessel in accordance with DIN 4807-2 and DIN-EN 12828. If the expansion vessels sized for standard solutions is insufficient, install an appropriately sized expansion vessel on site.</p>	Page 70
8	<p>The transferable output in conjunction with an underfloor heating system directly downstream is restricted for the Logamax plus GB172/GB172T gas condensing boilers. When transferring greater outputs, allow for a low loss header with flow temperature sensor. Underfloor heating systems with pipes that are permeable to oxygen require system separation. Weather-compensated control is recommended in conjunction with underfloor heating systems due to the inertia during heat-up.</p>	<p>Page 67</p> <p>Page 88</p>
9	<p>The power supply must be 230 V AC, 50 Hz. Install an isolator in the power cable (MCB 10 A, type B with at least 3 mm contact separation). The power supply connection must only be made by an authorised electrician. For electrical installations, observe all relevant local and national regulations (e.g. VDE in Germany) plus those specified by your local power supply utility.</p> <p>The GB172/GB172T is equipped with a 1.5 m long power cable with plug. It can be connected to a standard socket. A permanent electrical connection is also possible after removing the power supply cable from the terminal strip.</p>	<p>Page 49 ff.</p> <p>Page 88 ff.</p>
10	<p>The operation of the Logamatic EMS control system requires – apart from the principle operation via the Logamatic BC25 base controller – an RC25/RC20 RF or RC35 programming unit. The flexibility of the Logamatic EMS control system enables the arrangement of the RC35 programming unit either on the wall in the living space or in the boiler itself. If the RC35 programming unit is clipped into the boiler, an additional RC25/RC20 RF programming unit can be used as a remote control. Only one RC35 programming unit can be used per system. It can be allocated to any heating circuit. As a remote control for another heating circuit (only feasible with the RC35 programming unit in conjunction with the MM10 mixer module), a further RC25/RC20 RF programming unit can be installed in the living space of the second heating circuit. One RC25/RC20 RF programming unit can be used per heating circuit, i.e. not more than two per system.</p>	<p>Page 43</p> <p>Page 45 ff.</p> <p>Page 53</p> <p>Page 88 ff.</p>
11	<p>The RC35 programming unit can control further control components in conjunction with the additional function modules. The Logamatic EMS control system enables the wall mounting of the function modules near the respective pipe assembly. Alternatively, heating circuit quick installation sets with integral EMS modules (EMS Inside) can be used. For more complex hydraulic systems, use the Logamatic 4121 control unit.</p> <p>Primarily, this applies to the following:</p> <ul style="list-style-type: none"> • Systems with more than three heating circuits with mixer • Systems with a primary system 	<p>Page 43</p> <p>Page 48 ff.</p> <p>Page 90 ff.</p>
12	<p>Observe the pump curve for checking the residual head. The Logamax plus GB172/GB172T can be operated without minimum flow rate. An overflow valve is not required.</p>	

Table 28 Information on the sample circuit diagram (→ Fig. 61, page 61) for all systems with Logamax plus GB172/GB172T

6.2 Important hydraulic system components

6.2.1 Heating water

Heating water of poor quality encourages the formation of sludge and corrosion. This can lead to incorrect functions and can damage the heat exchanger. Therefore, heavily contaminated heating systems should be flushed through thoroughly with tap water prior to filling.

To prevent damage through scale build-up, the fill water may require treating, subject to the level of fill water hardness, system volume and the overall system output.

Total boiler output in kW	Sum of alkaline earths/total hardness of the fill and top-up water in °dh	Max. amount of fill and top-up water V_{max} in m ³
$\dot{Q} < 50$	Requirements according to Fig. 65	Requirements according to Fig. 65

Table 29 Table for aluminium heat exchangers

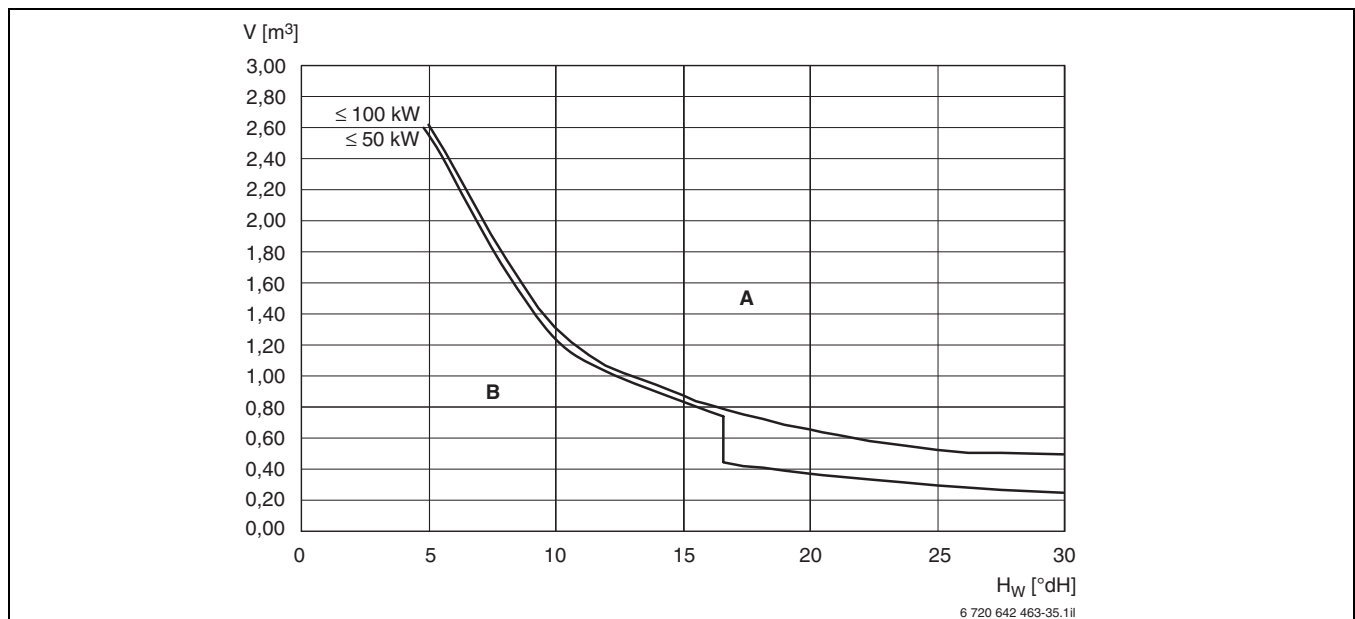


Fig. 65 Water treatment limits for single boiler systems ≤ 50 kW and ≤ 100 kW

- A** Above the curves, use fully desalinated fill water with a conductivity of $\leq 10 \mu\text{S/cm}$
- B** Below the curves, fill with untreated tap water that meets the requirements of the Drinking Water Ordinance [Germany]
- H_W** Water hardness
- V** Water volume over the service life of the boiler

The current guideline VDI 2035⁴⁴ "Prevention of damage in hot water heating systems" (as of 12/2005) aims to simplify the application and accommodate the trend towards more compact appliances with higher heat transfer rates. The diagram in Fig. 65 enables the permissible amount of fill and top-up water to be checked that can be filled during the service life of the boiler without special treatment, subject to the hardness (°dH) and the respective boiler output. Suitable water treatment steps are required if the water volume lies above the respective limit curve in the diagram.

Suitable measures are as follows:

- Use of desalinated fill water with a conductivity of $\leq 10 \mu\text{S/cm}$. No requirements are made of the pH value of the fill water. After filling the system, a low-salt operation results with a conductivity of generally 50 - 100 $\mu\text{S/cm}$.
- System separation by means of a heat exchanger; only fill the boiler circuit with untreated water (no chemicals, no softening).

To prevent the ingress of oxygen into the heating water, size the expansion vessel correctly (→ page 70).

When installing pipes that are permeable to oxygen, e.g. in underfloor heating systems, provide system separation by means of a heat exchanger (→ Fig. 67, page 68).

When modernising existing systems, protect the gas condensing boiler against sludge build-up from the existing heating system. For this purpose, the installation of a dirt trap into the common return line is strongly recommended. A dirt trap is not required if a new system is thoroughly flushed prior to filling, and loose particles as a result of oxygen corrosion can be prevented.

6.2.2 Hydraulics for maximum utilisation of the condensing effect

The Logamax plus GB172/GB172T gas condensing boilers require no minimum flow rate.

6.2.3 Underfloor heating system

Underfloor heating systems are the ideal combination for Logamax plus GB172/GB172T gas condensing boilers on account of their low design temperatures. We recommend the weather-compensated operation combined with a separate room temperature-dependent control because of the heat-up inertia. The Logamatic EMS control system with RC35 programming unit is suitable for this.

A temperature limiter (TWH) is required to protect the underfloor heating system. Connect this at the terminal strip for electrical connections, i.e. the terminal for the external switching contact, using a floating contact. The contact thermostat AT 90, part no. 80 155 200, can be used as a temperature limiter, for example.

Screed drying with underfloor heating systems can also be achieved without mixer module; this requires the RC35 programming unit.

1. Underfloor heating system directly downstream

An underfloor heating system directly downstream is only feasible with pipes that are impermeable to oxygen in accordance with DIN 4726. This is to prevent damage to the heat exchanger as a result of oxygen corrosion. The maximum transferable output of the Logamax plus GB172/GB172T with underfloor heating system directly downstream is limited (→ Table 30 and page 88).

Logamax plus	Maximum transferable output at 10 K temperature differential and 200 mbar residual head in kW
GB172 all models	10.0

Table 30 Maximum transferable output of the Logamax plus GB172/GB172T with underfloor heating system directly downstream

2. Underfloor heating system not directly downstream

Where a higher output is to be transferred, an underfloor heating system not directly downstream is required. This circuit requires a low loss header with flow temperature sensor and a secondary pump for the heating circuit (→ Fig. 66).

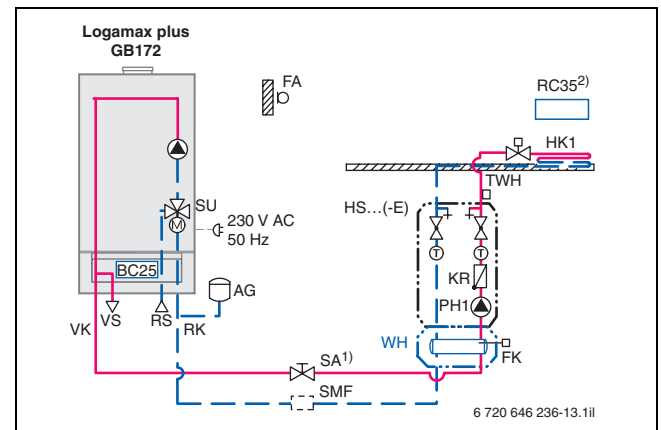


Fig. 66 Example of an underfloor heating system not directly downstream

- AG** Expansion vessel
- BC25** Base controller
- FA** Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
- FK** Flow temperature sensor
- HK** Heating circuit
- HS** Heating circuit quick installation set
- KR** Check valve
- RC35** Programming unit
- PH** Heating circuit pump (secondary pump)
- RK** Boiler return
- RS** Cylinder return
- SA** Line control and shut-off valve
- SMF** Dirt filter
- SU** Three-way diverter valve
- TWH** Temperature limiter - underfloor heating circuit
- VK** Boiler flow
- VS** Cylinder flow
- WH** Low loss header

- 1) Safety shut-off valve recommended
- 2) Additional RC25/RC20 RF programming unit feasible as remote control, if the RC35 programming unit has been clipped **into the boiler**

3. Underfloor heating system with system separation

Provide system separation for underfloor heating systems with pipes that are permeable to oxygen. The underfloor heating circuit must be protected separately, downstream of the heat exchanger, by means of an expansion vessel, safety valve and temperature limiter (→ Fig. 67). Size the heat exchanger in accordance with the selected system temperatures. The pressure drop on the primary side (boiler circuit) must be lower than the residual head of the pump integrated into the Logamax plus GB172/GB172T.

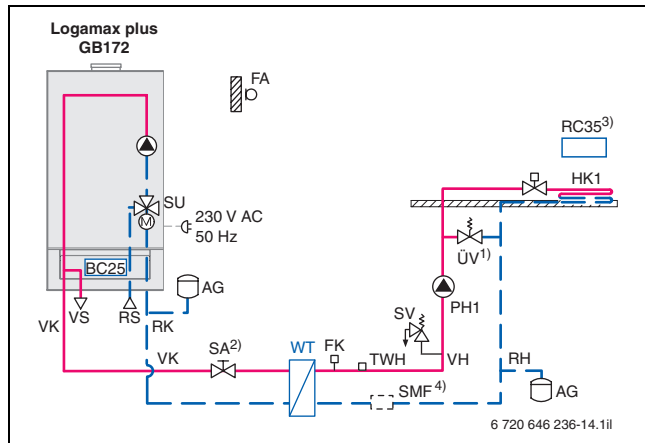


Fig. 67 Example of an underfloor heating system with system separation via a heat exchanger with pipes that are permeable to oxygen

- AG** Expansion vessel
- BC25** Base controller
- FA** Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
- FK** Flow temperature sensor
- HK** Heating circuit
- PH** Heating circuit pump (secondary pump)
- RC35** Programming unit
- RH** Heating circuit return
- RK** Boiler return
- RS** Cylinder return
- SA** Line control and shut-off valve
- SMF** Dirt filter
- SU** Three-way diverter valve
- TWH** Temperature limiter - underfloor heating circuit
- ÜV** Overflow valve
- VK** Boiler flow
- VH** Heating system flow
- VS** Cylinder flow
- WT** Heat exchanger for system separation

- 1) Overflow valve not required for variable speed pumps (→ Fig. 67)
- 2) Safety shut-off valve recommended
- 3) Additional RC25/RC20 RF programming unit may be used as a remote.
- 4) SMF recommended

6.2.4 Heating circuit pump

Heating circuit pump

If, in the case of a low temperature spread (e.g. 40/30 °C underfloor heating system), the residual head of the integral pump is insufficient to overcome the system pressure drop downstream, install a second pump externally. For this, use a low loss header to provide hydraulic separation.

An adequately sized heating circuit pump is integrated into the Logamax plus GB172/ GB172T. Fig. 68 to Fig. 70 show the available residual head for all boiler sizes. The 3-way diverter valve that is integrated in the boiler was taken into account. Constant pressure of 200 bar is the pump default setting.

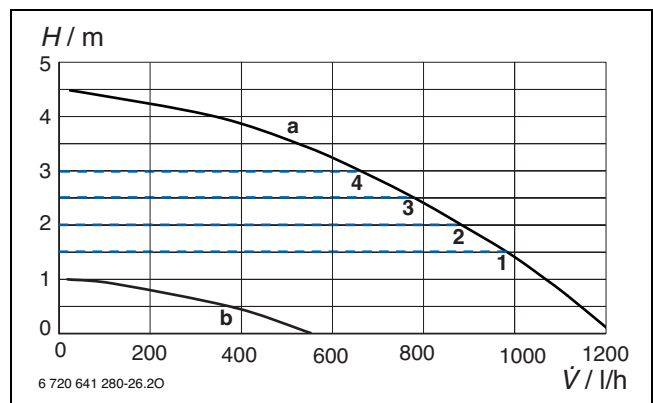


Fig. 68 Residual head of the Logamax plus GB172-14/20/24/24 K heating circuit pump

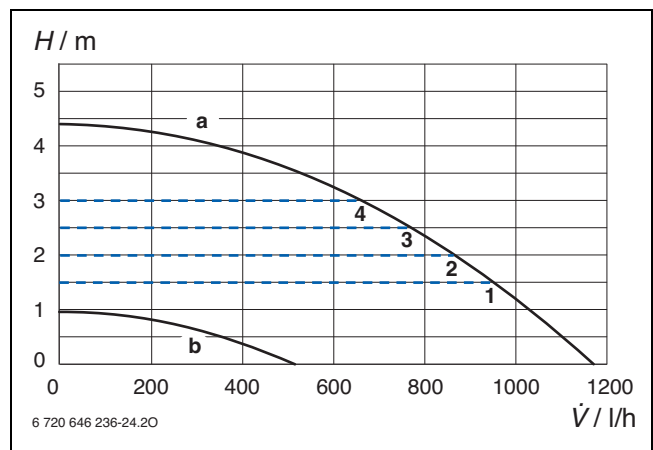


Fig. 69 Residual head of the heating circuit pump Logamax plus GB172-24 T50

- a** Pump curve at maximum pump rate (100 %)
- b** Pump curve at minimum pump rate (10 %)
- H** Residual head
- V-dot** Flow rate
- 1** Pump parameter: constant pressure 150 mbar
- 2** Pump parameter: constant pressure 200 mbar (standard setting)
- 3** Pump parameter: constant pressure 250 mbar
- 4** Pump parameter: constant pressure 300 mbar

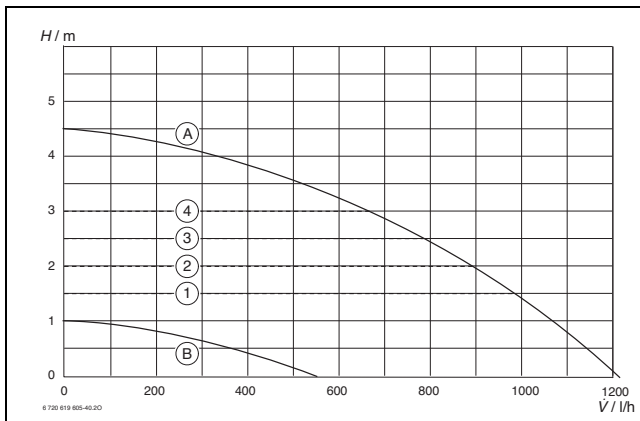


Fig. 70 Residual head of the heating circuit pump
Logamax plus GB172T

Key to Fig. 70:

- 1** Pump parameter field constant pressure 150 mbar
- 2** Pump parameter field constant pressure 200 bar (default setting)
- 3** Pump parameter field constant pressure 250 mbar
- 4** Pump parameter field constant pressure 300 mbar
- A** Pump curve at maximum pump rate
- B** Pump curve at minimum pump rate
- H** Residual head
- V** Flow rate

Anti-seizing control

Independently of the operation of the internal pump in the Logamax plus GB172/GB172T gas condensing boilers, the BC25 base controller starts a pump test run if the heating circuit control unit has not required any heat for 24 h. This prevents the pump from seizing up.

6.2.5 Expansion vessel

DIN-EN 12828 specifies that water-based heating systems must be equipped with an expansion vessel (AG) [EV].

An expansion vessel is either already integrated into the GB172/GB172T condensing boilers or is available as an accessory.

Expansion vessel	EV integrated	EV may be integrated as an option (accessory; part no. 7 736 995 013)	Additional EV may be integrated as an option (accessory; part no. 7 738 110 266)
GB172-14/20/24	–	12 l	–
GB172-24 K, GB172-24 T50	12 l	–	–
GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S	18 l	–	12 l
GB172-14/20 T210SR	12 l	–	–

Table 31 Specification of the expansion vessel

The expansion vessels have a pre-charge pressure of 0.75 bar and a response pressure of 3 bar.

Rough verification of an integral expansion vessel or selection of a separate expansion vessel

1. EV pre-charge pressure

$$p_0 = p_{st}$$

Form. 1 EV pre-charge pressure (at least 0.5 bar)

- p₀** EV pre-charge pressure in bar
- p_{st}** Static pressure of the heating system in bar (subject to building height)

2. Fill pressure

$$p_a = p_0 + 0,5 \text{ bar}$$

Form. 2 Fill pressure (at least 1.0 bar)

- p_a** Fill pressure in bar
- p₀** EV pre-charge pressure in bar

3. System volume

Subject to various heating system parameters, the system volume can be checked in Fig. 71.

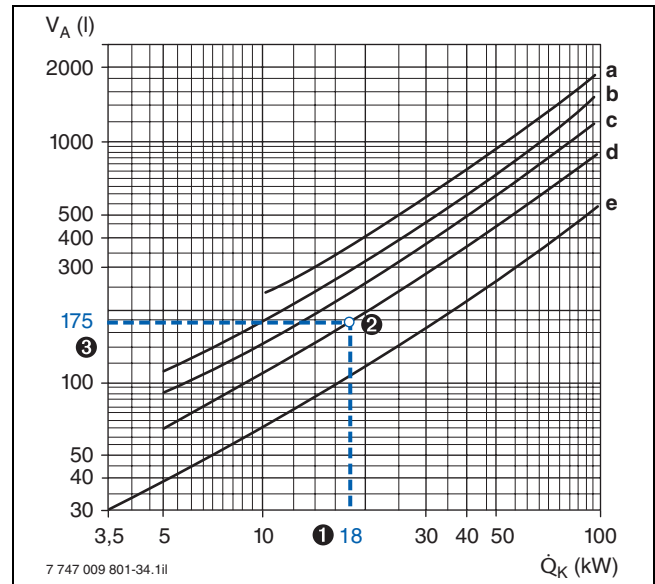


Fig. 71 Guidelines for average water content of heating systems (acc. to ZVH guideline 12.02)

- Q_K** Rated system output
- V_A** Average total system water content
- a** Underfloor heating system
- b** Steel radiators to DIN 4703
- c** Cast radiators to DIN 4703
- d** Panel radiators
- e** Convector heaters

Example 1

Given

- ① System output $\dot{Q}_K = 18 \text{ kW}$
- ② Panel radiators

Check

- ③ Total system water content = 175 l (→ Fig. 71, curve d)

4. Maximum permissible system volume

Subject to the maximum flow temperature ϑ_V to be established and the EV pre-charge pressure p_0 determined in accordance with formula 1 the maximum system volume for different EVs can be checked in table 32.

The maximum system volume identified by point 3 on the graph in Fig. 71 must be less than the maximum permissible system volume. If that is not the case, select a larger expansion vessel.

Example 2

Given

- ❶ Flow temperature $\vartheta_V = 50\text{ °C}$
- ❷ EV pre-charge pressure $p_0 = 1.00\text{ bar}$
- ❸ System volume $V_A = 175\text{ l}$

Check

- ❹ An EV with 12 litre capacity is required as the system volume determined in accordance with fig. 71 is less than the maximum permissible system volume.

Flow temperature ϑ_V in °C	Pre-charge pressure p_0 in bar	Expansion vessel					
		12 l	18 l	25 l	35 l	50 l	80 l
		Maximum permissible system volume V_A in litres					
90	0.75	101	216	300	420	600	960
	1.00	77	190	265	370	525	850
	1.25	53	159	220	309	441	705
	1.50	29	127	176	247	352	563
80	0.75	126	260	361	506	722	1155
	1.00	96	230	319	446	638	1020
	1.25	66	191	266	372	532	851
	1.50	36	153	213	298	426	681
70	0.75	161	319	443	620	886	1417
	1.00	122	282	391	547	782	1251
	1.25	84	235	326	456	652	1043
	1.50	46	188	261	365	522	835
60	0.75	216	403	560	783	1120	1792
	1.00	164	355	494	691	988	1580
	1.25	113	296	411	576	822	1315
	1.50	62	237	329	461	658	1052
❶ 50	0.75	308	524	727	1018	1454	2326
	❷ 1.00	❸ 234	462	642	898	1284	2054
	1.25	161	385	535	749	1070	1712
	1.50	88	308	428	599	856	1369
40	0.75	480	699	971	1360	1942	3107
	1.00	366	617	857	1200	1714	2742
	1.25	251	514	714	1000	1428	2284
	1.50	137	411	571	800	1142	1827

Table 32 Maximum permissible system volume subject to the flow temperature and the required pre-charge pressure of the EV

6.3 Boiler hydraulics for appliances with integral DHW heating

6.3.1 System example for the Logamax plus GB172-24 K with integral DHW heating according to the instantaneous water heater principle with RC25/RC20 RF or RC35 programming unit for one heating circuit

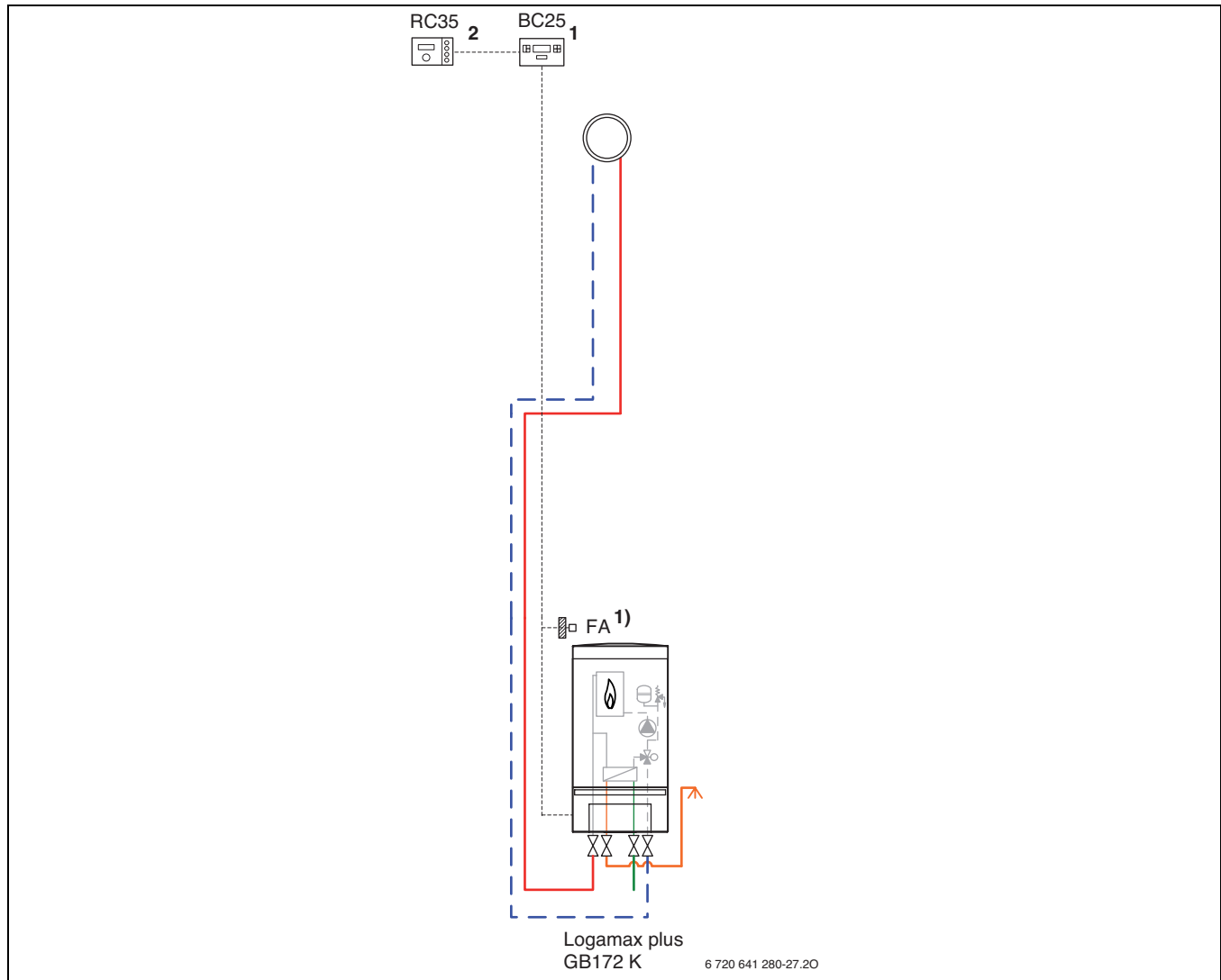


Fig. 72 Circuit diagram for the system example

FA Outside temperature sensor

1 Position on the heat source

2 Position on the heat source or on the wall

3 Position on the wall

1) If the system is regulated via the RC35 or RC25 programming unit in weather-compensated mode



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.



For a download of this hydraulic system scheme (number 3-1-1-2-1) see the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank

Brief description

- Logamax plus GB172-24 K gas condensing boiler with modulating operation and integral DHW heating
- Room temperature-dependent control as standard application in conjunction with the RC25/RC20 RF or RC35 programming unit. The FA outside temperature sensor for the RC35 and RC25 programming units also enables weather-compensated control.

Operational description

The modulating operation of the Logamax plus GB172-24 K is regulated by the Logamatic BC25 base controller. The BC25 also regulates the direct DHW heating via a plate heat exchanger. DHW mode timings can be regulated in conjunction with the RC35 programming unit.

Special design information

- This system layout is also suitable for underfloor heating systems (→ chapter 6.2.3, page 67).
- For the DHW connection on Logamax plus GB172-24 K combi boilers, use only pipework that is compatible with copper. Make all connections on the cold water and DHW sides in accordance with DIN 1988 and DIN 4753.
- A 12 l expansion vessel is already factory-fitted into the Logamax plus GB172-24 K. Check its size is adequate.
- Where required, adjust the setting of the differential pressure-dependent pump inside the Logamax plus GB172 subject to the relevant system (→ chapter 6.2.4, page 68).
- The default setting for pump modulation $\Delta p = \text{constant}$ is 200 mbar.

6.3.2 System example for the Logamax plus GB172-24 T50 with integral DHW heating with RC25/RC20 RF or RC35 programming unit for one heating circuit

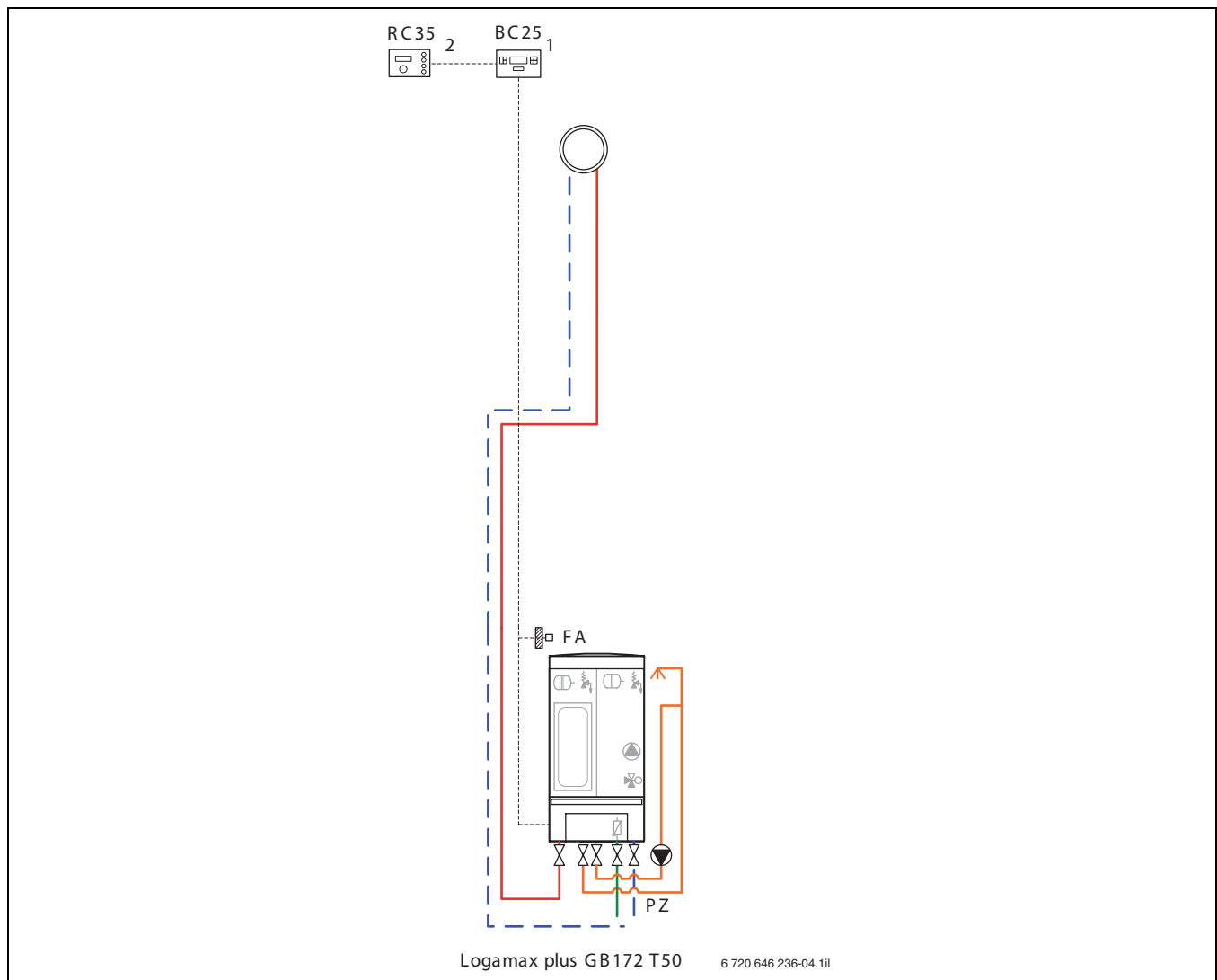


Fig. 73 Circuit diagram for the system example

- FA** Outside temperature sensor
1 Position on the heat source
2 Position on the heat source or on the wall
- 1) If the system is regulated via the RC35 or RC25 programming unit in weather-compensated mode



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.



You can download this system hydraulic scheme (number 3-1-1-2-16) from the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank

Brief description

- Logamax plus GB172-24 T50 gas condensing boiler with modulating operation and integral DHW heating by means of an integrated 48 l DHW cylinder
- Room temperature-dependent control as standard application in conjunction with the RC25/RC20 RF or RC35 programming unit. The FA outside temperature sensor for the RC35 and RC25 programming units also enables weather-compensated control.

Operational description

The modulating operation of the Logamax plus GB172-24 T50 is regulated by the Logamatic BC25 base controller. The BC25 also regulates DHW heating via the internal indirect coil. DHW mode and DHW circulation mode (option) can have timings set in conjunction with the RC35 programming unit.

Special design information

- This system layout is also suitable for underfloor heating systems (→ chapter 6.2.3, page 67).
- The DHW pipework of the GB172-24 T50 is made from stainless steel without use of copper. Consequently, this appliance is also suitable for zinc-plated/galvanised pipework. Make all connections on the cold water and DHW sides in accordance with DIN 1988 and DIN 4753.
- A 12 l expansion vessel is already factory-fitted into the Logamax plus GB172-24 T50. Check its size is adequate.
- An expansion vessel that can be integrated (DHW) (2 l; 3.5 bar) is available as an accessory.
- Where required, adjust the setting of the differential pressure-dependent pump inside the Logamax plus GB172-24 T50 subject to the relevant system (→ chapter 6.2.4, page 68).
- The default setting for pump modulation $\Delta p = \text{constant}$ is 200 mbar.
- Requires accessory "DHW circulation line connection". Linking the cold water distributor inside the GB172-24 T50 with the on-site DHW circulation line.

6.3.3 System example for the Logamax plus GB172-20 T100S or GB172-14/24 T150S with integral DHW heating by means of a stratification cylinder with RC25/RC20 or RC35 programming unit for one heating circuit

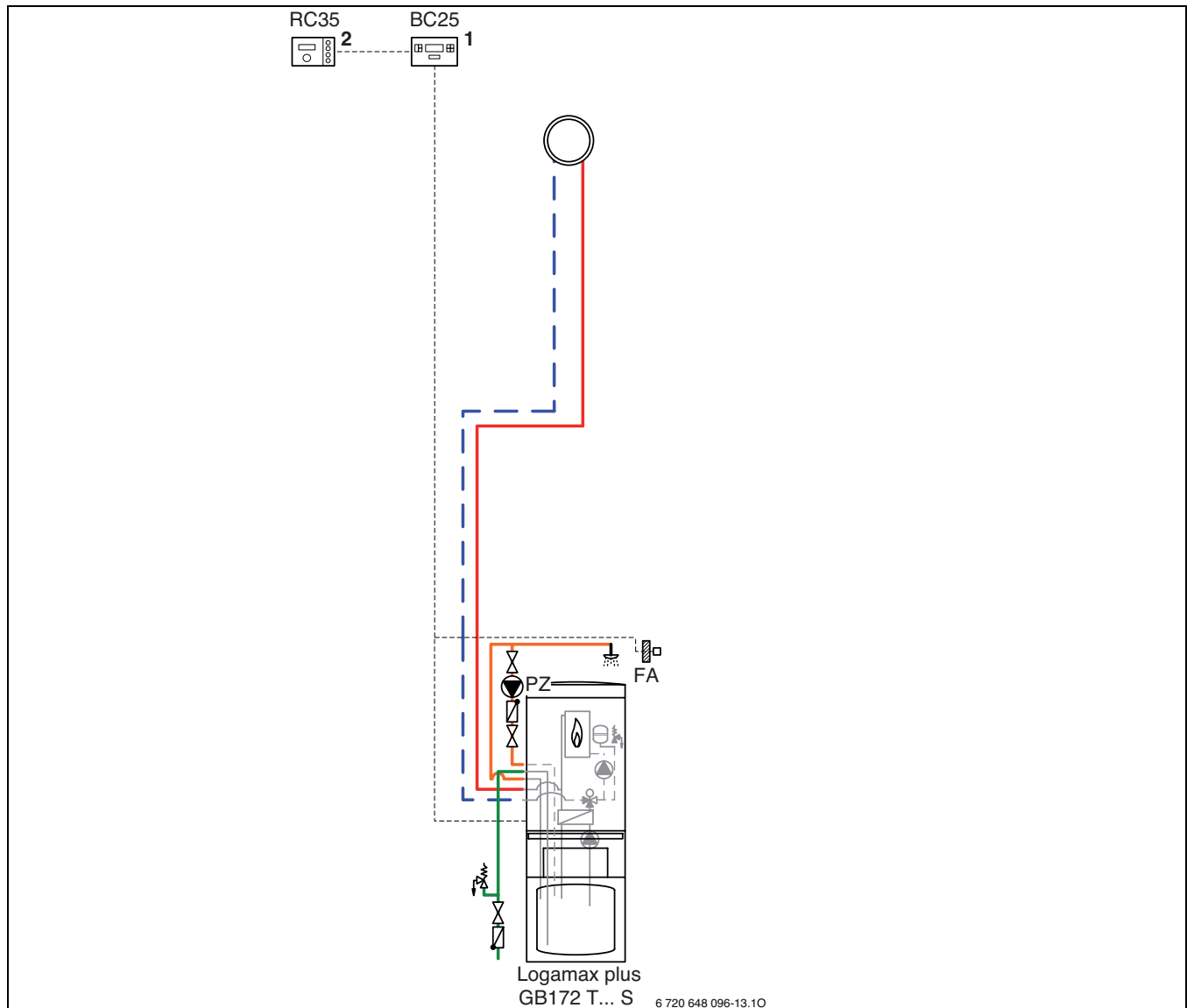


Fig. 74 Circuit diagram for the system example

- FA** Outside temperature sensor
- PZ** DHW circulation pump
- 1** Position on the heat source
- 2** Position on the heat source or on the wall

1) If the system is regulated via the RC35 or RC25 programming unit in weather-compensated mode

i This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.



You can download this system hydraulic scheme (number 2-2-2-13) from the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank

Brief description

- Logamax plus GB172-20 T100S or GB172-14/24 T150S gas condensing boiler with modulating operation and integral DHW heating by means of an integrated stratification cylinder with a capacity of 101 l or 148 l.
- Room temperature-dependent control as standard application in conjunction with the RC25/RC20 RF or RC35 programming unit. The FA outside temperature sensor for the RC35 and RC25 programming units also enables weather-compensated control.

Operational description

The modulating operation of the Logamax plus GB172-20 T100S and GB172-14/24 T150S is regulated by the Logamatic BC25 base controller. The BC25 also regulates DHW heating via the internal stratification cylinder. DHW mode and DHW circulation mode (option) can have timings set in conjunction with the RC35 programming unit.

Special design information

- From an overall hardness level of 21 °dH upwards, a dislodging of scale inside the plate heat exchanger must be expected. For this case we recommend the use of either the GB172-14 T120 or the GB172-14/20 T150 with cylinder with internal indirect coil or alternatively the use of a water treatment facility.
- This system layout is also suitable for underfloor heating systems (→ chapter 6.2.3, page 67).
- Make all connections on the cold water and DHW side in accordance with DIN 1988 and DIN 4753.
- An 18 l expansion vessel is already factory-fitted into the Logamax plus GB172-20 T100S and GB172-14/24 T150S. Check its size is adequate.
- An expansion vessel that can be integrated (DHW) (8 l; 3.5 bar) is available as an accessory.
- Adjust the setting of the differential pressure regulated pump in the Logamax plus GB172-20 T100S and GB172-14/24 T150S in accordance with the specific system, if required (→ chapter 6.2.4, page 68).
- The default setting for pump modulation $\Delta p = \text{constant}$ is 200 mbar.

6.3.4 System example for the Logamax plus GB172-14 T120 and GB172-14/20 T150 with integral DHW heating via internal indirect coil with RC25/RC20 RF or RC35 programming unit for one heating circuit

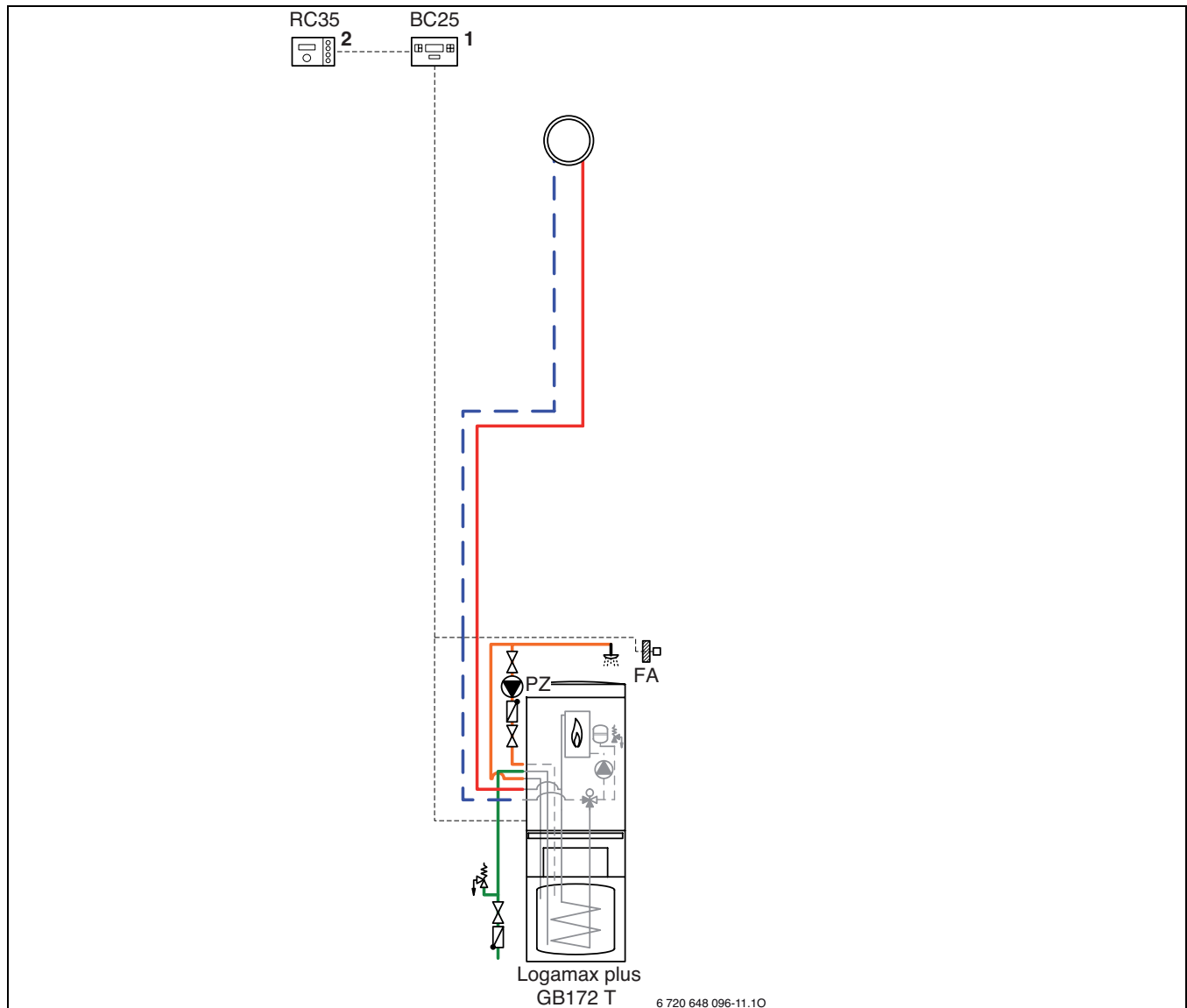


Fig. 75 Circuit diagram for the system example

- FA** Outside temperature sensor
- PZ** DHW circulation pump
- 1** Position on the heat source
- 2** Position on the heat source or on the wall

1) If the system is regulated via the RC35 or RC25 programming unit in weather-compensated mode



You can download this system hydraulic scheme (number 2-2-2-12) from the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.

Brief description

- Logamax plus GB172-14 T120 or GB172-14/20 T150 gas condensing boiler with modulating operation and integral DHW heating by means of a cylinder with internal indirect coil with a capacity of 115 l or 143 l.
- Room temperature-dependent control as standard application in conjunction with the RC25/RC20 RF or RC35 programming unit. The FA outside temperature sensor for the RC35 and RC25 programming units also enables weather-compensated control.

Operational description

The modulating operation of the Logamax plus GB172-14 T120 and GB172-14/20 T150 is regulated by the Logamatic BC25 base controller. The BC25 also regulates DHW heating via the internal indirect coil. DHW mode and DHW circulation mode (option) can have timings set in conjunction with the RC35 programming unit.

Special design information

- This system layout is also suitable for underfloor heating systems (→ chapter 6.2.3, page 67).
- The DHW pipework of the GB172-14 T120 and GB172-14/20 T150 is made from stainless steel without use of copper. Consequently, this appliance is also suitable for zinc-plated/galvanised pipework. Make all connections on the cold water and DHW sides in accordance with DIN 1988 and DIN 4753.
- An 18 l expansion vessel is already factory-fitted into the Logamax plus GB172-14 T120 and GB172-14/20 T150. Check its size is adequate.
- An expansion vessel that can be integrated (DHW) (8 l; 3.5 bar) is available as an accessory.
- Adjust the setting of the differential pressure regulated pump in the Logamax plus GB172-14 T120 and GB172-14/20 T150 in accordance with the specific system, if required (→ chapter 6.2.4, page 68).
- The default setting for pump modulation $\Delta p = \text{constant}$ is 200 mbar.

6.3.5 System example for the Logamax plus GB172-14/20 T210SR with a heating circuit without mixer directly downstream plus solar DHW heating

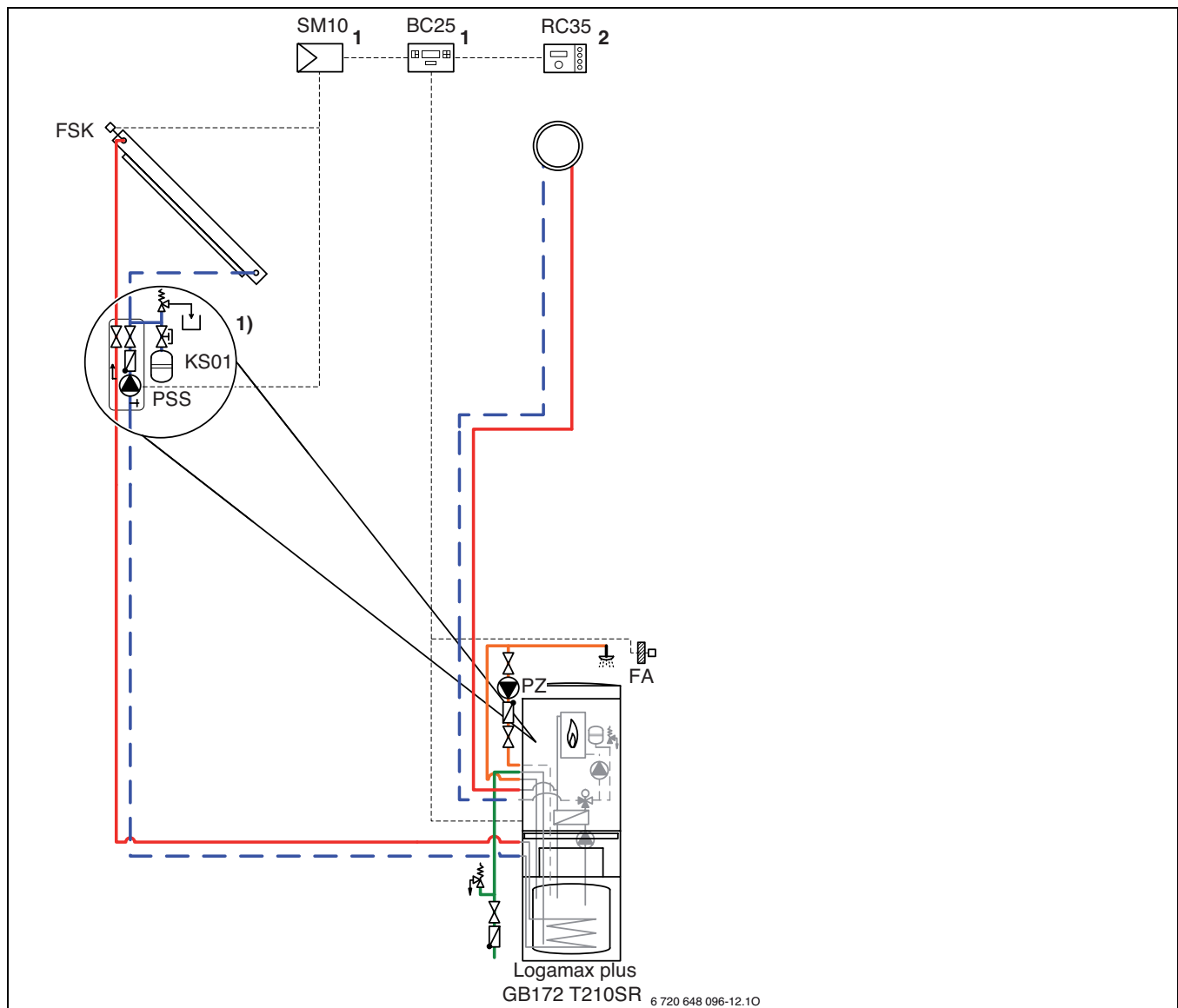


Fig. 76 Circuit diagram for the system example

- FA** Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
- FSK** Collector temperature sensor
- S01** Logasol solar pump station
- PSS** Solar circuit pump
- PZ** DHW circulation pump
- 1** Position on the heat source
- 2** Position on the heat source or on the wall

- 1)** The components of the KS01 complete station are already integrated into the GB172-14/20 T210SR compact heating centre.



For a download of this hydraulic system scheme (number 2-2-3-6) see the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.

Brief description

- The dual mode solar stratification cylinder is primarily supplied with heat by the solar thermal system. Where there is insufficient solar heat, the cylinder will be reheated by the condensing boiler via the plate-type heat exchanger mounted at the top.
- Only preheated water from the dual mode solar stratification cylinder is drawn and reheated. This safeguards the primary use of solar energy at all times. DHW heating by gas is restricted to the reheat function.
- Minimal installation effort through completely pre-assembled heating and solar unit that only needs to be connected up on site.

Special design information

- Use in detached houses on account of the dual mode solar stratification cylinder with 204 l capacity that enables the combination with two or three collectors.
- The compact heating centre already features an integral SM10 solar module.
- Solar pump station integrated into the compact heating centre, comprising solar circuit pump, expansion vessel, air vent valve, drain & fill valve, safety assembly and flow limiter.
- Solar pump station can be converted for l.h./r.h. use for optimum accessibility.
- Ideal installation of the solar connections through direct connection with locking ring fittings.
- The DHW mixer set accessory includes the DHW mixer as well as the components for DHW circulation (DHW circulation pump on site). Set the DHW mixer to 60 °C.

6.4 Boiler hydraulics for appliances with separate DHW heating

6.4.1 System example for the Logamax plus GB172 with RC25/RC20 RF or RC35 programming unit for one heating circuit

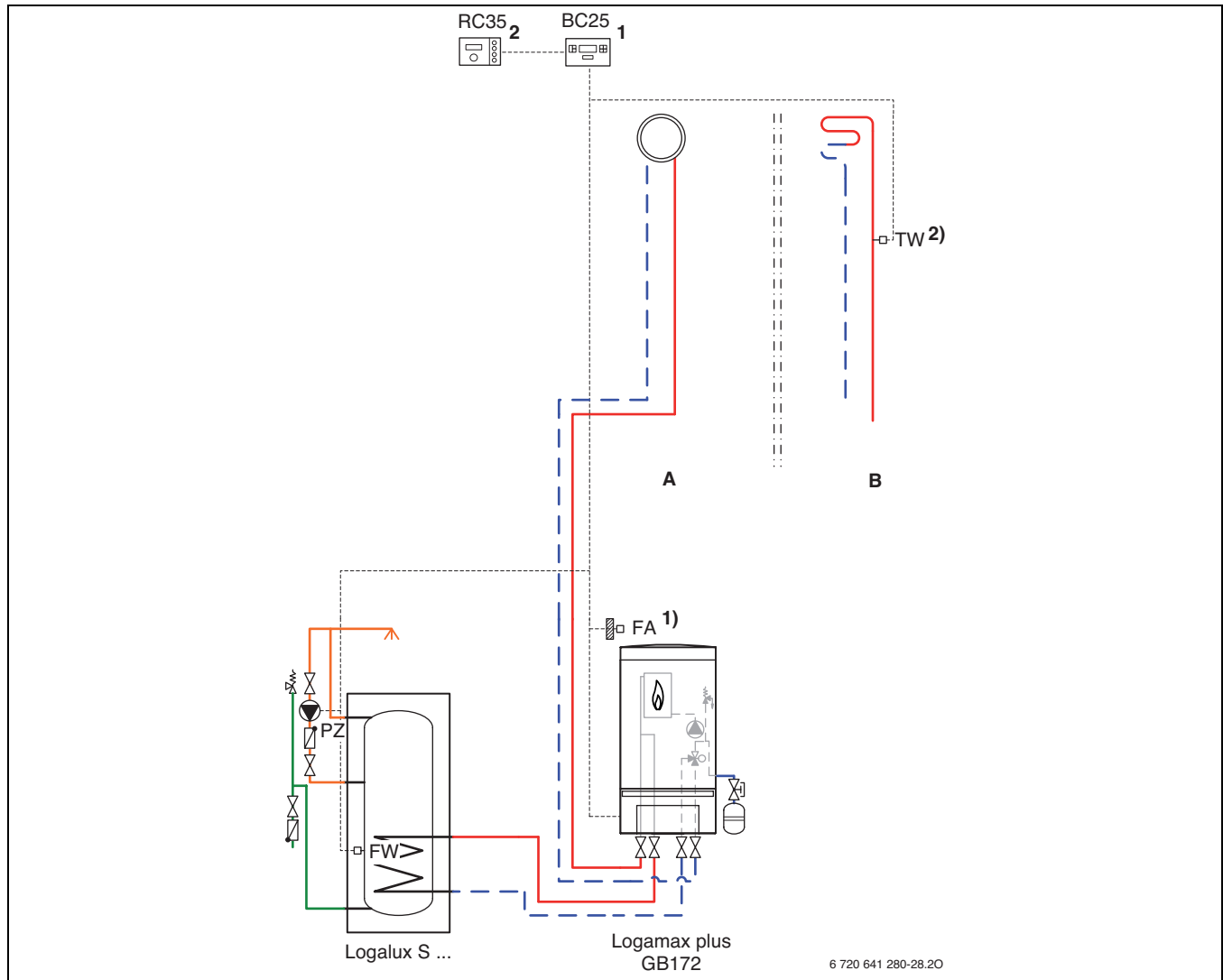


Fig. 77 Circuit diagram for the system example

- A** Heating circuit for radiators without mixer
- B** Underfloor heating system directly downstream (transferable output (→ Table 30, page 67): with this hydraulic circuit, system pressure drop and residual head of the integral pump must be taken into account.
- FA** Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control, available as an accessory for RC25)
- FW** DHW temperature sensor
- PZ** DHW circulation pump
- TW** Temperature limiter
- 1** Position on the heat source
- 2** Position on the heat source or on the wall
- 3** Position on the wall

- 1) If the system is regulated by the RC35 or RC25 in weather-compensated mode
- 2) Connection of the temperature limiter in the Logamax plus GB172



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.



For a download of this hydraulic system scheme (number 3-1-1-2-2) see the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank

Brief description

- Logamax plus GB172 gas condensing boiler with modulating operation and separate DHW heating.
- Room temperature-dependent control as standard application in conjunction with the RC25/RC20 RF or RC35 programming unit. The FA outside temperature sensor for the RC35 and RC25 programming units also enables weather-compensated control.
- The modulating operation of the Logamax plus is regulated by the BC25 base controller. This also regulates the DHW priority for the separate DHW cylinder via the integral 3-way diverter valve. A time profile can be selected in connection with the RC35 programming unit for heating operation in constant standby mode for DHW heating (24 hour mode). Alternatively, DHW heating can be linked to the times selected for heating operation. It is then only possible during the periods selected for heating or standby mode.

Special design information

- If no separate DHW cylinder is connected, seal the connections at the cylinder flow and return using the DHW caps 1/2 " (accessories).
- Generally, DHW heating takes priority (via the 3-way diverter valve either cylinder heating or heating mode).
- Order an expansion vessel of adequate size as an accessory.
- Where required, adjust the setting of the differential pressure-dependent pump inside the Logamax plus GB172 subject to the relevant system (→ chapter 6.2.4, page 68).
- The default setting for pump modulation $\Delta p = \text{constant}$ is 200 mbar.

6.4.2 System example for Logamax plus GB172 with RC35 programming unit for one heating circuit without mixer and one with mixer with the same time channel

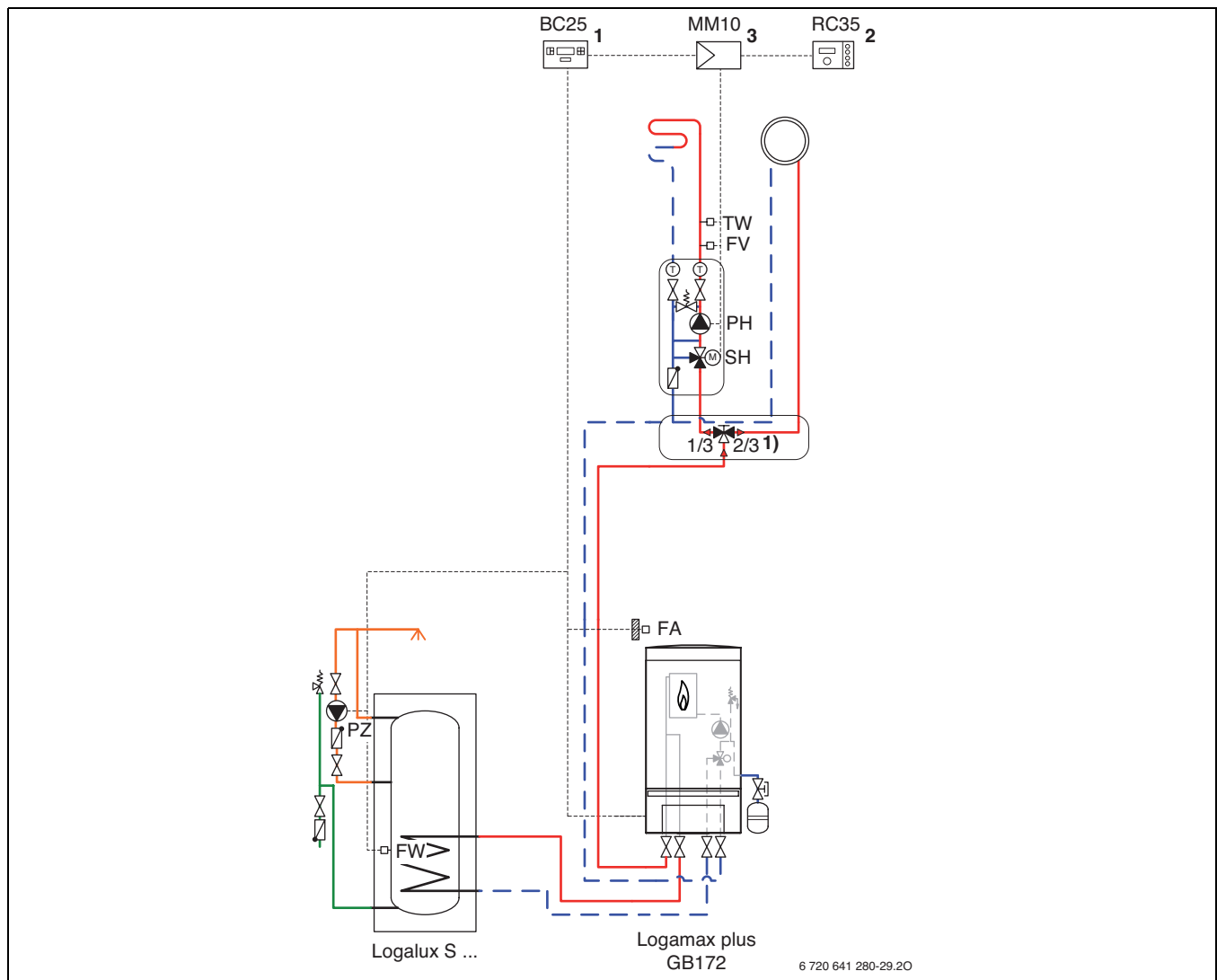


Fig. 78 Circuit diagram for the system example

- FA** Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
- FV** Flow temperature sensor
- FW** DHW temperature sensor
- PZ** DHW circulation pump
- PH** Heating circuit pump
- TW** Temperature limiter
- SH** Heating circuit actuator
- 1** Position on the heat source
- 2** Position on the heat source or on the wall
- 3** Position on the wall

- 1)** Preset at the factory



For a download of this hydraulic system scheme (number 3-1-1-2-3) see the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.

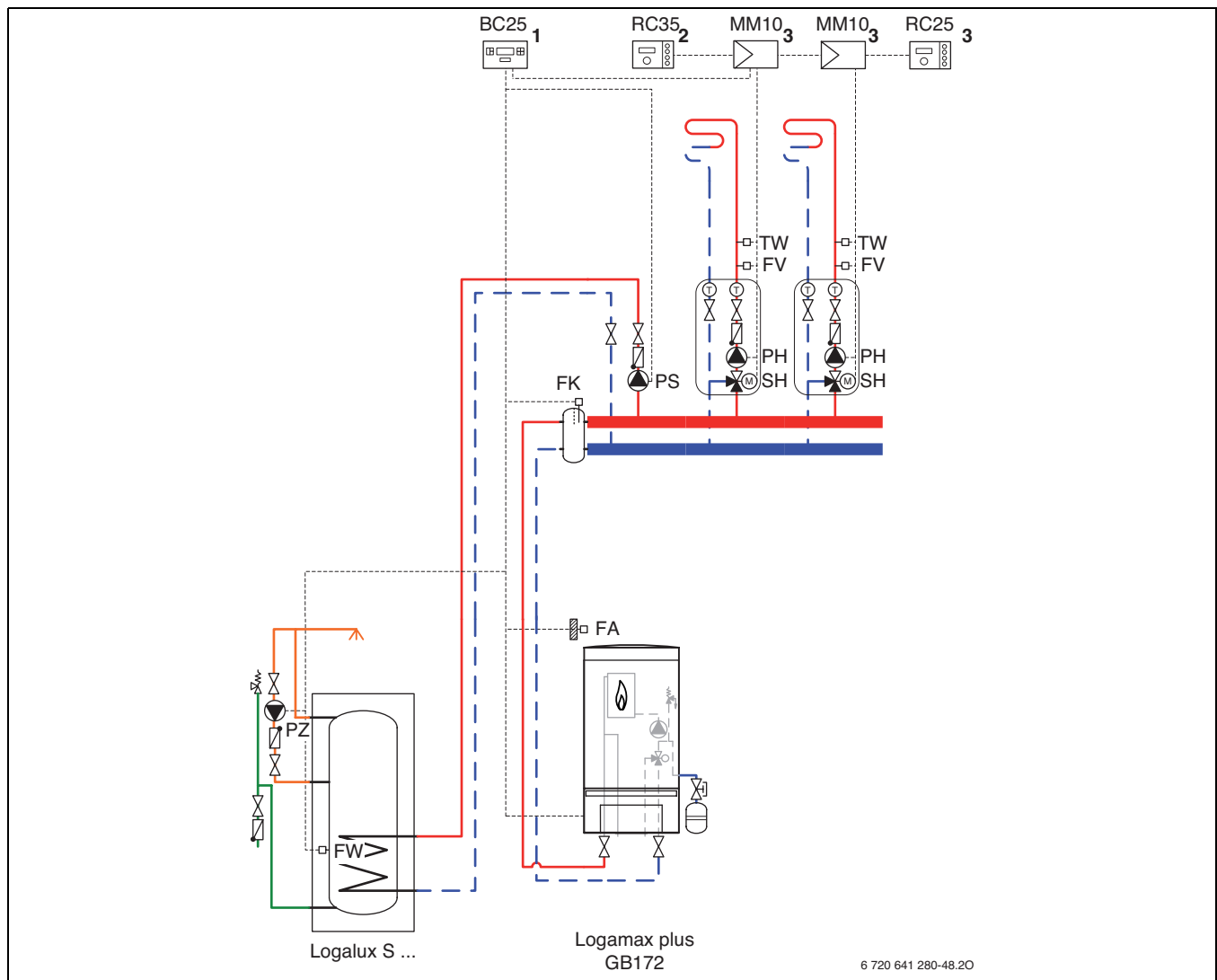
Brief description

- Logamax plus GB172 gas condensing boiler with modulating operation and separate DHW heating.
- The output of the underfloor heating circuit is limited to 50 % of the appliance output.
- The distribution valve is factory-set to 1/3 of the water volume of the underfloor heating system and to 2/3 of the water volume for radiator heating systems. Generally (maximum 50 % underfloor heating; underfloor heating 40/30 °C; radiators 70/50 °C), these systems will not require further balancing.
- DHW heating with this kind of hydraulic scheme can only be heated via a 3-way diverter valve.

Special design information

- Only the RC35 programming unit and the MM10 mixer module will be required.
- Enable the heating circuit with mixer for underfloor heating systems (HK2).
- Also enable the radiator heating circuit without mixer (HK1).
- Ensure that the same time slot is set for the heating circuit without mixer as for the heating circuit with mixer.
- The ready to plug-in AT90 is used as a temperature limiter (part no. 80 155 200) for the underfloor heating.
- It is not possible to use only the heating circuit with mixer. The time window for the circuit without mixer must be the same or larger than that of the circuit with mixer.
- Order an expansion vessel of adequate size as an accessory.

6.4.3 System example for the Logamax plus GB172 with low loss header, two heating circuits with mixer and DHW heating via cylinder primary pump



6 720 641 280-48.20

Fig. 79 Circuit diagram for the system example

FA	Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
FK	Low loss header sensor
FV	Flow temperature sensor
FW	DHW temperature sensor
PZ	DHW circulation pump
PH	Heating circuit pump
TW	Temperature limiter
SH	Heating circuit actuator
1	Position on the heat source
2	Position on the heat source or on the wall
3	Position on the wall



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.



You can check these system hydraulics in the Buderus hydraulic database at www.buderus.de/hydraulikdatenbank

Brief description

- Logamax plus GB172 gas condensing boiler with modulating operation and separate DHW heating via cylinder primary pump
- Control of the low loss header (separation) via Logamatic BC25
- Control of both heating circuits with mixer (HK1 and HK2) via MM10 mixer module
- Both heating circuits can be controlled in weather-compensated mode, room temperature-dependent mode or weather-compensated mode with room temperature hook-up mode.

Special design information

- The control of all heating circuits by means of the MM10 mixer modules enables the low loss header to be connected directly to the Logamatic BC25, making the WM10 low loss header module unnecessary.
- Optional DHW heating via an individual time channel including control of a DHW circulation pump and thermal disinfection.
- Generally, DHW heating takes priority (via the 3-way diverter valve either cylinder heating or heating mode) because of the selection of the DHW output at the RC35 programming unit.
- Size the flow and return lines to the low loss header for maximum boiler output.
- Determine the size of the low loss header in accordance with the maximum permissible flow rates:
 - Installing a Tacosetter upstream of the low loss header is recommended.
 - In combination with a low loss header, the integral pump in the GB172 must be controlled subject to output (setting 0 at the RC35 programming unit).

6.4.4 System example for the Logamax plus GB172 with low loss header, one heating circuit without mixer, one heating circuit with mixer and separate DHW heating via a 3-way diverter valve

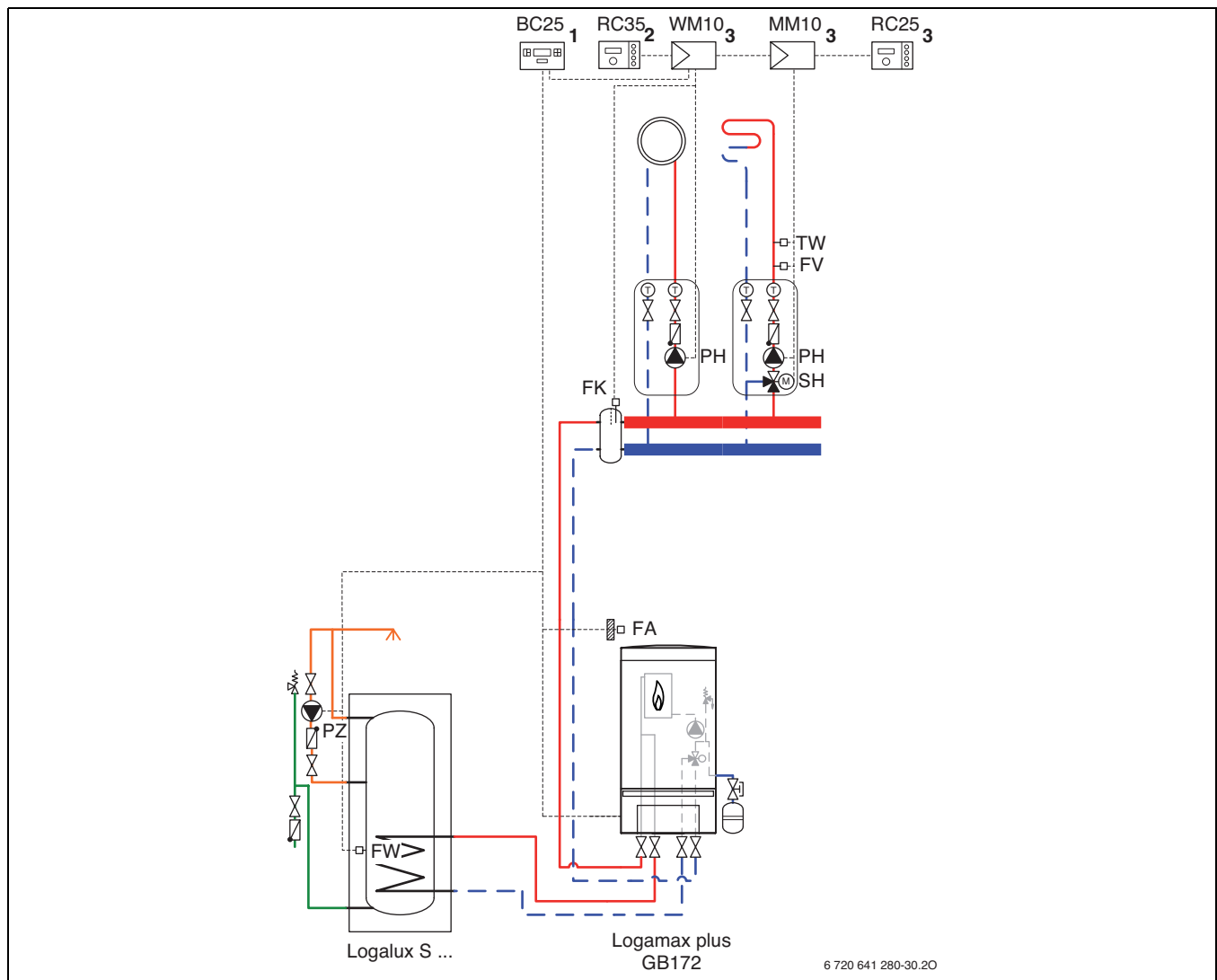


Fig. 80 Circuit diagram for the system example

FA	Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
FK	Low loss header sensor
FV	Flow temperature sensor
FW	DHW temperature sensor
PZ	DHW circulation pump
PH	Heating circuit pump
TW	Temperature limiter
SH	Heating circuit actuator
1	Position on the heat source
2	Position on the heat source or on the wall
3	Position on the wall



You can check these system hydraulics in the Buderus hydraulic database at www.buderus.de/hydraulikdatenbank



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.

Brief description

- Control of the low loss header (separation) and one heating circuit without mixer (HK1) via WM10 low loss header module.
- Control of one underfloor heating circuit with mixer (HK2) via MM10 mixer module.
- Both heating circuits can be controlled in weather-compensated mode, room temperature-dependent mode or weather-compensated mode with room temperature hook-up.

Special design information

- Optional DHW heating via an individual time channel including control of a DHW circulation pump and thermal disinfection.
- Generally, DHW heating takes priority (via the 3-way diverter valve either cylinder heating or heating mode) because of the selection of the DHW output at the RC35 programming unit.
- Size the flow and return lines to the low loss header for maximum boiler output.
- Determine the size of the low loss header in accordance with the maximum permissible flow rates.
- Installing a Tacosetter upstream of the low loss header is recommended.
- In combination with a low loss header, the integral pump in the GB172 must be controlled subject to output (setting 0 at the RC35 programming unit).
- Order an expansion vessel of adequate size as an accessory.

6.4.5 System example for the Logamax plus GB172 with a heating circuit without mixer directly downstream, solar DHW heating and DHW reheating via a 3-way diverter valve

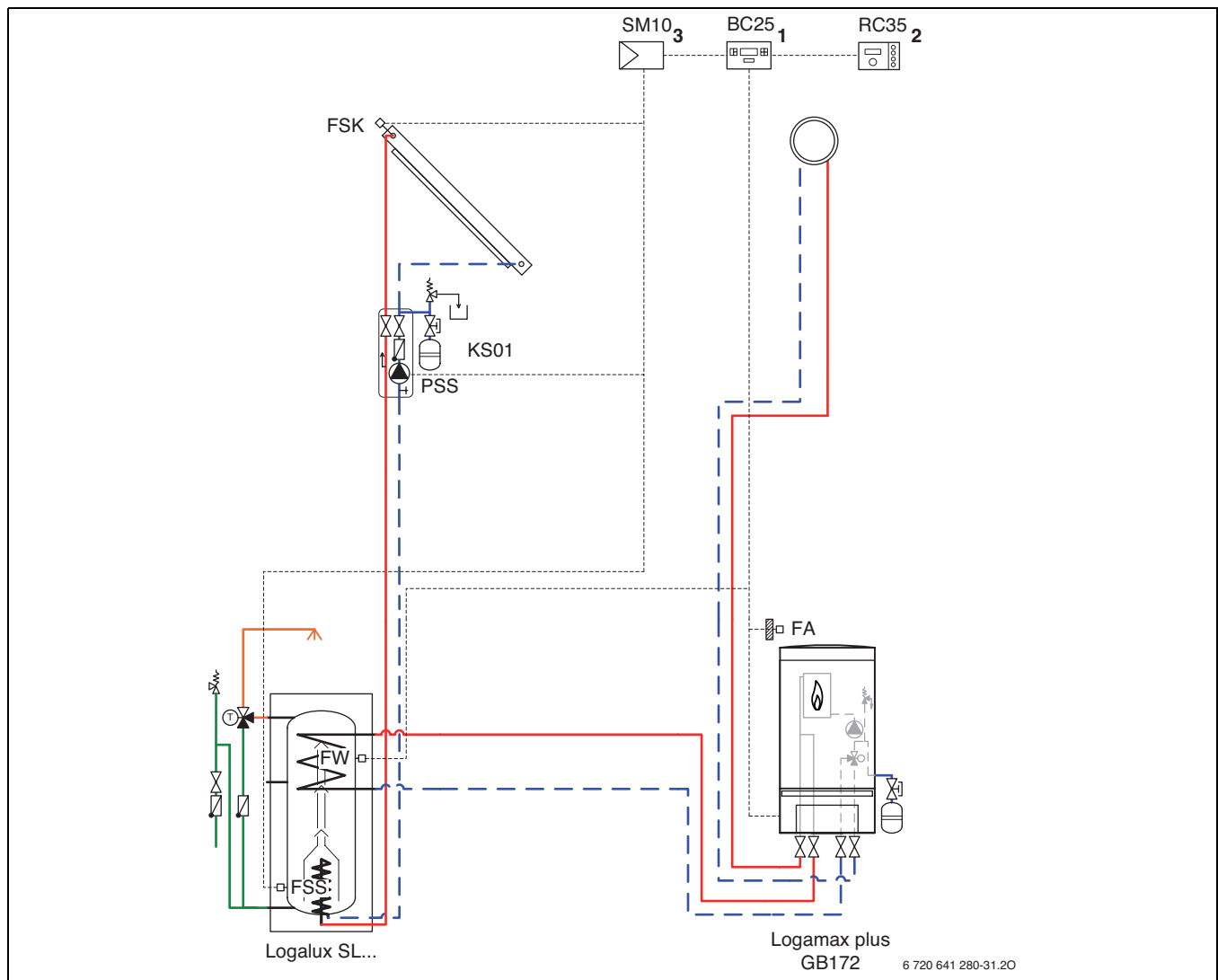


Fig. 81 Circuit diagram for the system example

- FA** Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
- FSK** Collector temperature sensor
- FSS** Cylinder temperature sensor
- FW** DHW temperature sensor
- KS01** Logasol solar pump station
- PSS** Solar circuit pump
- 1** Position on the heat source
- 2** Position on the heat source or on the wall
- 3** Position on the wall



For a download of this hydraulic system scheme (number 3-1-1-3-1) see the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.

Brief description

- Differential pressure-dependent operation of the heating circuit pump in the Logamax plus GB172
- Control of solar DHW heating with dual mode DHW cylinder via SM10 solar module; for this, the thermal disinfection function of the RC35 programming unit is automatically disabled.
- DHW reheating via the integral 3-way diverter valve of the Logamax plus.

Special design information

- The solar pump station can be delivered from the factory with an integral SM10 solar module. This is the recommended version for the Logamax plus GB172 as no modules can be integrated into this boiler.
- The intelligent linking of boiler and solar controllers with the SM10 solar module provides an optimised solar yield and saves reheating energy.
- Optional DHW via an individual time channel including control of a DHW circulation pump.
- Generally, DHW heating takes priority (via the 3-way diverter valve either cylinder heating or heating mode) because of the selection of the DHW output at the RC35 programming unit.
- Order an expansion vessel of adequate size as an accessory.
- Where required, adjust the setting of the differential pressure-dependent pump inside the Logamax plus GB172 subject to the relevant system (→ chapter 6.2.4, page 68).
- The default setting for pump modulation $\Delta p = \text{constant}$ is 200 mbar.

6.4.6 System example for the Logamax plus GB172 with solar central heating backup and one heating circuit with mixer

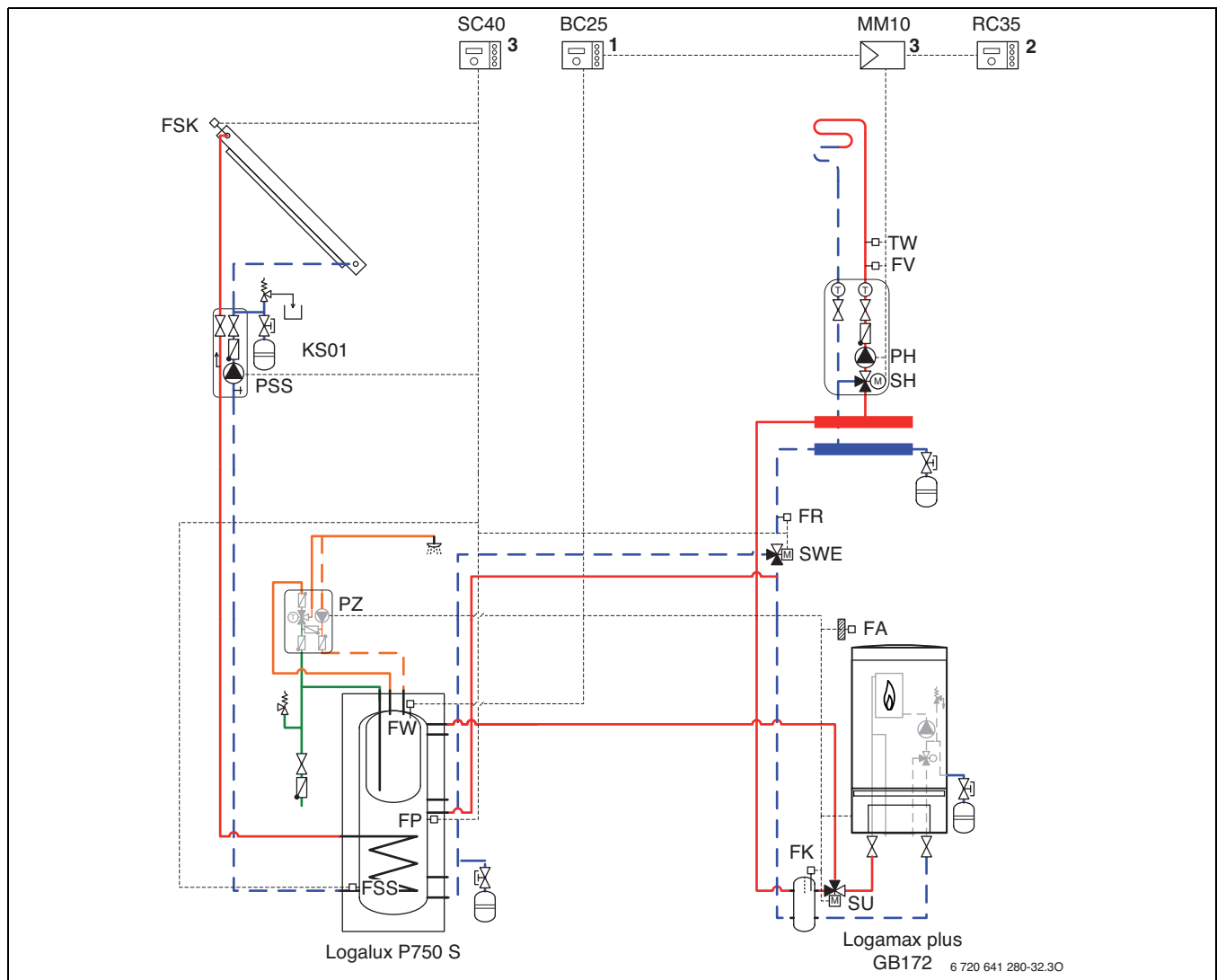


Fig. 82 Circuit diagram for the system example

- FA** Outside temperature sensor (standard delivery of the RC35 programming unit for weather-compensated control)
- FK** Flow temperature sensor
- FP** Buffer cylinder temperature sensor
- FR** Return temperature sensor
- FSK** Collector temperature sensor
- FSS** Cylinder temperature sensor
- FV** Flow temperature sensor
- FW** DHW temperature sensor
- KS01** Logasol solar pump station
- PSS** Solar circuit pump
- PZ** DHW circulation pump
- PH** Heating circuit pump
- TW** Temperature limiter
- SH** Heating circuit actuator
- SU** Three-way diverter valve
- SWE** Actuator, heat supply
- 1** Position on the heat source
- 2** Position on the heat source or on the wall
- 3** Position on the wall

1) Remove the plug of the internal 3-way diverter valve and adjust parameter 2.1F in the BC25



This circuit diagram is only a schematic illustration and provides a non-binding indication of a possible hydraulic circuit. Install safety equipment in accordance with applicable standards and local regulations.



For a download of this hydraulic system scheme (number 3-1-1-4-1) see the Buderus hydraulics database at www.buderus.de/hydraulikdatenbank

Brief description

- Solar central heating backup and DHW heating by means of a combi buffer cylinder
- DHW reheating by the GB172 via an external 230 V 3-way valve (accessory, part no. 7 736 995 008)
- Control of the solar DHW heating and central heating backup with return changeover via Logamatic SC40 solar controller.
- External heat recognition via low loss header temperature sensor (accessory); if sufficient external heat is available from the buffer cylinder, the internal pump as well as the appliance burner will be switched off.
- The heating circuits are regulated via a 3-way mixer.

Special design information

- In combination with a low loss header, the integral pump in the GB172 must be controlled subject to output (setting 0 at the RC35 programming unit).
- If the buffer cylinder temperature is higher than the heating return temperature, the buffer cylinder will also be used for central heating via the Logamatic SC40 solar controller and the HZG-Set.
- The RC35 programming unit enables an individual time channel for DHW heating.
- Installing a Tacosetter upstream of the low loss header is recommended.
- The low loss header “across” is unsuitable for this hydraulic layout. Use the low loss headers WHY 80/60 or WHY 120/80.
- Order an expansion vessel of adequate size as an accessory.

7 Condensate drain

Route the condensate from gas condensing boilers into the public sewer system in accordance with local regulations. It is crucial to determine whether the condensate must be neutralised prior to induction into the sewer system. This depends on the boiler output and the respective regulations of the local water authority (→ Table 33). Code of Practice A 251 of the ATV applies [in Germany] to the calculation of the annual amount of condensate. This Code of Practice lists a specific amount of condensate as empirical value of maximum 0.14 kg/kWh.



It is appropriate to check local regulations regarding draining condensate in good time prior to installation. The local water supply utility is the responsible body for questions concerning waste water.

Neutralisation obligation

Boiler output in kW	Neutralisation
≤ 25	no ¹⁾
> 25 to ≤ 200	no ²⁾
> 200	yes

Table 33 Neutralisation obligation for gas condensing boilers

- 1) Neutralising the condensate is required when draining the domestic waste water into a small treatment plant and for buildings and properties where the waste pipes do not meet the material requirements of the ATV Code of Practice A 251 - [Germany].
- 2) Neutralisation of the condensate is required for buildings where the requirement of adequate admixing (→ Table 34) with domestic waste water (at a ratio of 1:25) is not met.

For small systems with less than 25 kW output, there is no obligation to neutralise (→ Table 33) if the waste water does not flow into small treatment plants or if the drain lines meet the material requirements of the ATV Code of Practice A 251 [Germany].

Materials for condensate hoses

According to the ATV datasheet A 251, the following are suitable materials for condensate hoses:

- Clay pipes (to DIN-EN 295-1)
- Rigid PVC pipes
- PVC pipes (polyethylene)
- PE-HD pipes (polypropylene)
- PP pipes
- ABS-ASA pipes
- Stainless steel pipes
- Borosilicate glass pipes

If an admixing of the condensate with domestic waste water at a ratio of at least 1:25 is assured (→ Table 34), then the following may be used:

- Fibre cement pipes
- Cast or steel pipes to DIN 19522-1 and DIN 19530-1 and 19530-2

Copper pipes are unsuitable for draining condensate.

Adequate admixing

If the conditions in table 34 are met, then adequate admixing of condensate with domestic waste water will result. The above details refer to 2000 hours of full utilisation in accordance with guideline VDI 2067 (maximum value).

Boiler output in kW ²⁾	Amount of condensate ¹⁾ in m ³ /a	Boiler load	
		Office and commercial buildings ¹⁾ Number of employees	Residential buildings ¹⁾ Number of residential units
25	7	≥ 10	≥ 1
50	14	≥ 20	≥ 2
100	28	≥ 40	≥ 4
150	42	≥ 60	≥ 6
200	56	≥ 80	≥ 8

Table 34 Conditions for an adequate admixing of condensate with domestic waste water

- 1) Maximum values at a system temperature 40/30 °C and 2000 hours run
- 2) Combustion output

7.1 Condensate drain from the gas condensing boiler and the flue

To ensure the condensate generated in the flue can drain via the gas condensing boiler, route the flue inside the installation room with a slight slope ($\geq 3^\circ$, i.e. approx. 5 cm height differential per metre) towards the gas condensing boiler.



Observe the relevant regulations concerning waste drainage from buildings and other appropriate local regulations. Ensure particularly that the drain line is ventilated in accordance with regulations and that it drains **freely** (\rightarrow Fig. 83) into a drain outlet with a siphon, to prevent the stench trap being emptied and to prevent condensate from backing up into the appliance.

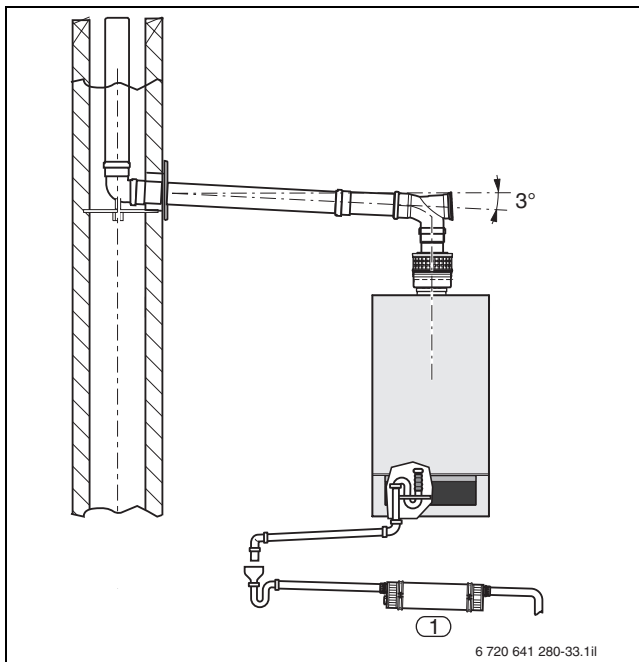


Fig. 83 Condensate drain from the gas condensing boiler and a flue via the neutralising system

1 Neutralising system

7.2 Condensate drain from a moisture-resistant chimney

Drain condensate in accordance with the details specified by the chimney manufacturer if a moisture-resistant chimney (suitable for condensing boilers) is used.

Via stench trap with funnel, the condensate from the chimney can be routed indirectly into the building drain together with the condensate from the gas condensing boiler.

8 Installation

8.1 Selection aid for connection accessories Logamax plus GB172









Connection accessories	Part no.																
		AP	UP	AP	UP	AP	UP	AP	UP	AP	UP	AP	UP	AP	UP	AP	UP
Accessories for heating circuit and gas connection																	
U-MA – Mounting plate	7 095 450	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
MR – Mounting frame ¹⁾	7 736 995 014	□	□	□	□	-	-	-	-	-	-	□	□	□	□	□	□
AS5-AP – connection set 5	7 736 613 430	●	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-
AS5-UP – connection set 5	7 736 613 431	-	●	-	-	-	-	-	-	-	-	-	-	-	-	-	●
DHW caps ½ "	7 709 000 227	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MKU – panel for unfinished walls	87 094 080	-	□	-	□	-	□	-	□	-	□	-	□	-	□	-	□
Accessories for appliances with integral DHW heating																	
AS6-AP – connection set 6	7 736 613 432	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-	-
AS6-UP – connection set 6	7 736 613 433	-	-	-	●	-	●	-	-	-	-	-	-	-	-	-	-
DHW line connection	7 716 780 233	-	-	-	-	□	□	-	-	-	-	-	-	-	-	-	-
Expansion vessel (DHW) 2 l; 3,5 bar	7 716 780 229	-	-	-	-	□	□	-	-	-	-	-	-	-	-	-	-
Accessories for external DWH cylinders																	
AS E – cylinder connection set	5 991 387	-	-	-	-	-	-	-	-	-	-	-	-	●	●	●	●
AS7-AP – connection set 7	7 736 613 434	-	-	-	-	-	-	●	-	-	-	●	-	●	-	-	-
AS7-UP – connection set 7	7 736 613 435	-	-	-	-	-	-	-	●	-	-	-	●	-	●	-	-
AS8-AP – connection set 8	7 736 613 436	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-
AS8-UP – connection set 8	7 736 613 437	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-
N-Flex GB172-/U152/U154	7 095 484	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●
GB172 cover	7 719 002 755 ²⁾	□	□	□	□	-	-	□	□	-	-	□	□	-	-	-	-
GB172 cover with H65 W	7 719 003 026	-	-	-	-	-	-	-	-	□	□	-	-	-	-	-	-

Table 35 Selection aid for connection accessories (→ Table 36, page 98 ff.)

Connection accessories	Part no.	without cylinder		with integral DHW heating GB172-24 K		with integral DHW heating GB172 T50		with H65 W hanging below		with H65 W hanging adjacent		with WU120 W/WU160 W floor standing below		with S120 W floor standing below		with SU160 W/SU200 W/SU300 W floor standing adjacent	
		AP	UP	AP	UP	AP	UP	AP	UP	AP	UP	AP	UP	AP	UP	AP	UP
Accessories for the sanitary side of DHW cylinders																	
S-Flex – connection set	87 094 838	-	-	-	-	-	-	□	□	□	□	□	□	□	□	-	-
U-DM – Pressure reducer for installation in S-Flex ³⁾	7 095 604	-	-	-	-	-	-	□	□	□	□	□	□	□	□	-	-
ZP – DHW circulation pump connection	87 094 842	-	-	-	-	-	-	□	□	□	□	-	-	□	□	-	-
Accessories for flue connection																	
Pre-installation bracket, flue gas	7 736 995 015	□	□	□	□	-	-	-	-	-	-	□	□	□	□	□	□
Replacement connection piece Ø 60/100	7 719 003 381	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
DHW circulation pipe for WU120 W/WU16 W	7 719 001 934	-	-	-	-	-	-	-	-	-	-	□	□	-	-	-	-

Table 35 Selection aid for connection accessories (→ Table 36, page 98 ff.)

- 1) The U-MA connecting plate will not be required when utilising the mounting frame.
- 2) Cannot be combined with S-Flex
- 3) If no pressure reducer is installed in the building.

- AP** Installation on finished walls
UP Installation on unfinished walls
● Required
□ Option
- Cannot be used

Connection accessories for Logamax plus GB172-14/20/24/24 K

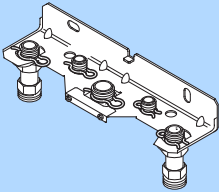
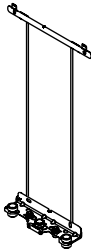
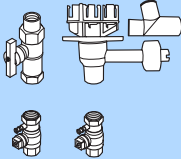
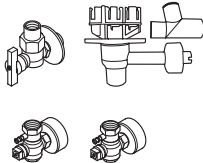
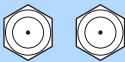
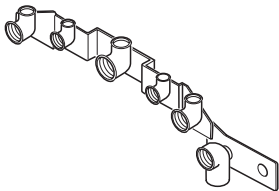
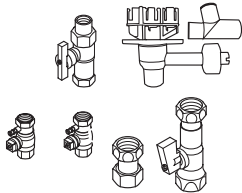
Designation		Description
Accessories for heating circuit and gas connection		
U-MA Mounting plate		<ul style="list-style-type: none"> • Heating circuit R $\frac{3}{4}$ • Cold water and DHW R $\frac{1}{2}$ • Gas R $\frac{1}{2}$
Mounting frame		<ul style="list-style-type: none"> • Suitable for GB172 (not for GB172-24 T50) • No U-MA mounting plate required
AS5-AP – connection set 5		<ul style="list-style-type: none"> • Installation on finished walls • Comprising: <ul style="list-style-type: none"> – HA (2 service valves, heating circuit Rp $\frac{3}{4}$) – GA-BS (straight-through gas tap Rp $\frac{1}{2}$ with integral fire safety valve) – Drain outlet kit
AS5-UP – connection set 5		<ul style="list-style-type: none"> • Installation on unfinished walls • Comprising: <ul style="list-style-type: none"> – HU (2 service valves, heating circuit R $\frac{3}{4}$) – GU-BS (right-angle gas tap R $\frac{1}{2}$ with integral fire safety valve) – Drain outlet kit
DHW caps $\frac{1}{2}$ "		<ul style="list-style-type: none"> • Required during installation if no DHW cylinder is connected
MKU panel for unfinished walls		<ul style="list-style-type: none"> • For single appliances, combi boilers, appliances with H65 W hanging adjacent, with WU120 W/WU160 W/S120 floor standing and with SU160/200/300 W • Pre-installation on unfinished walls
Accessories for combi boilers		
AS6-AP connection set 6		<ul style="list-style-type: none"> • Installation on finished walls • Comprising: <ul style="list-style-type: none"> – HA (2 service valves, heating circuit Rp $\frac{3}{4}$) – GA-BS (straight-through gas valve Rp $\frac{1}{2}$ with integral fire safety valve) – Drain outlet kit – U-BA (DHW connection set with connection valve Rp $\frac{1}{2}$ and spacer)

Table 36 Connection accessories for Logamax plus GB172-14/20/24/24 K
(assignment → Table 35; installed dimensions → Fig. 30 to Fig. 34, page 37 ff.)

Connection accessories for Logamax plus GB172-14/20/24/24 K

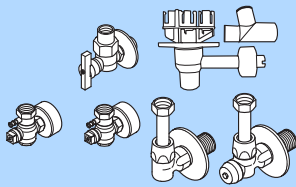
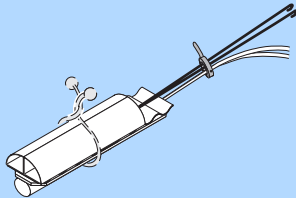
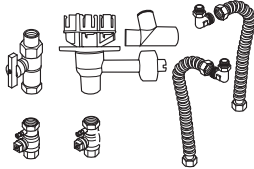
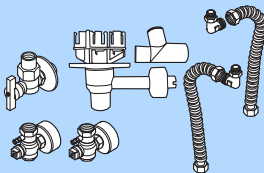
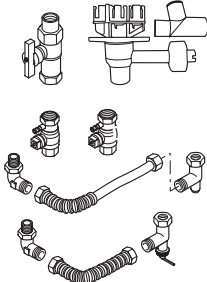
Designation		Description
<p>AS6-UP – connection set 6</p>		<ul style="list-style-type: none"> • Installation on unfinished walls • Comprising: <ul style="list-style-type: none"> – HU (2 service valves, heating circuit R ¾) – GU-BS (right-angle gas tap R ½ with integral fire safety valve) – Drain outlet kit – U-BU (DHW connection set complete with right-angle valve R ½ , connection bend, two copper pipes, two union nuts and two pipe collars)
<p>Accessories for external DWH cylinders</p>		
<p>AS E cylinder connection set</p>		<ul style="list-style-type: none"> • DHW temperature sensor Ø 6 mm for DHW heating with plug for connection to the boiler terminal strip • Including ¼ circular sensor segments (dummy segments) and spring hook (plastic spiral) for temperature sensor Ø 6 mm in conjunction with DHW cylinders larger than 120 l • Plug for cylinder primary pump and DHW circulation pump
<p>AS7-AP connection set 7</p>		<ul style="list-style-type: none"> • Installation on finished walls • For DHW cylinder wall mounted below or freestanding below • Comprising: <ul style="list-style-type: none"> – HA (description → AS5-AP) – GA-BS (description → AS5-AP) – Drain outlet kit – U-Flex (flexible pipe set on the heating circuit side with connection bend)
<p>AS7-UP – connection set 7</p>		<ul style="list-style-type: none"> • Installation on unfinished walls • For DHW cylinder wall mounted below or freestanding below • Comprising: <ul style="list-style-type: none"> – HU (description → AS5-UP) – GU-BS (description → AS5-UP) – Drain outlet kit – U-Flex (flexible pipe set on the heating circuit side with connection bend)
<p>AS8-AP connection set 8</p>		<ul style="list-style-type: none"> • Installation on finished walls • For wall mounted adjacent DHW cylinders • Comprising: <ul style="list-style-type: none"> – HA (description → AS5-AP) – GA-BS (description → AS5-AP) – Drain outlet kit – N-Flex (flexible pipework set for the heating circuit side)

Table 36 Connection accessories for Logamax plus GB172-14/20/24/24 K
(assignment → Table 35; installed dimensions → Fig. 30 to Fig. 34, page 37 ff.)

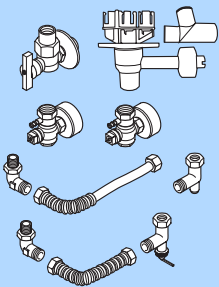
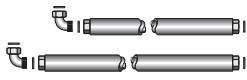
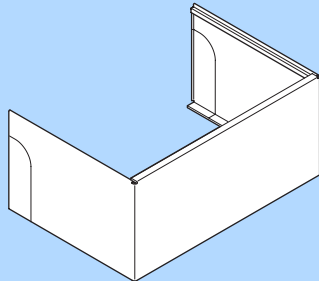
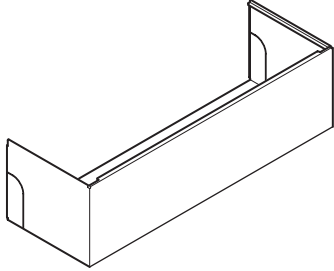
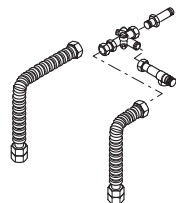
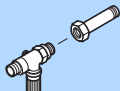

Connection accessories for Logamax plus GB172-14/20/24/24 K		
Designation		Description
AS8-UP – connection set 8		<ul style="list-style-type: none"> • Installation on unfinished walls • For wall mounted adjacent DHW cylinders • Comprising: <ul style="list-style-type: none"> – HU (description → AS5-UP) – GU-BS (description → AS5-UP) – Drain outlet kit – N-Flex (flexible pipework set for the heating circuit side)
N-Flex Flexible pipe set on the heating circuit side		<ul style="list-style-type: none"> • Installation on finished walls • For DHW cylinders SU160 W, SU200 W and SU300 W
Cover for GB172		<ul style="list-style-type: none"> • May be used with the GB172 and GB172-24 K without cylinder, GB172 with H65W hanging below and GB172 with WU... floor standing below • Cannot be combined with S-Flex • Height: 205 mm
Cover for GB172 with Logalux H65 W		<ul style="list-style-type: none"> • May be used for the GB172 with H65W hanging adjacent
Accessories for the sanitary side of DHW cylinders		
S-Flex Flexible connection set for the sanitary side		<ul style="list-style-type: none"> • Installation on finished and unfinished walls • For DHW cylinders wall mounted below or freestanding below H65 W, WU120 W, WU160 W and S120 W • For H65 W wall mounted adjacent DHW cylinder with safety valve • Non-return valve • Cylinder pipe connection for cold water and DHW • Cannot be combined with cover GB172
U-DM Pressure reducer		<ul style="list-style-type: none"> • Retrofit with S-Flex • Pressure reducer to 4 bar
ZP DHW circulation pump connection		<ul style="list-style-type: none"> • For the connection of a DHW circulation pump • For retrofitting with S-Flex

Table 36 Connection accessories for Logamax plus GB172-14/20/24/24 K
(assignment → Table 35; installed dimensions → Fig. 30 to Fig. 34, page 37 ff.)

Connection accessories for Logamax plus GB172-14/20/24/24 K


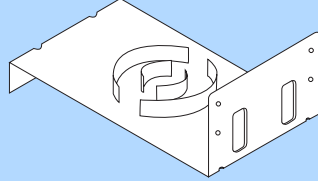
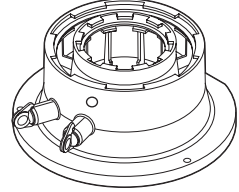
Designation		Description
DHW circulation pipe for Logalux WU120 W/WU160 W		<ul style="list-style-type: none"> For integration into the Logalux WU120 W and WU160 W DHW cylinders
Accessories for flue connection		
Pre-installation bracket, flue gas		<ul style="list-style-type: none"> For installing a flue system prior to the installation of the condensing boiler - may be used more than once
Replacement connection piece Ø 60/100		<ul style="list-style-type: none"> When using a flue system Ø 60/100 mm Calculated function verification is always required for the flue system

Table 36 Connection accessories for Logamax plus GB172-14/20/24/24 K
(assignment → Table 35; installed dimensions → Fig. 30 to Fig. 34, page 37 ff.)

Connection accessories for the Logamax plus GB172-24 T50

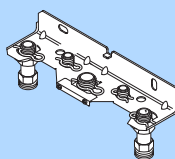
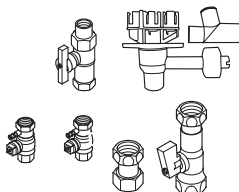
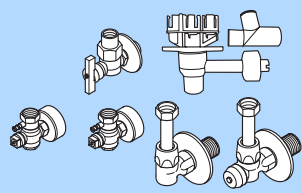
Designation		Description
Accessories for heating circuit and gas connection		
U-MA Mounting plate		<ul style="list-style-type: none"> Heating circuit R ¾ Cold water and DHW R ½ Gas R ½
AS6-AP connection set 6		<ul style="list-style-type: none"> Installation on finished walls Comprising: <ul style="list-style-type: none"> HA (2 service valves, heating circuit Rp ¾) GA-BS (straight-through gas valve Rp ½ with integral fire safety valve) Drain outlet kit U-BA (DHW connection set with connection valve Rp ½ and spacer)
AS6-UP – connection set 6		<ul style="list-style-type: none"> Installation on unfinished walls Comprising: <ul style="list-style-type: none"> HU (2 service valves, heating circuit R ¾) GU-BS (right-angle gas tap R ½ with integral fire safety valve) Drain outlet kit U-BU (DHW connection set complete with right-angle valve R ½ , connection bend, two copper pipes, two union nuts and two pipe collars)

Table 37 Connection accessories for the Logamax plus GB172-24 T50
(assignment → Table 35; installed dimensions → Fig. 30 to Fig. 34, page 37 ff.)

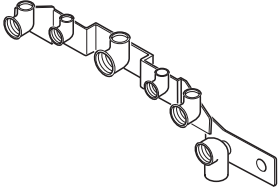


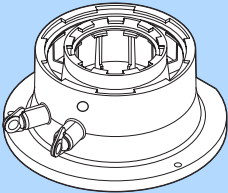
Connection accessories for the Logamax plus GB172-24 T50		
Designation		Description
MKU panel for unfinished walls		<ul style="list-style-type: none"> For single appliances, combi boilers, appliances with H65 W hanging adjacent, with WU120 W/WU160 W/S120 floor standing and with SU160/200/300 W Pre-installation on unfinished walls
Accessories for the sanitary side of DHW cylinders		
DHW line connection		<ul style="list-style-type: none"> Flexible stainless steel hose for the connection of a DHW circulation line to the GB172-24 T50 Length 315 mm 1/2" female connection with flat gasket
DHW expansion vessel		<ul style="list-style-type: none"> 2 l capacity 3.5 bar pre-charge pressure For integration in Logamax plus GB172-24 T50
Accessories for flue connection		
Replacement connection piece Ø 60/100		<ul style="list-style-type: none"> When using a flue system Ø 60/100 mm Calculated function verification is always required for the flue system

Table 37 Connection accessories for the Logamax plus GB172-24 T50
 (assignment → Table 35; installed dimensions → Fig. 30 to Fig. 34, page 37 ff.)

8.2 Selection aid for pre-installation unit Logamax plus GB172 and GB172-24 K – not applicable for GB172-24 T50

Connection accessories	Part no.	Logamax plus GB172 without cylinder		Logamax plus GB172-24 K with integral DHW heating	
		AP	UP	AP	UP
Accessories					
MV – Pre-installation unit ¹⁾	7 736 995 025	●	●	●	●
Pre-installation bracket, flue gas	7 736 995 015	□	□	□	□

Table 38 Selection aid for pre-installation unit for Logamax plus GB172 and GB172-24 K (connection accessories → Table 39)

1) The selection aids on page 96 f. are not applicable if the pre-installation unit is used.

- AP** Installation on finished walls
- UP** Installation on unfinished walls
- Required
- Option

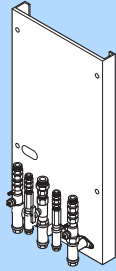
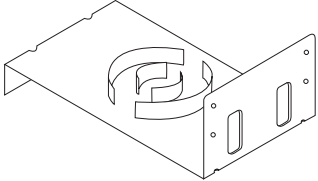
Connection accessories for the Logamax plus GB172 and GB172-24 K when using the pre-installation unit	
Designation	Description
Accessories	
MV – Pre-installation unit	 <ul style="list-style-type: none"> • Heating circuit, gas and DHW connections, incl. service taps
Pre-installation bracket, flue gas	 <ul style="list-style-type: none"> • For installing a flue system prior to the installation of the condensing boiler - may be used more than once

Table 39 Connection accessories for Logamax plus GB172 and GB172-24 K when using the pre-installation unit (assignment → Table 38)

8.3 Selection aid for connection accessories Logamax plus GB172T




Connection accessories	Part no.	Gas condensing boilers Logamax plus GB172-.. ..T		
		T120 T150	T100S T150S	T210SR
				
Accessories for heating circuit and gas connection				
Valve set for gas and central heating ¹⁾	7 719 002 072	●	●	●
Accessories for connection pipes				
Connection set gas heating on the side (l.h./r.h. side)	7 124 040	☐	☐	☐
Connection set, gas heating, top	7 738 110 265	☐	☐	–
Rear gas heating connection set	7 124 050	☐	☐	–
Accessories on the sanitary side				
Valve set, 10 bar	7 124 030	☐	☐	☐
DHW expansion vessel, may be integrated, 8 l	7 719 002 734	☐	☐	–
Accessories GB172-14/20 T210SR				
DHW mixer set		–	–	☐
- for use at the back without side covers	7 738 110 268			
- for use at the back with side covers	7 738 110 322			
Rear side covers GB172-14/20 T210SR incl. gas heating connection set at the side, (l.h./r.h. side), long version	7 738 110 269	–	–	☐
Solar medium container, 8 l, arranged at the back	7 124 140	–	–	☐
Optional accessories				
Drain outlet kit	7 124 100	☐	☐	☐
Additional expansion vessel, may be integrated, 12 l	7 738 110 266	☐	☐	– ²⁾
Symbol key:		● Required; ☐ Option; – Not applicable		

Table 40 Selection aid for connection accessories for the Logamax plus GB172T gas condensing boilers

1) Part of the gas heating connection set at the back

2) 12 l expansion vessel may be integrated; already part of the GB172-14/20 T210SR

Connection accessories for gas condensing boilers Logamax plus GB172T

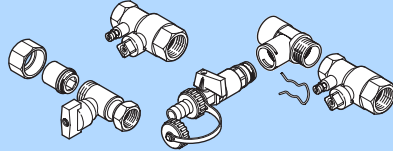
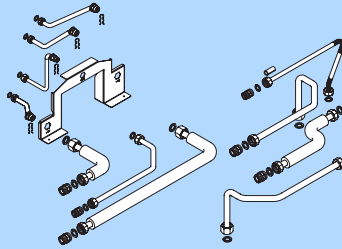
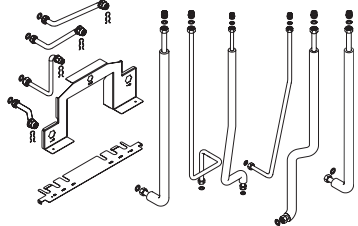
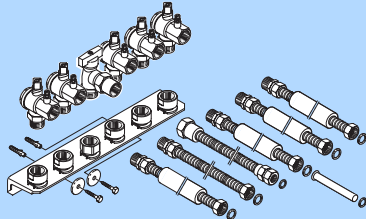
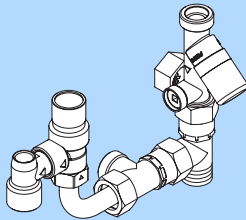
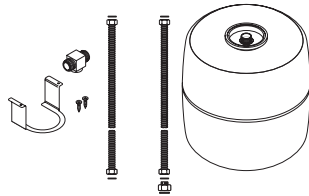
Designation		Description
Accessories for heating circuit and gas connection		
Valve set, gas and heating		<ul style="list-style-type: none"> • Including drain & fill valve • Service valves 3/4" • Gas tap with thermally activated shut-off device 1/2" • Not suitable for rear gas heating connection set
Accessories for connection pipes		
Connection set gas heating on the side (l.h./r.h. side)		<ul style="list-style-type: none"> • Not suitable in connection with rear side cover
Connection set, gas heating, top		<ul style="list-style-type: none"> • Intended for GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S (not for GB172-14/20 T210SR)
Rear gas heating connection set		<ul style="list-style-type: none"> • Integral service valves 3/4" and gas tap with thermally activated shut-off device 1/2" • Intended for GB172-14 T120, GB172-14/20 T150, GB172-20 T100S, GB172-14/24 T150S (not for GB172-14/20 T210SR)
Accessories on the sanitary side		
Valve set		<ul style="list-style-type: none"> • Sanitary cold water safety assembly • Safety valve 10 bar • Non-return valve • Drain hose safety valve • G 3/4 x G 3/4 • Intended for side connection set, top (not for rear connection set)
8 l DHW expansion vessel		<ul style="list-style-type: none"> • May be integrated with the GB172-14 T120, GB172-14/20 T150, GB172-20 T100S and GB172-14/24 T150S • Not in connection with the top connection set • Not for GB172-14/20 T210SR

Table 41 Connection accessories for gas condensing boilers Logamax plus GB172-... T...

Connection accessories for gas condensing boilers Logamax plus GB172T

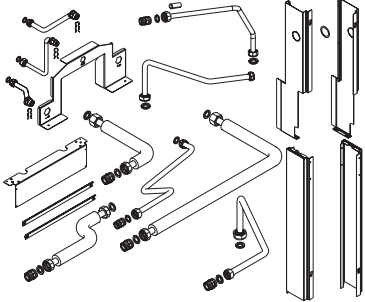
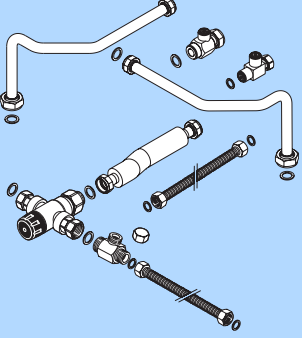



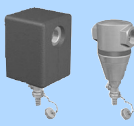
Designation		Description
Accessories GB172-14/20 T210SR		
Rear side cover		<ul style="list-style-type: none"> Incl. side connection set, long version
DHW mixer set		<ul style="list-style-type: none"> Thermally activated 3-way mixer DHW circulation connection, matched to the mixer For DHW temperatures > 60° For cylinder water temperatures > 60°
Solar medium container		<ul style="list-style-type: none"> 8 l
Optional accessories		
Tacosetter		<ul style="list-style-type: none"> DN 20, Rp 3/4, 240-900 l/min DN 25, Rp 1, 600-2400 l/min
Dirt filter (heating system)		<ul style="list-style-type: none"> For installation in the heating return Filter unit 500 µm With stainless steel mesh core Rp 1, flow rate ≤ 3200 l/h
Logafix absorption air separator with EPP thermal insulation		<ul style="list-style-type: none"> Internal thread 3/4", to 120 °C and up to 10 bar Internal thread 1", to 120 °C and up to 10 bar
Logafix sludge separator with EPP thermal insulation		<ul style="list-style-type: none"> Internal thread 3/4", to 120 °C and up to 10 bar Internal thread 1", to 120 °C and up to 10 bar

Table 41 Connection accessories for gas condensing boilers Logamax plus GB172-... T...

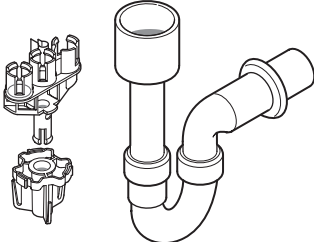
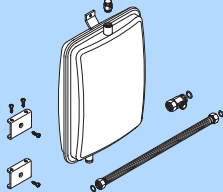




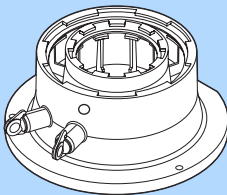
Connection accessories for gas condensing boilers Logamax plus GB172T		
Designation		Description
Drain outlet kit		DN 40 siphon, complete with fixing materials and pipe collar
Additional 12 l expansion vessel		<ul style="list-style-type: none"> • In addition to the AG 18 l supplied • May be integrated with the GB172-14 T120, GB172-14/20 T150, GB172-20 T100S and GB172-14/24 T150S • Not for GB172-14/20 T210SR ¹⁾
Neutrakon condensate neutralisation		Neutralisation with HT connection DN 40 up to 60 kW
Neutralising granulate		5 kg top-up pack
CP1 condensate pump		Maximum head 4.5 m
Condensate pump Wilo Drainlife Con		<ul style="list-style-type: none"> • Maximum head 6 m • Without neutralisation
Contact thermostat AT 90		With power cable and special plug for connecting the appliance to the respective Buderus control unit
Miscellaneous		
Module retainer for fitting 1 module		For fitting 1 module within the boiler casing
Cleaning set		Cleaning set comprising a brush and lifting tool
Accessories for flue connection		
Replacement connection piece Ø 60/100		<ul style="list-style-type: none"> • When using a flue system Ø 60/100 mm • Calculated function verification for the flue system is not required

Table 41 Connection accessories for gas condensing boilers Logamax plus GB172-... T...

1) 12 l expansion vessel may be integrated; already part of the GB172-14/24 T210SR

8.4 Heating circuit quick installation systems

8.4.1 Quick installation system combinations complete with low loss header WHY... and heating circuit distributor

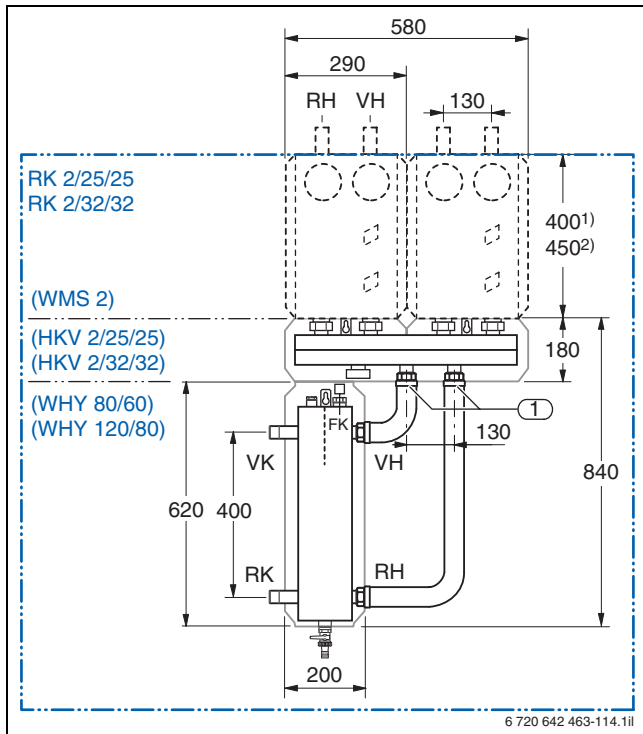


Fig. 84 Dimensions of the quick installation system combinations RK 2/25/25 and RK 2/32/32 for two heating circuits (dim. in mm)

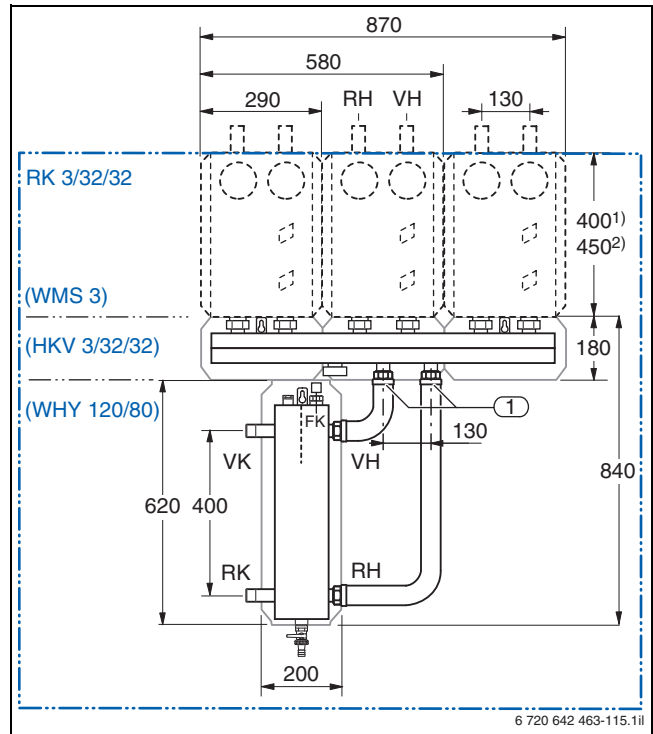


Fig. 85 Dimensions of the quick installation system combinations RK 3/32/32 for three heating circuits (dim. in mm)

FK Flow temperature sensor

RH Heating circuit return

RK Boiler return

VH Heating circuit flow

VK Boiler flow

1 Connection pipes

1) Height of the heating circuit connection set HSM 15, HSM 20, HSM 25 and HS 25

Connecting one DN 25 set on a DN 32 distributor requires the ES0 set, part no. 67 900 475.

2) Height of the heating circuit connection sets HSM 32 and HS 32

FK Flow temperature sensor

RH Heating circuit return

RK Boiler return

VH Heating circuit flow

VK Boiler flow

1 Connection pipes

1) Height of the heating circuit connection set HSM 15, HSM 20, HSM 25 and HS 25

Connecting one DN 25 set on a DN 32 distributor requires the ES0 set, part no. 67 900 475.

2) Height of the heating circuit connection sets HSM 32 and HS 32



System combination installation either to the right or left of the gas condensing boiler.

Connection diameter		
For heating circuit flow and return	Rp 1	For HSM 15(-E), HSM 20(-E), HSM 25(-E) and HS 25(-E)
	Rp 1 1/4	For HSM 32(-E) and HS 32(-E)
For the WHY 80/60 low loss header	R 1	For boiler flow and return max. flow rate 2.5 m ³ /h (→ Table 44, page 110 ff.)
For the WHY 120/80 low loss header	R 1 1/2	For boiler flow and return max. flow rate 5.0 m ³ /h (→ Table 44, page 110 ff.)

Table 42

8.4.2 Quick installation system combinations with low loss header across (DN 25)

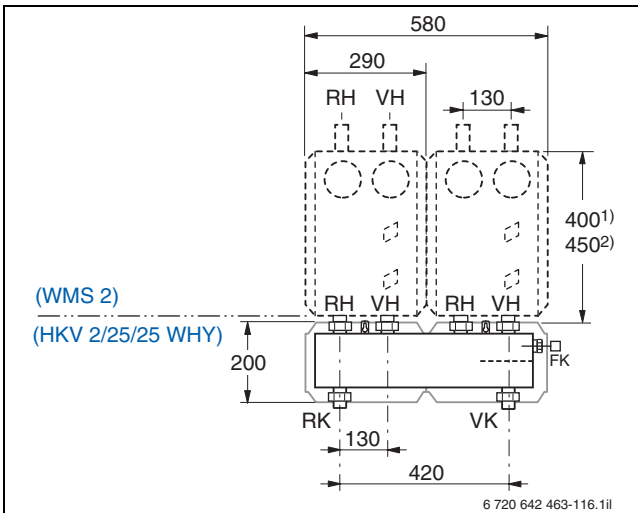


Fig. 86 Dimensions of the system combination heating circuit distributor with integral low loss header for two heating circuits (dim. in mm)

- FK** Flow temperature sensor
- RH** Heating circuit return
- RK** Boiler return
- VH** Heating circuit flow
- VK** Boiler flow

- 1) Height of the heating circuit connection sets HSM 15(-E), HSM 20(-E), HSM 25(-E) and HS 25(-E)
- 2) Height of the heating circuit connection sets HSM 32(-E) and HS 32(-E)
Connecting one DN 32 set on a DN 25 distributor requires the ÜS1 adaptor set, part no. 63 012 309.

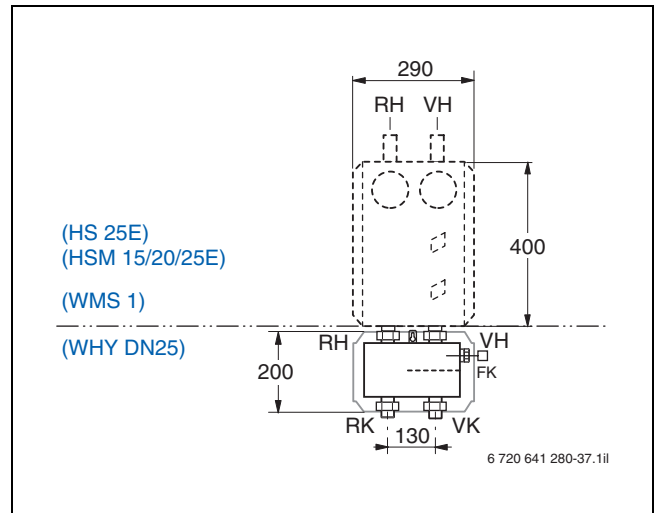


Fig. 87 Dimensions of system combinations with low loss header across for direct connection with a heating circuit connection set for one heating circuit (dim. in mm)

- FK** Flow temperature sensor
- RH** Heating circuit return
- RK** Boiler return
- VH** Heating circuit flow
- VK** Boiler flow



System combination installation either to the right or left of the gas condensing boiler.

Connection diameter		
For heating circuit flow and return	Rp 1	For HSM 20, HSM 25 and HS 25
	Rp 1¼	For HSM 32(-E) and HS 32(-E)
For the WHY DN 25 low loss header across and heating circuit distributor with HKV 2/25/25 WHY low loss header	R 1	For boiler flow and return max. flow rate 2.0 m ³ /h (→ Table 44, page 110 ff.)

Table 43

8.4.3 Internal diameter, heating circuit quick installation system (example)

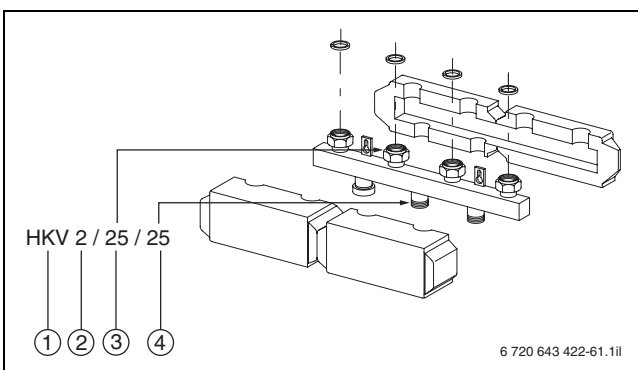


Fig. 88 Internal diameter, heating circuit quick installation systems (example)

- 1 Heating circuit distributor
- 2 Number of heating circuit connection sets that can be used; here there are two
- 3 Top connection dim., here DN 25
- 4 Bottom connection dim., here DN 25

8.4.4 Accessories for heating circuit quick installation systems

Accessories	Part no.	Logamax plus
Combinations		
HKV 2/25/25 WHY Quick installation combination	63 042 000	<ul style="list-style-type: none"> • Heating circuit distributor DN 25 with integral low loss header, up to 2000 l/h • WMS 2 wall mounting bracket for heating circuit distributor • Including heating circuit distributor connection set
RK 2/25/25 across Quick installation combination	80 700 278	<ul style="list-style-type: none"> • Quick assembly combination with low loss header, across, up to 2000 l/h • WMS 2 for HKV 2/25/25 • HKV 2/25/25, heating circuit distributor
RK 2/25/25 Heating circuit quick assembly system	80 700 276	<ul style="list-style-type: none"> • Quick assembly combination with low loss header, up to 2500 l/hDN 25 • Connection pipes from the low loss header to the distributor DN 25 • HKV 2/25/25, heating circuit distributor • WMS 2 for HKV 2/25/25
RK 2/32/32 Heating circuit quick assembly system	80 700 280	<ul style="list-style-type: none"> • Quick assembly combination with low loss header, up to 5000 l/h • Connection pipes to the low loss header • HKV 2/32/32, heating circuit distributor • WMS 2 for HKV 2/32/32
RK 3/32/32 Heating circuit quick assembly system	80 700 284	<ul style="list-style-type: none"> • Quick assembly combination with low loss header, up to 5000 l/h • Connection pipes to the low loss header • HKV 3/32 • WMS 3 for HKV 3/32/32
Components for free combinations		
WHY 80/60 Low loss header	63 013 537	<ul style="list-style-type: none"> • Low loss header DN 80/DN 60 with black insulation • Including sensor well for cylindrical sensor, wall mounting bracket, drain tap, rawl plugs and screws • Maximum 2500 l/h • Connection dimension primary R 1, secondary G 1¼
WHY 120/80 Low loss header	67 900 186	<ul style="list-style-type: none"> • Low loss header DN 120/DN 80 with black insulation • Including sensor well for cylindrical sensor, wall mounting bracket, drain tap, rawl plugs and screws • Maximum 5000 l/h • Connection dimension primary R 1½, secondary G 1½
Low loss header across	63 016 381	<ul style="list-style-type: none"> • Low loss header with insulation • Connection directly on the HKV 2/25/25 • Including sensor well for cylindrical sensors • Maximum 2000 l/h
AS HKV 25 connection set	5 354 210	<ul style="list-style-type: none"> • For on-site connection on the secondary side of the low loss header for WHY 80/60
AS HKV 32 connection set	5 584 552	<ul style="list-style-type: none"> • For on-site connection on the secondary side of the low loss header for WHY 120/80

Table 44 Accessories

Accessories	Part no.	Logamax plus
Low loss header Sinus 80/120	89 200 972	<ul style="list-style-type: none"> • Low loss header Sinus DN 80/DN 120 to 8000 l/h incl. insulation • Material ST 37-2, 1/2 " fem. connections • No air vent valve, drain or temperature sensor
Sensor well 1/2"	5 446 142	<ul style="list-style-type: none"> • R 1/2 150 mm long for Logamatic temperature sensor FV/FZ
Heating circuit distributor	5 024 880	<ul style="list-style-type: none"> • HKV 2/25/25 for 2 heating circuits
Heating circuit distributor	5 024 871	<ul style="list-style-type: none"> • HKV 3/35/32 for 3 heating circuits
Heating circuit distributor	5 024 870	<ul style="list-style-type: none"> • HKV 2/32/32 for 2 heating circuits
Heating circuit distributor	5 024 872	<ul style="list-style-type: none"> • HKV 3/32/32 for 3 heating circuits
Heating circuit distributor	5 024 882	<ul style="list-style-type: none"> • HKV 4/25/40 for 4 heating circuits
Heating circuit distributor	5 024 884	<ul style="list-style-type: none"> • HKV 5/25/40 for 5 heating circuits
Wall mounting set	67 900 470	<ul style="list-style-type: none"> • WMS 1 for wall mounting an individual quick installation set
Wall mounting set	67 900 471	<ul style="list-style-type: none"> • WMS 2 for HKV 2/32/32 + HKV 2/25/25
Wall mounting set	67 900 472	<ul style="list-style-type: none"> • WMS 3 for HKV 3/32/32 + HKV 3/25
Wall mounting set	63 014 540	<ul style="list-style-type: none"> • WMS 4/5 for HKV 4/25/40/HKV 5/25/40
Connection pipes	63 013 548	<ul style="list-style-type: none"> • From the low loss header 80/60 to heating circuit distributor HKV 2/25/25
Connection pipes	5 584 584	<ul style="list-style-type: none"> • From the low loss header 80/120 to heating circuit distributor HKV 2/32/32
Connection pipes	5 584 586	<ul style="list-style-type: none"> • From the low loss header 80/120 to heating circuit distributors HKV 3/32/32 and HKV 3/25
Contact thermostat AT 90	80 155 200	<ul style="list-style-type: none"> • For underfloor heating systems • Fully wired in conjunction with the Logamatic 4000
Heating circuit quick installation sets		
With high efficiency pump, efficiency category A, white	8 718 577 628	<ul style="list-style-type: none"> • HS 25/4 E plus, white • For 1 heating circuit without mixer, DN 25, high efficiency pump, permanent magnet motor, 4 m pump
With high efficiency pump, efficiency category A, white	7 747 009 405	<ul style="list-style-type: none"> • HS 25/6 E plus, white • For 1 heating circuit without mixer, DN 25, high efficiency pump, permanent magnet motor, 6 m pump
With high efficiency pump, efficiency category A, white	8 718 577 390	<ul style="list-style-type: none"> • HS 32 E plus, white • For 1 heating circuit without mixer, DN 32, high efficiency pump, permanent magnet motor
With high efficiency pump, efficiency category A, white	8 718 577 385	<ul style="list-style-type: none"> • HSM 15 E plus, white • For 1 heating circuit with mixer, DN 15, high efficiency pump, permanent magnet motor
With high efficiency pump, efficiency category A, white	7 747 010 369	<ul style="list-style-type: none"> • HSM 20 E plus, white • For 1 heating circuit with mixer, DN 20, high efficiency pump, permanent magnet motor

Table 44 Accessories

Accessories	Part no.	Logamax plus
With high efficiency pump, efficiency category A, white	7 747 009 406	<ul style="list-style-type: none"> • HSM 25 E plus, white • For 1 heating circuit with mixer, DN 25, high efficiency pump, permanent magnet motor
With high efficiency pump, efficiency category A, white	8 718 577 393	<ul style="list-style-type: none"> • HSM 32 E plus, white • For 1 heating circuit with mixer, DN 32, high efficiency pump, permanent magnet motor
With high efficiency pump, efficiency category A, EMS inside, white	8 718 577 629	<ul style="list-style-type: none"> • HS 25/4 E plus, white, EMS integral • For 1 heating circuit without mixer, DN 25, high efficiency pump, permanent magnet motor, 4 m pump • WM10 low loss header module, integral
With high efficiency pump, efficiency category A, EMS inside, white	8 718 577 388	<ul style="list-style-type: none"> • HS 25/6 E plus, white, EMS inside • For 1 heating circuit without mixer, DN 25, high efficiency pump, permanent magnet motor, 6 m pump • WM10 low loss header module, integral
With high efficiency pump, efficiency category A, EMS inside, white	8 718 577 392	<ul style="list-style-type: none"> • HS 32 E plus, white, EMS inside • For 1 heating circuit without mixer, DN 32, high efficiency pump, permanent magnet motor • WM10 low loss header module, integral
With high efficiency pump, efficiency category A, EMS inside, white	8 718 577 386	<ul style="list-style-type: none"> • HSM 15 E plus, white, EMS inside • For 1 heating circuit with mixer, DN 15, high efficiency pump, permanent magnet motor • MM10 mixer module, integral
With high efficiency pump, efficiency category A, EMS inside, white	8 718 577 387	<ul style="list-style-type: none"> • HSM 20 E plus, white, EMS inside • For 1 heating circuit with mixer, DN 20, high efficiency pump, permanent magnet motor • MM10 mixer module, integral
With high efficiency pump, efficiency category A, EMS inside, white	8 718 577 389	<ul style="list-style-type: none"> • HSM 25 E plus, white, EMS inside • For 1 heating circuit with mixer, DN 25, high efficiency pump, permanent magnet motor • MM10 mixer module, integral
With high efficiency pump, efficiency category A, EMS inside, white	8 718 577 395	<ul style="list-style-type: none"> • HSM 32 E plus, white, EMS inside • For 1 heating circuit with mixer, DN 32, high efficiency pump, permanent magnet motor • MM10 mixer module, integral
Connection set ES0	67 900 475	<ul style="list-style-type: none"> • ES0 for heating circuit connection set DN 15/20/25 fitted on distributor DN 32
Adaptor set ÜS1	63 012 350	<ul style="list-style-type: none"> • For connecting a heating circuit quick installation set DN 32 to a distributor DN 25
Adaptor set ÜS2	63 210 008	<ul style="list-style-type: none"> • For HKV 32 combined with HS 25, HSM 15/20/25 • Installed height 50 mm • For the same installed height of DN 15/20/25 with DN 32
Adaptor set ÜS3	63 034 128	<ul style="list-style-type: none"> • Adaptor set G 1½ to G 1¼
Adaptor set	5 024 886	<ul style="list-style-type: none"> • DN 40 to DN 32, with flat gaskets, G 2 to G ½

Table 44 Accessories

Accessories	Part no.	Logamax plus
Adaptor set	5 024 888	<ul style="list-style-type: none"> • DN 40 to DN 32, conical, G 2 to R 1½ • For connecting distributors HKV 4/25/40 and HKV 5/25/40
Pipe assembly for heat meter	80 680 154	<ul style="list-style-type: none"> • ¾", heat meter installed length 110 mm • For installation upstream of the heating circuit set, height approx. 200 mm • For standard heat meters made by Pollux and Deltamess
Pipe assembly for heat meter	80 680 156	<ul style="list-style-type: none"> • 1", heat meter installed length 130 mm • For installation upstream of the heating circuit set, height approx. 200 mm • For standard heat meters made by Pollux and Deltamess
Pipe assembly for system separation	80 680 158	<ul style="list-style-type: none"> • For existing systems with pipes permeable to oxygen; black thermal insulation • For system separation, installed height approx. 200 mm, DN 25 • Up to 15 kW with Grundfos Alpha 2, ΔT = 10 K • For installation below a heating circuit quick installation set DN 15/DN 20/DN 25 • With safety valve 3 bar • With pressure gauge, drain & fill valve and air vent valve; stainless steel plate heat exchanger • Requires a minimum clearance on the r.h. side of 150 mm

Table 44 Accessories



All EC pumps can be manually switched to operate in their various stages.

8.4.5 Residual head of the heating circuit connection set

HS 25/4-E plus

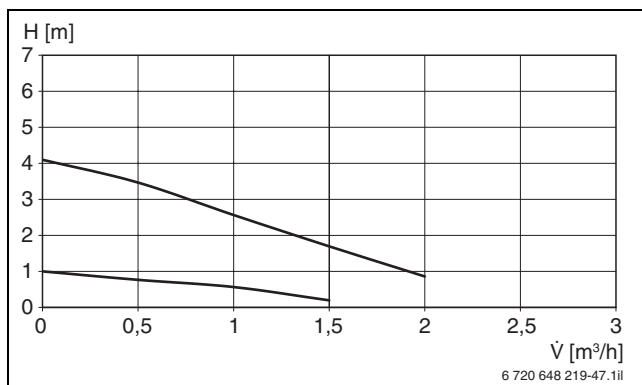


Fig. 89 Residual head HS 25/4-E plus

H Residual head
V Heating circuit flow rate

HS 25/6-E plus

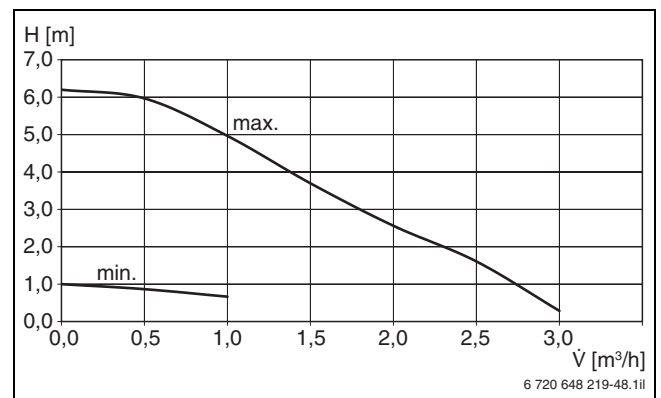


Fig. 90 Residual head HS 25/6-E plus

H Residual head
V Heating circuit flow rate

HS 32-E plus

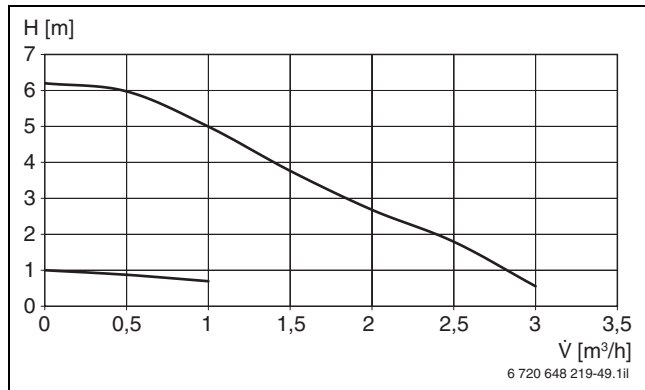


Fig. 91 Residual head HS 32-E plus

H Residual head
 \dot{V} Heating circuit flow rate

HSM 15-E plus

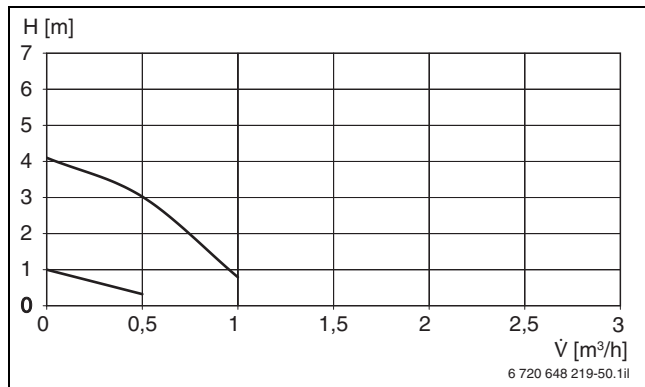


Fig. 92 Residual head HSM 15-E plus

H Residual head
 \dot{V} Heating circuit flow rate

HSM 20-E plus

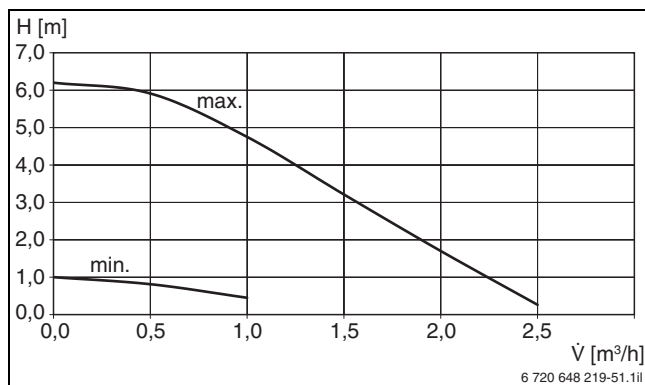


Fig. 93 Residual head HSM 20-E plus

H Residual head
 \dot{V} Heating circuit flow rate

HSM 25-E plus

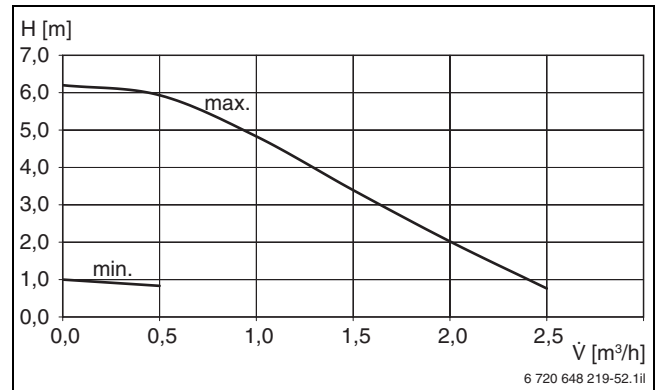


Fig. 94 Residual head HSM 25-E plus

H Residual head
 \dot{V} Heating circuit flow rate

HSM 32-E plus

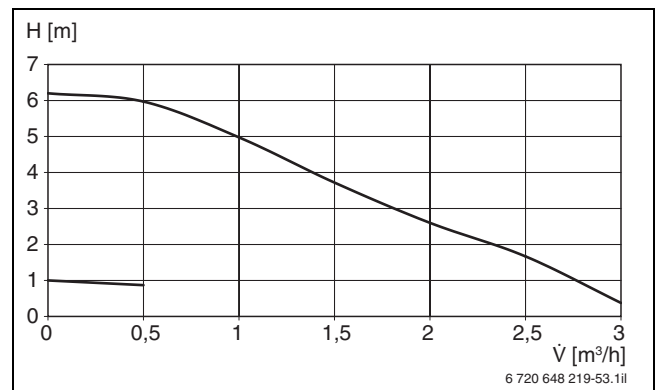


Fig. 95 Residual head HSM 32-E plus

H Residual head
 \dot{V} Heating circuit flow rate

8.5 Heat exchanger recognition set for gas condensing boilers

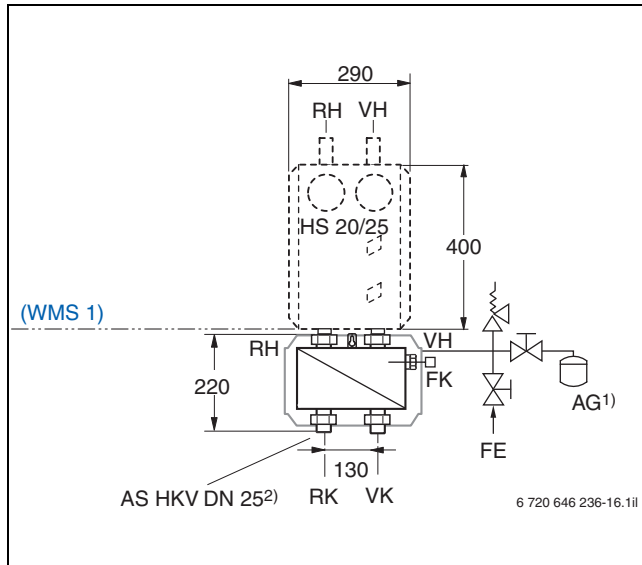


Fig. 96 Dimensions of heat exchanger recognition set with integral heating circuit pump (dim. in mm)

- AG** Expansion vessel
- FK** Flow temperature sensor
- FE** Drain & fill valve (DFV)
- RH** Heating circuit return
- RK** Boiler return
- VH** Heating circuit flow
- VK** Boiler flow

- 1) Install expansion vessel on site
- 2) Adaptor from G 1¼ to R 1 (order as an accessory)

Application in underfloor heating systems with pipes that are permeable to oxygen or in system where antifreeze is to be used for specific heating circuits.

The heating circuit downstream of the heat exchanger is protected by a safety set.

Size the expansion vessel on site to DIN 4807 and DIN-EN 12828.

Maximum transfer capacity of the system separation for heating circuits with $\Delta T = 10\text{ K}$ and 200 mbar pressure drop:

HS 25/4 E plus	8.5 kW
HS 25/6 E plus	15 kW
HSM15 E plus	7 kW
HSM 20 E plus	15 kW
HSM 25 E plus	15 kW

Table 45

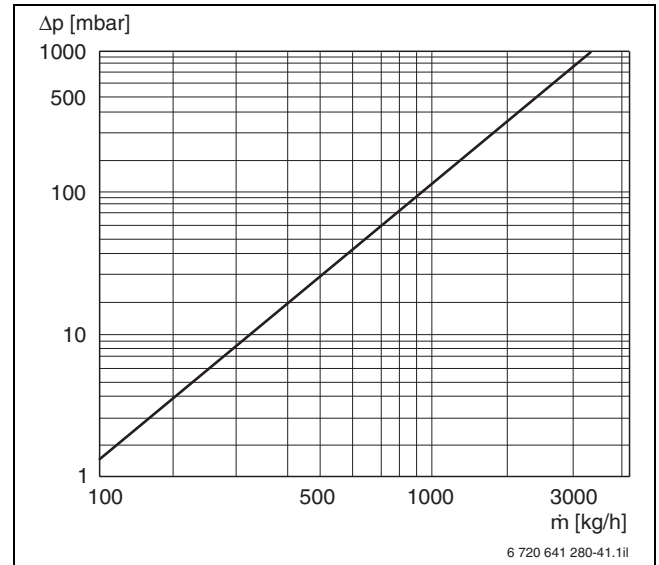


Fig. 97 Pressure drop curve of the heat exchanger

- Δp Pressure drop
- \dot{m} Mass flow rate

The pipe assembly for system separation includes a copper-soldered stainless steel heat exchanger, a 2.5 bar safety valve, a pressure gauge, a drain & fill valve and a G ¾ connection for an on-site expansion vessel.

The insulation of the low loss header across is used as thermal insulation.

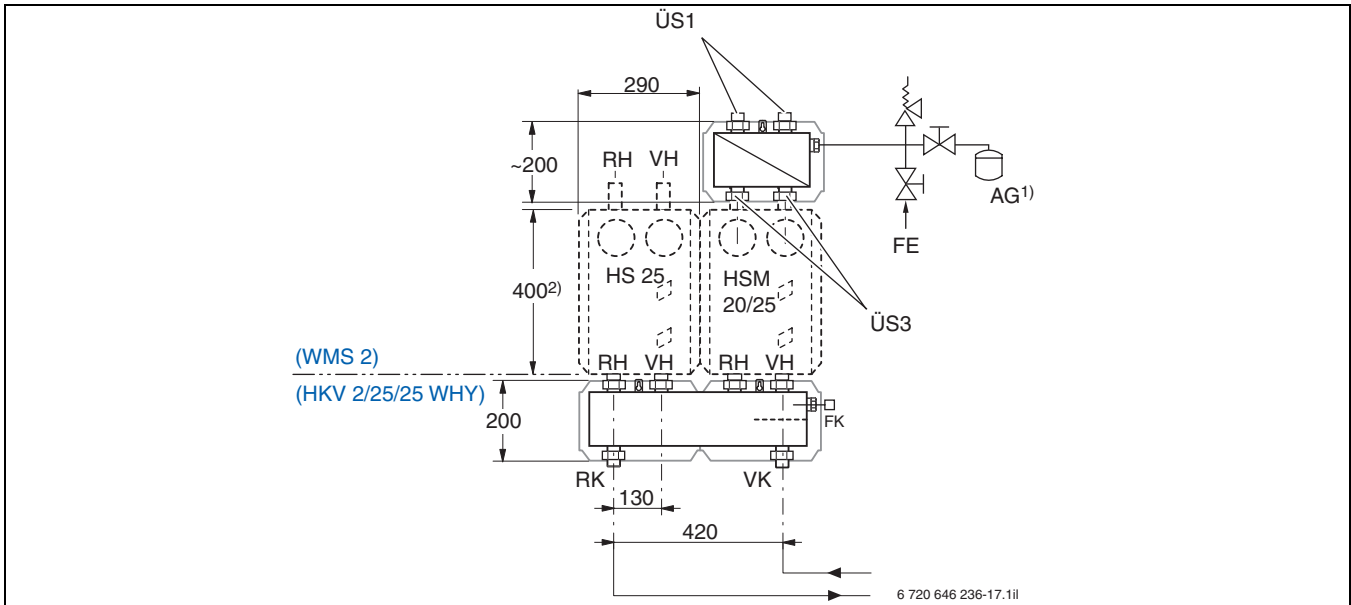


Fig. 98 Dimensions of the system separation set heating circuit distributor DN 25 with integral low loss header for two heating circuits (dim. in mm)

- AG** Expansion vessel
- FK** Flow temperature sensor
- FE** Drain & fill valve (DFV)
- RH** Heating circuit return
- RK** Boiler return
- ÜS1** Adaptor set G 1¼ to G 1½ (part no. 63 012 350), on-site pump
- ÜS3** Adaptor set G 1½ to G 1¼ (part no. 63 034 128)
- VH** Heating circuit flow
- VK** Boiler flow
- 1) Install expansion vessel on site
- 2) Height of the heating circuit quick installation sets HSM 15(-E), HSM 20(-E), HSM 25(-E) and HS 25(-E)

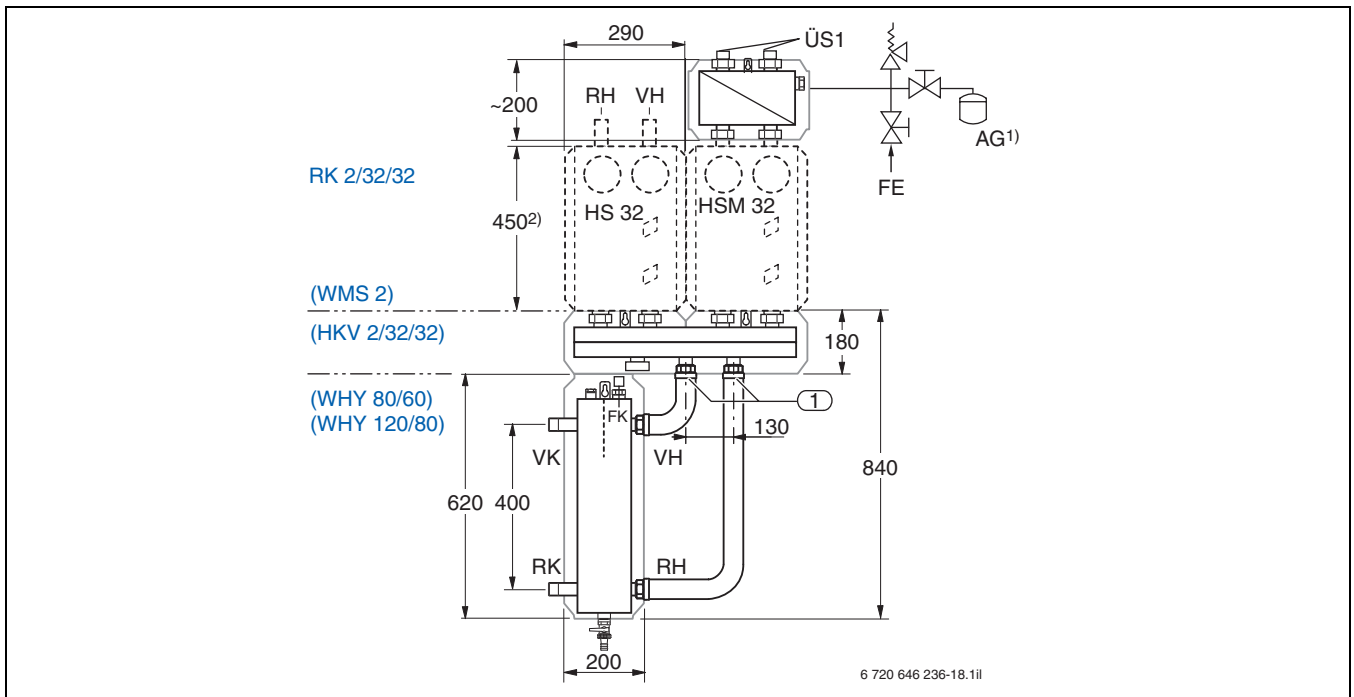


Fig. 99 Dimensions of the system separation set with components DN 32 (dim. in mm)

- AG** Expansion vessel
FK Flow temperature sensor
FE Drain & fill valve (DFV)
RH Heating circuit return
RK Boiler return
ÜS1 Adaptor set G 1¼ to G 1½ (part no. 63 012 350), on-site pump
VH Heating circuit flow
VK Boiler flow
1 Connection pipes
- 1) Install expansion vessel on site
 2) Height of the heating circuit quick installation sets HSM 32(-E) and HS 32(-E)

8.6 Transferable output of the heating circuit quick installation sets

Set	K _{VS} in m ³ /h	Transferable output at ΔT = 20K and 200 mbar in kW
HSM 15 E plus	2.5	16
HSM 20 E plus	6.3	40
HSM 25 E plus	8	45
HSM 32 E plus	18	55
HS 25/4 E plus	–	30
HS 25/6 E plus	–	50
HS 32 E plus	–	55

Table 46 Transferable output of the heating circuit quick installation sets

8.7 Heat meter set

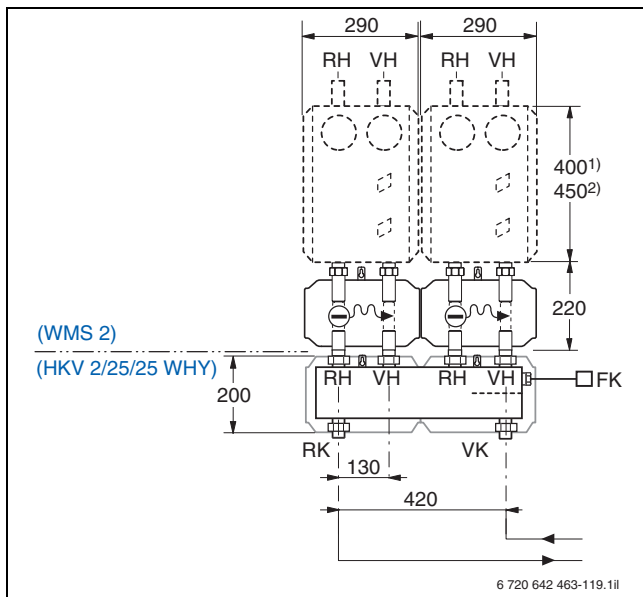


Fig. 100 Dimensions of the heat meter set (dim. in mm)

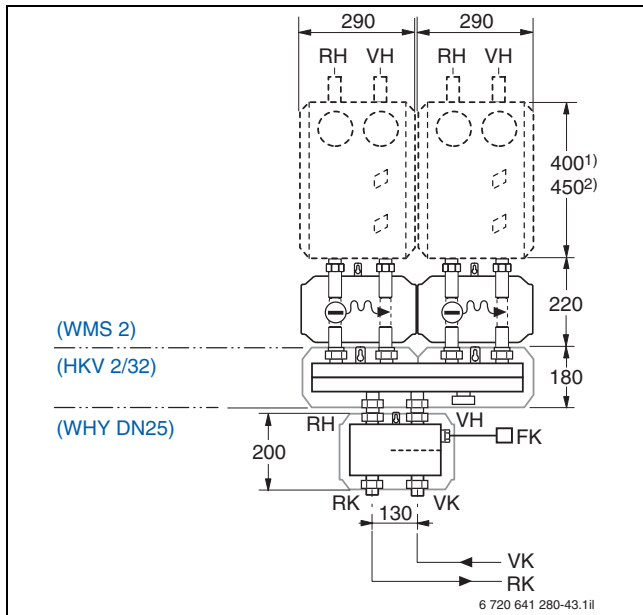


Fig. 101 Dimensions of the heat meter set with heating circuit distributor (dim. in mm)

Key to Fig. 100 and Fig. 101:

- FK** Flow temperature sensor
- RH** Heating circuit return
- RK** Boiler return
- VH** Heating circuit flow
- VK** Boiler flow

- 1) Height of the heating circuit quick installation sets HSM 15, HSM 20, HSM 25 and HS 25
- 2) Height of the heating circuit quick installation sets HSM 32 and HS 32

The compact heat meters made by Pollux and by Deltamess can be used (→ current Buderus catalogue of heating accessories, chapter “Measuring and control technology”). Alternative heat meters cannot be used, as the insulation is matched to Pollux and Deltamess products. The heat meter is not part of the standard delivery of the set.

The heat meter set is available in two versions. One version for the heat meter of 110 mm length, 3/4" flat gasket for the heat meter made by Pollux and Deltamess, and one for 130 mm length, 1" flat gasket. The set can be mounted immediately below a heating circuit quick installation set. The thermal insulation of the low loss header across is used as insulation, creating a harmonious design together with the heating quick installation set.

Combination	Required accessories	
	Connection set ES 0 (part no. 6 7900 475)	Adaptor set ÜS1 (part no. 6 3012 350)
Installation of the WMZ set on HKV DN 25	–	–
Installation of the WMZ set on HKV DN 32	Yes	–
Fitting a HKS DN 25 onto the WMZ set	–	–
Fitting a HKS DN 32 onto the WMZ set	–	Yes

Table 47 Accessories for different combinations

9 Flue systems for open flue operation

9.1 General information for open flue operation

9.1.1 Regulations

In accordance with the [German] Technical Rules for Gas Installations DVGW-TRGI 2008, the contracted installer must seek the agreement of the responsible flue gas inspector prior to commencement of work on the flue system or notify the flue gas inspector of the installation in writing. In this connection, observe the relevant national and regional regulations. It is recommended to ask the flue gas inspector to confirm his participation in writing.



Gas combustion equipment must be connected to the flue on the same floor where it is installed.

Important standards, ordinances, regulations and directives concerning the sizing and implementation of flue systems are as follows:

- EN 483
- EN 677
- DIN-EN 13384-1 and DIN-EN 13384-2
- DIN 18160-1 and DIN 18160-5
- Technical Rules for Gas Installations DVGW-TRGI 2008 [Germany]
- Landesbauordnung (LBO) [Germany]
- Muster-Feuerungsverordnung (MuFeuVO) [Germany]
- Feuerungsverordnung (FeuVO) of the relevant Federal State [Germany]

9.1.2 System certification

The flue of the Buderus sets GA, ÜB-Flex with GA, GA-X with GA-K, ÜB-Flex with GA-X and GA-K, GA-X with LAS-K for connection to a moisture-resistant flue system (LAS-multiple connection) and GN have been system-certified together with the Logamax plus GB172/GB172T gas condensing boiler for open flue operation.

The system certification complies with the Gas Appliances Directive 90/396/EEC as well as the EN 483 and EN 677 standards. Joint approval of the Buderus set with the appliance is documented by the corresponding CE designation. The CE designation is listed in the technical guide of the relevant gas condensing boiler. No additional CE approval of the flue system is required.

The application limits of the Buderus sets for open flue operation of the Logamax plus GB172/ GB172T were finally determined. Special determinations for the implementation of the respective flue or air/flue pipe, the maximum permissible overall flue length and the number of diversions within the flue line are summarised on pages 124 to 131.

A calculation of the flue system to DIN-EN 13384-1/2 is not required. The manufacturer of the moisture-resistant chimney or air/flue gas system must only calculate the size of the moisture-resistant chimney in connection with the Buderus GN and LAS-K sets.

9.1.3 General requirements of the installation room

Observe all building regulations and the Technical Rules for Gas Installations applicable to installation rooms (DVGW-TRGI 2008 [Germany]). The installation room must be free from the risk of frost.

Combustion air must be free from excessive dust levels and from halogenated compounds or other corrosive substances. Otherwise there would be a risk of damage to the burner and the heating surfaces.

Halogen compounds are highly corrosive. They are contained, for example, in spray cans, thinners, cleaning & degreasing agents and in solvents.



Easily inflammable and explosive materials or liquids must not be stored or used in the vicinity of the gas condensing boiler.

The maximum surface temperature of the gas condensing boiler and the flue is less than 85 °C. Therefore, minimum clearances towards combustible building materials need not be observed. The boiler can, for example, be installed on a wooden wall (→ DVGW-TRGI 2008, section 8.1.6).

The boiler can be installed without side clearances. All maintenance can be carried out from the front.

Prohibited installation areas

Gas appliances must not be installed in essential stairways (e.g. escape routes), in rooms with essential stairways and exits to the outdoors as well as in essential hallways. This does not apply to buildings of building categories 1 and 2.

Gas appliances must also never be installed in any rooms or parts thereof that are subject to explosion protection.

The following rooms are not permissible for gas appliances category B:

- Bathrooms and toilets without windows to the outside that are vented via common shafts and ducts without fan assistance

- Rooms or apartments from which fans extract air

Exceptions

- The installation areas feature adequate vents to the outside.
- The flue gas is routed to the outside by fans via ventilation and flue systems in accordance with DVGW Code of Practice G 626 [Germany].
- The measures specified in section 8.2.2.3 of the DVGW-TRGI 2008 are maintained.
- Rooms or utility areas where combustion equipment is installed (e.g. fireplaces) that is normally operated with an open flue

Exceptions

- The requirements in section 9.2.1, first paragraph of the DVGW-TRGI 2008 are met in individual cases.
- The gas condensing boilers are located in rooms where their operational reliability cannot be put at risk from the operation of open fireplaces.
- The combustion equipment does not have its own combustion air supply.

Installation room conditions

Install gas appliances type B_{23P} (formerly B₂₃) in rooms that feature a vent leading to the outside of at least 150 cm² or two vents of 75 cm² each; alternatively pipes towards the outside with cross-sections offering the equivalent flow rate.

An additional 2 cm² are required for every kilowatt in excess of 50 kW total rated output.

Wire mesh and grilles must not reduce the required cross-section.

Gas appliances type B₃₃ may be installed in rooms with or without a door to the outside or window that can be opened, independent of the volume of the room, subject to an adequate supply of combustion air and correct flue gas routing being ensured (interconnected room air supply to DVGW-TRGI 2008, section 9.2.2).

Installation room for rated output ≤ 100 kW

The open flue operation of the Logamax plus GB172/GB172T with rated heating output of up to 100 kW requires no special installation room.

In accordance with DVGW-TRGI 2008, the installation of the Logamax plus GB172/GB172T gas condensing boiler is **not permissible in occupied rooms** when used in conjunction with **sets GA and GN** (appliance type B_{23P} (former designation B₂₃)).

The installation room must have vents to the outside with the following cross-sections:

- ≤ 50 kW: 1 × 150 cm² or 2 × 75 cm²
- > 50 kW: The ventilation apertures must be at least 150 cm² plus 2 cm² for every kilowatt above a total rated output in excess of 50 kW.

However, the installation of the Logamax plus GB172/GB172T gas condensing boiler **is permissible in occupied rooms** when used in conjunction with **set GA-X** (appliance type B₃₃). The output of the specified gas condensing boilers lies below 35 kW, and no flue gases can enter the installation room with air/flue gas routing via the GA-X set, since the flue inside the installation room is surrounded by combustion air. However, the adequate supply of combustion air must be ensured in compliance with DVGW-TRGI 2008, section 9.2, via an interconnected combustion air supply.

For open flue operation, the installation room must meet the following requirements:

- The installation room must not be used for other purposes, except the following:
 - For routing services into the building, including their shut-off, control and measuring facilities
 - For the installation of combustion equipment for liquid fuels, heat pumps, CHP modules or permanently fixed internal combustion engines
 - For the storage of fuels
- The installation room must not have any opening to other rooms except doorways.
- The doors to the installation room must be tight and self-closing.
- The installation room must be able to be vented.

For solid fuel combustion equipment the rated output must not exceed 50 kW. If that is the case, the structural requirements for boiler rooms must be met.

Install an emergency stop switch outside the installation room in accordance with DVGW-TRGI 2008, section 8.1.4.2 [or local regulations].

9.1.4 Air/flue gas line

Buderus sets

The flue that is part of the Buderus set is made from plastic. It is installed as a complete pipe system or as a connection piece between the gas condensing boiler and a moisture-resistant chimney.

The flue systems are categorised in accordance with DIN-EN 14471. The flue systems certified by Buderus as systems correspond to the following classification (→ Fig. 102):

- System-certified flue systems 1
 - Internally PP, externally steel, e.g. GA-K, GAF-K, DO
 - EN 14471 T120 H1 o W 2 O00 E D L0

- System-certified flue systems 2 internally PP, externally PP, e.g. DO-S
 - EN 14471 T120 H1 o W 2 O00 I D L1
- System-certified flue systems 3 single wall PP, e.g. GA, GN
 - Combined with Logamax plus GB172/GB172T, with flue gas temperatures < 85 °C, EN 14471 T120 H1 o W 2 O00 I D L applies
 - If the approval of the flue system with flue gas temperatures of 120 °C is utilised, EN 14471 T120 H1 o W 2 O20 I D L applies

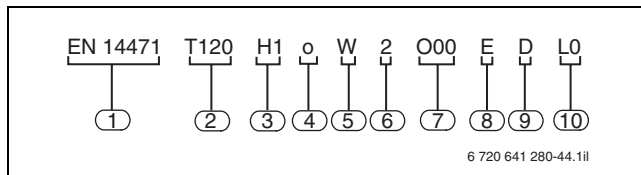


Fig. 102 Identification using system-certified flue system 1 as an example

- 1 Standard number
- 2 Temperature class
- 3 Pressure category
- 4 Soot fire resistance
- 5 Condensate resistance
- 6 Corrosion resistance
- 7 Clearance from combustible materials
- 8 Installation location
- 9 Fire resistance
- 10 Casing

Explanation of the identification for Buderus

- Temperature category T120
 - Permissible flue gas temperature ≤ 120 °C
 - Test temperature 150 °C
- Pressure category H1
 - Leakage rate $0.006 \text{ l}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$
 - Test pressure 5000 Pa high pressure flue systems
- Soot fire resistance category o
 - Flues that are not resistant to soot fires
- Condensate resistance category W
 - Flues for moist operation
- Corrosion resistance category 2
 - Fuel oil with a sulphur content up to 0,2 % (also applicable to gas)
- Clearance from combustible materials
 - The clearance of the outer casing of a flue system to combustible materials is designated Oxx. Value xx is stated in mm. Example: O50 corresponds to a clearance of 50 mm

- The clearance towards combustible materials applies when utilising the temperature category T120. If this is considered in conjunction with a boiler, then the maximum possible flue gas temperature of the boiler is critical. If that lies below 85 °C, then no clearance is required. This must be specified in the manufacturer's documentation. Therefore, when using single walled pipes with the Logamax plus GB172/GB172T, O00 applies.
- Installation location
 - Category I for the installation of the flue system or parts of the flue system inside a building
 - Category E for the installation of the flue system or parts of the flue system inside or outside a building
- Fire resistance category D (fire characteristics)
 - Not insignificant contribution to a fire
- Casing categories
 - L0 for non-flammable casing
 - L1 for flammable casing
 - L for designs without casing



The flue system must be identified as system-certified following installation. For this purpose, an ID label is therefore supplied with each standard set (→ Fig. 103).

Diesen Aufkleber an der Abgaseinführung als zusätzliche Kennzeichnung der Abgasanlage anbringen.

Buderus D – 35573 Wetzlar

**Systemzertifizierte Abgasanlage für Buderus
Gas-Brennwertkessel Logamax plus**
sowie
Öl/Gas-Brennwertkessel Logano plus

Zulässige Installationsarten und Produktidentnummer siehe Kesseltypenschild. Zulässige maximale Baulängen und weitere Informationen entnehmen Sie bitte der Montageanleitung des Abgassystems oder der Planungsunterlage.

Die Produkte der Abgasanlage erfüllen ebenfalls die Anforderungen der EN14471 und können somit bei von der Systemzertifizierung abweichenden Installation gemäß nationaler Verwendungsregeln und den Produktvorgaben der CE-Zertifizierung 0036 CPD 9169 003 verwendet werden. Hierbei gilt:

Abgasleitung

- für Überdruck / Unterdruck
- für Brennstoffe Gas oder Heizöl EL
- maximal zulässige Abgastemperatur 120 °C
- Kennzeichnungsklassen:

einwandig:	EN14471 T120 H1 O W2 O20 I D L
konzentrisch:	EN14471 T120 H1 O W2 O00 E D L0

6 720 642 463-76.11l

Fig. 103 ID label for system certification

Combustion air supply

With open flue operation, the fan of the gas condensing boiler draws in the required combustion air from the installation room. A special ventilation air grille prevents the ingress of foreign bodies. It is part of the standard delivery of Buderus standard sets GA, GA-X and GN.

Condensate drain from the flue

To ensure the safe drainage of condensate, the flue must be installed with a 3° slope (5 cm/m) from the vertical section of the flue system towards the boiler. In the case of longer horizontal flue sections it may be necessary to support the horizontal section on site to ensure the correct slope towards the boiler. The condensate from the flue and from the flue gas header in the gas condensing boiler flows directly into the stench trap (siphon) of the gas condensing boiler.

Drain the condensate from the moisture-resistant flue on site when connecting to a moisture-resistant flue system with the Buderus sets GN or GA-X with LAS-K (LAS multiple connection).



Route the condensate from the gas condensing boiler (the flue) and the moisture-resistant flue correctly to the public sewer, or neutralise it if required. Special design information regarding condensate drainage → chapter 7.

Shafts for flues



Shafts for flues must not be used for any other purpose.

Flues that bridge several floors must be arranged in their own shafts inside buildings.

Exceptions

- Flues in building categories 1 and 2, provided that the flue is not routed through more than one utility unit. Building categories 1 and 2 are those with a height to the top edge of the floor on the highest storey that could house an installation room of no more than 7 m on average above ground level, and with no more than two utility units of no more than 400 m² in total **or**
- Flues with a single connection inside the room where the combustion appliance is installed **or**
- Flues operated with negative pressure:
 - that offer a fire resistance of at least 90 minutes (ID L90 or higher) **and**
 - in building categories 1 and 2 that offer a fire resistance of at least 30 minutes (ID L30 or higher).

Several flues in a common shaft are only permissible if:

- the flues are made from non-combustible materials **or**
- the associated combustion equipment is installed on the same floor **or**
- a transfer of fire between floors is prevented through an automatic shut-off facility or other measures **or**
- the flue has received general Building Regulations approval.

These shafts must offer:

- a fire resistance of at least 90 minutes **and**
- in building categories 1 and 2 a fire resistance of at least 30 minutes.

Routing solar lines through existing shafts for flues

Deviating from para. 7 sect. 5 FeuVO [Germany], retrospective routing of solar lines in existing flue shafts can be acceptable under the following conditions:

- The retrospective routing of solar lines in existing flue shafts is limited to building categories 1 and 2 (para. 2 sect. 3 sentence 1 no. 1 and 2 MBO) and to solar lines that transport water only.
- The heat transfer of solar lines and fittings should be limited by means of thermal insulation in accordance with the Energy Savings Order dated 16 November 2001, appendix 5, table 1 [Germany]. Alternatively, from a building regulations point of view, the minimum thickness of thermal insulation can also be halved. The insulating layers must be resistant to the maximum applicable temperatures inside the solar lines as well as to the temperature stresses resulting from the flue system.
- Ensure the safe operation of the combustion system by a calculation to DIN-EN 13384-1: 2003 03.
- The inside wall of the shaft must be smooth and free from protrusions; all-round adequate secondary ventilation (annular gap) must still be ensured after the installation of the solar lines. Ensure the stability of the flue system as well as the permanent retention of the solar lines and the sensor lead. Permanently prevent any contact between the flue and the thermally insulated solar lines.
- The clearance between the solar line (including thermal insulation) and flue line must be:
 - at least 2 cm for flues with circular cross-sections inside a rectangular shaft
 - at least 3 cm for flues with circular cross-sections inside a circular shaft **and**
 - at least 3 cm for flues with rectangular cross-sections inside a rectangular shaft.
- Using appropriate material, seal the remaining cross-sections in the shaft wall apertures through which the solar lines are routed.
- The solar lines including their thermal insulation must correspond to the requirements of the flue where their temperature resistance is concerned.

9.1.5 Inspection apertures

According to DIN 18160-1 and DIN 18160-5, flue systems for open flue operation must be able to be inspected and cleaned easily and safely. For this, allow for inspection apertures (→ Fig. 104 and Fig. 105).



When arranging the inspection apertures, comply with the requirements of DIN 18160-5 as well as all locally applicable building regulations. For this we recommend contacting your local flue gas inspector [where appropriate].

Position of the lower inspection aperture

- When connecting the Logamax plus GB172/GB172T to a flue, provide a low level inspection aperture
 - in the vertical section of the flue, immediately above the flue diversion,
 - at the face of the straight horizontal flue section, no further than 1 m from the diversion into the vertical section, subject to there being no diversion in between (→ Fig. 104, page 123) **or**
 - in the side of the horizontal section of the flue, no further than 30 cm from the diversion into the vertical section (→ Fig. 105).
- When connecting the gas condensing boilers to a moisture-resistant flue system (LAS multiple connection), provide a lower inspection aperture below the lowest connection at the base of the vertical section of the moisture-resistant flue (LAS).
- Provide a floor area of at least 1 m × 1 m to DIN 18160-5 in front of the lower inspection aperture.

Position of the upper inspection aperture

- An upper inspection aperture is not required if:
 - The internal diameter of the flue is \leq DN 200.
 - The lower inspection aperture at DN 160 and DN 200 is arranged in accordance with Fig. 105
 - The lower inspection aperture is located no further than 15 m from the terminal
 - The vertical flue section is routed at an angle of no more than 30° (corbelled)
 - The lower inspection aperture is implemented in accordance with DIN 18160-1 and 18160-5 (→ Fig. 104)
- Upstream and downstream of every diversion in excess of 30° , an additional inspection bend is required.
- Provide a floor area of at least 0.5 m × 0.5 m to DIN 18160-5 in front of the upper inspection aperture.

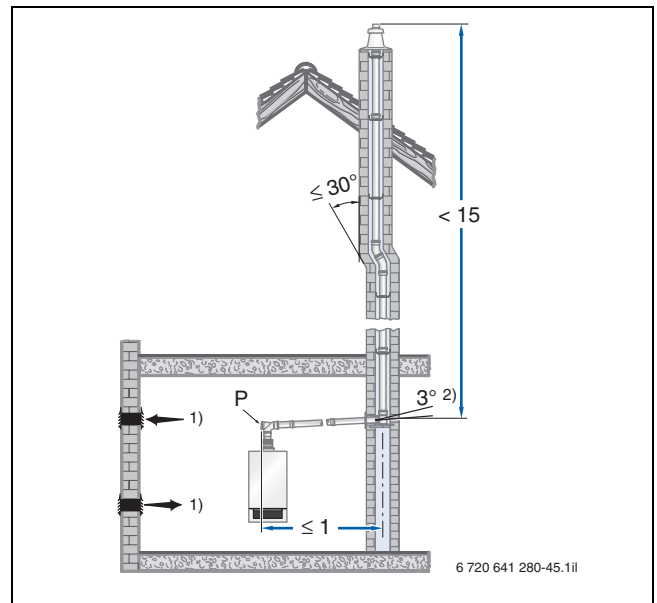


Fig. 104 Example with the inspection aperture (P) located in a horizontal flue without diversions in the installation room (dim. in m)

- 1) Vent to the outside
- 2) $3^\circ = 5 \text{ cm/m}$

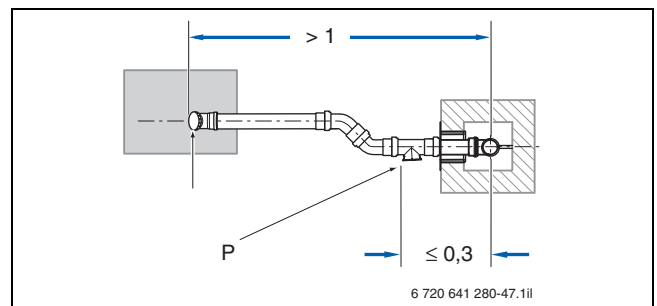


Fig. 105 Example with the inspection apertures (P) located in a horizontal flue with diversions in the installation room - top view (dim. in m)

9.2 Flue gas routed through a flue inside a shaft with GA set and secondary ventilation

Appliance type B_{23P} (formerly B₂₃)

Observe the general information on page 119 ff.

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾	Reduction of the total length for each additional pipe diversion ²⁾
	in m	in m
-14...	25	0
-20...	25	0
-24...	25	1.5

Table 48 Maximum permissible total flue length (→ Fig. 107)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set; horizontal length L₁ ≤ 2 m
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Adequate combustion air supply

According to the Technical Rules for Gas Installations DVGW-TRGI 2008 [Germany], the adequate supply of combustion air in the installation room requires vents towards the outside with a free cross-section of 1 × 150 cm² or 2 × 75 cm².

Maintain the minimum dimensions of the shaft cross-section to ensure that the free cross-section is adequate for the secondary ventilation of the flue (→ Fig. 106).

Inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 123 f.).

Shaft terminal in conjunction with combustion equipment for solid fuel

If the shaft cover of the GA set and the chimney terminal of combustion equipment for solid fuel are side by side, then the shaft cover must be made from non-combustible material. In such applications use the standard GA set with stainless steel shaft cover and terminal pipe (→ Fig. 107).

If there is a risk of soot fire in the adjacent chimney, the plastic flue must be at least 50 mm away from the wall of the adjacent chimney (according to the state combustion order [Germany]). Where this cannot be ensured, design the flue using non-combustible materials (e.g. stainless steel → Fig. 106) and route it inside the shaft used for the condensing boiler.

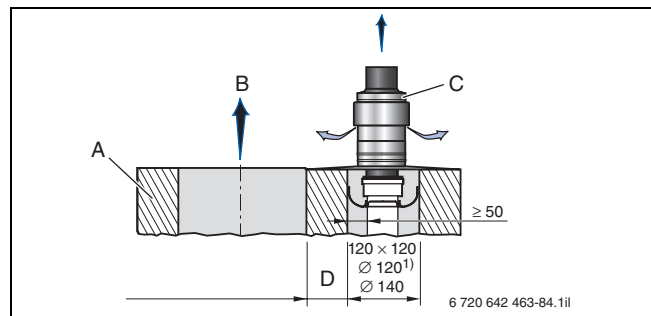


Fig. 106 Minimum dimensions of the shaft cross-section and the shaft terminal for the flue (dim. in mm)

- A Chimney F 90
- B Flue gas from the combustion equipment for solid fuel
- C Stainless steel shaft cover
- D Minimum wall thickness for chimney F90 (L90)
- 1) Required shaft cross-section with ≤ 1.5 mm surface finish

GA set

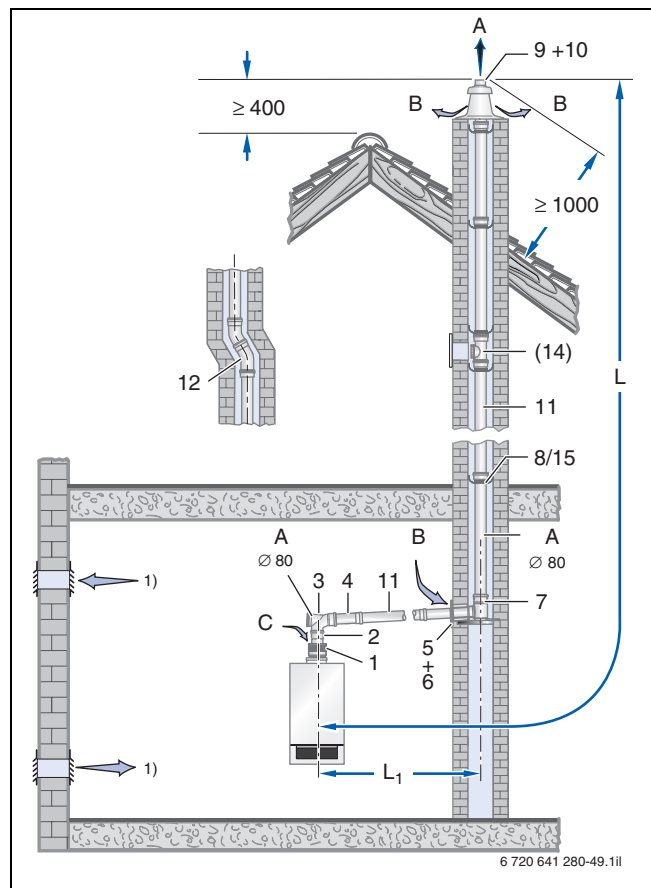
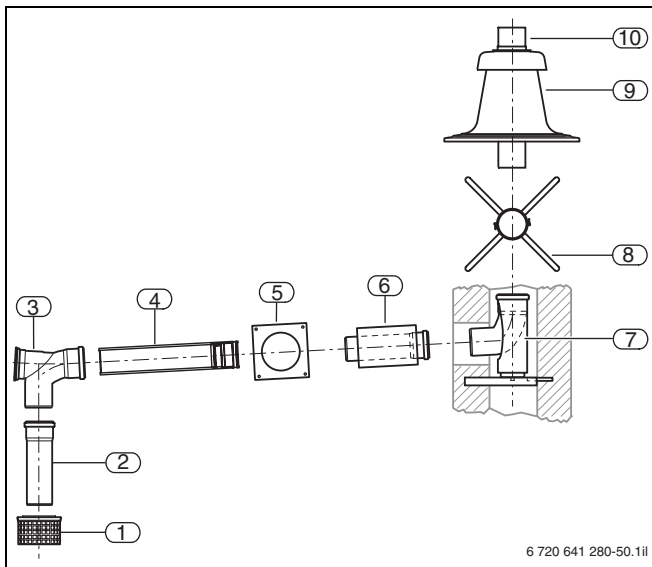


Fig. 107 Installation version (dim. in mm)

- A Flue gas
- B Secondary ventilation
- C Supply air
- 1) Vent to the outside 1 × 150 cm² or 2 × 75 cm²



- 1 Ventilation air grille
- 2 Flue pipe, 250 mm long
- 3 Inspection bend
- 4 Flue pipe, 500 mm long
- 5 Cover
- 6 Concentric wall outlet,
Ø 80 mm, 500 mm long
Ø 125 mm, 300 mm long
- 7 87° bend including support and support rail
- 8 Spacer (6 pce)
- 9 Shaft cover
- 10 Terminal pipe without female connection,
Ø 80 mm, 500 mm long

The following are also part of the standard delivery:

- One tube Centrocerin
- System certification label

Fig. 108 Plastic components of the GA set

Flue gas routing through a flue with secondary ventilation inside a shaft with GA set	Part no.	Details
Standard set GA for Logamax plus GB172/GB172T		
GA made from PP plastic, Ø 80 mm with stainless steel shaft cover and terminal pipe ¹⁾	87 094 034 87 094 523	Fig. 108
Optional equipment		
Flue pipe pack, Ø 80 mm: 4 pipes 2000 mm, 1 pipe 1000 mm, 2 pipes 500 mm long	77 190 036 69	Fig. 107, pos. 11
Flue pipe, Ø 80 mm, 500 mm long, effective length 450 mm	77 190 015 25	Fig. 107, pos. 11
Flue pipe, Ø 80 mm, 1000 mm long, effective length 950 mm	77 190 015 26	Fig. 107, pos. 11
Flue pipe, Ø 80 mm, 2000 mm long, effective length 1950 mm	77 190 015 27	Fig. 107, pos. 11
87° bend	77 190 015 34	Fig. 107, pos. 12
45° bend	77 190 015 35	Fig. 107, pos. 12
30° bend	77 190 018 51	Fig. 107, pos. 12
15° bend	77 190 018 50	Fig. 107, pos. 12
87° inspection bend	87 094 537	Fig. 107, pos. 3
Pipe with inspection aperture	77 190 015 33	–
Spacer (4 pce)	87 094 614	Fig. 107, pos. 8 and pos. 15
Stainless steel shaft cover and terminal pipe ¹⁾	87 094 920	Fig. 107, pos. 9 and pos. 10
Adaptor plastic Ø 80 mm to stainless steel for the use of stainless steel flue pipes Ø 80 mm made by Raab	77 472 255 08	–

Table 49 Components of the GA set

1) Not in connection with ÜB-Flex

9.3 Concentric air/flue gas routing in open flue operation with GA-X set in conjunction with GA-K or LAS-K set (LAS multiple connection)

Appliance type B₃₃

Observe the general information on page 119 ff.

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾ in m	Reduction of the total length for each additional pipe diversion ²⁾ in m
Standard GA-X set in conjunction with GA-K		
-14...	25	0
-20...	25	0
-24...	25	1.5
Standard GA-X set in conjunction with LAS-K		
All appliances	1.4	0

Table 50 Maximum permissible total flue length (→ Fig. 109)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set; horizontal length L₁ = 2 m
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Adequate combustion air supply

When using the GA-X set, flue gas cannot enter the installation room as the flue is surrounded by combustion air inside the room. Therefore, this method of routing air and flue gas is permissible for occupied rooms, subject to the total output of the open flue combustion equipment not exceeding 35 kW, and an adequate interconnected combustion air supply in accordance with DVGW-TRGI 2008, section 5.5. Alternatively, the installation room requires vents towards the outside (→ Fig. 109).

Minimum dimensions and inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 123 f.).

When using the GA-X set in conjunction with the GA-K set, maintain minimum dimensions of shaft cross-section to ensure that the remaining cross-section is adequate for the secondary ventilation of the flue (→ Fig. 129, page 143). For further requirements when using the GA-K set, → page 143 f.

Air/flue gas system

The GA-X and LAS-K sets enable multiple appliances to be connected to a single air/flue gas system. The manufacturer of the LAS will calculate the required cross-section. [In Germany] the connection of multiple appliances requires the permission of the flue gas inspector.

GA-X set in conjunction with the GA-K or LAS-K set

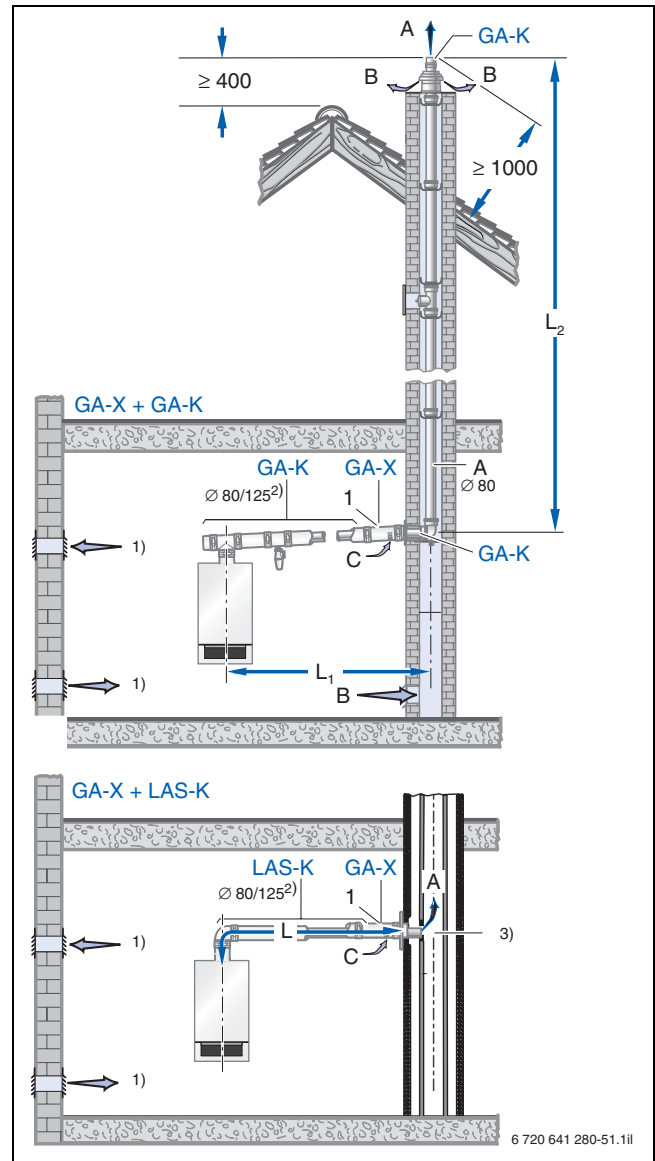


Fig. 109 Installation version (dim. in mm)

- A** Flue gas
- B** Secondary ventilation
- C** Supply air
- 1)** Interconnected combustion air supply to TRGI or vent to the outside 1 × 150 cm² or 2 × 75 cm²
- 2)** Concentric balanced flue
- 3)** The manufacturer of the LAS will calculate and supply the required cross-section

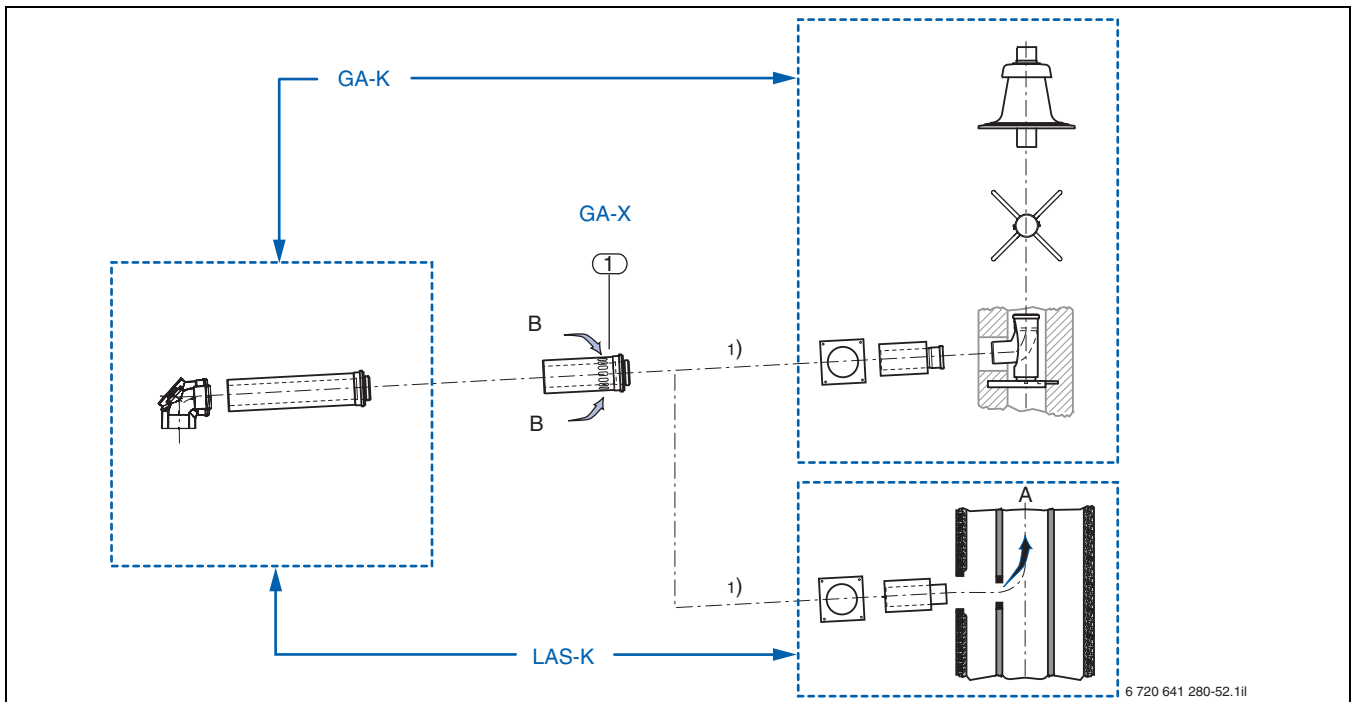


Fig. 110 Components of the standard set GA-X made from plastic, in conjunction with the GA-K standard set (→ Table 62, page 144) or LAS-K (→ Table 73 page 156)

- A Flue gas
- B Supply air
- 1 Concentric pipe with ventilation air grille, gasket for the ventilation air pipe at the female connection
- 1) Alternative

Concentric air/flue gas routing in open flue operation with GA-X set	Part no.	Details
Standard set GA-X for Logamax plus GB172/GB172T		
GA-X in PP plastic/zinc-plated steel (painted white), Ø 80/125 mm	87 094 528	Fig. 110
For concentric air/flue gas routing via a flue with secondary ventilation in a shaft, the standard GA-X set is only permissible in conjunction with the standard GA-K set (GA-K in conjunction with GA-X only permissible up to 35 kW).		
For combining the GA-X standard set with the GA-K standard set:		
GA-K made from PP plastic/zinc-plated steel (painted white), Ø 80/125 mm with shaft cover and terminal pipe made from stainless steel ¹⁾	77 472 153 65 77 472 153 66	Fig. 130, page 143
Air grille	87 092 146	Fig. 109
For concentric air/flue gas routing via a moisture-resistant flue system (multiple connection), the standard GA-X set is only permissible in conjunction with the LAS-K set (LAS-K in conjunction with GA-X only permissible up to 35 kW).		
For combining the GA-X standard set with the LAS-K standard set:		
LAS-K in PP plastic/zinc-plated steel (painted white), Ø 80/125 mm	77 472 153 70	Fig. 142, page 155
Optional equipment		
Components of the air/flue gas line inside the installation room and for flues with secondary ventilation inside shafts: The equipment in addition to the GA-K standard set applies to the Logamax plus GB172/GB172T. However, the use of the GA-K set in conjunction with GA-X is only permissible, in accordance with the DVGW-TRGI 2008, up to a total rated output of the open flue combustion equipment of 35 kW.		Table 62, page 144
Components of the air/flue gas line inside the installation room: The equipment in addition to the LAS-K standard set applies to the Logamax plus GB172/GB172T. However, the use of the LAS-K set in conjunction with GA-X is only permissible, in accordance with the DVGW-TRGI 2008, up to a total rated output of the open flue combustion equipment of 35 kW.		Table 73, page 156

Table 51 Components of the GA-X set in conjunction with the GA-K or LAS-K set

1) Not in connection with ÜB-Flex

9.4 Routing flue gas via flexible flues inside a shaft with the ÜB-Flex set in conjunction with the GA set or with the GA-X and GA-K sets

For the Logamax plus GB172/GB172T the ÜB-Flex set can only be used in conjunction with the GA set or the GA-X and GA-K sets.

Appliance type B_{23P} (formerly B₂₃) – ÜB-Flex set in conjunction with the GA set

Appliance type B₃₃ – ÜB-Flex set in conjunction with the GA-X and GA-K sets

Observe the general information on page 119 ff.

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾	Reduction of the total length for each additional pipe diversion ²⁾
	in m	in m
-14...	25	0
-20...	25	0
-24...	25	1.5

Table 52 Maximum permissible total flue length (→ Fig. 112)

- 1) The installed lengths apply inclusive of the pipe diversions included in the GA-K standard set; horizontal length L₁ ≤ 2 m
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Adequate combustion air supply

Subject to the selected combination, the design information appertaining to the GA set (→ page 124) or that appertaining to the GA-X set, apply in conjunction with the GA-K set (→ page 126). Maintain the minimum dimensions of the shaft cross-section to ensure that the free cross-section is adequate for the secondary ventilation of the flue (→ Fig. 111).

According to the Technical Rules for Gas Installations DVGW-TRGI 2008 [Germany], the adequate supply of combustion air in the installation room requires vents towards the outside with specified cross-sections.

Minimum dimensions and inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 123 f.).

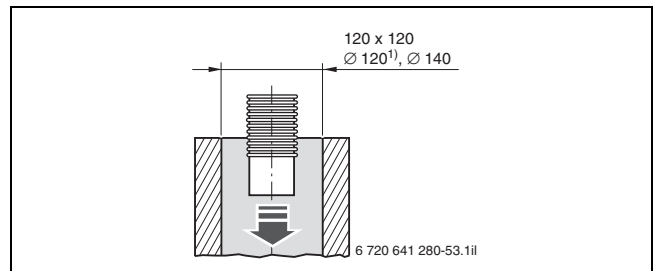


Fig. 111 Minimum dimensions of the shaft cross-section for the installation of the flexible flue (dim. in mm)

- 1) Required shaft cross-section with system certification for ≤ 1.5 mm surface finish

ÜB-Flex set in conjunction with the GA set or the GA-X and GA-K sets

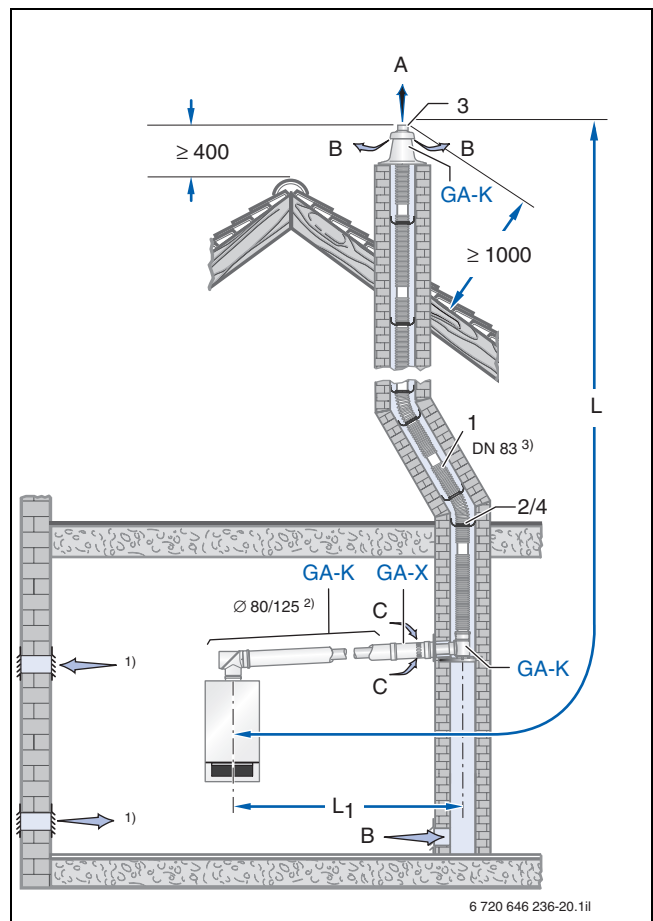
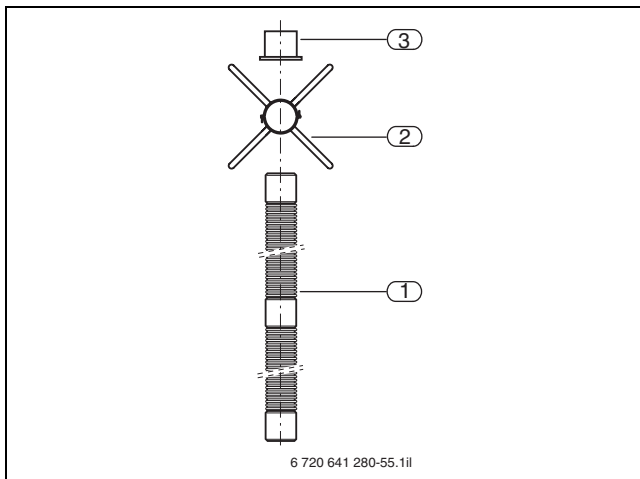


Fig. 112 Installation version (dim. in mm)

- A Flue gas
- B Secondary ventilation
- C Supply air
- 1) Interconnected combustion air supply to TRGI or vent to the outside 1 × 150 cm² or 2 × 75 cm²
- 2) Concentric balanced flue
- 3) Flexible flue pipe



- 1 Flexible flue DN 83, 12.5 m or 25 m long
- 2 Spacer for flexible flue pipe, DN 83, 8 pce (for 12.5 m) or 16 pce (for 25 m)
- 3 Spring ring for bracket, incl. terminal pipe

Fig. 113 Plastic components of the ÜB-Flex set, DN 83

Routing flue gas through a flexible flue inside a shaft with the ÜB-Flex set in conjunction with the GA set or the GA-X and GA-K sets	Part no.	Details
ÜB-Flex standard set for Logamax plus GB172/GB172T		
ÜB-Flex standard set 12.5 m with flexible flue pipe made from PP plastic 12.5 m long	87 094 036	Fig. 113
ÜB-Flex standard set 25 m with flexible flue pipe made from PP plastic 25 m long	87 094 038	Fig. 113
For operating the Logamax plus GB172/GB172T the ÜB-Flex standard set can only be used in conjunction with the GA standard set.		
For combining the ÜB-Flex set with the GA standard set:		
GA made from PP	87 094 034	Fig. 107, page 124
For operating the Logamax plus GB172/GB172T in occupied rooms the ÜB-Flex standard set can only be used in conjunction with the GA-X and GA-K standard sets.		
For combining the ÜB-Flex set with the GA-K and GA-X standard sets:		
GA-X in PP plastic/zinc-plated steel (painted white), Ø 80/125 mm GA-K in PP plastic/zinc-plated steel (painted white), Ø 80/125 mm	87 094 528 77 472 153 65	Fig. 109, page 126 and Fig. 130, page 143
Optional equipment		
Spacer for flexible flue pipe, 4 pce	87 094 614	Fig. 112, pos. 2 and pos. 4
Connecting piece for two flexible flue pipes	87 094 668	–
Pipe with inspection aperture ÜB-Flex	87 094 676	–
Components of the flue inside the installation room (equipment in addition to the GA standard set for the Logamax plus GB172/GB172T)		Table 49, page 125
Components of the air/flue gas line inside the installation room (equipment in addition to the GA-K standard set for the Logamax plus GB172/GB172T). In accordance with the DVGW-TRGI 2008, however, the use of the GA-K set in conjunction with the GA-X is only permissible up to a total rated heating output of combustion equipment up to 35 kW.		Table 62, page 144 and table 51, page 127
Draw-in aid for easy installation of the flexible pipe	87 090 580	–

Table 53 Components of ÜB-Flex set in conjunction with the GA set or in conjunction with the GA-K and GA-X sets, but not in connection with a stainless steel shaft cover and terminal pipe

9.5 Routing the flue gas via a moisture-resistant chimney with set GN

Appliance type B₂₃ (formerly B₂₃)

Observe the general information on page 119 ff.

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾ in m	Reduction of the total length for each additional pipe diversion ²⁾ in m
All appliances	2	0

Table 54 Maximum permissible total flue length (→ Fig. 114)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set.
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Adequate combustion air supply

According to the Technical Rules for Gas Installations DVGW-TRGI 2008 [Germany], the adequate supply of combustion air in the installation room requires vents towards the outside with a free cross-section of 1 × 150 cm² or 2 × 75 cm² (up to 50 kW rated output).

Chimney connection

Also, when connecting the Logamax plus GB172/GB172T to a moisture-resistant special chimney, only a flue approved together with the gas condensing boiler (e.g. Buderus GN standard set) may be used as connection piece. In Germany, the moisture-resistant chimney must be approved by the Deutsches Institut für Bautechnik (DIBt).

Sizing the moisture-resistant chimney

The sizing of the connection piece and the chimney must ensure that positive pressure in the gas-tight flue is reduced and consequently only negative pressure persists inside the moisture-resistant chimney (→ Fig. 114). Only the respective manufacturer is responsible for sizing and supplying the moisture-resistant chimney. The flue gas parameters must be known to enable the calculation to be carried out (→ Table 55).

Inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 123 f.).

GN set

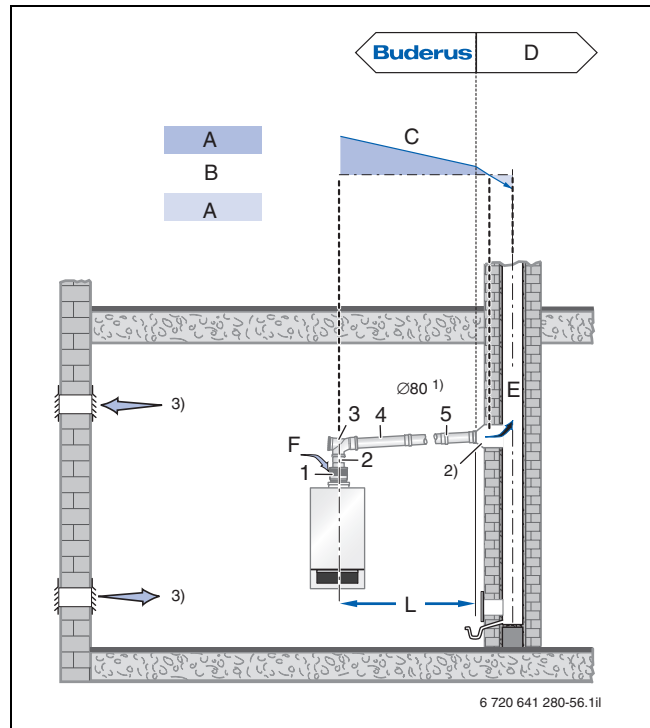
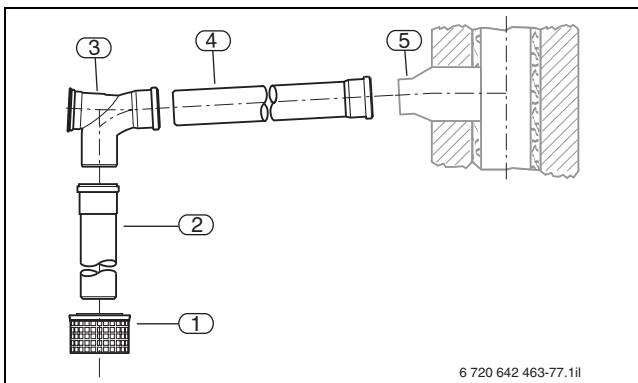


Fig. 114 Installation version (dim. in mm)

- A Positive pressure
- B Atmospheric pressure
- C Reduction of positive pressure
- D Chimney manufacturer
- E Flue gas
- F Supply air
- 1) Flue pipe
- 2) Connection piece supplied by the manufacturer of the moisture-resistant chimney
- 3) Vent to the outside 1 × 150 cm² or 2 × 75 cm²

Logamax plus GB172 GB172T	Flue gas mass flow rate		Exhaust gas temperature				CO ₂ contents		Available draught in Pa
	min. in g/s	max. in g/s	at 40/30 °C		at 80/60 °C		min. in %	max.	
			min. in °C	max. in °C	min. in °C	max. in °C			
-14...	1.4	6.3	30	49	58	65	8.6	9.4	80
-20...	2.3	10.5	36	58	58	75	8.6	9.4	80
-24...	3.2	13.1	32	60	57	90	8.6	9.4	80

Table 55 Flue gas parameters to size a moisture-resistant chimney in accordance with DIN EN 13384-1



- 1 Ventilation air grille
- 2 Flue pipe Ø 80 mm, 250 mm long
- 3 Inspection bend
- 4 Flue pipe, 1000 mm long
- 5 Boiler flue connection -
Supplied by the manufacturer of the moisture-resistant chimney

The following are also part of the standard delivery:
 – One tube Centrocerin
 – System certification label

Fig. 115 Components of the GN standard set made from plastic, Ø 80 mm

Routing the flue gas via a moisture-resistant chimney with set GN	Part no.	Details
GN standard set for Logamax plus GB172/G172T		
GN in PP plastic	87 094 044	Fig. 115
Optional equipment		
Flue pipe pack, 4 pipes 2000 mm, 1 pipe 1000 mm, 2 pipes 500 mm long	77 190 036 69	–
Flue pipe, 500 mm long, effective length 450 mm	77 190 015 25	–
Flue pipe, 1000 mm long, effective length 950 mm	77 190 015 26	–
Flue pipe, 2000 mm long, effective length 1950 mm	77 190 015 27	–
87° bend	77 190 015 34	–
45° bend	77 190 015 35	–
30° bend	77 190 018 51	–
15° bend	77 190 018 50	–
87° inspection bend	87 094 537	Fig. 114, pos. 3
Pipe with inspection aperture	77 190 015 33	–

Table 56 Components of the GN set

10 Flue systems for balanced flue operation

10.1 General information for balanced flue operation

10.1.1 Regulations

In accordance with the [German] Technical Rules for Gas Installations DVGW-TRGI 2008, the contracted installer must seek the agreement of the responsible flue gas inspector prior to commencement of work on the flue system or notify the flue gas inspector of the installation in writing. In this connection, observe the relevant national and regional regulations. It is recommended to ask the flue gas inspector to confirm his participation in writing.



Gas combustion equipment must be connected to the flue on the same floor where it is installed.

Important standards, ordinances, regulations and directives concerning the sizing and implementation of flue systems are as follows:

- EN 483
- EN 677
- DIN-EN 13384-1 and DIN-EN 13384-2
- DIN 18160-1 and DIN 18160-5
- Technical Rules for Gas Installations DVGW-TRGI 2008 [Germany]
- Landesbauordnung (LBO) [Germany]
- Muster-Feuerungsverordnung (MuFeuVO) [Germany]
- Feuerungsverordnung (FeuVO) of the relevant Federal State [Germany]

10.1.2 System certification

The air/flue gas lines of the Buderus sets DO, DO-S, GA-K, ÜB-Flex with GA-K, GAF-K, GAL-K and LAS-K have been system-certified together with the Logamax plus GB172/ G172T for **balanced** flue operation.

The system certification complies with the Gas Appliances Directive 90/396/EEC as well as the EN 483 and EN 677 standards. Joint approval of the Buderus set with the appliance is documented by the corresponding CE designation. The CE number is specified in the technical guide for the respective Logamax plus GB172/G172T. No additional CE approval of the flue system is required.

The application limits of the Buderus sets for **balanced** flue operation of the Logamax plus GB172/G172T were finally determined. Special determinations for the implementation of the respective air/flue gas line, the maximum permissible overall flue length and the number of diversions within the flue line are summarised on pages 137 to 156.

A calculation of the flue system to DIN-EN 13384-1 is not required. Only the sizing of the air/flue gas system in conjunction with the Buderus LAS-Kset must be carried out by the relevant LAS manufacturer, subject to system configuration.

10.1.3 General requirements of the installation room

Observe all building regulations and the Technical Rules for Gas Installations applicable to installation rooms (DVGW-TRGI 2008 [Germany]). The installation room must be free from the risk of frost.

Combustion air must be free from excessive dust levels and from halogenated compounds or other corrosive substances. Otherwise there would be a risk of damage to the burner and the heating surfaces.

Halogen compounds are highly corrosive. They are contained, for example, in spray cans, thinners, cleaning & degreasing agents and in solvents.



Easily inflammable and explosive materials or liquids must not be stored or used in the vicinity of the gas condensing boiler.

The maximum surface temperature of the gas condensing boiler and the flue is less than 85 °C. Therefore, minimum clearances towards combustible building materials need not be observed. The boiler can, for example, be installed on a wooden wall (→ DVGW-TRGI 2008, section 8.1.6).

The boiler can be installed without side clearances. All maintenance can be carried out from the front.

Prohibited installation areas

Gas appliances must not be installed in essential stairways (e.g. escape routes), in rooms with essential stairways and exits to the outdoors as well as in essential hallways. This does not apply to buildings of building categories 1 and 2.

Gas appliances must also never be installed in any rooms or parts thereof that are subject to explosion protection.

The Logamax plus gas condensing boilers for balanced flue operation may also be installed in garages. Provide adequate protection of the gas condensing boilers against mechanical damage, e.g. by means of a hoop or deflector.

Installation room for rated output ≤ 100 kW

The **balanced** flue operation of the Logamax plus GB172/G172T with rated heating output of up to 100 kW requires no special installation room. Additional measures for supplying combustion air are not required. Furthermore, no requirements regarding the size of the installation room are required since the flue systems of these gas condensing boilers comply with the designation "X" = higher tightness.

For balanced flue operation up to 100 kW, the Logamax plus gas condensing boilers can also be installed in **rooms occupied by people**.

Installation room for rated output > 100 kW

In accordance with DVGW-TRGI 2008, gas combustion equipment with a total rated output in excess of 100 kW requires a specific installation room. Observe the respective country-specific combustion ordinances.

For balanced flue operation, the installation room must meet the following requirements:

- The installation room must not be used for other purposes, except the following:
 - For routing services into the building, including their shut-off, control and measuring facilities
 - For the installation of combustion equipment for liquid fuels, heat pumps, CHP modules or permanently fixed internal combustion engines
 - For the storage of fuels
- The installation room must not have any opening to other rooms except doorways.
- The doors to the installation room must be tight and self-closing.
- The installation room must be able to be vented.

Install an emergency stop switch outside the installation room in accordance with DVGW-TRGI 2008, section 8.1.4.2 [or local regulations]. The burners of the gas condensing boilers must be able to be switched off at any time by means of an emergency stop switch.

10.1.4 Air/flue gas line

Buderus sets

In **balanced** flue operation, the fan draws in the required combustion air from the outside into the gas condensing boiler. The air/flue gas line of the Buderus sets is a concentric pipe or a pipe-in-pipe system made of plastic/steel.

The outer concentric pipe supplies the combustion air. With components for internal rooms, it is made from zinc-plated steel, painted white. For components used externally, it is made from zinc-plated steel painted white, black or red or made from stainless steel. The inner pipe is a plastic flue pipe. The roof outlet of the DO set is completely made from plastic and is black or terracotta in colour on the outside.

The concentric air/flue gas line is installed as a complete pipework system or as a connection piece between the gas condensing boiler and a concentric air/flue gas system.

The flue systems are categorised in accordance with DIN-EN 14471. The flue systems certified by Buderus correspond to the following classification (→ Fig. 116):

- system-certified flue systems 1
PP interior, steel exterior, e.g. GA-K, GAF-K, DO
 - EN 14471 T120 H1 o W 2 O00 E D L0
- System-certified flue systems 2
internally PP, externally PP, e.g. DO-S
 - EN 14471 T120 H1 o W 2 O00 I D L1
- System-certified flue systems 3
single wall PP, e.g. GA, GN
 - combined with Logamax plus GB172/G172T, with flue gas temperatures < 85 °C, EN 14471 T120 H1 o W 2 O00 I D L applies
 - If the approval of the flue system with flue gas temperatures of 120 °C is used, EN 14471 T120 H1 o W 2 O20 I D L applies

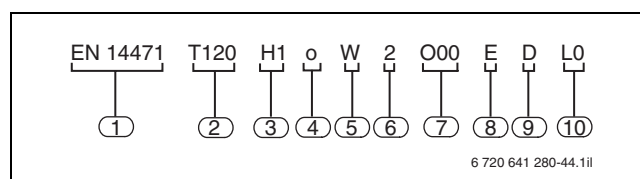


Fig. 116 Identification using system-certified flue system 1 as an example

- 1 Standard number
- 2 Temperature class
- 3 Pressure category
- 4 Soot fire resistance
- 5 Condensate resistance
- 6 Corrosion resistance
- 7 Clearance from combustible materials
- 8 Installation location
- 9 Fire resistance
- 10 Casing

Explanation of the identification for Buderus

- Temperature category T120
 - Permissible flue gas temperature $\leq 120\text{ °C}$
 - Test temperature 150 °C
- Pressure category H1
 - Leakage rate $0.006\text{ l}\cdot\text{s}^{-1}\cdot\text{m}^{-2}$
 - Test pressure 5000 Pa high pressure flue systems
- Soot fire resistance category o
 - Flues that are not resistant to soot fires
- Condensate resistance category W
 - Flues for moist operation
- Corrosion resistance category 2
 - Fuel oil with a sulphur content up to $0,2\%$ (also applicable to gas)
- Clearance from combustible materials
 - The clearance of the outer casing of a flue system to combustible materials is designated **Oxx**. Value xx is stated in mm.
Example: O50 corresponds to a clearance of 50 mm
 - The clearance towards combustible materials applies when utilising the temperature category T120. If this is considered in conjunction with a boiler, then the maximum possible flue gas temperature of the boiler is critical. If that lies below 85 °C , then no clearance is required. This must be specified in the manufacturer's documentation. Therefore, when using single walled pipes with the Logamax plus GB172/G172T, O00 applies.
- Installation location
 - Category I for the installation of the flue system or parts of the flue system inside a building
 - Category E for the installation of the flue system or parts of the flue system inside or outside a building
- Fire resistance category D (fire characteristics)
 - Not negligible contribution to a fire
- Casing categories
 - L0 for non-flammable casing
 - L1 for flammable casing
 - L for designs without casing



The flue system must be identified as system-certified following installation. For this purpose, an ID label for system certification is included with every standard set (→ Fig. 117).



Fig. 117 ID label for system certification

Existing chimney shaft

Generally, a chimney sweep should clean the chimney prior to installing the flue with the Buderus GA-K or ÜB-Flex set in conjunction with GA-K if one or more of the following applies:

- The combustion air is drawn in via an existing chimney shaft to which oil or solid fuel combustion equipment has been connected **or**
- Dust loads due to unstable chimney pointing must be expected.

If dust loads continue to be a risk factor or deposits from oil or solid fuel combustion equipment are still present, use the DO-S or GAL-K sets instead of the GA-K or ÜB-Flex sets in conjunction with GA-K.

Air/flue gas system

To connect the gas condensing boiler and the air/flue gas system (LAS), the concentric air/flue gas line of the Buderus LAS-K set is provided. The fan of the gas condensing boiler generates positive pressure inside the inner pipe of the connection piece to the LAS. Negative pressure is created in the flue shaft of the LAS through thermal updraught.

Condensate drain from the flue

To ensure the safe drainage of condensate, the flue must be installed with a 3° slope (5 cm/m) from the vertical section of the flue system towards the boiler. In the case of longer horizontal flue sections it may be necessary to support the horizontal section on site to ensure the correct slope towards the boiler. The condensate from the flue and from the flue gas header in the gas condensing boiler flows directly into the stretch trap (siphon) of the gas condensing boiler.

When connecting to a moisture-resistant flue system with the Buderus LAS-K set (LAS multiple connection) drain the condensate from the moisture-resistant flue system on site.



Route the condensate from the gas condensing boiler (the flue) and the moisture-resistant flue correctly to the public sewer, or neutralise it if required. Special design information regarding condensate drainage → chapter 7.

Shafts for flues



Shafts for flues must not be used for any other purpose.

Flues that bridge several floors must be arranged in their own shafts inside buildings.

Exceptions

- Flues in building categories 1 and 2, provided that the flue is not routed through more than one utility unit. Building categories 1 and 2 are those with a height to the top edge of the floor on the highest storey that could house an installation room of no more than 7 m on average above ground level, and with no more than two utility units of no more than 400 m² in total **or**
- Flues with a single connection inside the room where the combustion appliance is installed **or**
- Flues operated with negative pressure:
 - that offer a fire resistance of at least 90 minutes (ID L90 or higher) **and**
 - in building categories 1 and 2 that offer a fire resistance of at least 30 minutes (ID L30 or higher).

Several flues in a common shaft are only permissible if:

- the flues are made from non-combustible materials **or**
- the associated combustion equipment is installed on the same floor **or**
- a transfer of fire between floors is prevented through an automatic shut-off facility or other measures **or**
- the flue has received general Building Regulations approval.

These shafts must offer:

- a fire resistance of at least 90 minutes **and**
- in building categories 1 and 2 a fire resistance of at least 30 minutes.

Routing solar lines through existing shafts for flues

Deviating from para. 7 sect. 5 FeuVO [Germany], retrospective routing of solar lines in existing flue shafts can be acceptable under the following conditions:

- The retrospective routing of solar lines in existing flue shafts is limited to building categories 1 and 2 (para. 2 sect. 3 sentence 1 no. 1 and 2 MBO) and to solar lines that transport water only.
- The heat transfer of solar lines and fittings should be limited by means of thermal insulation in accordance with the Energy Savings Order dated 16 November 2001, appendix 5, table 1 [Germany]. Alternatively, from a building regulations point of view, the minimum thickness of thermal insulation can also be halved. The insulating layers must be resistant to the maximum applicable temperatures inside the solar lines as well as to the temperature stresses resulting from the flue system.
- Ensure the safe operation of the combustion system by a calculation to DIN-EN 13384-1: 2003 03.
- The inside wall of the shaft must be smooth and free from protrusions; all-round adequate secondary ventilation (annular gap) must still be ensured after the installation of the solar lines. Ensure the stability of the flue system as well as the permanent retention of the solar lines and the sensor lead. Permanently prevent any contact between the flue and the thermally insulated solar lines.
- The clearance between the solar line (including thermal insulation) and flue line must be:
 - at least 2 cm for flues with circular cross-sections inside a rectangular shaft
 - at least 3 cm for flues with circular cross-sections inside a circular shaft **and**
 - at least 3 cm for flues with rectangular cross-sections inside a rectangular shaft.
- Using appropriate material, seal the remaining cross-sections in the shaft wall apertures through which the solar lines are routed.
- The solar lines including their thermal insulation must correspond to the requirements of the flue where their temperature resistance is concerned.

10.1.5 Inspection apertures

According to DIN 18160-1 and DIN 18160-5, flue systems for **balanced** flue operation must be able to be inspected and cleaned easily and safely. For this, allow for inspection apertures (→ Fig. 118 and Fig. 105).

When arranging the inspection apertures, comply with the requirements of DIN 18160-5 as well as all locally applicable building regulations. For this we recommend contacting your local flue gas inspector [where appropriate].

Inspection apertures for DO and LAS-K sets

Where installation space is available, provide an inspection aperture. Where installation space is inadequate, the inspection aperture can be omitted on flues with a length of less than 4 m subject to consultation with the flue gas inspector. In such cases, the test ports on the boiler flue connection are adequate. The suitability for use of the flue is verifiable through taking test measurements. Using the test ports at the boiler flue connection, an endoscope can be used for a visual check.

If there are no inspection apertures, the flue would need to be dismantled for necessary cleaning involving a lot more effort.

Position of the lower inspection aperture

- When connecting a Logamax plus GB172/G172T gas condensing boiler to a flue, provide a low level inspection aperture
 - in the vertical section of the flue, immediately above the flue diversion,
 - at the face of the straight horizontal section of the flue, no further than 1 m from the diversion into the vertical section, subject to there being no diversion in between (→ Fig. 118), **or**
 - in the side of the horizontal section of the flue, no further than 30 cm from the diversion into the vertical section (→ Fig. 105).
- When connecting the gas condensing boilers to a moisture-resistant flue system (LAS multiple connection), provide a lower inspection aperture below the lowest connection at the base of the vertical section of the moisture-resistant flue (LAS).
- Provide a floor area of at least 1 m × 1 m to DIN 18160-5 in front of the lower inspection aperture.

Position of the upper inspection aperture

- An upper inspection aperture is not required in flues, if:
 - The lower inspection aperture is located no further than 15 m from the terminal
 - The vertical flue section is routed at an angle of no more than 30° (corbelled)
 - The lower inspection aperture is implemented in accordance with DIN 18160-1 and DIN 18160-5 (→ Fig. 118 and Fig. 105).
- Upstream and downstream of every diversion in excess of 30°, an additional inspection bend is required.
- Provide a floor area of at least 0.5 m × 0.5 m to DIN 18160-5 in front of the upper inspection aperture.

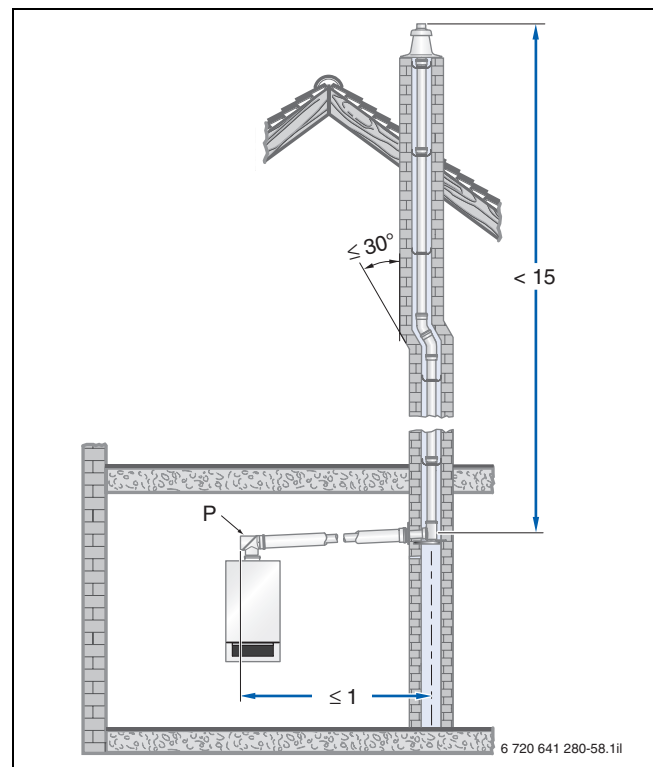


Fig. 118 Example with the inspection aperture (P) located in a flue without diversions in the installation room (dim. in m)

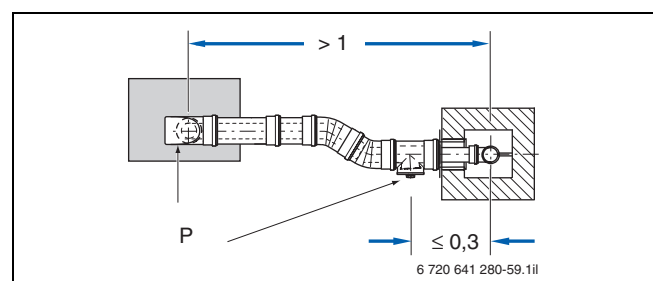


Fig. 119 Example with the inspection apertures (P) located in a flue with diversions in the installation room - top view (dim. in m)

10.2 Vertical, concentric air/flue gas routing above the roof with the DO set

Appliance type C_{33x}

Observe the general information on page 132 ff.

Logamax plus GB172 GB172T	Maximum permissible total length L in m	Reduction of the total length for each additional pipe diversion ¹⁾ in m
-14...	10	0
-20...	13	0
-24...	19	1.5

Table 57 Maximum permissible total installed flue length (→ Fig. 120)

1) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Air/flue gas line inside a shaft or inside a protective pipe

In accordance with the Technical Rules for Gas Installations DVGW-TRGI 2008 [Germany], floors may be bridged if the air/flue gas line complies with the criteria described here.

If only the roof structure lies above the installation room, then encase the air/flue gas line between the upper edge of the ceiling inside the installation room and the roof skin. For this, a non-combustible rigid material or a protective metal pipe (→ Fig. 120) will suffice. If a level of fire resistance has been specified for the ceiling, then the same applies to the casing.

When bridging floors, allow for a shaft with fire resistance category L 30 (F 30) or L 90 (F 90) for the balanced flue outside the installation room up to the roof skin (→ "Flue shafts" page 135 and Fig. 120). For this, use only approved shaft structures (by Promat, for example).

Minimum clearances and inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 136). On the roof, maintain minimum clearances towards windows (→ Fig. 123).

DO set

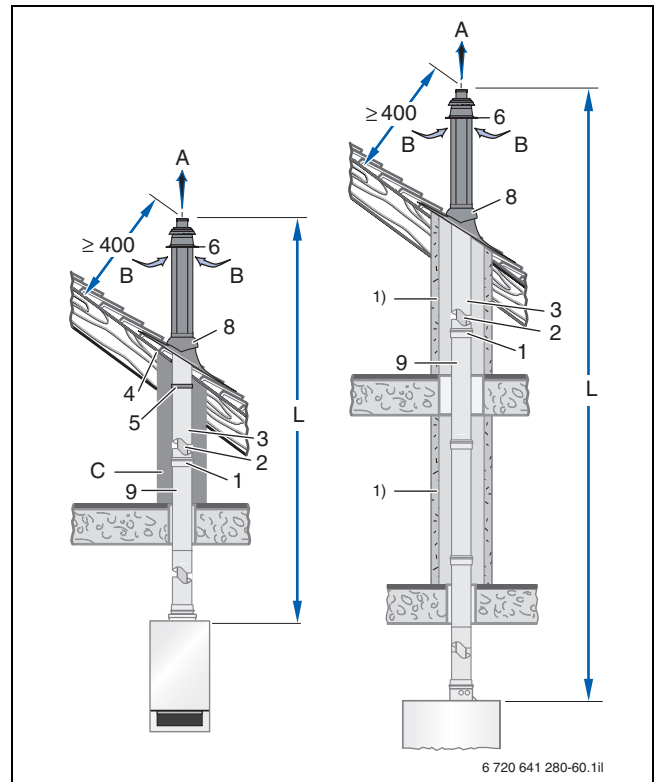


Fig. 120 Installation versions (dim. in mm)

- A Flue gas
- B Supply air
- C Protective cover
- 1) Shaft L 30 (F 30) or L 90 (F 90)

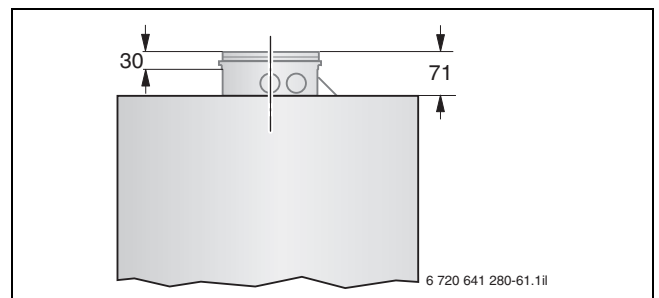


Fig. 121 Installed dimensions for the concentric connection piece (dim. in mm)

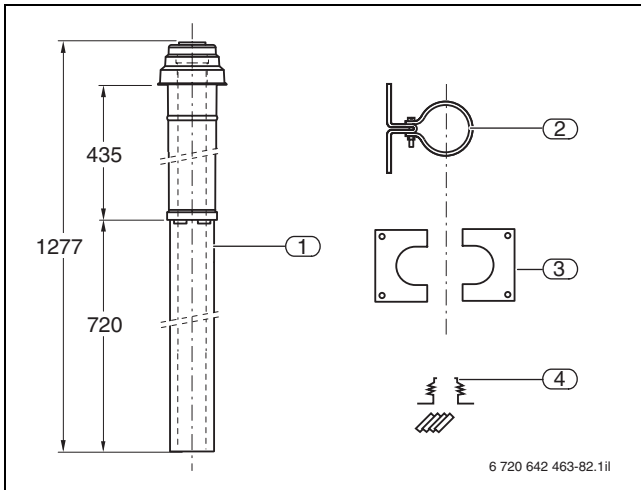


Fig. 122 Plastic components of the standard DO set (dim. in mm)

- 1 Roof outlet Ø 80/125 mm
- 2 Rafter clip, zinc-plated steel
- 3 Cover, in 3 parts
- 4 Pipe collar (accessory for tying in a vapour barrier)

The following are also part of the standard delivery:

- One tube Centrocerin
- System certification label

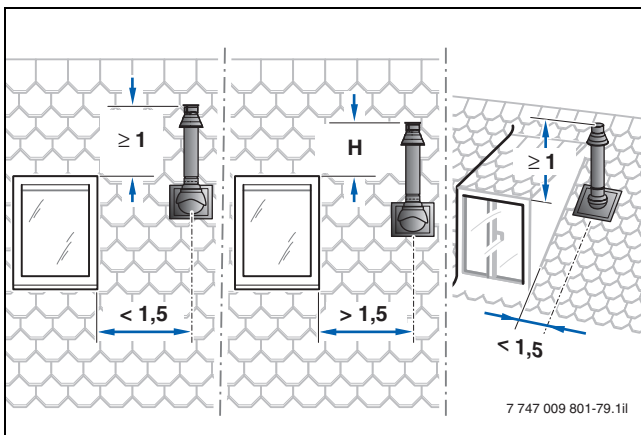


Fig. 123 Minimum clearances towards windows with DO set (dim. in m) (examples in accordance with the Muster-Feuerungsverordnung [Germany]; regulations → page 132)

- H** No special clearance required

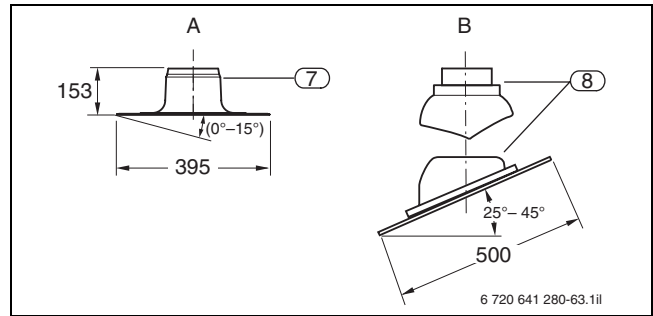


Fig. 124 Universal roof tile and adhesive flat roof flange as additional equipment for the standard DO set (must be ordered separately); (dim. in mm)

- A** For flat roof
- B** For pitched roof
- 7** Adhesive flat roof flange
- 8** Universal roof tile



Tiles for alternative roof slopes available on request.

Vertical, concentric air/flue gas routing above the roof with the DO set	Part no.	Details
DO standard set for Logamax plus GB172/G172T		
DO with plastic roof outlet PP/PE, steel inside, painted white, Ø 80/125 mm	black exterior terracotta exterior	77 190 036 60 77 190 036 61
		Fig. 122
DO with plastic PP/PE roof outlet, steel interior, painted white, including sliding adaptor for easy installation, Ø 80/125 mm	black exterior terracotta exterior	77 366 147 18 77 366 147 19
Optional equipment		
Adhesive flat roof flange, Ø 125 mm, not adjustable		77 190 008 38
		Fig. 124, pos. 7
Adhesive flat roof flange, Ø 125 mm, pitch adjustable from 0° to 15°		87 094 912
		Fig. 124, pos. 7
Adhesive flat roof flange, Ø 125 mm, 250 mm high, not adjustable		87 094 904
		Fig. 124, pos. 7
Universal roof tile, Ø 125 mm 5° to 25° adjustable slope	black terracotta	77 472 048 12 77 472 048 11
25° to 45° adjustable slope	black terracotta	77 190 028 57 77 190 028 55
35° to 55° adjustable slope	black terracotta	77 472 048 14 77 472 048 13
		Fig. 124, pos. 8
Concentric sliding adaptor/installation aid Ø 80/125 mm with long female connection, maximum effective length 250 mm, only for vertical installation		87 094 950
		–
Concentric pipe, 500 mm long, effective length 450 mm		77 190 027 63
		Fig. 120, pos. 9
Concentric pipe, 1000 mm long, effective length 950 mm		77 190 027 64
		Fig. 120, pos. 9
Concentric pipe, 2000 mm long, effective length 1950 mm		77 190 027 65
		Fig. 120, pos. 9
Concentric 87° bend		77 190 027 66
		–
Concentric 45° bend		77 190 027 67
		–
Concentric 30° bend		77 190 027 68
		–
Concentric 15° bend		87 094 580
		–
Concentric 87° inspection bend		77 190 033 82
		–
Concentric stainless steel adaptor Ø 80/125 mm from plastic pipe Ø 80/125 mm to stainless steel pipe made by Raab Ø 80/125 mm		77 472 225 09
		–
Concentric pipe with inspection aperture		77 190 027 60
		–
Pipe collar, DN 100 to DN 130, for tying the roof outlet into the vapour barrier		77 472 045 34
		–
Jacket pipe extension 500 mm for DO external, with interior pipe for outdoors 1 m above the roof	black terracotta	77 190 020 42 77 190 020 41
		–

Table 58 Components of the DO set

10.3 Air/flue gas routing via concentric pipe inside a shaft with DO-S set

Appliance type C_{33x}

Observe the general information on page 132 ff.

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾ in m	Reduction of the total length for each additional pipe diversion ²⁾ in m
-14...	10	0
-20...	13	0
-24...	19	1.5

Table 59 Maximum permissible total installed flue length (→ Fig. 126)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set; horizontal length $L_1 \leq 2$ m
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Adequate combustion air supply

The DO-S set is ideally suited for the modernisation of older buildings, if the combustion air **cannot** be drawn in via the existing chimney shaft (→ page 133). An adequate supply of combustion air is assured via the concentric air/flue gas line.

Air/flue gas line inside a shaft

For the vertical, concentric air/flue gas line, a shaft of fire resistance category L 30 (F 30) or L 90 (F 90) would be suitable. The minimum dimensions for the shaft cross-section are required for the installation of the air/flue gas line (→ Fig. 125).

Minimum dimensions and inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 136).

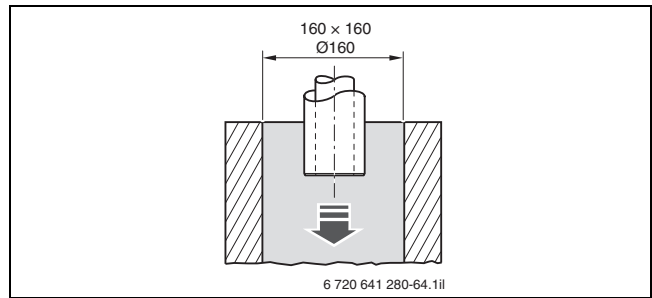


Fig. 125 Minimum dimensions of the shaft cross-section for the installation of the air/flue gas line (dim. in mm)

DO-S set

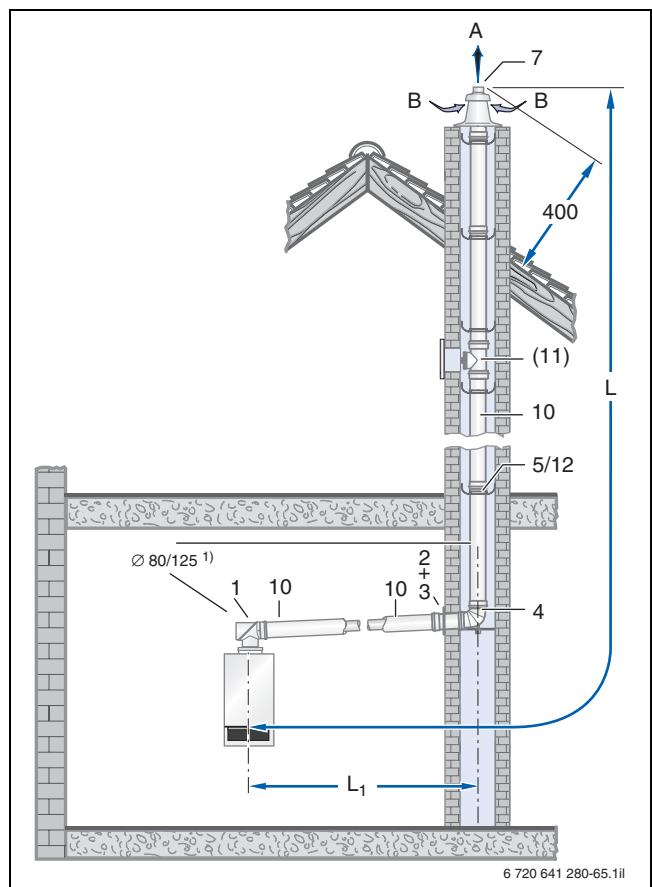


Fig. 126 Installation version (dim. in mm)

- A** Flue gas
- B** Supply air
- 1)** Concentric balanced flue

Version 1 – Shaft terminates above the roof

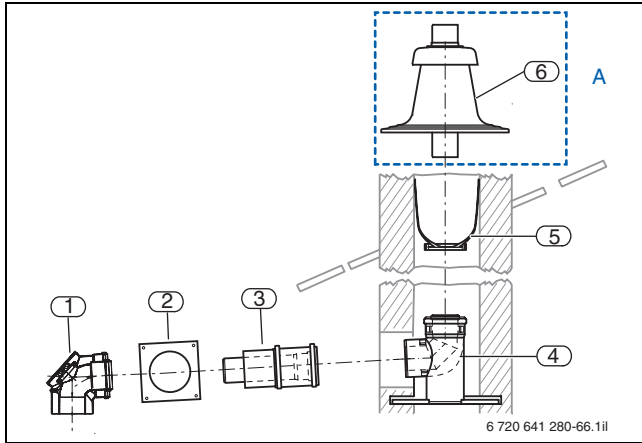


Fig. 127 Plastic components of the standard DO-S set

- A** Additional equipment required
- 1** Concentric inspection bend
- 2** Cover
- 3** Concentric wall outlet with female connection
- 4** Concentric support bend, including support rail
- 5** Spacer, Ø 125 mm (6 pce)

The following are also part of the standard delivery:

- One tube Centrocerin
- System certification label

Version 2 – Shaft terminates inside the roof skin

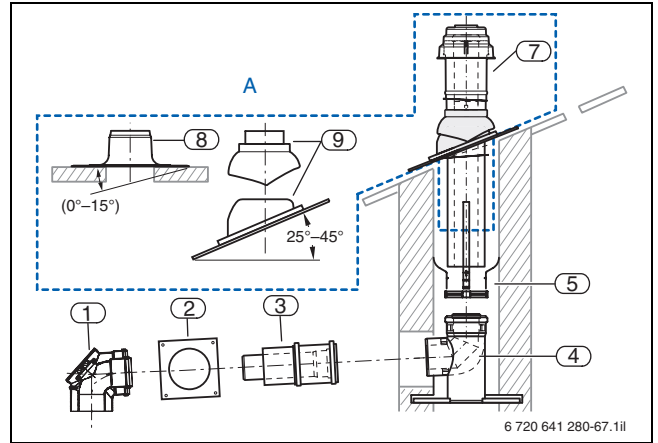


Fig. 128 Plastic components of the standard DO-S set

- A** Additional equipment required
- 1** Concentric inspection bend
- 2** Cover
- 3** Concentric wall outlet with female connection
- 4** Concentric support bend, including support rail
- 5** Spacer, Ø 125 mm (6 pce)

The following are also part of the standard delivery:

- One tube Centrocerin
- System certification label

Air/flue gas routing via concentric pipe inside a shaft with DO-S set	Part no.	Details
DO-S standard set for Logamax plus GB172/G172T		
DO-S made from PP plastic/zinc-plated steel, painted white, Ø 80/125 mm	77 472 153 68	Fig. 127 and Fig. 128
The standard DO-S set as version 1 can only be used with the following additional equipment:		
Shaft cover with terminal pipe without female connection, Ø 80 mm, 500 mm long	87 092 056	Fig. 127, pos. 6
The standard DO-S set as version 2 can only be used with the standard DO set for concentric air/flue gas routing above pitched roofs and with the following additional equipment:		
DO made from PP/PE and steel, painted white, Ø 80/125 mm	black exterior 77 190 036 60 terracotta exterior 77 190 036 61	Fig. 128, pos. 7
Optional equipment		
Adhesive flat roof flange, Ø 125 mm, not adjustable	77 190 008 38	Fig. 128, pos. 8
Adhesive flat roof flange, Ø 125 mm, pitch adjustable from 0° to 15°	87 094 912	Fig. 128, pos. 8
Universal roof tile, black coated, Ø 125 mm, pitch adjustable from 25° to 45°	77 190 028 57	Fig. 128, pos. 9
Universal roof tile, terracotta coated, Ø 125 mm, pitch adjustable from 25° to 45°	77 190 028 55	Fig. 128, pos. 9
Additional equipment for air/flue gas line inside the installation room		
Concentric components of the additional equipment for standard GA-K set	–	Table 62, page 144
Additional equipment for air/flue gas line inside the shaft		
Spacer, Ø 125 mm (4 pce)	87 094 618	Fig. 126, pos. 5 and pos. 12
Concentric pipe with inspection aperture, Ø 80/125 mm, white	77 190 027 60	
Concentric 15° bend, Ø 80/125 mm	87 094 580	Fig. 126, pos. 11
Concentric 30° bend, Ø 80/125 mm	77 190 027 68	–
Concentric pipe, Ø 80/125 mm, 500 mm, effective length 450 mm	77 190 027 63	–
Concentric pipe, Ø 80/125 mm, 1000 mm, effective length 950 mm	77 190 027 64	–
Concentric pipe, Ø 80/125 mm, 2000 mm, effective length 1950 mm	77 190 027 65	–

Table 60 Components of the DO-S set

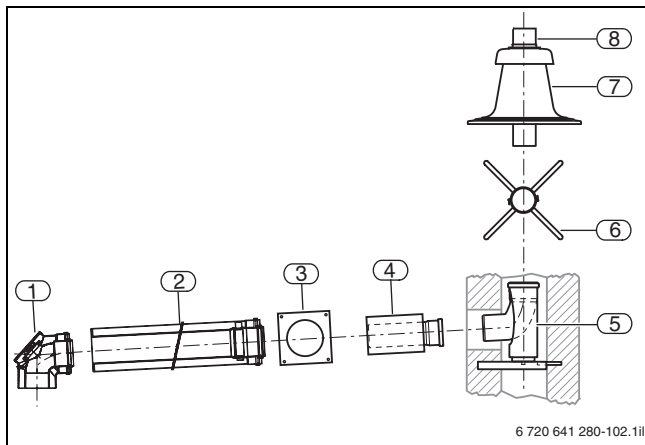


Fig. 131 Plastic components of the standard GA-K set

- 1 Concentric inspection bend
- 2 Concentric pipe, 500 mm long
- 3 Cover
- 4 Concentric wall outlet, Ø 80 mm, 500 mm long; Ø 125 mm, 300 mm long
- 5 87° bend including support and support rail
- 6 Spacer (6 pce)
- 7 Shaft cover
- 8 Terminal pipe without female connection, Ø 80 mm, 500 mm long

The following are also part of the standard delivery:
 – One tube Centrocerin
 – System certification label

Concentric air/flue gas routing through a flue and shaft with GA-K set	Part no.	Details
GA-K standard set for Logamax plus GB172/G172T		
GA-K made from PP plastic/zinc-plated steel (painted white), Ø 80/125 mm with shaft cover and terminal pipe made from stainless steel ¹⁾	77 472 153 65 77 472 153 66	Fig. 131
Optional equipment		
Concentric pipe, 500 mm long, effective length 450 mm	77 190 027 63	Fig. 130, pos. 9
Concentric pipe, 1000 mm long, effective length 950 mm	77 190 027 64	Fig. 130, pos. 9
Concentric pipe, 2000 mm long, effective length 1950 mm	77 190 027 65	Fig. 130, pos. 9
Concentric 87° bend	77 190 027 66	–
Concentric 45° bend	77 472 213 80	–
Concentric 30° bend	77 190 027 68	–
Concentric 15° bend	87 094 580	–
Concentric 87° inspection bend	77 190 033 82	Fig. 130, pos. 1
Concentric pipe with inspection aperture, white, Ø 80/125 mm, 250 mm long	77 190 027 60	Fig. 130, pos. 15
Flue pipe pack, Ø 80 mm: 4 pipes 2000 mm long, 1 pipe 1000 mm long, 2 pipes 500 mm long	77 190 036 69	Fig. 130, pos. 13
Flue pipe, 500 mm long, effective length 450 mm	77 190 015 25	Fig. 130, pos. 13
Flue pipe, 1000 mm long, effective length 950 mm	77 190 015 26	Fig. 130, pos. 13
Flue pipe, 2000 mm long, effective length 1950 mm	77 190 015 27	Fig. 130, pos. 13
87° bend	77 190 015 34	–
45° bend	77 190 015 35	–
30° bend	77 190 018 51	–
15° bend	77 190 018 50	–
Pipe with inspection aperture, Ø 80 mm, 250 mm long	77 190 015 33	Fig. 130, pos. 16
Spacer (4 pce)	87 094 614	Fig. 130, pos. 6 and pos. 16
Stainless steel shaft cover with terminal pipe ¹⁾	87 094 920	Fig. 130, pos. 7 and pos. 8
Adaptor plastic pipe Ø 80 mm for intersection with stainless steel for the use of stainless steel flue pipes Ø 80 mm made by Raab	77 472 255 08	–
Adaptor plastic pipe Ø 80/125 mm for intersection with stainless steel for the use of stainless steel flue pipes Ø 80/125 mm made by Raab	77 472 255 09	–

Table 62 Components of the GA-K set

1) Not in connection with ÜB-Flex

10.5 Concentric air/flue gas routing through a flexible flue and shaft with ÜB-Flex set in conjunction with the GA-K set

For the Logamax plus GB172/G172T the ÜB-Flex set can only be used in conjunction with the GA-K set (→ Fig. 133).

Appliance type C_{93x} (former designation C_{33x})

Observe the general information on page 132 ff. as well as the specific information regarding the standard GA-K set (→ page 143 f.).

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾	Reduction of the total length for each additional pipe diversion ²⁾
	in m	in m
-14...	10	0
-20...	13	0
-24...	18	1.5

Table 63 Maximum permissible total installed length of the flue with ÜB-Flex set in conjunction with the GA-K set (→ Fig. 133)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set; horizontal length L₁ ≤ 2 m
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Adequate combustion air supply

The ÜB-Flex set in conjunction with the GA-K set is ideally suited for the modernisation of older buildings with an offset shaft, if the combustion air can be drawn in via the existing chimney shaft (→ page 133). Have the shaft cleaned by a chimney sweep prior to installing the flue.

Maintain the minimum dimensions of the shaft cross-section to ensure that the free cross-section is adequate for drawing in the combustion air (→ Fig. 132). The secondary ventilation aperture in the shaft must be omitted.

Minimum dimensions and inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 136).

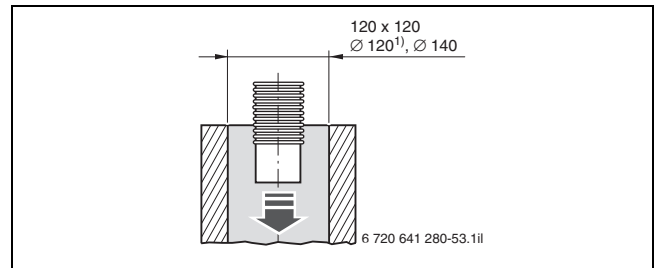


Fig. 132 Minimum dimensions of the shaft cross-section for the installation of the flexible flue (dim. in mm)

- 1) Required shaft cross-section with system certification for ≤ 1.5 mm surface finish

ÜB-Flex set in conjunction with the GA-K set

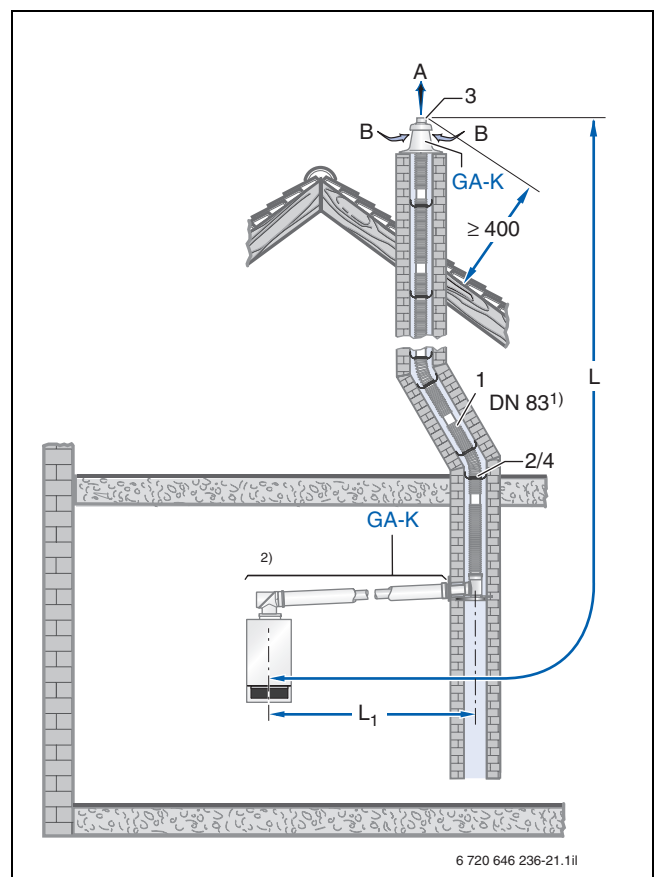
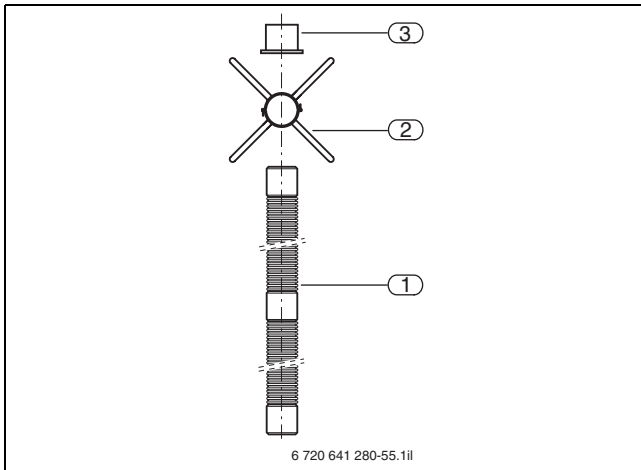


Fig. 133 Installation version (dim. in mm)

- A Flue gas
- B Supply air
- 1) Flexible flue pipe
- 2) Concentric balanced flue



- 1 Flexible flue DN 83, 12.5 m or 25 m long
- 2 Spacer for flexible flue pipe, DN 83, 8 pce (for 12.5 m) or 16 pce (for 25 m)
- 3 Spring ring for bracket, incl. terminal pipe

Fig. 134 Components of the ÜB-Flex standard set made from plastic, DN 83

Concentric air/flue gas routing through a flexible flue and shaft with the ÜB-Flex and GA-K sets	Part no.	Details
ÜB-Flex standard set for Logamax plus GB172/G172T		
ÜB-Flex standard set 12.5 m with flexible flue pipe made from PP plastic 12.5 m long	87 094 036	Fig. 134
ÜB-Flex standard set 25 m with flexible plastic flue PP, 25 m long	87 094 038	Fig. 134
The operation is only possible when using the ÜB-Flex standard set in conjunction with the GA-K set. For combining the ÜB-Flex set with the GA-K standard set:		
GA-K in PP plastic/zinc-plated steel (painted white), Ø 80/125 mm	77 472 153 65	Fig. 130, page 143
Optional equipment		
Spacer for flexible flue pipe (4 pce)	87 094 614	Fig. 133, pos. 2 and pos. 4
Connecting piece for two flexible flue pipes	87 094 668	–
Pipe with inspection aperture ÜB-Flex	87 094 676	–
Components for the flue inside the installation room (additional equipment to the standard set GA-K)	–	Table 62, page 144

Table 64 Components of the ÜB-Flex set in conjunction with the GA-K set, but not in connection with shaft cover and terminal pipe made from stainless steel

10.6 Concentric air/flue gas routing on an external wall with GAF-K set

Appliance type C_{53x}

Observe the general information on page 132 ff.

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾ in m	Reduction of the total length for each additional pipe diversion ²⁾ in m
-14...	18	0
-20...	25	0
-24...	25	1.5

Table 65 Maximum permissible total installed flue length (→ Fig. 135)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set; horizontal length L₁ and L_{1, alternative} ≤ 2 m
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis.

Adequate combustion air supply

The GAF-K set is ideally suited to the modernisation of older buildings, if the combustion air **cannot** be drawn in via an existing chimney shaft.

The ventilation air tee must be at least 30 cm above ground level to draw in the combustion air at the level of the wall outlet. Subject to the relevant geography, the height of snow deposits must also be taken into account. In any case, air must be drawn in at a level above the height of snow deposits that can be expected. Where this condition cannot be met, the combustion air can alternatively be drawn in via a concentric ventilation air connector that must be installed in the air/flue gas line on the wall (→ Fig. 136, alternative ventilation air).

Minimum dimensions and inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 136).

The flue on the external wall must be at least 20 cm away from windows. Provide wall mounting brackets every 2 m.

Roof outlet

The air/flue gas line on an external wall can be routed through the eaves (→ Fig. 135). This requires the concentric roof outlet and either an adhesive flat roof flange or a universal roof tile with cowl as additional equipment (→ Fig. 136, roof outlet).

GAF-K set

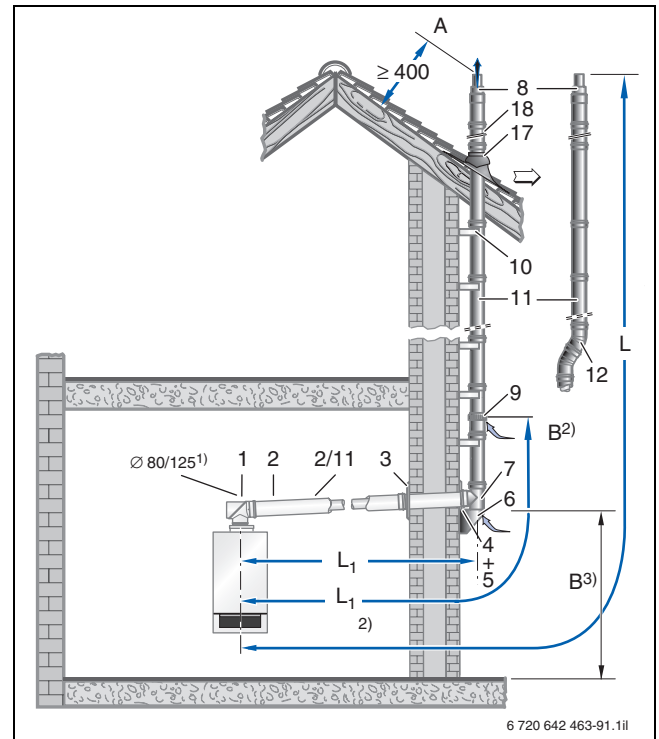


Fig. 135 Installation version with the GAF-K set (dim. in mm)

- A** Flue gas
- B** Supply air
- 1)** Concentric balanced flue
- 2)** Alternative
- 3)** At ≥ 30 cm (observe the height of snow deposits)

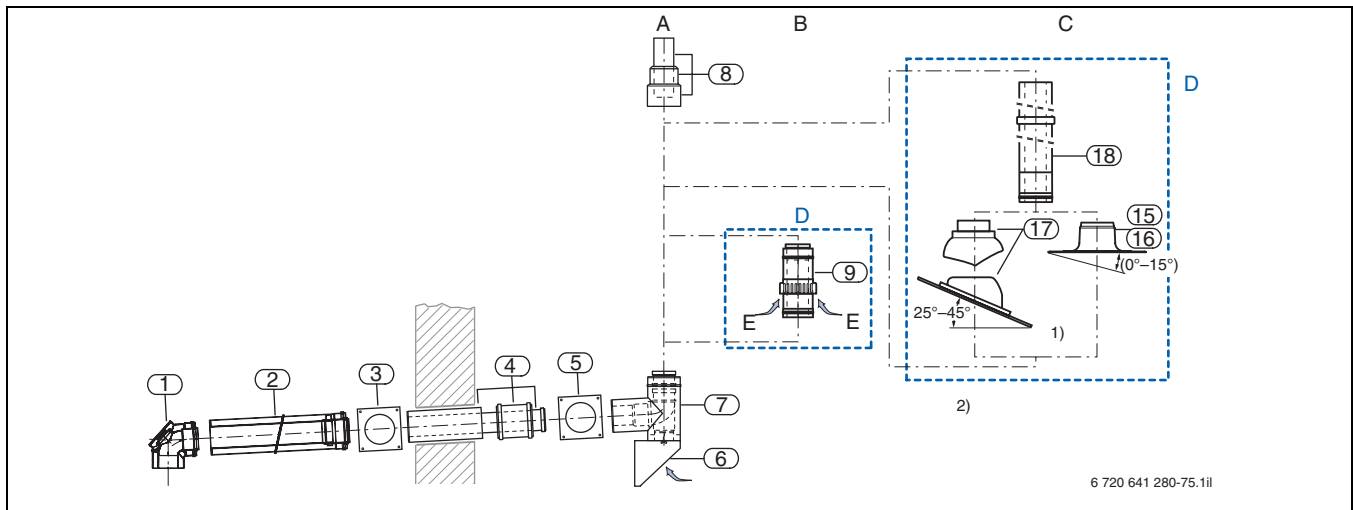


Fig. 136 Plastic components of the standard GAF-K set

- A** Standard
- B** Ventilation air alternative
- C** Roof outlet (→ Fig. 135)
- D** Optional equipment
- E** Supply air
- 1** Concentric inspection bend
- 2** Concentric pipe, 500 mm long
- 3** Cover, painted white
- 4** Concentric wall outlet including twin female connection, Ø 80 mm, 500 mm long, Ø 125 mm, 400 mm long
- 5** Cover, stainless steel
- 6** External wall panel
- 7** Ventilation air tee for wall panel
- 8** Terminal connection; pipe clip for terminal connection; terminal pipe without female connection, Ø 80 mm, 250 mm long
- 9** Ventilation air connector (the alternative ventilation air connector includes a seal that enables the standard ventilation air aperture in the external wall panel to be sealed off. Observe the maximum permissible length up to the ventilation air inlet.)
- 1) Alternative
- 2) Tiles for alternative roof slopes available on request

The following are also part of the standard delivery:

- One tube Centrocerin
- System certification label

Concentric air/flue gas routing on an external wall with GAF-K set	Part no.		Details
GAF-K standard set for Logamax plus GB172/G172T	Plastic		
GAF-K in plastic PP/zinc-plated steel (painted white) inside the installation room and plastic PP/stainless steel on the external wall, Ø 80/125 mm	77 472 153 69		Fig. 136
Optional equipment	Plastic/steel, white	Plastic/stainless steel	
Concentric ventilation air connector, stainless steel, Ø 125 mm	–	87 094 664	Fig. 135, pos. 9
Wall mounting bracket, stainless steel, Ø 125 mm, wall clearance 40 to 65 mm	–	87 094 626	Fig. 135, pos. 10
Wall mounting bracket extension; overall wall clearance 150 to 230 mm	–	87 094 710	Fig. 135, pos. 10
External wall panel extension; overall wall clearance 150 to 230 mm	–	87 094 712	Fig. 135, pos. 10
Concentric pipe, 500 mm long, effective length 450 mm	77 190 027 63	87 094 628	Fig. 135, pos. 2 and pos. 11
Concentric pipe, 1000 mm long, effective length 950 mm	77 190 027 64	87 094 632	Fig. 135, pos. 2 and pos. 11
Concentric pipe, 2000 mm long, effective length 1950 mm	77 190 027 65	87 094 636	Fig. 135, pos. 2 and pos. 11
Concentric 87° bend	77 190 027 66	87 094 644	Fig. 135, pos. 12
Concentric 45° bend	77 472 213 80	87 094 648	Fig. 135, pos. 12
Concentric 30° bend	77 190 027 68	87 094 652	Fig. 135, pos. 12
Concentric 15° bend	87 094 580	87 094 656	Fig. 135, pos. 12
Concentric 87° inspection bend	77 190 033 82	–	Fig. 135, pos. 1
Concentric pipe with inspection aperture	77 190 027 60	87 094 640	–
Additional equipment required for roof outlet on an external wall			
Adhesive flat roof flange, Ø 125 mm, not adjustable	–	87 094 910	Fig. 136, pos. 15
Adhesive flat roof flange, Ø 125 mm, pitch adjustable from 0° to 15°	–	87 094 912	Fig. 136, pos. 16
Roof tile, black coated, Ø 125 mm, pitch adjustable from 25° to 45°	–	87 094 852	Fig. 136, pos. 17
Roof tile, terracotta coated, Ø 125 mm, pitch adjustable from 25° to 45°	–	87 094 850	Fig. 136, pos. 17
Concentric roof outlet, stainless steel, without terminal piece	–	87 094 660	Fig. 136, pos. 18

Table 66 Plastic components of the standard GAF-K set

10.7 Concentric air/flue gas routing via a separate combustion air line inside the installation room and via a flue with secondary ventilation in a shaft with GAL-K set

For the Logamax plus GB172/G172T the Buderus GAL-K set can only be used in conjunction with the GA-K set (→ Fig. 138).

Appliance type C_{53x}

Observe the general information on page 132 ff. as well as the specific information regarding the standard GA-K set (→ page 143 f.).

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾	Reduction of the total length for each additional pipe diversion ²⁾
	in m	in m
-14...	25	0
-20...	25	0
-24...	25	1.5
All appliances	L ₃ = 5 m	0

Table 67 Maximum permissible total installed flue length (→ Fig. 138)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set; horizontal length L₁ ≤ 2 m
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Adequate combustion air supply

The GAL-K set is ideally suited for the modernisation of older buildings, if the combustion air **cannot** be drawn in via the existing chimney shaft (→ page 133). The adequate supply of combustion air from the outside is safeguarded by the separate ventilation air line in the installation room.



The ventilation air aperture and the terminal of the flue shaft must be arranged on the same side of the building (identical pressure range).

Maintain the minimum dimensions of the shaft cross-section to ensure that the free cross-section is adequate for the secondary ventilation of the flue (→ Fig. 137).

Minimum dimensions and inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 136).

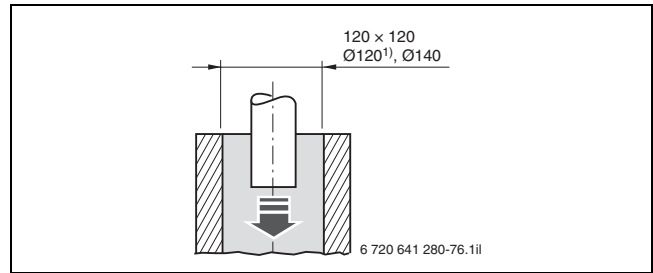


Fig. 137 Minimum dimensions of the shaft cross-section for the installation of the flue (dim. in mm)

- 1) Required shaft cross-section with system certification for ≤ 1.5 mm surface finish

GAL-K set in conjunction with the GA-K set

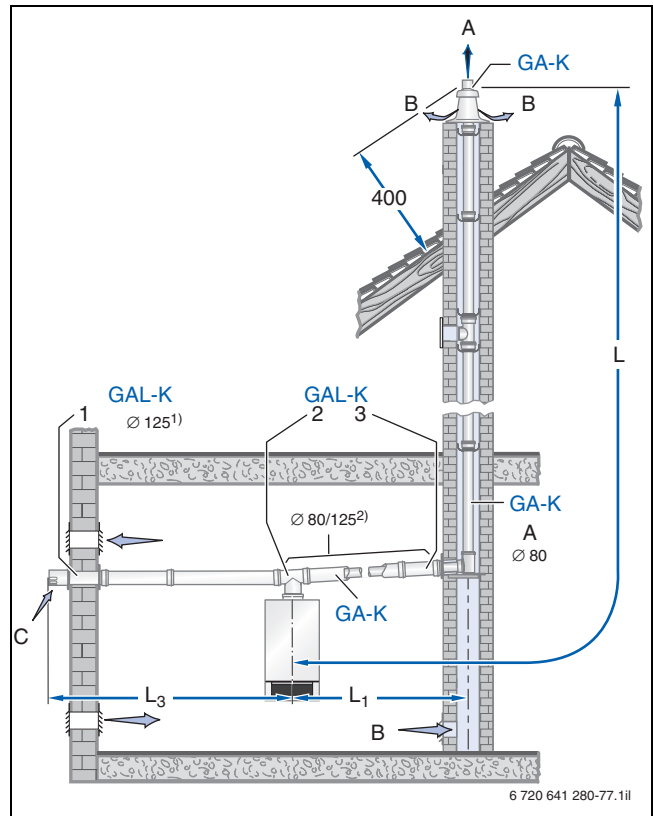


Fig. 138 Installation version (dim. in mm)

- A Flue gas
- B Secondary ventilation
- C Supply air
- 1) Ventilation air pipe
- 2) Concentric balanced flue

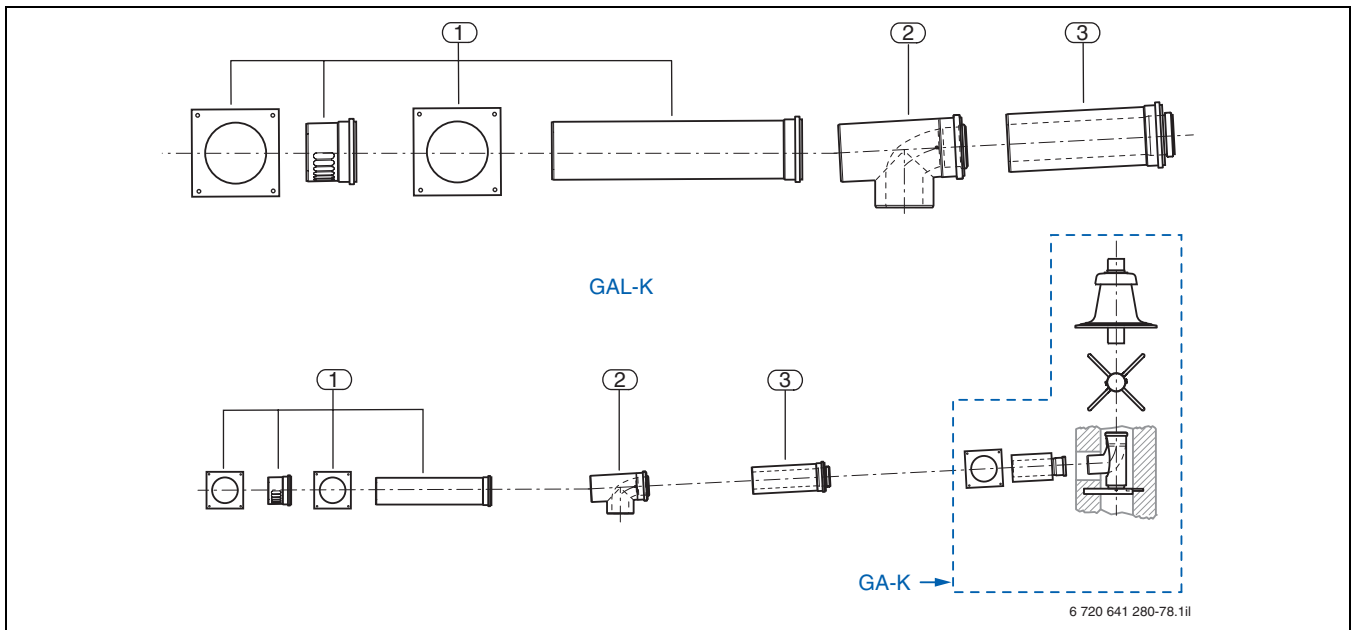


Fig. 139 Plastic components of the standard GAL-K set

- 1 Fascia cover; cover with ventilation air aperture;
ventilation pipe, 500 mm long; fascia cover
- 2 Concentric tee with inspection aperture
- 3 Concentric pipe with gasket for the ventilation air pipe at
the female connection, 250 mm long

Concentric air/flue gas routing via a separate combustion air line inside the installation room and via a flue with secondary ventilation in a shaft with the GAL-K set	Part no.	Details
GAL-K standard set for the Logamax plus GB172/G172T made from PP plastic/zinc-plated steel (painted white)		
GAL-K, Ø 80/125 mm	87 094 459	Fig. 139
For operating the Logamax plus GB172/G172T the GAL-K extension set can only be used in conjunction with the GA-K standard set.		
For combining the GAL-K extension set with the GA-K standard set (made from PP plastic/zinc-plated steel (painted white)):		
GA-K Ø 80/125 mm	77 472 153 65	Fig. 130, page 143
GA-K Ø 80/125 mm with shaft cover and terminal pipe made from stainless steel ¹⁾	77 472 153 66	Fig. 130, page 143
Optional equipment		
Supply air pipe, white painted steel, Ø 125 mm, 1000 mm long	87 092 202	–
Supply air pipe, white painted steel, Ø 125 mm, 500 mm long	87 092 024	–
Tee with inspection aperture for ventilation air, white painted steel, Ø 125 mm (may be converted to straight-through format)	87 092 002	–
Cover for inspection tee (required for inspection tee)	87 092 006	–

Table 68 Components of the GAL-K set in conjunction with the GA-K set

1) Not in connection with ÜB-Flex

10.8 Concentric air/flue gas routing for multiple boiler connections under positive pressure operation

Possible applications

For extensive modernisations, for example when replacing outdated conventional wall mounted boilers or in new build, there is the option of connecting up to five Logamax plus GB172/G172T to one common flue. For this, the GB172/G172T may be distributed over several floors.

When replacing open flue boilers there is the benefit that gas condensing boilers can be operated post modernisation with balanced flues, which safeguards the supply of combustion air at all times.

Standards and approvals

The Logamax plus GB172/G172T gas condensing boilers are system-certified together with the LAS-K for multiple connections in positive pressure operation in accordance with the DVGW Code of practice G 635 (appliance type C_{43x}).

The air/flue gas system supplied by Raab holds the DIBt approval Z-7.5-3047 that is based on the CE certification of the flue pipes.

Suitable appliances for multiple connection

No special versions of the GB172/G172T are required for multiple connections in positive pressure operation. All Logamax plus GB172/G172T gas condensing boilers are factory-fitted with a flue gas non-return device for positive pressure operation compliant with the DVGW Code of Practice G 635 making them suitable for multiple connection in positive pressure operation.

Sizing for multiple connection

Shaft in mm	Flue in mm	Maximum height H ₁ above the highest boiler in m		
		14...	20...	24...
for 2 GB172/G172T appliances				
140 × 200	Ø 113	30.5	30.5	26
200 × 200	Ø 113	30.5	30.5	30.5
for 3 GB172/G172T appliances				
140 × 200	Ø 113	27.5	19	11
200 × 200	Ø 113	27.5	27.5	17.5
for 4 GB172/G172T appliances				
140 × 200	Ø 113	24.5	8	3
200 × 200	Ø 113	24.5	14.5	7.5
for 5 GB172/G172T appliances				
140 × 200	Ø 113	16.5	–	–
200 × 200	Ø 113	21.5	4.5	–

Table 69 Maximum height above the highest boiler; effective height between appliances 3 m

Shaft in mm	Flue in mm	Maximum height H ₁ above the highest boiler in m		
		14...	20...	24...
for 2 GB172/G172T appliances				
140 × 200	Ø 113	30	30	26
200 × 200	Ø 113	30	30	30
for 3 GB172/G172T appliances				
140 × 200	Ø 113	26.5	18.5	10.5
200 × 200	Ø 113	26.5	26.5	18
for 4 GB172/G172T appliances				
140 × 200	Ø 113	23	7.5	2.5
200 × 200	Ø 113	23	14	7
for 5 GB172/G172T appliances				
140 × 200	Ø 113	15.5	–	–
200 × 200	Ø 113	19.5	4.5	–

Table 70 Maximum height above the highest boiler; effective height between appliances 3.5 m

Observe the following:

- When combining boilers of different output sizes, apply the values for the highest output in the table. Alternatively, an individual calculation can be carried out.

Multiple connection set

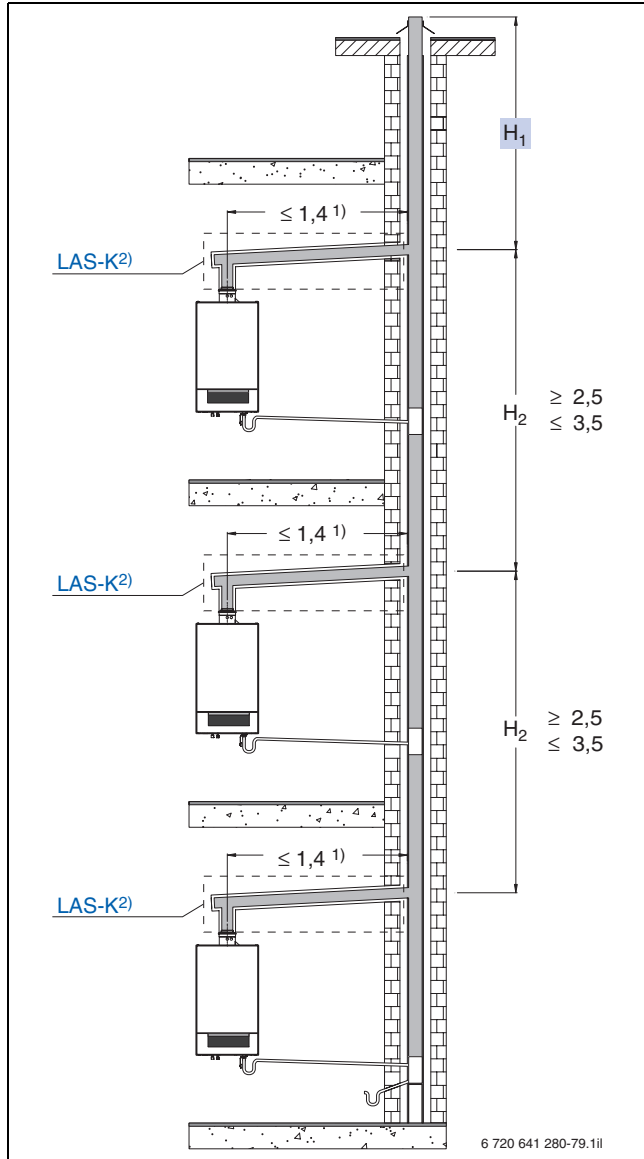


Fig. 140 Installation versions (dim. in mm)

- 1) Greater lengths may be possible, subject to calculation.
- 2) Standard LAS-K set; components → page 155 f.

- More favourable values can be expected in the case of larger shaft cross-sections; these should be verified by an individual calculation. In the case of smaller shaft cross-sections, a \varnothing 100 mm flue can be used (maximum length and required components on request).

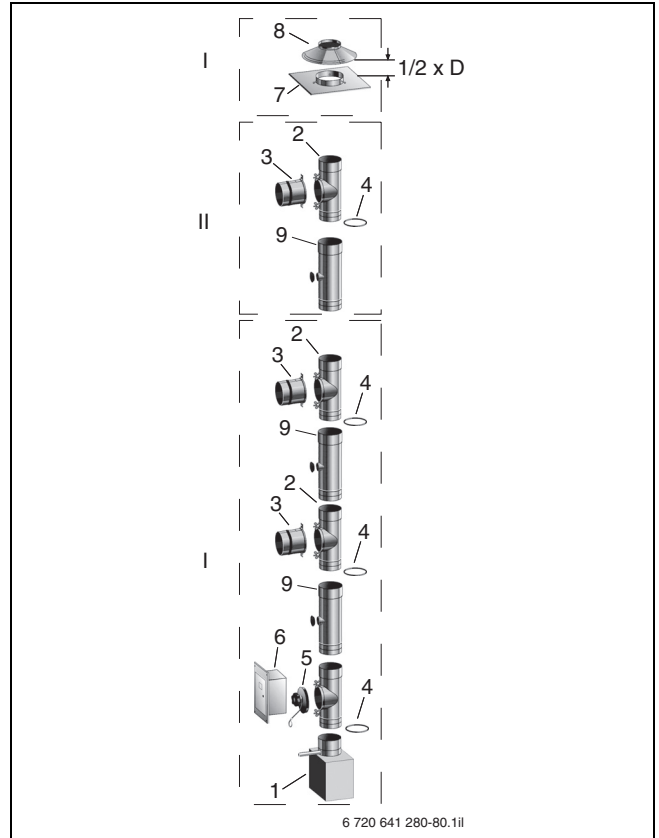


Fig. 141 Components of the multiple connection set

- I** Standard set for multiple connection of two Logamax plus GB172/G172T:
 - 1 Condensate pan with drain
 - 2 90° tee for cleaning/connection part, 260 mm (3 pce)
 - 3 Connection part, 120 mm (2 pce)
 - 4 Seal ring, pressure-tight (3 pce)
 - 5 Spring-loaded cover, pressure-tight
 - 6 Stainless steel door 14/20 with wall box 75 mm
 - 7 Shaft cover, sheet steel 340/340 mm
 - 8 Rain collar with toggle fastener
 - 9 Longitudinal element with condensate return, 340 mm (accessory; not part of the standard set)
- II** Extension set for one additional boiler for multiple connection:
 - 2 90° tee for cleaning/connection part, 260 mm
 - 3 Connection part, 120 mm
 - 4 Seal ring, pressure-tight
 - 9 Longitudinal element with condensate return, 340 mm (accessory; not part of the extension set)

Concentric air/flue gas routing for multiple boiler connections and LAS-K	Part no.	Details
Standard set, multiple connection Logamax plus GB172/G172T		
Standard set for two boilers Ø 113	80 983 700	Fig. 141
Extension set for one additional boiler Ø 113	80 983 702	Fig. 141
Additional equipment, shaft Ø 113		
90° tee for cleaning cover/connection part (preparation for retrospective appliance connection)	80 983 110	–
Spring-loaded cover, pressure-tight (DD) - required for preparing a retrospective appliance connection	80 983 130	–
Connection part for retrospective appliance connection (to connect to LAS-K)	80 983 500	–
Longitudinal element 1000 mm	80 983 200	–
Longitudinal element 1000 mm with drain loops	80 983 204	–
Longitudinal element 500 mm	80 983 210	–
Longitudinal element 250 mm	80 983 220	–
Longitudinal element with condensate return, 340 mm	80 983 510	–
Compensator 255 mm - 400 mm	80 983 230	–
Gasket, pressure-tight (DD)	80 983 350	–
87° bend, rigid	80 983 258	–
45° bend, rigid	80 983 262	–
30° bend, rigid	80 983 254	–
5° bend, rigid	80 983 250	–
Wall clip L	80 983 310	–
Lightning protection clip	80 993 070	–
Stainless steel door 4/20 with wall box 75 mm	80 993 100	–
Stainless steel door 20/30 with wall box 75 mm	80 993 120	–
Shaft cover, sheet steel, 340/340 mm	80 993 080	–
Spacer with toggle fastener	80 993 300	–
Plug-in siphon, plastic	80 993 060	–
Rain collar with toggle fastener	80 993 240	–
Sealing set, shaft cover to sheet metal 500/500	80 993 090	–
Lubricant, tube, 100 g	80 993 050	–

Table 71 Components of the multiple connection set

10.9 Concentric air/flue gas routing via an air/flue gas system with LAS-K set

Appliance type C_{43x}

Observe the general information on page 132 ff.

Logamax plus GB172 GB172T	Maximum permissible overall length L ¹⁾ in m	Reduction of the total length for each additional pipe diversion ²⁾ in m
-14...	1.4	0
-20...	1.4	0
-24...	1.4	0

Table 72 Maximum permissible total installed flue length (→ Fig. 142)

- 1) The installed lengths apply inclusive of the pipe diversions included in the standard set; following calculation by the LAS manufacturer, greater lengths may be possible
- 2) Up to three reductions for additional bends or inspection bends can be taken into consideration; more than three must be checked on an individual basis

Connection to the air/flue gas system

When connecting the Logamax plus GB172/G172T gas condensing boilers directly to the chimney, a wall construction in front with a minimum thickness of 11.5 cm is required (→ Fig. 142).

Each manufacturer may specify different connections for linking the concentric air/flue gas line to the LAS chimney.

GB172/G172T are suitable for connection to a air/flue gas system operating with negative pressure. The manufacturer will size the air/flue gas system.

[In Germany,] general building regulations approval from the Institut für Bautechnik (DIBt) must be granted for the air/flue gas system.

i For further information, see the DVGW Code of Practice G 636 "Gas appliances for connection to an air/flue gas system operating with negative pressure (standardised procedure)."

Inspection apertures

Allow for inspection apertures in accordance with regulations (→ page 136).

LAS-K set

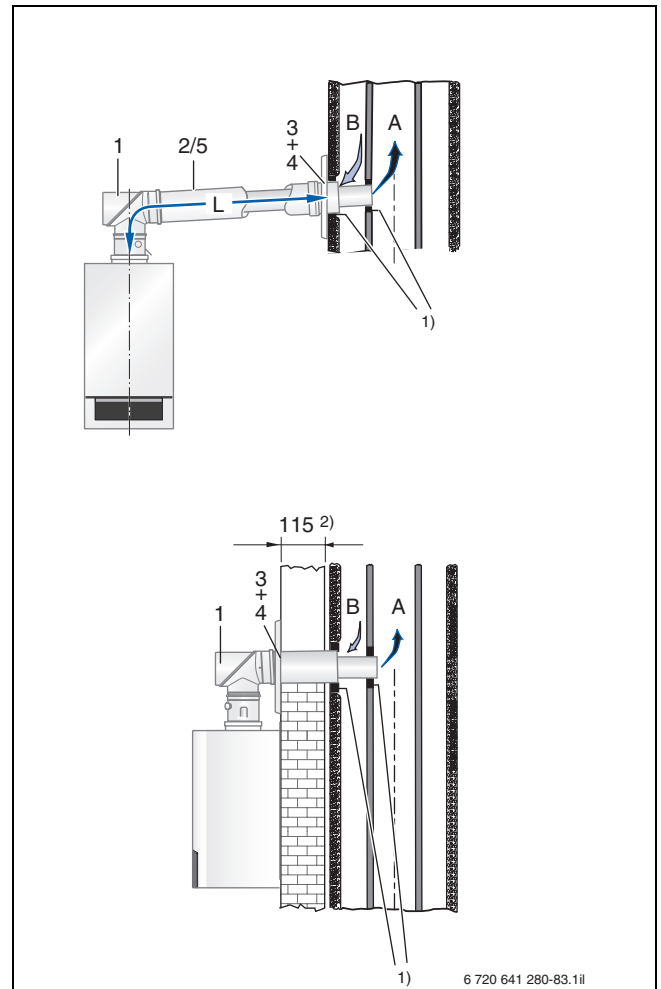


Fig. 142 Installation versions (dim. in mm)

- A** Flue gas
- B** Supply air
- 1)** Seal supplied by the manufacturer of the LAS
- 2)** Facing wall for LAS-K only for installation directly to the LAS with connection at the back

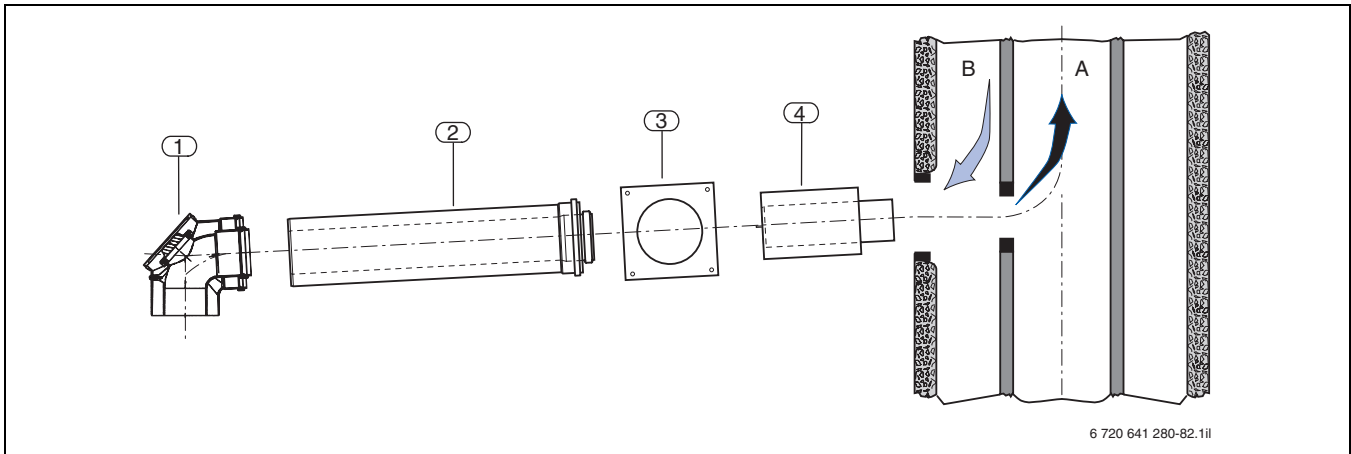


Fig. 143 Components of the LAS-K standard set made from plastic, Ø 80/125 mm

- A** Flue gas
- B** Supply air
- 1** Concentric inspection bend
- 2** Concentric pipe, 500 mm long
- 3** Cover
- 4** Concentric wall outlet
(Ø 80 mm, 500 mm long; Ø 125 mm, 300 mm long)

Concentric air/flue gas routing via a balanced flue system	Part no.	Details
LAS-K standard set for the Logamax plus GB172/G172T made from PP plastic/zinc-plated steel (painted white)		
LAS-K made from PP/zinc-plated steel (painted white)	7747215370	Fig. 143
Optional equipment		
Concentric pipe, 500 mm long; effective length 450 mm	77 190 027 63	Fig. 142, pos. 2 and pos. 5
Concentric pipe, 1000 mm long; effective length 950 mm	77 190 027 64	Fig. 142, pos. 2 and pos. 5
Concentric 87° bend	77 190 027 66	–
Concentric 45° bend	77 192 213 80	–
Concentric 30° bend	77 190 027 68	–
Concentric 15° bend	87 094 580	–
Concentric 87° inspection bend	77 190 033 82	Fig. 142, pos. 1
Concentric pipe with inspection aperture	77 190 037 60	–

Table 73 Components of the LAS-K set

11 Individual components for flue systems

11.1 Components for individual appliances, internal diameter Ø 80 mm

Seal

- Lip seal

Part numbers

- For the relevant sets in chapters 9 and 10 for the selected flue system

Inspection bend, long

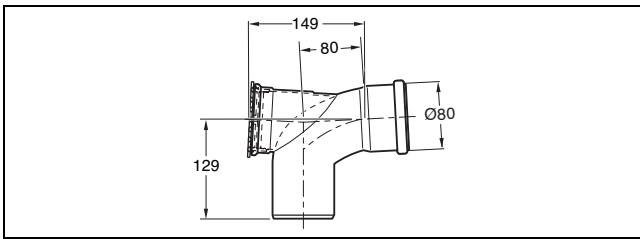


Fig. 144 Inspection bend, long (dim. in mm)

Pipe with inspection aperture

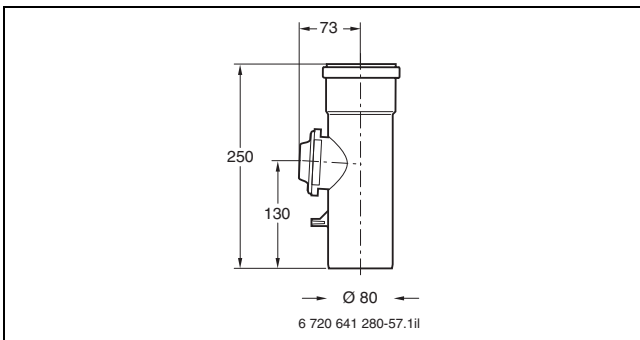


Fig. 145 Pipe with inspection aperture (dim. in mm)

Bend

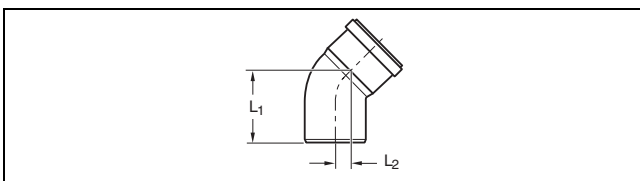


Fig. 146 Bend

Ø in mm	α	L ₁ in mm	L ₂ in mm
80	87°	112.9	59.9
80	45°	100.9	20
80	30°	94.3	10.5
80	15°	84.9	2.3

Table 74 Bend dimensions

Offset dimensions, bend

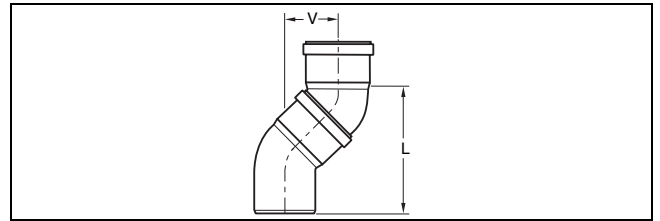


Fig. 147 Offset dimensions, bend

Ø in mm	Bend	V in mm	L in mm
80	2 × 87°	174.8	179.2
80	2 × 45°	77.2	186.4
80	2 × 30°	48.5	181.1
80	2 × 15°	22.1	167.5

Table 75 Offset dimensions, bend

Flue pipe

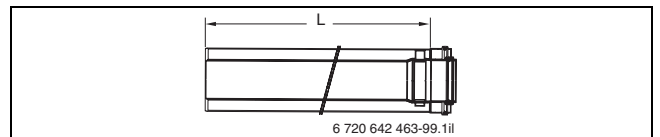


Fig. 148 Flue pipe Ø 80

Ø in mm	L in mm
80	450, 950, 1950

Table 76 Flue pipe dimensions

Shaft cover

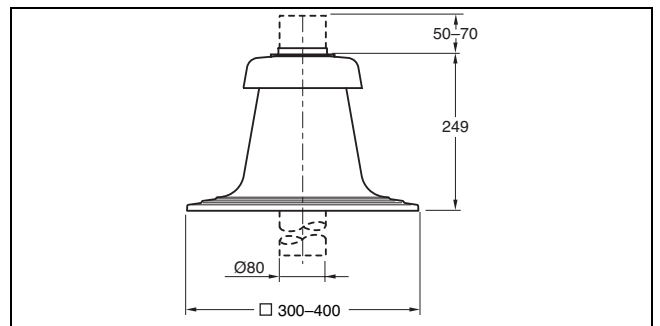


Fig. 149 Shaft cover (dim. in mm)

Spacer for flue inside shaft

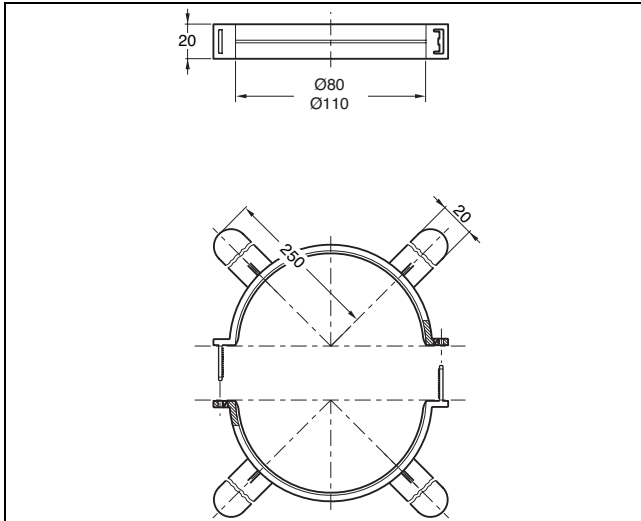


Fig. 150 Spacer for flue inside shaft (dim. in mm)

Chimney connection (part of the standard GA set)

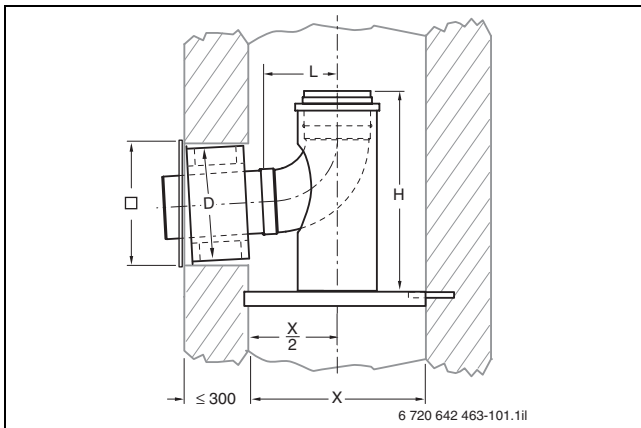


Fig. 151 Chimney connection (dim. in mm)

Ø in mm	D in mm	L in mm	H in mm	□ in mm	X in mm
80	125	125	244	200	≤ 300

Table 77 Chimney connection dimensions

Ventilation air grille (part of the standard GA-X set)

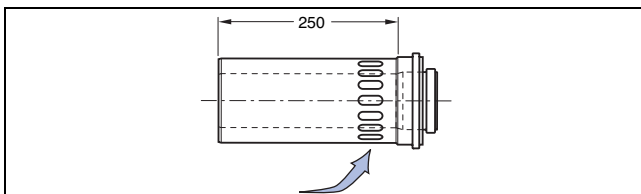


Fig. 152 Ventilation air grille (dim. in mm)

11.2 Components for individual appliances, internal diameter Ø 125 mm

Slope

- Adjustable from 0° to 15°

Seal

- Lip seal

Part numbers

- For the relevant sets in chapters 9 and 10 for the selected flue system

Adhesive flat roof flange, adjustable from 0° to 15°

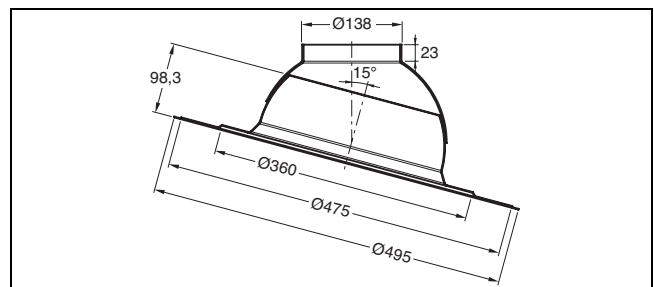


Fig. 153 Adhesive flat roof flange (dim. in mm)

11.3 Air/flue gas lines for individual appliances, internal diameter Ø 80/125 mm

Seal

- Lip seal

Part numbers

- For the relevant sets in chapters 9 and 10 for the selected flue system

Concentric inspection bend/tee

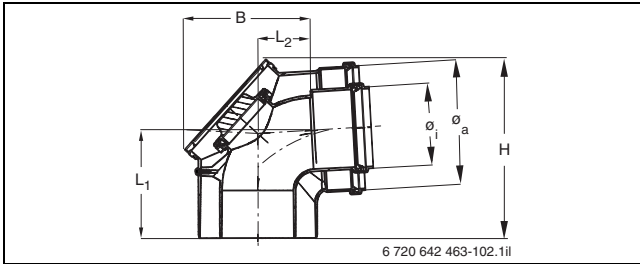


Fig. 154 Concentric inspection bend Ø 80/125

Ø _i /Ø _a in mm	L ₁ in mm	L ₂ in mm	B in mm	H in mm
80/125	110	70	140	190

Table 78 Concentric inspection bend/tee dimensions

Concentric sliding piece/installation aid

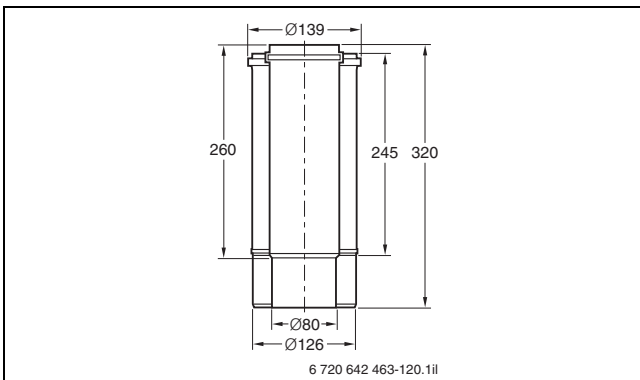


Fig. 155 Concentric sliding piece (dim. in mm)

Concentric pipe with inspection aperture

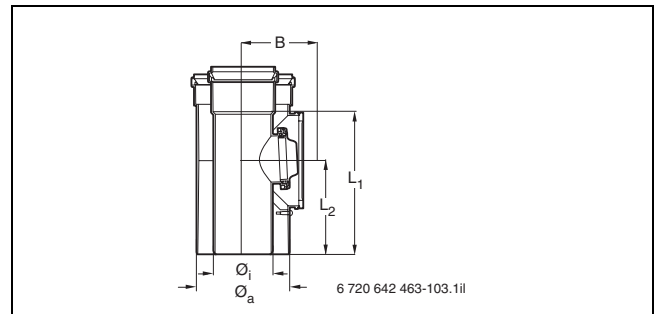


Fig. 156 Concentric pipe with inspection aperture Ø 80/125

Ø _i /Ø _a in mm	L ₁ in mm	L ₂ in mm	B in mm
80/125	190	125	80

Table 79 Concentric pipe with inspection aperture Ø 80/125 dimensions

Concentric pipe with inspection aperture, stainless steel (for GAF-K set)

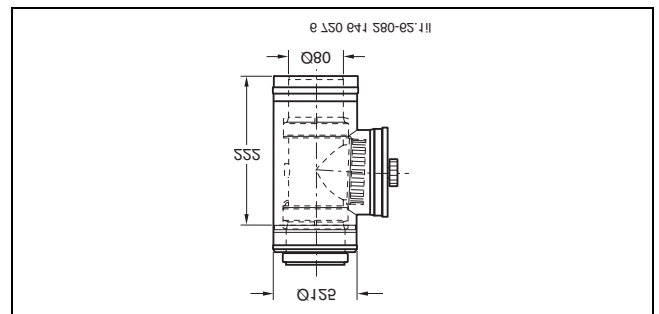


Fig. 157 Concentric pipe with inspection aperture (dim. in mm)

Concentric bend

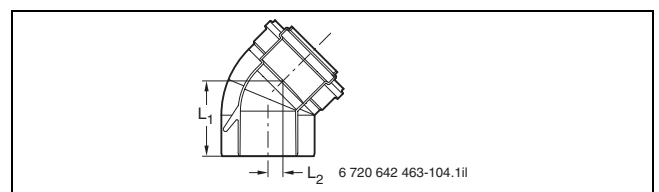


Fig. 158 Concentric bend Ø 80/125

Ø in mm	α	L ₁ in mm	L ₂ in mm
80/125	87°	112.9	59.9
80/125	45°	100.9	20
80/125	30°	93.6	9.8
80/125	15°	76	3.5

Table 80 Concentric bend dimensions

Offset dimensions, concentric bend

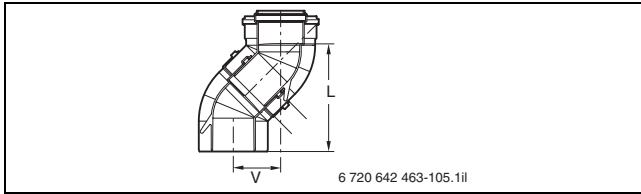


Fig. 159 Offset dimensions, concentric bend Ø 80/125

Ø in mm	Bend	V in mm	L in mm
80/125	2 × 87°	179.8	179.4
80/125	2 × 45°	85.7	194.9
80/125	2 × 30°	54.1	189.9
80/125	2 × 15°	20	151

Table 81 Offset dimensions, concentric bend

**Concentric chimney connection
(part of the standard GA-K set)**

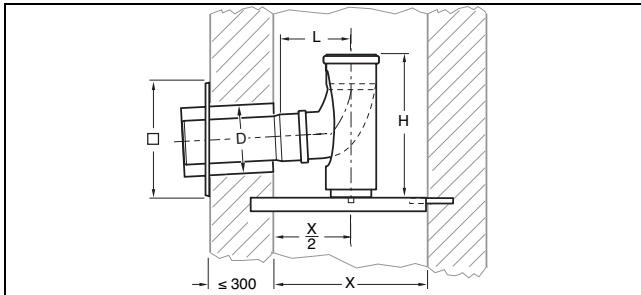


Fig. 160 Concentric chimney connection (dim. in mm)

Ø in mm	D in mm	L in mm	H in mm	□ in mm	X in mm
80	125	125	244	200	≤ 300

Table 82 Concentric chimney connection dimensions

**Concentric ventilation air tee, stainless steel
(part of the standard GAF-K set)**

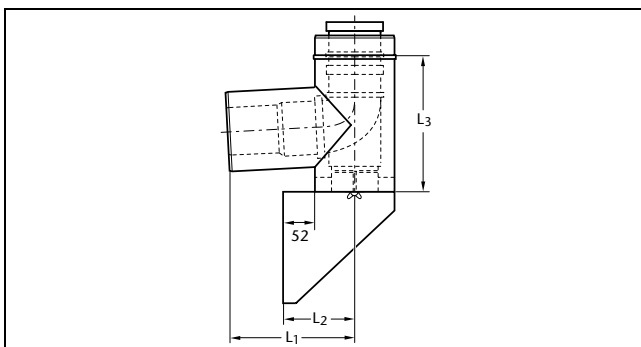


Fig. 161 Concentric ventilation air tee

Ø in mm	L ₁ in mm	L ₂ in mm	L ₃ in mm
80/125	237	115	229

Table 83 Concentric ventilation air tee dimensions

**Concentric ventilation air connector, stainless steel
(for GAF-K set)**

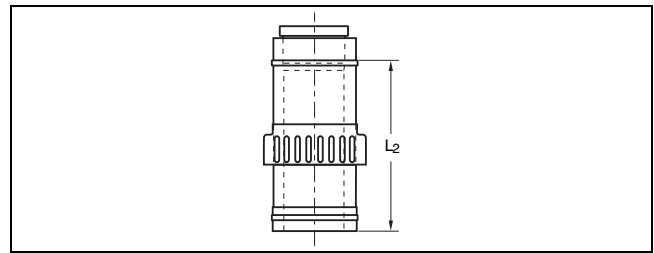


Fig. 162 Concentric ventilation air connector

Ø in mm	L ₂ in mm
80/125	250

Table 84 Concentric ventilation air connector dimensions

**Roof outlet with terminal piece, stainless steel
(for GAF-K set)**

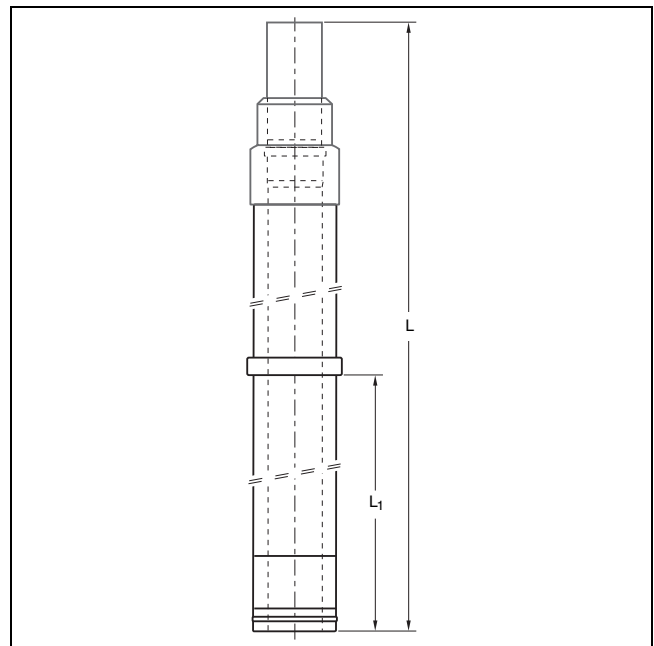


Fig. 163 Roof outlet with terminal piece

Ø in mm	L in mm	L ₁ in mm
80/125	1250	650

Table 85 Roof outlet with terminal piece dimensions

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