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Technical guide  
Issue 12/2010



## **Logano S825L/S825L LN and Logano plus SB825L/SB825L LN**

Conventional boiler/gas  
condensing boiler

Output range from  
650 kW to 19200 kW

**Heat is our element**

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# Table of contents

|          |                                                                                                                  |           |  |  |
|----------|------------------------------------------------------------------------------------------------------------------|-----------|--|--|
| <b>1</b> | <b>Oil/gas special boilers</b>                                                                                   | <b>5</b>  |  |  |
| 1.1      | Types and output                                                                                                 | 5         |  |  |
| 1.2      | Overview of models                                                                                               | 5         |  |  |
| 1.3      | Possible applications                                                                                            | 6         |  |  |
| 1.4      | Benefits and features                                                                                            | 6         |  |  |
| <b>2</b> | <b>Basic principles</b>                                                                                          | <b>7</b>  |  |  |
| 2.1      | Basic principles of condensing technology                                                                        | 7         |  |  |
| 2.1.1    | Net and gross calorific values                                                                                   | 7         |  |  |
| 2.1.2    | Boiler efficiency above 100 %                                                                                    | 7         |  |  |
| 2.2      | Making optimal use of condensing technology                                                                      | 8         |  |  |
| 2.2.1    | Matching to the heating system                                                                                   | 8         |  |  |
| 2.2.2    | High standard seasonal efficiency [to DIN]                                                                       | 9         |  |  |
| 2.2.3    | Sizing information                                                                                               | 9         |  |  |
| 2.3      | Economic viability considerations                                                                                | 10        |  |  |
| 2.3.1    | Simplified comparison of conventional boilers and gas condensing boilers                                         | 10        |  |  |
| <b>3</b> | <b>Technical description</b>                                                                                     | <b>11</b> |  |  |
| 3.1      | Logano S825L and S825L LN conventional boilers, and Logano plus SB825L and SB825L LN gas condensing boilers      | 11        |  |  |
| 3.1.1    | Equipment overview                                                                                               | 11        |  |  |
| 3.1.2    | Function principle                                                                                               | 12        |  |  |
| 3.2      | Dimensions and specification of the Logano S825L and S825L LN conventional boilers                               | 14        |  |  |
| 3.2.1    | Dimensions Logano S825L, boiler sizes 650 to 5200                                                                | 14        |  |  |
| 3.2.2    | Dimensions Logano S825L, boiler sizes 6500 to 19200                                                              | 15        |  |  |
| 3.2.3    | Dimensions Logano S825L LN, boiler sizes 750 to 3500                                                             | 16        |  |  |
| 3.2.4    | Dimensions Logano S825L LN, boiler sizes 4250 to 17500                                                           | 17        |  |  |
| 3.2.5    | Specification Logano S825L, boiler sizes 650 to 5200                                                             | 18        |  |  |
| 3.2.6    | Specification Logano S825L, boiler sizes 6500 to 19200                                                           | 18        |  |  |
| 3.2.7    | Specification Logano S825L LN, boiler sizes 750 to 3500                                                          | 19        |  |  |
| 3.2.8    | Specification Logano S825L LN, boiler sizes 4250 to 17500                                                        | 19        |  |  |
| 3.3      | Dimensions and specification of the Logano plus SB825L and SB825L LN gas condensing boilers                      | 20        |  |  |
| 3.3.1    | Dimensions Logano plus SB825L, boiler sizes 1000 to 5200                                                         | 20        |  |  |
| 3.3.2    | Dimensions Logano plus SB825L, boiler sizes 6500 to 19200                                                        | 21        |  |  |
| 3.3.3    | Dimensions Logano plus SB825L LN, boiler sizes 750 to 3500                                                       | 22        |  |  |
| 3.3.4    | Dimensions Logano plus SB825L LN, boiler sizes 4250 to 17500                                                     | 23        |  |  |
| 3.3.5    | Specification Logano plus SB825L, boiler sizes 1000 to 5200                                                      | 24        |  |  |
| 3.3.6    | Specification Logano plus SB825L, boiler sizes 6500 to 19200                                                     | 25        |  |  |
| 3.3.7    | Specification Logano plus SB825L LN, boiler sizes 750 to 3500                                                    | 26        |  |  |
| 3.3.8    | Specification Logano plus SB825L LN, boiler sizes 4250 to 17500                                                  | 27        |  |  |
| 3.4      | Flue gas heat exchanger ECO 6 SA (stand-alone)                                                                   | 28        |  |  |
| 3.4.1    | Function principle                                                                                               | 28        |  |  |
| 3.4.2    | Specification flue gas heat exchanger ECO 6 SA                                                                   | 28        |  |  |
| 3.5      | Connections                                                                                                      | 30        |  |  |
| 3.5.1    | Flow and return                                                                                                  | 30        |  |  |
| 3.5.2    | Flow safety line and safety valve connections                                                                    | 31        |  |  |
| 3.5.3    | Flue outlet connection                                                                                           | 31        |  |  |
| 3.5.4    | Condensing heat exchanger connection for integral version (Logano plus SB825) and stand-alone version (ECO 6 SA) | 32        |  |  |
| 3.5.5    | Connector                                                                                                        | 33        |  |  |
| 3.6      | Parameters                                                                                                       | 34        |  |  |
| 3.6.1    | Pressure drop on the water side                                                                                  | 34        |  |  |
| 3.6.2    | Pressure drop on the hot gas side                                                                                | 35        |  |  |
| 3.6.3    | Combustion chamber volume load                                                                                   | 37        |  |  |
| 3.6.4    | Boiler efficiency, standard seasonal efficiency [to DIN] and standby loss                                        | 38        |  |  |
| 3.6.5    | Rated output of the condensing heat exchanger                                                                    | 41        |  |  |
| 3.6.6    | Flue gas temperature                                                                                             | 42        |  |  |
| <b>4</b> | <b>Burners</b>                                                                                                   | <b>44</b> |  |  |
| 4.1      | General requirements                                                                                             | 44        |  |  |
| 4.2      | Information on burner selection                                                                                  | 44        |  |  |
| 4.3      | Matched pressure-jet burners                                                                                     | 44        |  |  |
| 4.4      | Combustion details for the Logano S825L and S825L LN conventional boilers                                        | 45        |  |  |
| 4.4.1    | Combustion details for the Logano S825L, boiler sizes 650 to 5200                                                | 45        |  |  |
| 4.4.2    | Combustion details Logano S825L, boiler sizes 6500 to 19200                                                      | 46        |  |  |
| 4.4.3    | Combustion details for the Logano S825L LN, boiler sizes 750 to 3500                                             | 47        |  |  |

|          |                                                                                    |           |          |                                                                                                                                         |           |
|----------|------------------------------------------------------------------------------------|-----------|----------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 4.4.4    | Combustion details for the Logano S825L LN, boiler sizes 4250 to 17500             | 48        | 7.2.2    | Telecontrol modem for optimum service connections                                                                                       | 71        |
| 4.5      | Combustion details for the Logano plus SB825L and SB825L LN gas condensing boilers | 49        | 7.2.3    | Logamatic Easycom                                                                                                                       | 71        |
| 4.5.1    | Combustion details for the Logano plus SB825L, boiler sizes 1000 to 5200           | 49        | 7.2.4    | Logamatic Easycom PRO                                                                                                                   | 71        |
| 4.5.2    | Combustion details for the Logano plus SB825L, boiler sizes 6500 to 19200          | 50        | 7.2.5    | Logamatic Service Key                                                                                                                   | 71        |
| 4.5.3    | Combustion details for the Logano plus SB825L LN, boiler sizes 750 to 3500         | 51        |          |                                                                                                                                         |           |
| 4.5.4    | Combustion details for the Logano plus SB825L LN, boiler sizes 4250 to 17500       | 52        | <b>8</b> | <b>DHW heating</b>                                                                                                                      | <b>72</b> |
| <b>5</b> | <b>Regulations and operating conditions</b>                                        | <b>53</b> | 8.1      | Systems for DHW heating                                                                                                                 | 72        |
| 5.1      | Extracts from the regulations                                                      | 53        | 8.2      | DHW temperature control                                                                                                                 | 72        |
| 5.2      | German Immissions Act (BlmSchG)                                                    | 54        |          |                                                                                                                                         |           |
| 5.2.1    | Table extracted from the 1st BlmSchV "Small and medium-sized combustion systems"   | 54        | <b>9</b> | <b>System examples</b>                                                                                                                  | <b>73</b> |
| 5.2.2    | Information on flue gas tests pursuant to BlmSchV/TA Luft                          | 55        | 9.1      | Information regarding all system examples                                                                                               | 73        |
| 5.3      | Operating requirements                                                             | 56        | 9.1.1    | Hydraulic connection                                                                                                                    | 74        |
| 5.3.1    | Operating conditions                                                               | 56        | 9.1.2    | Control                                                                                                                                 | 74        |
| 5.3.2    | Fuel                                                                               | 57        | 9.1.3    | DHW heating                                                                                                                             | 74        |
| 5.3.3    | Corrosion protection in heating systems                                            | 57        | 9.1.4    | Pipework schemes                                                                                                                        | 75        |
| 5.3.4    | Corrosion protection if system out of use for long periods                         | 58        | 9.2      | Safety equipment to DIN-EN 12828                                                                                                        | 78        |
| 5.3.5    | Guidelines for water quality                                                       | 58        | 9.2.1    | Requirements                                                                                                                            | 78        |
| 5.3.6    | Minimum requirements of water analyses for designing a water treatment system      | 60        | 9.2.2    | Layout of safety components to DIN-EN 12828                                                                                             | 78        |
| <b>6</b> | <b>Sound pressure level from noise in the boiler system</b>                        | <b>61</b> | 9.2.3    | Safety equipment for the condensing heat exchanger                                                                                      | 79        |
| 6.1      | Sound emissions from the boiler system                                             | 61        | 9.2.4    | Maximum operating flow temperatures                                                                                                     | 79        |
| 6.2      | Noise in the installation room                                                     | 61        | 9.3      | Sizing and installation information                                                                                                     | 79        |
| 6.3      | Noise at the chimney outlet                                                        | 62        | 9.3.1    | Boiler circuit pump in the bypass as shunt pump                                                                                         | 79        |
| <b>7</b> | <b>Heating controls</b>                                                            | <b>63</b> | 9.3.2    | Boiler circuit pump as primary circuit pump                                                                                             | 81        |
| 7.1      | Control systems                                                                    | 63        | 9.3.3    | Hydraulic balancing line                                                                                                                | 82        |
| 7.1.1    | Logamatic 4212 control unit with ZM427 auxiliary module                            | 63        | 9.4      | Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler and heating circuit control unit                           | 83        |
| 7.1.2    | Logamatic 4321 und 4322 control units                                              | 64        | 9.5      | Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler and heating circuit control unit with hydraulic separation | 84        |
| 7.1.3    | Side control unit retainer                                                         | 66        | 9.6      | Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler circuit control unit                                       | 85        |
| 7.1.4    | DA... display and control units                                                    | 68        | 9.7      | Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler circuit control unit with hydraulic separation             | 86        |
| 7.1.5    | Burner control panel                                                               | 68        | 9.8      | 2-boiler system with two Logano S825L and S825L LN boilers: Logamatic boiler circuit control unit with hydraulic separation             | 87        |
| 7.1.6    | Buderus control panel system Logamatic 4411                                        | 68        | 9.9      | Single boiler system with Logano plus SB825L and SB825L LN gas condensing boiler: Logamatic boiler circuit control unit                 | 88        |
| 7.2      | Logamatic telecontrol system                                                       | 69        |          |                                                                                                                                         |           |
| 7.2.1    | Overview of the Logamatic telecontrol system                                       | 70        |          |                                                                                                                                         |           |

|           |                                                                                                                                                                                                |           |              |                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------|--------------------------------------------------------------------|
| 9.10      | Single boiler system with Logano plus SB825L and SB825L LN gas condensing boiler: Logamatic boiler circuit control unit with hydraulic separation                                              | 89        |              |                                                                    |
| 9.11      | 2-boiler system with Logano S825L and S825L LN conventional boiler and Logano plus SB825L and SB825L LN gas condensing boiler: Logamatic boiler circuit control unit with hydraulic separation | 90        |              |                                                                    |
| 9.12      | Logano plus SB825L and SB825L LN gas condensing boiler: dual fuel combustion with condensing heat exchanger                                                                                    | 91        |              |                                                                    |
| <b>10</b> | <b>Installation</b>                                                                                                                                                                            | <b>92</b> | <b>11</b>    | <b>Flue system</b>                                                 |
| 10.1      | Transport and handling                                                                                                                                                                         | 92        | 11.1         | Requirements                                                       |
| 10.1.1    | Delivery method and transport options                                                                                                                                                          | 92        | 11.1.1       | General information                                                |
| 10.1.2    | Handling dimensions                                                                                                                                                                            | 92        | 11.1.2       | Special information for flue systems with gas condensing boilers   |
| 10.2      | Design of installation rooms and combustion air supply                                                                                                                                         | 93        | 11.1.3       | Material requirements for flue systems with gas condensing boilers |
| 10.2.1    | Installation room                                                                                                                                                                              | 93        | 11.2         | Parameters for sizing flue systems                                 |
| 10.2.2    | Combustion air supply                                                                                                                                                                          | 94        | 11.2.1       | Logano S825L and S825L LN conventional boilers                     |
| 10.3      | Installed dimensions                                                                                                                                                                           | 95        | 11.2.2       | Logano plus SB825L and SB825L LN gas condensing boilers            |
| 10.3.1    | Installation room dimensions for the Logano S825L and S825L LN conventional boilers                                                                                                            | 95        |              |                                                                    |
| 10.3.2    | Installation room dimensions for the Logano plus SB825L and SB825L LN gas condensing boilers                                                                                                   | 96        | <b>12</b>    | <b>Condensate drainage</b>                                         |
| 10.4      | Additional safety equipment to DIN-EN 12828                                                                                                                                                    | 97        | 12.1         | Condensate                                                         |
| 10.4.1    | Safety equipment                                                                                                                                                                               | 97        | 12.1.1       | Creation                                                           |
| 10.4.2    | Boiler safety equipment assembly to DIN-EN 12828                                                                                                                                               | 98        | 12.1.2       | Condensate disposal                                                |
| 10.4.3    | Intermediate return piece                                                                                                                                                                      | 99        | 12.2         | Neutralising system NE 2.0                                         |
| 10.4.4    | Safety valve to DIN-EN 12828                                                                                                                                                                   | 100       | 12.2.1       | Siting                                                             |
| 10.4.5    | Flash trap to DIN-EN 12828                                                                                                                                                                     | 101       | 12.2.2       | Equipment level                                                    |
| 10.4.6    | Return temperature raising set                                                                                                                                                                 | 102       | 12.2.3       | Neutralising agent                                                 |
| 10.5      | Additional devices for sound insulation                                                                                                                                                        | 103       | 12.2.4       | Pump output graph                                                  |
| 10.5.1    | Requirements                                                                                                                                                                                   | 103       |              |                                                                    |
| 10.5.2    | Flue gas silencer                                                                                                                                                                              | 103       | <b>13</b>    | <b>Selection aids</b>                                              |
| 10.5.3    | Burner silencer hood                                                                                                                                                                           | 104       | 13.1         | Boiler selection                                                   |
| 10.5.4    | Boiler mounts to attenuate structure-borne noise                                                                                                                                               | 104       | 13.2         | Boiler selection questionnaire                                     |
| 10.5.5    | Boiler foundation                                                                                                                                                                              | 105       |              |                                                                    |
| 10.6      | Additional accessories                                                                                                                                                                         | 106       | <b>Index</b> | <b>117</b>                                                         |
| 10.6.1    | Drain connection and blow-down valve assembly                                                                                                                                                  | 106       |              |                                                                    |
| 10.6.2    | Walk-on boiler cover                                                                                                                                                                           | 106       |              |                                                                    |

# 1 Oil/gas special boilers

## 1.1 Types and output

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, are special boilers for positive pressure combustion in accordance with the requirements of EN 303. They are constructed with reference to the guidelines of the relevant TRD 300. Buderus offers these boilers in the output range from 650 kW to 19200 kW.

The boilers are designed to produce low pressure hot water with no more than 110 °C (shutdown temperature of the high limit safety cut-out) for heating systems that correspond to the requirements of DIN-EN 12828. The permissible overall pressure must not exceed 6 bar (or 10 bar). For higher pressures, (13 bar or 16 bar), please contact your local Buderus sales office.

## 1.2 Overview of models

| Logano<br>Logano plus     | Unit | S825L<br>Boiler size<br>650 to 19200 | S825L LN<br>Boiler size<br>750 to 17500                               | SB825L<br>Boiler size<br>1000 to 19200 | SB825L LN<br>Boiler size<br>750 to 17500                              |
|---------------------------|------|--------------------------------------|-----------------------------------------------------------------------|----------------------------------------|-----------------------------------------------------------------------|
| Condensing heat exchanger | –    | –                                    | –                                                                     | yes                                    | yes                                                                   |
| Special features          | –    | –                                    | Low combustion chamber volume load for minimum NO <sub>x</sub> values | –                                      | Low combustion chamber volume load for minimum NO <sub>x</sub> values |
| Safety temperature        | °C   | ≤ 110                                |                                                                       |                                        |                                                                       |
| Safety pressure           | bar  | ≤ 10                                 |                                                                       |                                        |                                                                       |
| Dimensions                |      | → page 14 f.                         | → page 16 f.                                                          | → page 20 f.                           | → page 22 f.                                                          |
| Specification             |      | → page 18                            | → page 19                                                             | → page 24 f.                           | → page 26 f.                                                          |

Tab. 1 Overview of models Logano S825L/L LN and Logano plus SB825L/L LN

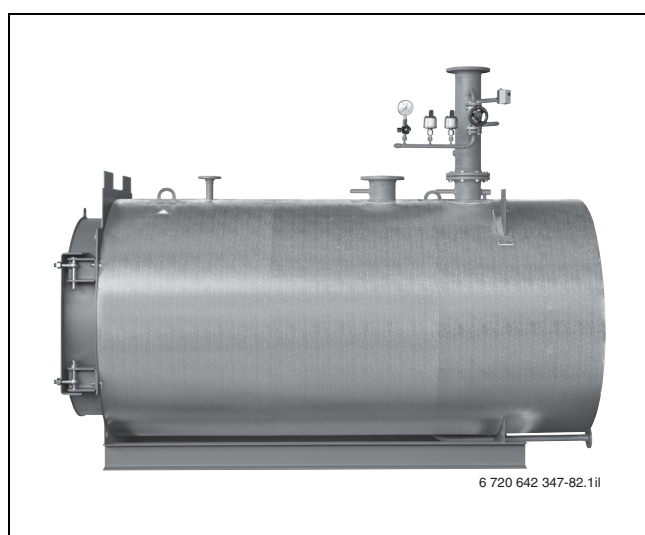


Fig. 1 Logano S825L/L LN

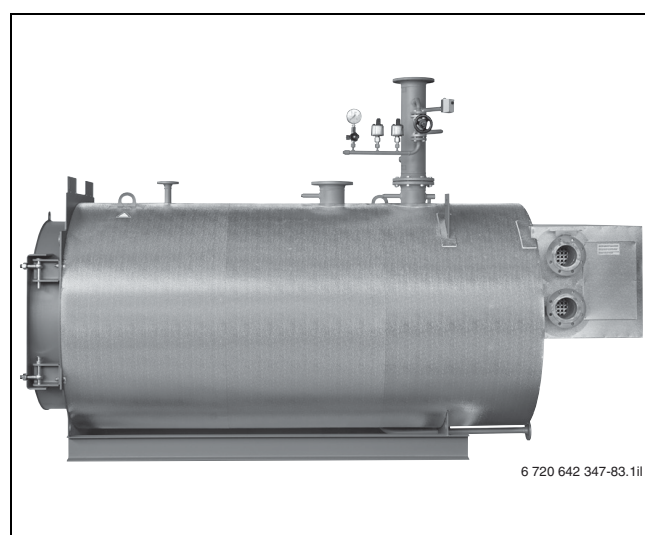


Fig. 2 Logano plus SB825L/L LN

### 1.3 Possible applications

The modular design and additional equipment mean the boiler can be used in any application. A suitable version is available for the requirements of any project.

The optimum application is in large-scale systems, e.g. hospitals, industrial plants, district heating centres, heating stations and commercial operations.

### 1.4 Benefits and features

- **3-pass principle**

The 3-pass technology enables the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, to achieve outstanding combustion figures.

- **Optimised temperature characteristics**

The boilers have a generously sized secondary heating surface in the second pass, designed as a double row. The inner hot gas reversing chamber, which is completely surrounded by water, enables very low temperatures in the front reversing area from the second to the third pass. This significantly reduces the thermal load of the door.

- **Compact construction**

The symmetrical secondary heating surfaces, arranged in a circle around the combustion chamber, enable the compact construction of these boilers. This means they have a low weight and require only a small floor area for installation. The burner door can close on the r.h. or l.h. side.

- **Environmentally responsible with low emissions**

The 3-pass design and water-cooled combustion chamber offer ideal conditions for operation with low emissions, especially in conjunction with the advanced burners that are matched to the boiler. Meeting the highest demands regarding low emissions, especially with oil combustion, is no problem for the Logano S825L LN and Logano plus SB825L LN conventional boiler types with their particularly large combustion chambers (→ Tab. 1, page 5).

- **Economic viability**

Extremely high efficiency is possible, subject to the temperature of the heating medium and the boiler load. The radiation losses of the boiler are negligibly low and the full utilisation of the burner control range enables good efficiency at partial load.

- **Operational reliability**

Due to the optimised design of the combustion chamber and the water guide system, the Logano S825L and S825L LN, as well as the Logano plus SB825L and SB825L LN, are very reliable and safe in operation. The low water content enables a short heat-up time and low minimum return temperature. This means the dew point range in the heat-up phase is quickly passed.

- **Even load distribution**

For even load distribution, the boiler is equipped with a base frame of channel sections. If the floor of the boiler room is even, an additional boiler foundation is not required.

- **Simple maintenance**

The front boiler door can be pivoted right out, and can be opened easily even when the burner is fitted. When the door is open, the combustion chamber and secondary heating surface are freely accessible, and can be cleaned quickly and easily. The reversing chamber is visible through the combustion chamber. As an option, an inspection port on the water side is available. This gives a better view of the heating surfaces. It means the heating surfaces can be viewed from the water chamber.

- **Matching system technology**

Numerous matching accessories are available for all boilers, which enable optimisation of the entire system.

## 2 Basic principles

### 2.1 Basic principles of condensing technology

#### 2.1.1 Net and gross calorific values

The net calorific value  $H_i$  (formerly  $H_U$ ) specifies the amount of heat that can be obtained from one cubic metre of gas or one kilogram of fuel oil. With this reference figure, the products of combustion are present in a gaseous state.

Compared to the net calorific value  $H_i$ , the gross calorific value  $H_g$  (formerly  $H_o$ ) also contains the condensation heat from the water vapour as additional energy.

#### 2.1.2 Boiler efficiency above 100 %

The condensing boiler utilises not only the net calorific value  $H_i$  in order to produce heat, but also the gross calorific value  $H_g$  of a fuel.

For all efficiency calculations in German and European standards, the net calorific value  $H_i$  is always selected at 100 % as a reference figure, meaning that a boiler efficiency of over 100 % can result. This is the only way to be able to compare conventional boilers and condensing boilers.

Boiler efficiency can be raised by up to 15 % in comparison with conventional boilers. Compared with older systems, it is even possible to save up to 40 % energy.

When comparing the energy utilisation of conventional boilers and gas condensing boilers, an energy statement such as the example shown in Fig. 3 can result.

#### Condensation heat (latent heat)

- With natural gas, the proportion of condensation heat is 11 %, relative to the net calorific value  $H_i$ . This heat is unused in conventional boilers.
- By making use of the condensation in the water vapour, the gas condensing boiler enables considerable utilisation of this heat potential.

#### Flue gas loss (sensible heat)

- With the conventional boiler, the heat in the flue gas, which is at a relatively high temperature of 150 °C to 210 °C, escapes. This means an unused heat proportion of around 6 % to 9 % is lost.
- The dramatic reduction of the flue gas temperatures in gas condensing boilers to levels of up to 30 °C utilises the sensible proportion of heat in the hot gas and significantly lowers the flue gas loss.

#### Energy statement comparing conventional boilers and gas condensing boilers

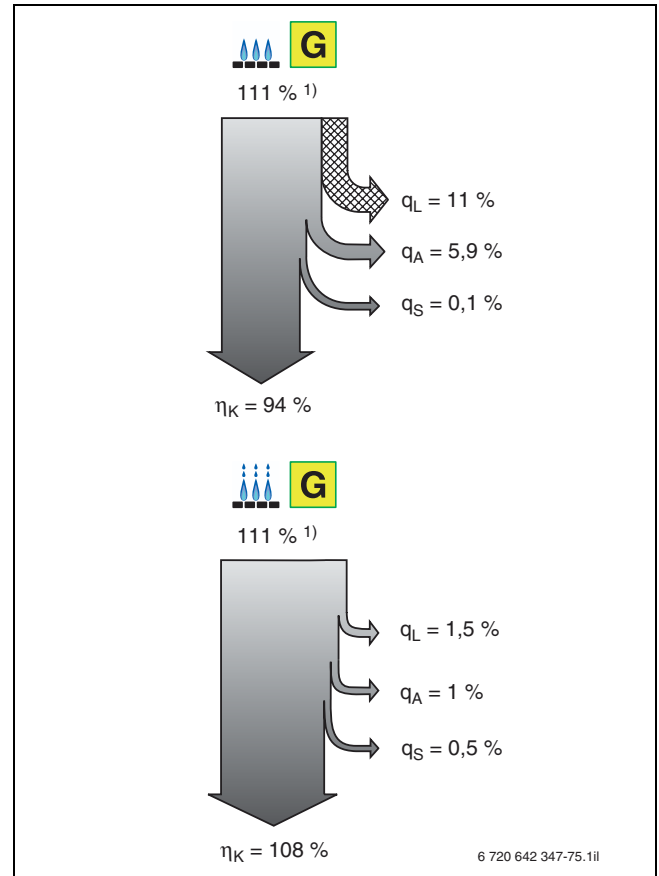


Fig. 3 Energy statement comparing conventional boilers and gas condensing boilers

- G** Conventional boiler
- G** Gas condensing boiler
- $\eta_K$  Boiler efficiency
- $q_A$  Flue gas losses (sensible heat)
- $q_L$  Unused condensation heat (latent heat)
- $q_S$  Radiation losses
- 1) Relative to net calorific value  $H_i = 100\%$

## 2.2 Making optimal use of condensing technology

### 2.2.1 Matching to the heating system

Gas condensing boilers can be installed in any heating system. However, the available proportion of condensation heat and the efficiency resulting from this type of operating mode depend on the design of the heating system.

To be able to use the condensation heat of the water vapour in the hot gas, the hot gas must be cooled to below the dew point. The utilisation rate of the condensation heat is therefore necessarily subject to the system design temperatures and the hours run in the condensation range. This is shown by the graphs in Fig. 4 and Fig. 5. The dew point temperature here is 50 °C.

#### Heating system 40/30 °C

In this system, the benefits of the performance capacity of condensing technology can be seen throughout the heating season. The low return temperatures are constantly below the dew point temperature, so condensation heat is always created (→ Fig. 4). This is achieved with low temperature panel heaters or underfloor heating systems, which are ideal for condensing boilers.

Targeted utilisation of the condensing effect is possible with a separately connected condensing heat exchanger (BWT).

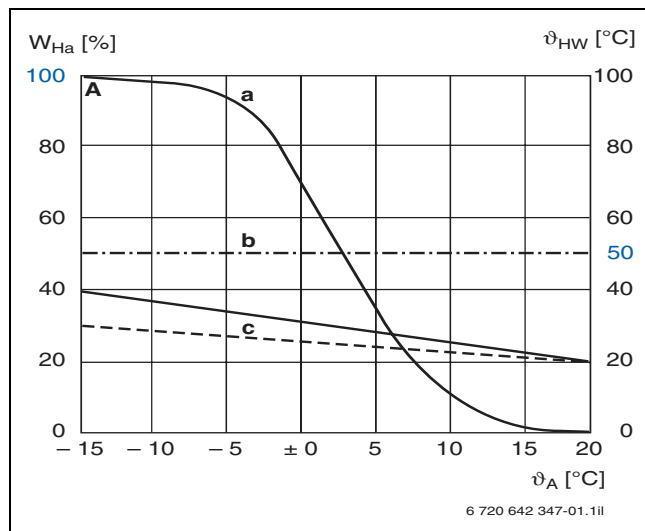


Fig. 4 Condensation heat utilisation at 40/30 °C

- A** Proportion of operation with condensation heat utilisation
- a** Annual heat load curve
- b** Dew point temperature curve
- c** System temperatures
- $\vartheta_A$  Outside temperature
- $\vartheta_{HW}$  Heating water temperature
- $W_{Ha}$  Annual heat load

#### Heating system 75/60 °C

Even with a design temperature of 75/60 °C, it is possible to make above average utilisation of the condensation heat for around 95 % of the annual heat load. This applies for outside temperatures of -7 °C to +20 °C (→ Fig. 5).

Due to the safety supplements in the former DIN 4701 from 1959, older heating systems designed with 90/70 °C are nowadays to all intents and purposes operated as systems with 75/60 °C. Even if these systems were run with system temperatures of 90/70 °C and modulating, weather-compensated heating circuit temperatures, they would still use the condensation heat for 80 % of the annual heating load.

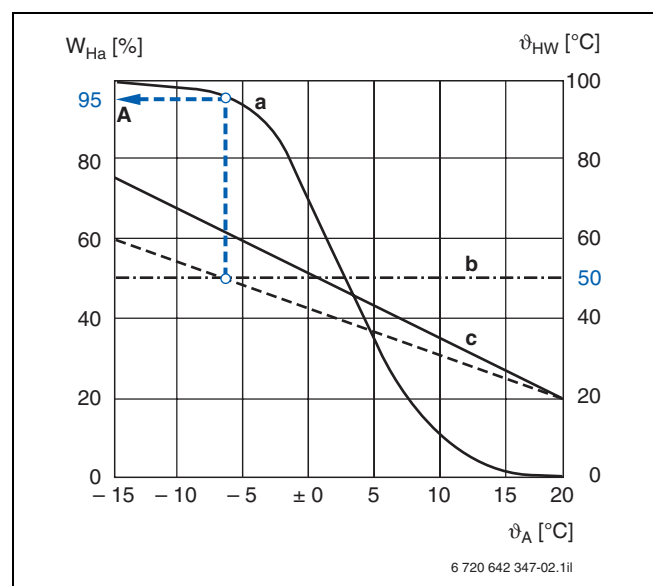


Fig. 5 Condensation heat utilisation at 75/60 °C

- A** Proportion of operation with condensation heat utilisation
- a** Annual heat load curve
- b** Dew point temperature curve
- c** System temperatures
- $\vartheta_A$  Outside temperature
- $\vartheta_{HW}$  Heating water temperature
- $W_{Ha}$  Annual heat load

### 2.2.2 High standard seasonal efficiency [to DIN]

The graphs in Fig. 4 and Fig. 5 show that the varying proportion of condensation heat utilisation has a direct influence on the energy efficiency of the gas condensing boiler.

The high standard seasonal efficiency [to DIN] of gas condensing boilers is based on the following influences:

- Achievement of high CO<sub>2</sub> levels. The higher the CO<sub>2</sub> level, the higher the dew point temperature of the hot gases.
- Lower system and return temperatures can be maintained. The lower the system and return temperatures, the higher the condensation rate and the lower the flue gas temperature.

The Logano S825L and S825L LN boilers, as well as the Logano plus SB825L and SB825L LN boilers, can be matched individually to the prevailing system characteristics and requirements, subject to the individual project. Enquire at your local Buderus sales office for project-specific parameters.

### 2.2.3 Sizing information

In new installations, every opportunity should be exploited to achieve optimum operation of the gas condensing boiler.

A high standard seasonal efficiency [to DIN] is achieved if the following criteria are satisfied:

- Limit the return temperature upstream of the condensing heat exchanger to a maximum of 50 °C, at least partially. In this connection, it is significant that the separate connections for the boiler and condensing heat exchanger mean a partial flow rate of 20 % with a low design temperature (e.g. 40/30 °C) is sufficient to achieve excellent condensing efficiency.
- Aim for a temperature spread between the flow and return of at least 20 K.
- Avoid facilities for raising the return temperature (e.g. 4-way mixers, bypass circuits, low loss headers, depressurised distributors, etc.).

For more detailed information on the hydraulic connection, see Chapter 9 on page 73 ff.

## 2.3 Economic viability considerations

### 2.3.1 Simplified comparison of conventional boilers and gas condensing boilers

#### Fuel costs

- Given
  - Building heat demand  $\dot{Q}_N = 2000 \text{ kW}$
  - Annual heating energy demand  $\dot{Q}_A = 3400000 \text{ kWh/a}$
  - System design temperatures:  
Ventilation  $\vartheta_V/\vartheta_R = 90/70 \text{ °C}$  (proportion 20 %)  
Radiators  $\vartheta_V/\vartheta_R = 75/60 \text{ °C}$  (proportion 50 %)  
Underfloor heating system  $\vartheta_V/\vartheta_R = 40/30 \text{ °C}$  (proportion 30 %)
  - Fuel costs  $K_B = 0.50 \text{ Euro/m}^3$
  - Logano S825L-2500 conventional boiler, rated output 2000 kW,  $\eta_N = 94,9 \%$
  - Logano plus SB825L-2500 gas condensing boiler, rated output 2000 kW,  $\eta_N = 102,3 \%$

The efficiency levels  $\eta_N$  specified for the Logano plus SB825L-2500 gas condensing boiler apply if the underfloor heating system is connected separately to the condensing heat exchanger.

- Sought
  - Fuel consumption
  - Fuel costs
- Calculation

$$B_V = \frac{\dot{Q}_A}{\eta_N \times H_i}$$

Form. 1 Calculation of annual fuel consumption

- $B_V$**  Annual fuel consumption in  $\text{m}^3/\text{a}$   
 **$\eta_N$**  Standard seasonal efficiency in %  
 **$H_i$**  Net calorific value; here natural gas simplified with  $10 \text{ kWh/m}^3$   
 **$\dot{Q}_A$**  Net heating energy demand in  $\text{kWh/a}$

$$K_{Ba} = B_V \times K_B$$

Form. 2 Calculation of annual fuel costs

- $B_V$**  Annual fuel consumption in  $\text{m}^3/\text{a}$   
 **$K_B$**  Fuel costs  
 **$K_{Ba}$**  Annual fuel costs

- Result
  - Logano S825L, boiler size 2500:  
Fuel consumption  $B_V = 358272 \text{ m}^3/\text{a}$ ,  
Fuel costs  $K_{Ba} = 179136 \text{ Euro/a}$
  - Logano SB825L, boiler size 2500:  
Fuel consumption  $B_V = 332356 \text{ m}^3/\text{a}$ ,  
Fuel costs  $K_{Ba} = 166178 \text{ Euro/a}$

Heating with the gas condensing boiler results in savings of around 11601 Euro on fuel costs per year.

#### Investment costs

| Scope of investment <sup>1)</sup> | Unit | Logano S825L, boiler size 2500 | Logano plus SB825L, boiler size 2500 |
|-----------------------------------|------|--------------------------------|--------------------------------------|
| Sum of investment costs           | Euro | 50000                          | 63000                                |

Tab. 2 Investment costs for conventional boilers and gas condensing boilers (values rounded off)

1) Incl. accessories

The investment costs are based on the costs of a boiler system. This includes the costs of the boiler, boiler circuit control unit, pressure-jet burner and flue system, as well as the costs of the safety equipment and return temperature raising facility. The cost of the Logano plus SB825L gas condensing boiler additionally includes the neutralising system for the condensate. Costs for installation have not been taken into account.

#### Reflux of capital

| Type of cost                          | Unit          | Logano S825L, boiler size 2500 | Logano plus SB825L, boiler size 2500 |
|---------------------------------------|---------------|--------------------------------|--------------------------------------|
| Investment costs                      | Euro          | 50000                          | 63000                                |
| Costs linked to capital <sup>1)</sup> | Euro/a        | 5220                           | 6577                                 |
| Fuel costs                            | Euro/a        | 179136                         | 166178                               |
| <b>Total costs</b>                    | <b>Euro/a</b> | <b>184356</b>                  | <b>172755</b>                        |

Tab. 3 Total costs for conventional boilers and gas condensing boilers (values rounded off)

1) Annuity 9,44 %, interest 5 %, maintenance 1 %

In this example, the investment costs have been repaid due to the lower fuel costs after about one year. It is generally true that condensing technology pays for itself faster the greater the output and the higher the fuel costs. No subsidies have been taken into account in the calculations. With the Logano plus SB825L and SB825L LN, it is possible to integrate further condensing heat exchangers. This results in higher efficiency and therefore lower fuel costs.

## 3 Technical description

### 3.1 Logano S825L and S825L LN conventional boilers, and Logano plus SB825L and SB825L LN gas condensing boilers

#### 3.1.1 Equipment overview

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, are oil/gas special boilers for positive pressure combustion to EN 303. These boilers are designed to produce low pressure hot water with no more than 110 °C (shutdown temperature of the high limit safety cut-out) for heating systems that correspond to the demands of DIN-EN 12828. The permissible overall pressure must not exceed 6 bar (or 10 bar). For higher pressures, please contact your local Buderus sales office. The modular design of the boiler and additional equipment enables universal application.

#### Logano S825L “standardised” conventional boiler

- Round boiler casing made of textured aluminium sheeting
- Visible parts of the boiler primed in blue
- Thermal insulation (100 mm) and extremely well insulated burner door
- Boiler pressure body with connections for flow, return, safety valve and drain (all internal diameters are fixed)
- Bottom rear inspection aperture on flue gas collector
- Boiler base frame for even load distribution and easy transportation
- Foil packaging as splash guard included in standard delivery
- Control unit retainer included in standard delivery, arranged at the factory to fit on the r.h. side (can be fitted on the l.h. side on site)
- Large burner door closing on the l.h. side (can be changed to the r.h. side on site)
- Air-cooled combustion chamber sight glass
- Door lining designed to suit any type of burner (burner plates for connecting the burner can be ordered)
- As an option, also available as a unit version (with boiler and burner)

#### Logano S825L LN “standardised” conventional boiler

- Round boiler casing made of textured aluminium sheeting
- Visible parts of the boiler primed in blue
- Thermal insulation (100 mm) and extremely well insulated burner door
- Boiler pressure body with connections for flow, return, safety valve and drain
- Bottom rear inspection aperture on flue gas collector
- Boiler base frame for even load distribution and easy transportation

- Control unit retainer included in standard delivery, arranged at the factory to fit on the r.h. side (can be fitted on the l.h. side on site)
- Large burner door closing on the l.h. side (can be changed to the r.h. side on site)
- Air-cooled combustion chamber sight glass

#### Logano S825L and S825L LN conventional boilers

- Round boiler casing made of textured aluminium sheeting
- Visible parts of the boiler primed in blue
- Thermal insulation (100 mm) and extremely well insulated burner door
- Boiler pressure body with connections for flow, return, safety valve and drain
- As an option with inspection port on the water side
- Bottom rear inspection aperture on flue gas collector
- Boiler base frame for even load distribution and easy transportation
- Large burner door closing on the l.h. side (can be changed to the r.h. side if required)
- Air-cooled combustion chamber sight glass

#### Logano plus SB825L and SB825L LN gas condensing boilers

- Round boiler casing made of textured aluminium sheeting
- Visible parts of the boiler primed in blue
- Thermal insulation (100 mm) and extremely well insulated burner door
- Boiler pressure body with connections for flow, return, safety valve and drain
- As an option with inspection port on the water side
- Bottom rear inspection aperture on flue gas collector
- Boiler base frame for even load distribution and easy transportation
- Large burner door closing on the l.h. side (can be changed to the r.h. side if required)
- Air-cooled combustion chamber sight glass
- With condensing heat exchanger made of stainless steel with connections for the flow, return and condensate drain
- Water connections on either the l.h. or r.h. side

### 3.1.2 Function principle

#### Boiler technology

All Logano S825L and S825L LN conventional boilers, as well as Logano plus SB825L and SB825L LN gas condensing boilers, have a water guide element installed below the return connector. With this, the return water generates an injector effect through its velocity as it flows back, so hotter boiler water is added and mixes with the cooler return water. The targeted feed of the return water results in excellent flow across the entire boiler cross-section. Due to the flat temperature slope in the boiler block, the boiler overall provides an extremely even temperature distribution. The flow through the boiler

results in condensation-free and safe heating operation with a minimum return temperature as low as 50 °C.

The boiler is built using the 3-pass design and the countercurrent heat exchanger principle. Together with an effective heating surface design, these are the prerequisites for low emissions and high energy efficiency. Subject to the system, the Logano S825L and S825L LN conventional boilers achieve very high standard seasonal efficiency [to DIN], which can be increased to up to 108 % with the Logano plus SB825L and SB825L LN gas condensing boilers.

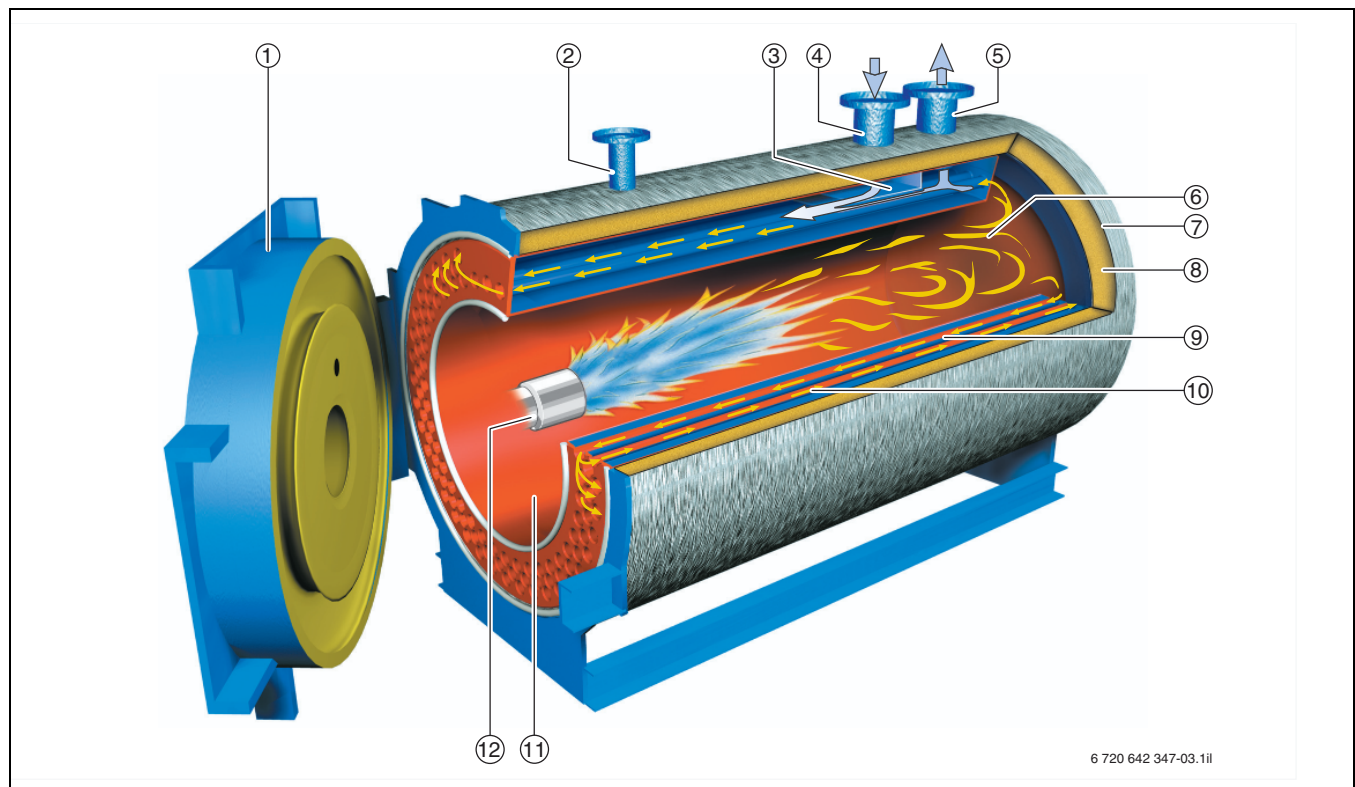


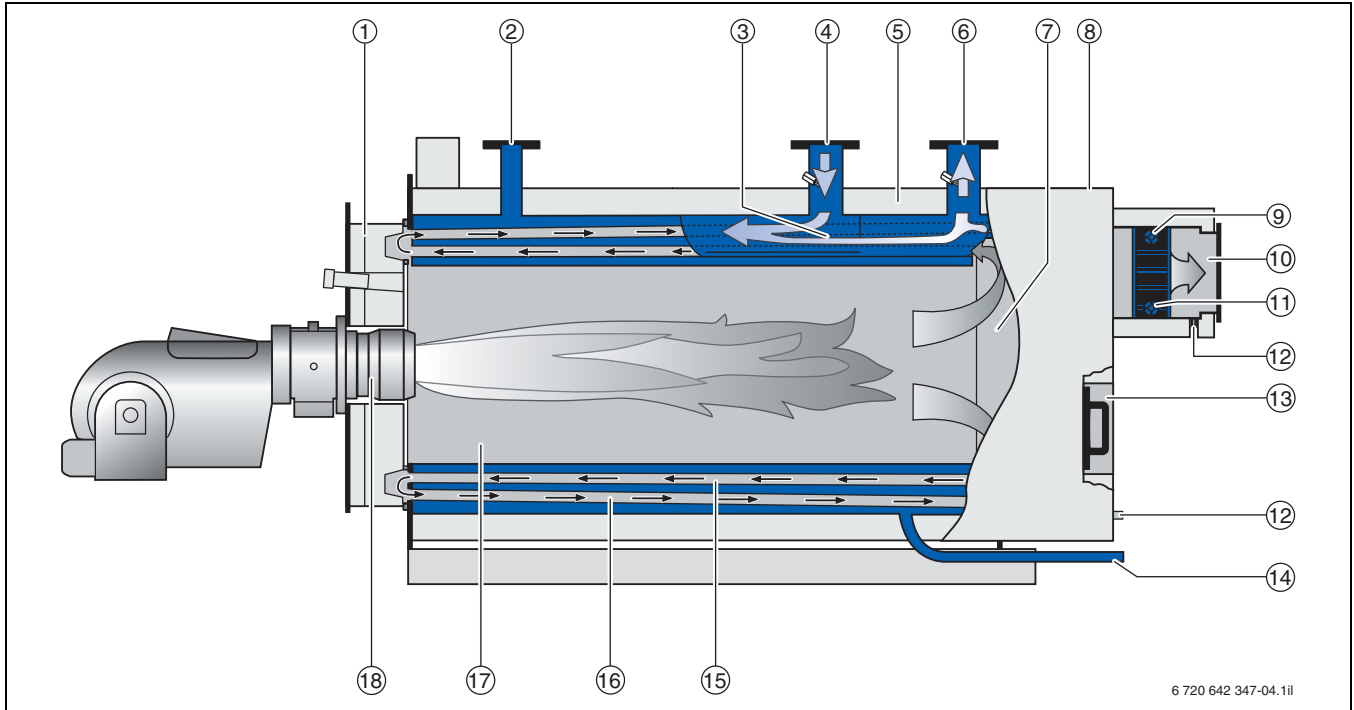
Fig. 6 Sectional view showing the function principle of the Logano S825L/L LN

- 1 Burner door
- 2 Safety flow (→ Fig. 72, page 100)
- 3 Water guide system
- 4 Return (→ Fig. 71, page 99 and Fig. 74, page 102)
- 5 Flow (→ Fig. 70, page 98)
- 6 Hot gas reversing chamber
- 7 Protective aluminium casing
- 8 High grade insulation without thermal bridges
- 9 First secondary heating surface (second pass) designed as a double row
- 10 Second secondary heating surface (third pass)
- 11 Combustion chamber (first pass)
- 12 Blast tube

### Gas condensing technology

Compared with the Logano S825L and S825L LN conventional boilers, the Logano plus SB825L and SB825L LN gas condensing boilers have an additional condensing heat exchanger made of smooth stainless steel tubes. It is fitted in the chamber for the flue gas

collector. The condensing heat exchanger is also designed for modular construction. This means the most suitably sized heat exchanger, or number thereof, for the project in question can be chosen on an individual basis.



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Fig. 7 Function principle of the Logano plus SB825L/L LN

- 1 Burner door
- 2 Safety flow (→ Fig. 72, page 100)
- 3 Water guide system
- 4 Return (→ Fig. 71, page 99 and Fig. 74, page 102)
- 5 High grade insulation without thermal bridges
- 6 Flow (→ Fig. 70, page 98)
- 7 Hot gas reversing chamber
- 8 Protective aluminium casing
- 9 Condensing heat exchanger flow
- 10 Condensing heat exchanger made of stainless steel
- 11 Condensing heat exchanger return
- 12 Condensate connector
- 13 Inspection aperture
- 14 Drain connection (→ Fig. 77, page 106)
- 15 First secondary heating surface (second pass) designed as a double row
- 16 Second secondary heating surface (third pass)
- 17 Combustion chamber (first pass)
- 18 Blast tube



Inspection aperture on the water side is optional.

## 3.2 Dimensions and specification of the Logano S825L and S825L LN conventional boilers

### 3.2.1 Dimensions Logano S825L, boiler sizes 650 to 5200

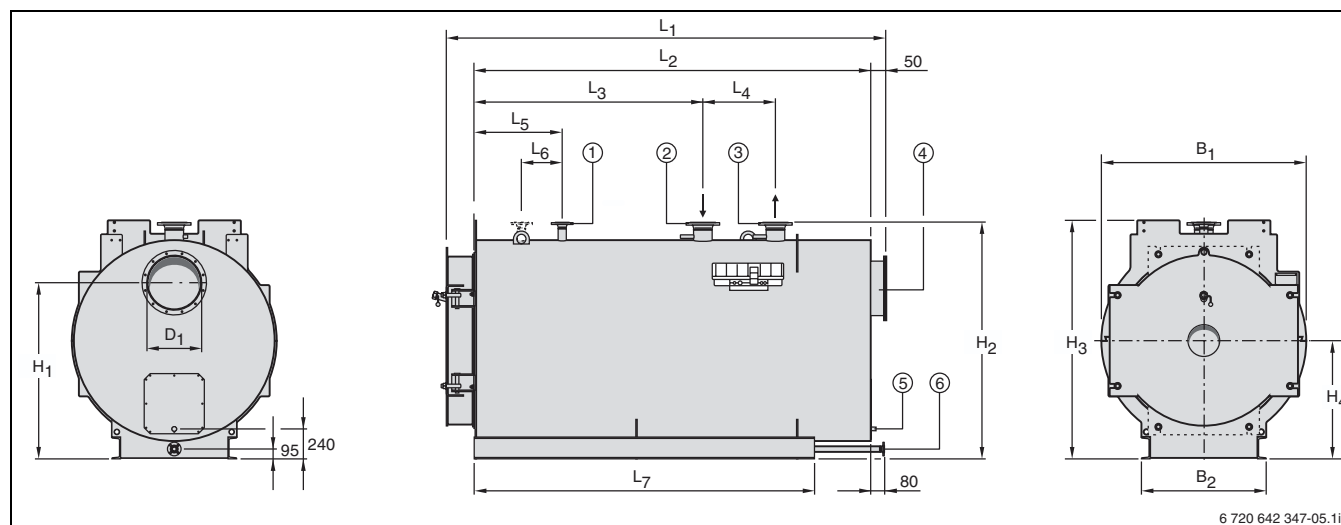


Fig. 8 Dimensions Logano S825L, boiler sizes 650 to 5200 (dim. in mm)

- |          |                                 |          |                                     |
|----------|---------------------------------|----------|-------------------------------------|
| <b>1</b> | Flow safety line / safety valve | <b>4</b> | Flue outlet                         |
| <b>2</b> | Return                          | <b>5</b> | Flue gas condensate drainage system |
| <b>3</b> | Flow                            | <b>6</b> | Boiler drain                        |

| Boiler size                               |                  | Unit | 650                           | 1000                          | 1350                          | 1900                          | 2500                          | 3050                          | 3700                          | 4200                          | 5200                          |
|-------------------------------------------|------------------|------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Length                                    | L <sub>1</sub>   | mm   | 2290                          | 2680                          | 2950                          | 3220                          | 3675                          | 3725                          | 4075                          | 4570                          | 4700                          |
|                                           | L <sub>2</sub>   | mm   | 2040                          | 2425                          | 2695                          | 2960                          | 3420                          | 3465                          | 3820                          | 4250                          | 4380                          |
| Max. length<br>Unit version <sup>1)</sup> | L <sub>Ges</sub> | mm   | 3347                          | 3962                          | 4232                          | 4735                          | –                             | –                             | –                             | –                             | –                             |
|                                           | L <sub>B</sub>   | mm   | 1057                          | 1282                          | 1282                          | 1515                          | –                             | –                             | –                             | –                             | –                             |
| Height                                    | H <sub>2</sub>   | mm   | 1450                          | 1615                          | 1715                          | 1815                          | 1865                          | 1965                          | 2015                          | 2115                          | 2200                          |
|                                           | H <sub>3</sub>   | mm   | 1460                          | 1615                          | 1715                          | 1815                          | 1865                          | 1965                          | 2015                          | 2115                          | 2210                          |
| Width                                     | B <sub>1</sub>   | mm   | 1174                          | 1324                          | 1424                          | 1524                          | 1574                          | 1674                          | 1724                          | 1824                          | 1924                          |
| Burner door                               | Depth            | mm   | 190                           | 190                           | 190                           | 190                           | 190                           | 190                           | 190                           | 257                           | 257                           |
|                                           | H <sub>4</sub>   | mm   | 725                           | 800                           | 850                           | 900                           | 925                           | 975                           | 1000                          | 1050                          | 1100                          |
| Base frame                                | L <sub>7</sub>   | mm   | 1750                          | 2100                          | 2350                          | 2560                          | 3060                          | 3060                          | 3410                          | 3920                          | 3920                          |
|                                           | B <sub>2</sub>   | mm   | 710                           | 910                           | 910                           | 930                           | 1130                          | 1130                          | 1150                          | 1260                          | 1510                          |
|                                           | Channel section  | mm   | 120                           | 120                           | 120                           | 160                           | 160                           | 160                           | 200                           | 220                           | 220                           |
| Flue outlet                               | D <sub>1</sub>   | mm   | → Tab. 26, page 31            |                               |                               |                               |                               |                               |                               |                               |                               |
|                                           | H <sub>1</sub>   | mm   | 1055                          | 1180                          | 1240                          | 1340                          | 1350                          | 1415                          | 1490                          | 1500                          | 1600                          |
| Flow and return flange                    | –                | –    | → Tab. 22, page 30            |                               |                               |                               |                               |                               |                               |                               |                               |
| Flow safety line flange                   | –                | –    | → Tab. 25, page 31            |                               |                               |                               |                               |                               |                               |                               |                               |
| Clearance                                 | L <sub>3</sub>   | mm   | 1050                          | 1390                          | 1560                          | 1710                          | 2180                          | 2150                          | 2490                          | 2870                          | 2770                          |
|                                           | L <sub>4</sub>   | mm   | 450                           | 450                           | 500                           | 550                           | 550                           | 600                           | 600                           | 600                           | 800                           |
|                                           | L <sub>5</sub>   | mm   | 600                           | 600                           | 600                           | 600                           | 650                           | 650                           | 800                           | 650                           | 750                           |
|                                           | L <sub>6</sub>   | mm   | –                             | 250                           | 250                           | 250                           | 300                           | 300                           | 300                           | 300                           | 400                           |
| Boiler drain                              | –                | –    | DN25                          | DN25                          | DN32                          | DN32                          | DN32                          | DN32                          | DN32                          | DN32                          | DN32                          |
| Flue gas condensate drainage system       | inch             | –    | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> |

Tab. 4 Dimensions Logano S825L, boiler sizes 650 to 5200 (specification → Tab. 8, page 18)

- 1) Boilers with an output between 650 kW and 1900 kW are also available as unit versions (boiler + burner) or as standardised versions with fixed internal connection diameters (equipment overview → page 11). The permissible operating pressure is 6 bar.  
L<sub>Ges</sub> = approx. length of boiler + burner in the unit version; L<sub>B</sub> = approx. length of the burner in the unit version

### 3.2.2 Dimensions Logano S825L, boiler sizes 6500 to 19200

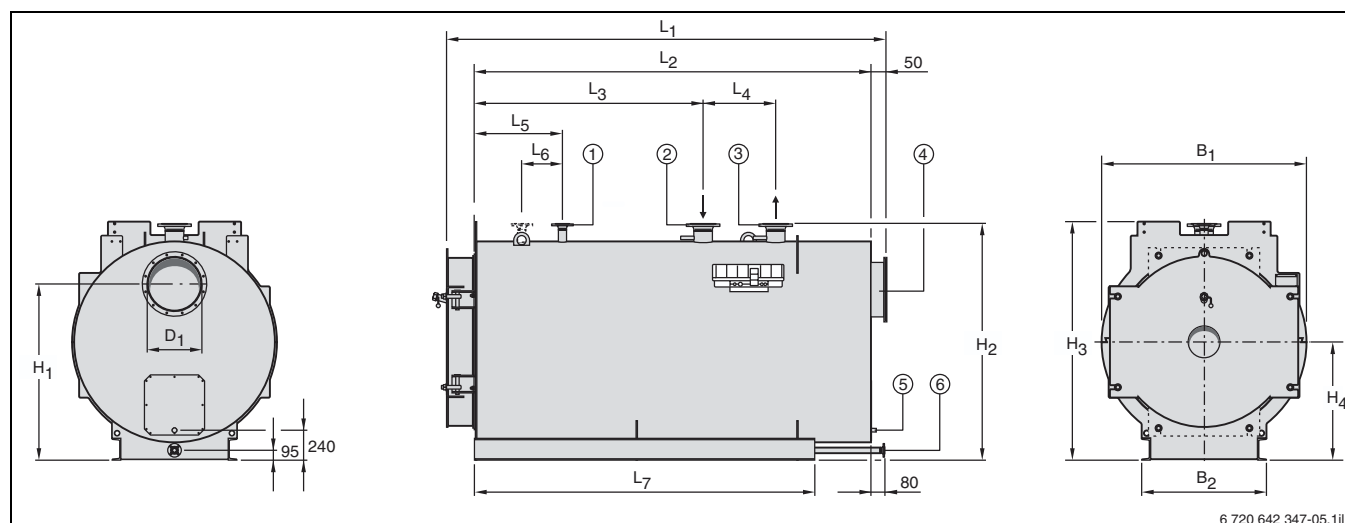


Fig. 9 Dimensions Logano S825L, boiler sizes 6500 to 19200 (dim. in mm)

- |          |                                 |          |                                     |
|----------|---------------------------------|----------|-------------------------------------|
| <b>1</b> | Flow safety line / safety valve | <b>4</b> | Flue outlet                         |
| <b>2</b> | Return                          | <b>5</b> | Flue gas condensate drainage system |
| <b>3</b> | Flow                            | <b>6</b> | Boiler drain                        |

| Boiler size                         |                 | Unit | 6500               | 7700 | 9300 | 11200 | 12600 | 14700 | 16400 | 19200 |
|-------------------------------------|-----------------|------|--------------------|------|------|-------|-------|-------|-------|-------|
| Length                              | L <sub>1</sub>  | mm   | 5090               | 5320 | 5520 | 5980  | 6315  | 7050  | 7530  | 7980  |
|                                     | L <sub>2</sub>  | mm   | 4770               | 5000 | 5200 | 5655  | 5990  | 6725  | 7170  | 7620  |
| Height                              | H <sub>2</sub>  | mm   | 2400               | 2550 | 2700 | 2850  | 3000  | 3200  | 3500  | 3700  |
|                                     | H <sub>3</sub>  | mm   | 2410               | 2560 | 2710 | 2900  | 3025  | 3270  | 3570  | 3770  |
| Width                               | B <sub>1</sub>  | mm   | 2124               | 2274 | 2424 | 2574  | 2724  | 2924  | 3224  | 3424  |
| Burner door                         | Depth           | mm   | 257                | 257  | 257  | 259   | 259   | 259   | 294   | 294   |
|                                     | H <sub>4</sub>  | mm   | 1200               | 1275 | 1350 | 1425  | 1500  | 1600  | 1750  | 1850  |
| Base frame                          | L <sub>7</sub>  | mm   | 4280               | 4480 | 4650 | 5050  | 5320  | 6000  | 6390  | 6790  |
|                                     | B <sub>2</sub>  | mm   | 1510               | 1520 | 1610 | 1630  | 1890  | 1890  | 2100  | 2100  |
|                                     | Channel section | mm   | 220                | 240  | 240  | 280   | 280   | 280   | 320   | 320   |
| Flue outlet                         | D <sub>1</sub>  | mm   | → Tab. 26, page 31 |      |      |       |       |       |       |       |
|                                     | H <sub>1</sub>  | mm   | 1750               | 1850 | 2000 | 2100  | 2200  | 2440  | 2600  | 2820  |
| Flow and return flange              | –               | –    | → Tab. 22; page 30 |      |      |       |       |       |       |       |
| Flow safety line flange             | –               | –    | → Tab. 25, page 31 |      |      |       |       |       |       |       |
| Clearance                           | L <sub>3</sub>  | mm   | 3130               | 3100 | 3250 | 3430  | 3100  | 3780  | 3940  | 4340  |
|                                     | L <sub>4</sub>  | mm   | 800                | 1000 | 1000 | 1200  | 1800  | 1800  | 2000  | 2000  |
|                                     | L <sub>5</sub>  | mm   | 1000               | 1100 | 1100 | 1100  | 1100  | 1100  | 1200  | 1200  |
|                                     | L <sub>6</sub>  | mm   | 400                | 500  | 500  | 500   | 500   | 500   | 600   | 600   |
| Boiler drain                        | –               | –    | DN50               | DN50 | DN50 | DN50  | DN50  | DN50  | DN50  | DN50  |
| Flue gas condensate drainage system | inch            | –    | R¾                 | R¾   | R¾   | R¾    | R¾    | R¾    | R¾    | R¾    |

Tab. 5 Dimensions Logano S825L, boiler sizes 6500 to 19200 (specification → Tab. 9, page 18)

## 3.2.3 Dimensions Logano S825L LN, boiler sizes 750 to 3500

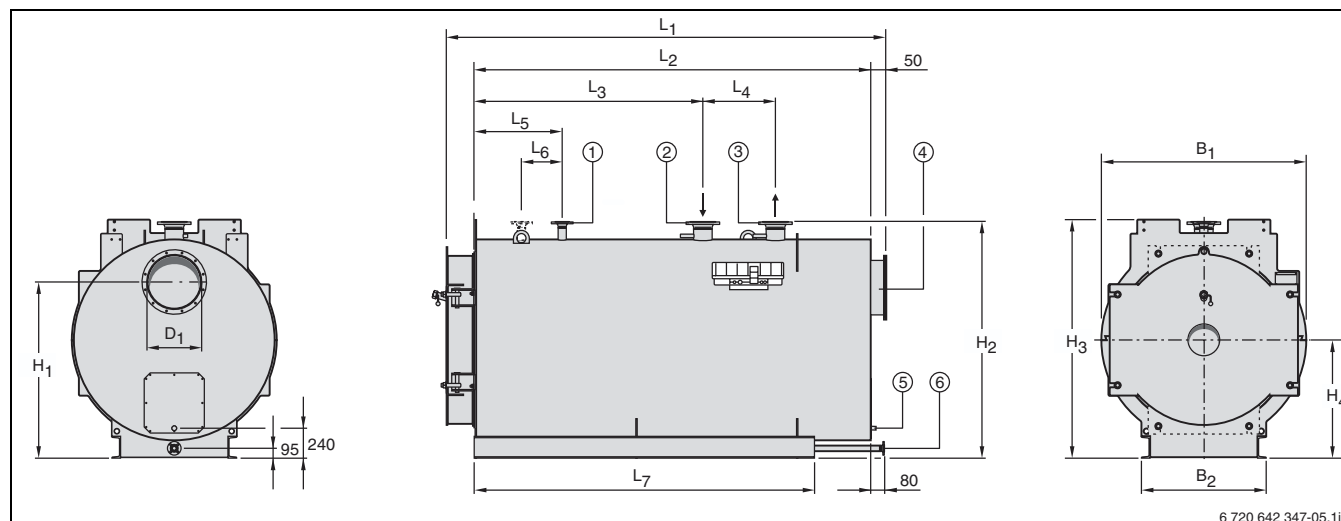


Fig. 10 Dimensions Logano S825L LN, boiler sizes 750 to 3500 (dim. in mm)

- |          |                                 |          |                                     |
|----------|---------------------------------|----------|-------------------------------------|
| <b>1</b> | Flow safety line / safety valve | <b>4</b> | Flue outlet                         |
| <b>2</b> | Return                          | <b>5</b> | Flue gas condensate drainage system |
| <b>3</b> | Flow                            | <b>6</b> | Boiler drain                        |

| Boiler size <sup>1)</sup>           |                 | Unit | 750                           | 1000                          | 1250                          | 1500                          | 2000                          | 2500                          | 3000                          | 3500                          |
|-------------------------------------|-----------------|------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Length                              | L <sub>1</sub>  | mm   | 2680                          | 2950                          | 3220                          | 3675                          | 3725                          | 4075                          | 4570                          | 4700                          |
|                                     | L <sub>2</sub>  | mm   | 2425                          | 2695                          | 2960                          | 3420                          | 3465                          | 3820                          | 4250                          | 4380                          |
| Height                              | H <sub>2</sub>  | mm   | 1615                          | 1715                          | 1815                          | 1865                          | 1965                          | 2015                          | 2115                          | 2215                          |
|                                     | H <sub>3</sub>  | mm   | 1615                          | 1715                          | 1815                          | 1865                          | 1965                          | 2015                          | 2115                          | 2215                          |
| Width                               | B <sub>1</sub>  | mm   | 1324                          | 1424                          | 1524                          | 1574                          | 1674                          | 1724                          | 1824                          | 1924                          |
| Burner door                         | Depth           | mm   | 190                           | 190                           | 190                           | 190                           | 190                           | 190                           | 257                           | 257                           |
|                                     | H <sub>4</sub>  | mm   | 800                           | 850                           | 900                           | 925                           | 975                           | 1000                          | 1050                          | 1100                          |
| Base frame                          | L <sub>7</sub>  | mm   | 2100                          | 2350                          | 2560                          | 3060                          | 3060                          | 3410                          | 3920                          | 3920                          |
|                                     | B <sub>2</sub>  | mm   | 910                           | 910                           | 930                           | 1130                          | 1130                          | 1150                          | 1260                          | 1510                          |
|                                     | Channel section | mm   | 120                           | 120                           | 160                           | 160                           | 160                           | 200                           | 220                           | 220                           |
| Flue outlet                         | D <sub>1</sub>  | mm   | → Tab. 26, page 31            |                               |                               |                               |                               |                               |                               |                               |
|                                     | H <sub>1</sub>  | mm   | 1180                          | 1240                          | 1340                          | 1350                          | 1415                          | 1490                          | 1500                          | 1600                          |
| Flow and return flange              | –               | –    | → Tab. 22, page 30            |                               |                               |                               |                               |                               |                               |                               |
| Flow safety line flange             | –               | –    | → Tab. 25, page 31            |                               |                               |                               |                               |                               |                               |                               |
| Clearance                           | L <sub>3</sub>  | mm   | 1390                          | 1560                          | 1710                          | 2180                          | 2150                          | 2490                          | 2870                          | 2770                          |
|                                     | L <sub>4</sub>  | mm   | 450                           | 500                           | 550                           | 550                           | 600                           | 600                           | 600                           | 800                           |
|                                     | L <sub>5</sub>  | mm   | 600                           | 600                           | 600                           | 650                           | 650                           | 800                           | 650                           | 750                           |
|                                     | L <sub>6</sub>  | mm   | –                             | –                             | –                             | –                             | –                             | –                             | –                             | –                             |
| Boiler drain                        | –               | –    | DN25                          | DN32                          | DN32                          | DN32                          | DN32                          | DN32                          | DN32                          | DN32                          |
| Flue gas condensate drainage system | inch            | –    | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> | R <sup>3</sup> / <sub>4</sub> |

Tab. 6 Dimensions Logano S825L LN, boiler sizes 750 to 3500 (specification → Tab. 10, page 19)

- 1) Boilers with an output between 750 kW and 1500 kW are also available as standardised versions (equipment overview → page 11).  
The permissible operating pressure is 6 bar.

### 3.2.4 Dimensions Logano S825L LN, boiler sizes 4250 to 17500

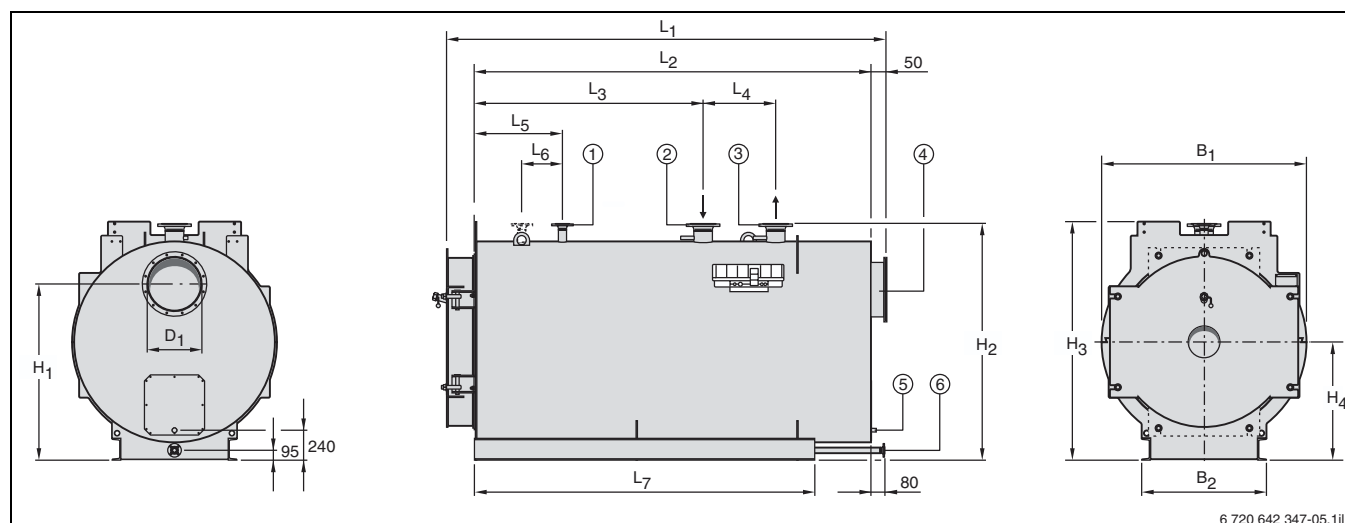


Fig. 11 Dimensions Logano S825L LN, boiler sizes 4250 to 17500 (dim. in mm)

- |          |                                 |          |                                     |
|----------|---------------------------------|----------|-------------------------------------|
| <b>1</b> | Flow safety line / safety valve | <b>4</b> | Flue outlet                         |
| <b>2</b> | Return                          | <b>5</b> | Flue gas condensate drainage system |
| <b>3</b> | Flow                            | <b>6</b> | Boiler drain                        |

| Boiler size                         |                 | Unit | 4250               | 5250 | 6000 | 8000 | 10000 | 12000 | 14000 | 17500 |
|-------------------------------------|-----------------|------|--------------------|------|------|------|-------|-------|-------|-------|
| Length                              | L <sub>1</sub>  | mm   | 5090               | 5320 | 5520 | 5980 | 6315  | 7050  | 7530  | 7980  |
|                                     | L <sub>2</sub>  | mm   | 4770               | 5000 | 5200 | 5655 | 5990  | 6725  | 7170  | 7620  |
| Height                              | H <sub>2</sub>  | mm   | 2415               | 2550 | 2700 | 2850 | 3000  | 3200  | 3500  | 3700  |
|                                     | H <sub>3</sub>  | mm   | 2415               | 2560 | 2710 | 2900 | 3025  | 3270  | 3570  | 3770  |
| Width                               | B <sub>1</sub>  | mm   | 2124               | 2274 | 2424 | 2574 | 2724  | 2924  | 3224  | 3424  |
| Burner door                         | Depth           | mm   | 257                | 257  | 257  | 259  | 259   | 259   | 294   | 294   |
|                                     | H <sub>4</sub>  | mm   | 1200               | 1275 | 1350 | 1425 | 1500  | 1600  | 1750  | 1850  |
| Base frame                          | L <sub>7</sub>  | mm   | 4280               | 4480 | 4650 | 5050 | 5320  | 6000  | 6390  | 6790  |
|                                     | B <sub>2</sub>  | mm   | 1510               | 1520 | 1610 | 1630 | 1890  | 1890  | 2100  | 2100  |
|                                     | Channel section | mm   | 220                | 240  | 240  | 280  | 280   | 280   | 320   | 320   |
| Flue outlet                         | D <sub>1</sub>  | mm   | → Tab. 26, page 31 |      |      |      |       |       |       |       |
|                                     | H <sub>1</sub>  | mm   | 1750               | 1850 | 2000 | 2100 | 2200  | 2440  | 2600  | 2820  |
| Flow and return flange              | –               | –    | → Tab. 22, page 30 |      |      |      |       |       |       |       |
| Flow safety line flange             | –               | –    | → Tab. 25, page 31 |      |      |      |       |       |       |       |
| Clearance                           | L <sub>3</sub>  | mm   | 3130               | 3100 | 3250 | 3430 | 3100  | 3780  | 3940  | 4340  |
|                                     | L <sub>4</sub>  | mm   | 800                | 1000 | 1000 | 1200 | 1800  | 1800  | 2000  | 2000  |
|                                     | L <sub>5</sub>  | mm   | 1000               | 1100 | 1100 | 1100 | 1100  | 1100  | 1200  | 1200  |
|                                     | L <sub>6</sub>  | mm   | –                  | –    | 500  | 500  | 500   | 500   | 600   | 600   |
| Boiler drain                        | –               | –    | DN50               | DN50 | DN50 | DN50 | DN50  | DN50  | DN50  | DN50  |
| Flue gas condensate drainage system | inch            | –    | R¾                 | R¾   | R¾   | R¾   | R¾    | R¾    | R¾    | R¾    |

Tab. 7 Dimensions Logano S825L LN, boiler sizes 4250 to 17500 (specification → Tab. 11, page 19)

### 3.2.5 Specification Logano S825L, boiler sizes 650 to 5200

| Boiler size <sup>1)</sup>               | Unit   | 650                   | 1000 | 1350 | 1900 | 2500 | 3050 | 3700 | 4200 | 5200  |
|-----------------------------------------|--------|-----------------------|------|------|------|------|------|------|------|-------|
| Max. rated output                       | kW     | 650                   | 1000 | 1350 | 1900 | 2500 | 3050 | 3700 | 4200 | 5200  |
| Shipping weight                         | 6 bar  | kg                    | 1700 | 2100 | 2600 | 3100 | 3900 | 4400 | 5300 | 6800  |
|                                         | 10 bar | kg                    | –    | 2100 | 2800 | 3300 | 4300 | 4900 | 5700 | 7100  |
| Operating weight <sup>2)</sup>          | 6 bar  | kg                    | 2800 | 3140 | 3970 | 4790 | 5840 | 6670 | 7870 | 10140 |
|                                         | 10 bar | kg                    | –    | 3130 | 4160 | 4990 | 6210 | 7140 | 9260 | 11880 |
| Boiler water capacity                   | 6 bar  | l                     | 660  | 1040 | 1370 | 1690 | 1940 | 2270 | 2570 | 3340  |
|                                         | 10 bar | l                     | –    | 1030 | 1360 | 1690 | 1910 | 2240 | 2560 | 3330  |
| Gas capacity                            | l      | 710                   | 1090 | 1400 | 1980 | 2580 | 3050 | 3670 | 4610 | 5440  |
| Flue gas temperature                    | °C     | → Fig. 30, page 42    |      |      |      |      |      |      |      |       |
| Required draught                        | Pa     | 0                     |      |      |      |      |      |      |      |       |
| Pressure drop on the hot gas side       | mbar   | → Fig. 19, page 35    |      |      |      |      |      |      |      |       |
| Permiss. flow temperature <sup>3)</sup> | °C     | 110                   |      |      |      |      |      |      |      |       |
| Permiss. operating pressure             | bar    | 6 or 10 <sup>4)</sup> |      |      |      |      |      |      |      |       |
| CE designation                          | –      | CE 0085 BO 0396       |      |      |      |      |      |      |      |       |

Tab. 8 Specification Logano S825L, boiler sizes 650 to 5200 (dim. → Fig. 8, page 14)

- 1) Boilers with an output between 650 kW and 1900 kW are also available as unit versions (boiler + burner) or as standardised versions with fixed internal connection diameters (equipment overview → page 11). The permissible operating pressure is 6 bar
- 2) The operating weight is the sum of the boiler weight and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 3) Safety limit of the high limit safety cut-out (STB); Maximum possible operating flow temperature (→ Tab. 50, page 79)
- 4) Higher pressures on request

### 3.2.6 Specification Logano S825L, boiler sizes 6500 to 19200

| Boiler size                             | Unit   | 6500                  | 7700  | 9300  | 11200 | 12600 | 14700 | 16400 | 19200 |
|-----------------------------------------|--------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| Max. rated output                       | kW     | 6500                  | 7700  | 9300  | 11200 | 12600 | 14700 | 16400 | 19200 |
| Shipping weight                         | 6 bar  | kg                    | 9500  | 11600 | 13300 | 17000 | 19300 | 23500 | 30400 |
|                                         | 10 bar | kg                    | 10300 | 12100 | 14400 | 17600 | 20300 | 25300 | 32100 |
| Operating weight <sup>1)</sup>          | 6 bar  | kg                    | 14970 | 18160 | 21260 | 26900 | 31130 | 39150 | 52480 |
|                                         | 10 bar | kg                    | 15770 | 18950 | 22280 | 27480 | 32110 | 40810 | 54150 |
| Boiler water capacity                   | 6 bar  | l                     | 5470  | 6560  | 7960  | 9900  | 11830 | 15650 | 22080 |
|                                         | 10 bar | l                     | 5470  | 6550  | 7880  | 9880  | 11810 | 15510 | 22050 |
| Gas capacity                            | l      | 7013                  | 8910  | 10550 | 13040 | 15620 | 20410 | 25270 | 31760 |
| Flue gas temperature                    | °C     | → Fig. 30, page 42    |       |       |       |       |       |       |       |
| Required draught                        | Pa     | 0                     |       |       |       |       |       |       |       |
| Pressure drop on the hot gas side       | mbar   | → Fig. 19, page 35    |       |       |       |       |       |       |       |
| Permiss. flow temperature <sup>2)</sup> | °C     | 110                   |       |       |       |       |       |       |       |
| Permiss. operating pressure             | bar    | 6 or 10 <sup>3)</sup> |       |       |       |       |       |       |       |
| CE designation                          | –      | CE 0085 BO 0396       |       |       |       |       |       |       |       |

Tab. 9 Specification Logano S825L, boiler sizes 6500 to 19200 (dim. → Fig. 9, page 15)

- 1) The operating weight is the sum of the boiler weight and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 2) Safety limit of the high limit safety cut-out (STB); Maximum possible operating flow temperature (→ Tab. 50, page 79)
- 3) Higher pressures on request

### 3.2.7 Specification Logano S825L LN, boiler sizes 750 to 3500

| Boiler size <sup>1)</sup>               | Unit   | 750                   | 1000 | 1250 | 1500 | 2000 | 2500 | 3000 | 3500  |
|-----------------------------------------|--------|-----------------------|------|------|------|------|------|------|-------|
| Max. rated output                       | kW     | 750                   | 1000 | 1250 | 1500 | 2000 | 2500 | 3000 | 3500  |
| Shipping weight                         | 6 bar  | kg                    | 2000 | 2400 | 2900 | 3500 | 4000 | 4900 | 6300  |
|                                         | 10 bar | kg                    | 2000 | 2600 | 3000 | 3800 | 4500 | 5300 | 6600  |
| Operating weight <sup>2)</sup>          | 6 bar  | kg                    | 3090 | 3850 | 4720 | 5750 | 6500 | 7730 | 9960  |
|                                         | 10 bar | kg                    | 3090 | 4050 | 4810 | 5990 | 6970 | 8120 | 10250 |
| Boiler water capacity                   | 6 bar  | l                     | 1090 | 1450 | 1820 | 2250 | 2500 | 2380 | 3360  |
|                                         | 10 bar | l                     | 1090 | 1450 | 1810 | 2190 | 2470 | 2820 | 3650  |
| Gas capacity                            | l      | 1400                  | 1400 | 1980 | 2580 | 3050 | 3670 | 4610 | 5440  |
| Flue gas temperature                    | °C     | → Fig. 31, page 43    |      |      |      |      |      |      |       |
| Required draught                        | Pa     | 0                     |      |      |      |      |      |      |       |
| Pressure drop on the hot gas side       | mbar   | → Fig. 20, page 35    |      |      |      |      |      |      |       |
| Permiss. flow temperature <sup>3)</sup> | °C     | 110                   |      |      |      |      |      |      |       |
| Permiss. operating pressure             | bar    | 6 or 10 <sup>4)</sup> |      |      |      |      |      |      |       |
| CE designation                          | –      | CE 0085 BO 0396       |      |      |      |      |      |      |       |

Tab. 10 Specification Logano S825L LN, boiler sizes 750 to 3500 (dim. → Fig. 10, page 16)

- 1) Boilers with an output between 750 kW and 1500 kW are also available as standardised versions (equipment overview → page 11).  
The permissible operating pressure is 6 bar
- 2) The operating weight is the sum of the boiler weight and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 3) Safety limit of the high limit safety cut-out (STB); Maximum possible operating flow temperature (→ Tab. 50, page 79)
- 4) Higher pressures on request

### 3.2.8 Specification Logano S825L LN, boiler sizes 4250 to 17500

| Boiler size                             | Unit   | 4250                  | 5250  | 6000  | 8000  | 10000 | 12000 | 14000 | 17500 |
|-----------------------------------------|--------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| Max. rated output                       | kW     | 4250                  | 5250  | 6000  | 8000  | 10000 | 12000 | 14000 | 17500 |
| Shipping weight                         | 6 bar  | kg                    | 8400  | 10500 | 12000 | 15800 | 18600 | 22700 | 29200 |
|                                         | 10 bar | kg                    | 9300  | 11000 | 13000 | 16200 | 19400 | 24300 | 30700 |
| Operating weight <sup>1)</sup>          | 6 bar  | kg                    | 14610 | 17890 | 21010 | 26770 | 31170 | 39320 | 52630 |
|                                         | 10 bar | kg                    | 15500 | 18380 | 21930 | 27150 | 31950 | 40790 | 54090 |
| Boiler water capacity                   | 6 bar  | l                     | 6210  | 7390  | 9010  | 10970 | 12570 | 16620 | 23430 |
|                                         | 10 bar | l                     | 6200  | 7380  | 8930  | 10950 | 12550 | 16490 | 23390 |
| Gas capacity                            | l      | 7130                  | 8910  | 10550 | 13040 | 15620 | 20410 | 25270 | 31760 |
| Flue gas temperature                    | °C     | → Fig. 31, page 43    |       |       |       |       |       |       |       |
| Required draught                        | Pa     | 0                     |       |       |       |       |       |       |       |
| Pressure drop on the hot gas side       | mbar   | → Fig. 20, page 35    |       |       |       |       |       |       |       |
| Permiss. flow temperature <sup>2)</sup> | °C     | 110                   |       |       |       |       |       |       |       |
| Permiss. operating pressure             | bar    | 6 or 10 <sup>3)</sup> |       |       |       |       |       |       |       |
| CE designation                          | –      | CE 0085 BO 0396       |       |       |       |       |       |       |       |

Tab. 11 Specification Logano S825L LN, boiler sizes 4250 to 17500 (dim. → Fig. 11, page 17)

- 1) The operating weight is the sum of the boiler weight and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 2) Safety limit of the high limit safety cut-out (STB); Maximum possible operating flow temperature (→ Tab. 50, page 79)
- 3) Higher pressures on request

### 3.3 Dimensions and specification of the Logano plus SB825L and SB825L LN gas condensing boilers

#### 3.3.1 Dimensions Logano plus SB825L, boiler sizes 1000 to 5200

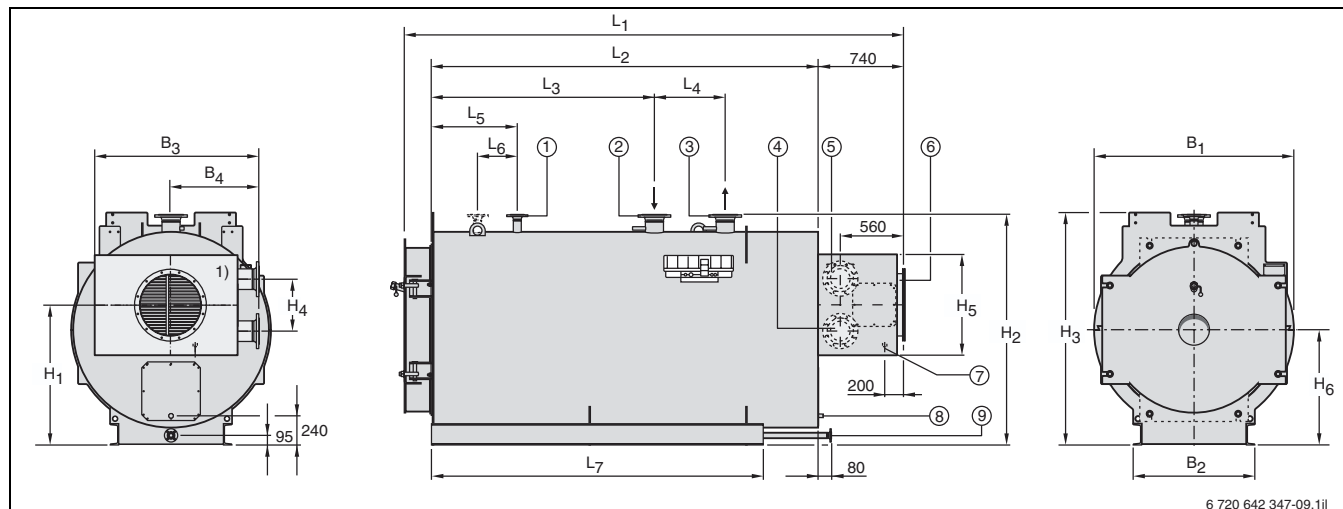


Fig. 12 Dimensions Logano plus SB825L, boiler sizes 1000 to 5200 (dim. in mm)

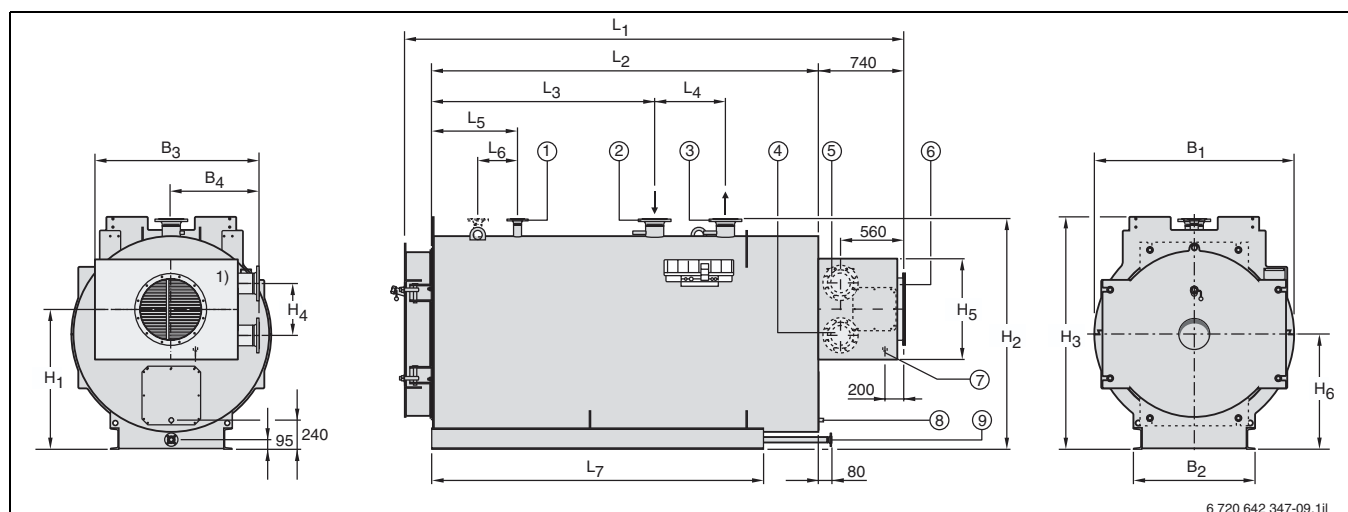
- |          |                         |           |                                                  |
|----------|-------------------------|-----------|--------------------------------------------------|
| <b>1</b> | Flow safety line        | <b>6</b>  | Flue outlet                                      |
| <b>2</b> | Return                  | <b>7</b>  | BWT condensate outlet (AKO)                      |
| <b>3</b> | Flow                    | <b>8</b>  | Flue gas condensate drainage system              |
| <b>4</b> | BWT return ( $R_{WT}$ ) | <b>9</b>  | Boiler drain                                     |
| <b>5</b> | BWT flow ( $V_{WT}$ )   | <b>1)</b> | BWT connections (also possible on the r.h. side) |

| Boiler size                         |                 | Unit | 1000               | 1350            | 1900            | 2500            | 3050            | 3700            | 4200            | 5200            |
|-------------------------------------|-----------------|------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Length                              | $L_1^{1)}$      | mm   | 3420               | 3690            | 3960            | 4415            | 4465            | 4815            | 5310            | 5440            |
|                                     | $L_2$           | mm   | 2425               | 2695            | 2960            | 3420            | 3465            | 3820            | 4250            | 4380            |
| Height                              | $H_2$           | mm   | 1615               | 1715            | 1815            | 1865            | 1965            | 2015            | 2115            | 2200            |
|                                     | $H_3$           | mm   | 1615               | 1715            | 1815            | 1865            | 1965            | 2015            | 2115            | 2210            |
| Width                               | $B_1$           | mm   | 1324               | 1424            | 1524            | 1574            | 1674            | 1724            | 1824            | 1924            |
| Burner door                         | Depth           | mm   | 190                | 190             | 190             | 190             | 190             | 190             | 257             | 257             |
|                                     | $H_6$           | mm   | 800                | 850             | 900             | 925             | 975             | 1000            | 1050            | 1100            |
| Base frame                          | $L_7$           | mm   | 2100               | 2350            | 2560            | 3060            | 3060            | 3410            | 3920            | 3920            |
|                                     | $B_2$           | mm   | 910                | 910             | 930             | 1130            | 1130            | 1150            | 1260            | 1510            |
|                                     | Channel section | mm   | 120                | 120             | 160             | 160             | 160             | 200             | 220             | 220             |
| BWT                                 | $H_1$           | mm   | 1060               | 1050            | 1150            | 1205            | 1215            | 1240            | 1260            | 1330            |
|                                     | $H_4$           | mm   | 251                | 326             | 326             | 401             | 422             | 447             | 497             | 572             |
|                                     | $H_5$           | mm   | 593                | 668             | 693             | 768             | 818             | 843             | 893             | 968             |
|                                     | $B_3$           | mm   | 1004               | 1094            | 1154            | 1254            | 1344            | 1384            | 1454            | 1564            |
|                                     | $B_4$           | mm   | 580                | 625             | 655             | 705             | 725             | 745             | 780             | 835             |
| Flange flow/return BWT              | $V_{WT}/R_{WT}$ | –    | → Tab. 28, page 32 |                 |                 |                 |                 |                 |                 |                 |
| BWT condensate outlet               | AKO             | –    | → Tab. 28, page 32 |                 |                 |                 |                 |                 |                 |                 |
| Flue outlet                         |                 | –    | → Tab. 26, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow and return              |                 | –    | → Tab. 22, page 30 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow safety line             |                 | –    | → Tab. 25, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Clearance                           | $L_3$           | mm   | 1390               | 1560            | 1710            | 2180            | 2150            | 2490            | 2870            | 2770            |
|                                     | $L_4$           | mm   | 450                | 500             | 550             | 550             | 600             | 600             | 600             | 800             |
|                                     | $L_5$           | mm   | 600                | 600             | 600             | 650             | 650             | 800             | 650             | 750             |
|                                     | $L_6$           | mm   | –                  | –               | –               | –               | –               | –               | –               | –               |
| Boiler drain                        |                 | –    | DN25               | DN32            | DN32            | DN32            | DN32            | DN32            | DN32            | DN32            |
| Flue gas condensate drainage system |                 | inch | R $\frac{3}{4}$    | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ |

Tab. 12 Dimensions Logano plus SB825L, boiler sizes 1000 to 5200  
(specification → Tab. 16, page 24)

1) Standard version with a condensing heat exchanger (BWT); for each additional BWT, the length  $L_1$  increases by 300 mm.

### 3.3.2 Dimensions Logano plus SB825L, boiler sizes 6500 to 19200



6 720 642 347-09.1il

Fig. 13 Dimensions Logano plus SB825L, boiler sizes 6500 to 19200 (dim. in mm)

- |   |                         |    |                                                  |
|---|-------------------------|----|--------------------------------------------------|
| 1 | Flow safety line        | 6  | Flue outlet                                      |
| 2 | Return                  | 7  | BWT condensate outlet (AKO)                      |
| 3 | Flow                    | 8  | Flue gas condensate drainage system              |
| 4 | BWT return ( $R_{WT}$ ) | 9  | Boiler drain                                     |
| 5 | BWT flow ( $V_{WT}$ )   | 1) | BWT connections (also possible on the r.h. side) |

| Boiler size                         |                 | Unit | 6500               | 7700            | 9300            | 11200           | 12600           | 14700           | 16400           | 19200           |
|-------------------------------------|-----------------|------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Length                              | $L_1^{1)}$      | mm   | 5830               | 6060            | 6260            | 6720            | 7055            | 7790            | 8270            | 8720            |
|                                     | $L_2$           | mm   | 4770               | 5000            | 5200            | 5655            | 5990            | 6725            | 7170            | 7620            |
| Height                              | $H_2$           | mm   | 2400               | 2550            | 2700            | 2850            | 3000            | 3200            | 3500            | 3700            |
|                                     | $H_3$           | mm   | 2410               | 2560            | 2710            | 2900            | 3025            | 3270            | 3570            | 3770            |
| Width                               | $B_1$           | mm   | 2124               | 2274            | 2424            | 2574            | 2724            | 2924            | 3224            | 3424            |
| Burner door                         | Depth           | mm   | 257                | 257             | 257             | 259             | 259             | 259             | 294             | 294             |
|                                     | $H_6$           | mm   | 1200               | 1275            | 1350            | 1425            | 1500            | 1600            | 1750            | 1850            |
| Base frame                          | $L_7$           | mm   | 4280               | 4480            | 4650            | 5050            | 5320            | 6000            | 6390            | 6790            |
|                                     | $B_2$           | mm   | 1510               | 1520            | 1610            | 1630            | 1890            | 1890            | 2100            | 2100            |
|                                     | Channel section | mm   | 220                | 240             | 240             | 280             | 280             | 280             | 320             | 320             |
| BWT                                 | $H_1$           | mm   | 1360               | 1495            | 1550            | 1705            | 1750            | 1900            | 2030            | 2150            |
|                                     | $H_4$           | mm   | 697                | 797             | 872             | 897             | 997             | 1097            | 1197            | 1297            |
|                                     | $H_5$           | mm   | 1093               | 1193            | 1268            | 1293            | 1393            | 1493            | 1593            | 1693            |
|                                     | $B_3$           | mm   | 1754               | 1804            | 2004            | 2054            | 2204            | 2354            | 2504            | 2654            |
|                                     | $B_4$           | mm   | 930                | 955             | 1055            | 1080            | 1155            | 1230            | 1305            | 1380            |
| Flange flow/return BWT              | $V_{WT}/R_{WT}$ | –    | → Tab. 28, page 32 |                 |                 |                 |                 |                 |                 |                 |
| BWT condensate outlet               | AKO             | –    | → Tab. 28, page 32 |                 |                 |                 |                 |                 |                 |                 |
| Flue outlet                         |                 | –    | → Tab. 26, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow and return              |                 | –    | → Tab. 22, page 30 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow safety line             |                 | –    | → Tab. 25, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Clearance                           | $L_3$           | mm   | 3130               | 3100            | 3250            | 3430            | 3100            | 3780            | 3940            | 4340            |
|                                     | $L_4$           | mm   | 800                | 1000            | 1000            | 1200            | 1800            | 1800            | 2000            | 2000            |
|                                     | $L_5$           | mm   | 1000               | 1100            | 1100            | 1100            | 1100            | 1100            | 1200            | 1200            |
|                                     | $L_6$           | mm   | 400                | 500             | 500             | 500             | 500             | 500             | 600             | 600             |
| Boiler drain                        |                 | –    | DN50               | DN50            | DN50            | DN50            | DN50            | DN50            | DN50            | DN50            |
| Flue gas condensate drainage system |                 | inch | R $\frac{3}{4}$    | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ |

Tab. 13 Dimensions Logano plus SB825L, boiler sizes 6500 to 19200  
(specification → Tab. 17, page 25)

1) Standard version with a condensing heat exchanger (BWT); for each additional BWT, the length  $L_1$  increases by 300 mm.

### 3.3.3 Dimensions Logano plus SB825L LN, boiler sizes 750 to 3500

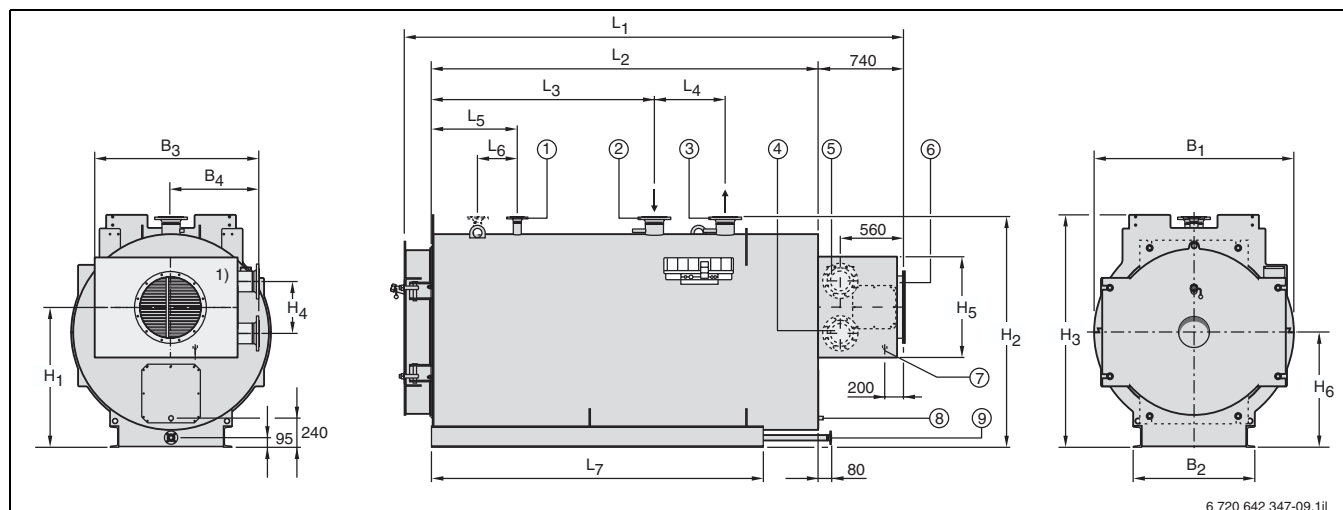


Fig. 14 Dimensions Logano plus SB825L LN, boiler sizes 750 to 3500 (dim. in mm)

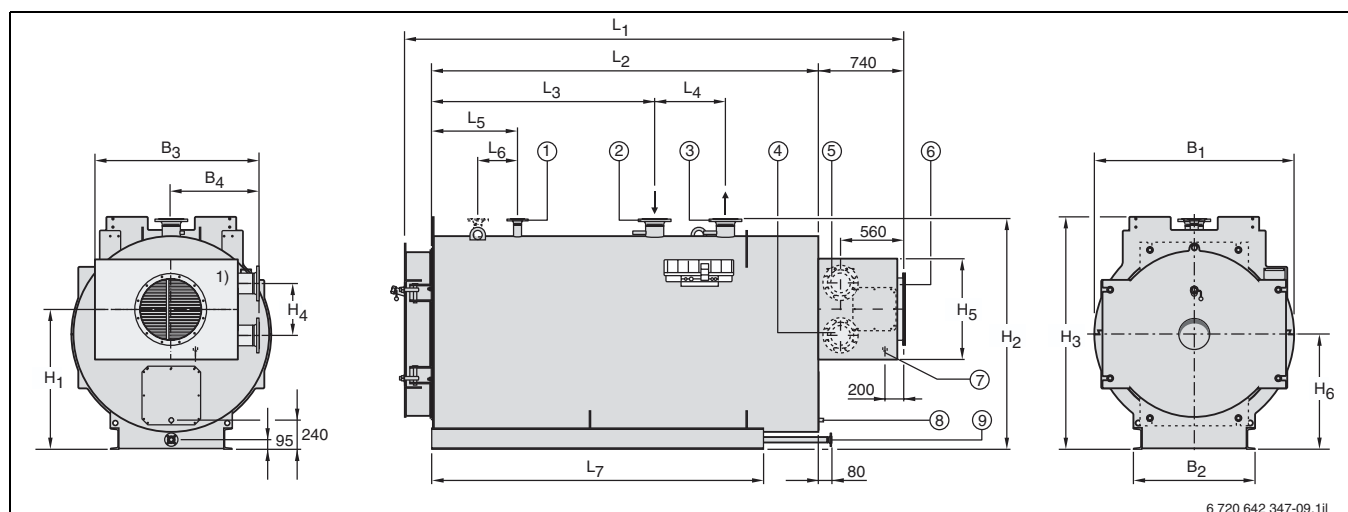
- |   |                         |    |                                                  |
|---|-------------------------|----|--------------------------------------------------|
| 1 | Flow safety line        | 6  | Flue outlet                                      |
| 2 | Return                  | 7  | BWT condensate outlet (AKO)                      |
| 3 | Flow                    | 8  | Flue gas condensate drainage system              |
| 4 | BWT return ( $R_{WT}$ ) | 9  | Boiler drain                                     |
| 5 | BWT flow ( $V_{WT}$ )   | 1) | BWT connections (also possible on the r.h. side) |

| Boiler size                         |                 | Unit | 750                | 1000            | 1250            | 1500            | 2000            | 2500            | 3000            | 3500            |
|-------------------------------------|-----------------|------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Length                              | $L_1^{1)}$      | mm   | 3420               | 3690            | 3960            | 4415            | 4465            | 4815            | 5310            | 5440            |
|                                     | $L_2$           | mm   | 2425               | 2695            | 2960            | 3420            | 3465            | 3820            | 4250            | 4380            |
| Height                              | $H_2$           | mm   | 1615               | 1715            | 1815            | 1865            | 1965            | 2015            | 2115            | 2215            |
|                                     | $H_3$           | mm   | 1615               | 1715            | 1815            | 1865            | 1965            | 2015            | 2115            | 2215            |
| Width                               | $B_1$           | mm   | 1324               | 1424            | 1524            | 1574            | 1674            | 1724            | 1824            | 1924            |
| Burner door                         | Depth           | mm   | 190                | 190             | 190             | 190             | 190             | 190             | 257             | 257             |
|                                     | $H_6$           | mm   | 800                | 850             | 900             | 925             | 975             | 1000            | 1050            | 1100            |
| Base frame                          | $L_7$           | mm   | 2100               | 2350            | 2560            | 3060            | 3060            | 3410            | 3920            | 3920            |
|                                     | $B_2$           | mm   | 910                | 910             | 930             | 1130            | 1130            | 1150            | 1260            | 1510            |
|                                     | Channel section | mm   | 120                | 120             | 160             | 160             | 160             | 200             | 220             | 220             |
| BWT                                 | $H_1$           | mm   | 1060               | 1050            | 1150            | 1205            | 1215            | 1240            | 1260            | 1330            |
|                                     | $H_4$           | mm   | 227                | 251             | 251             | 326             | 326             | 401             | 422             | 447             |
|                                     | $H_5$           | mm   | 543                | 593             | 593             | 668             | 693             | 768             | 818             | 843             |
|                                     | $B_3$           | mm   | 914                | 1004            | 1004            | 1094            | 1154            | 1254            | 1344            | 1384            |
|                                     | $B_4$           | mm   | 535                | 580             | 580             | 625             | 655             | 705             | 725             | 745             |
| Flange flow/return BWT              | $V_{WT}/R_{WT}$ | —    | → Tab. 29, page 32 |                 |                 |                 |                 |                 |                 |                 |
| BWT condensate outlet               | AKO             | —    | → Tab. 29, page 32 |                 |                 |                 |                 |                 |                 |                 |
| Flue outlet                         | —               | —    | → Tab. 26, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow and return              | —               | —    | → Tab. 22, page 30 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow safety line             | —               | —    | → Tab. 25, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Clearance                           | $L_3$           | mm   | 1390               | 1560            | 1710            | 2180            | 2150            | 2490            | 2870            | 2770            |
|                                     | $L_4$           | mm   | 450                | 500             | 550             | 550             | 600             | 600             | 600             | 800             |
|                                     | $L_5$           | mm   | 600                | 600             | 600             | 650             | 650             | 800             | 650             | 750             |
|                                     | $L_6$           | mm   | —                  | —               | —               | —               | —               | —               | —               | —               |
| Boiler drain                        | —               | —    | DN25               | DN32            | DN32            | DN32            | DN32            | DN32            | DN32            | DN32            |
| Flue gas condensate drainage system | —               | inch | R $\frac{3}{4}$    | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ |

Tab. 14 Dimensions Logano plus SB825L LN, boiler sizes 750 to 3500  
(specification → Tab. 18, page 26)

1) Standard version with a condensing heat exchanger (BWT); for each additional BWT, the length  $L_1$  increases by 300 mm.

### 3.3.4 Dimensions Logano plus SB825L LN, boiler sizes 4250 to 17500



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Fig. 15 Dimensions Logano plus SB825L LN, boiler sizes 4250 to 17500 (dim. in mm)

- |   |                         |    |                                                  |
|---|-------------------------|----|--------------------------------------------------|
| 1 | Flow safety line        | 6  | Flue outlet                                      |
| 2 | Return                  | 7  | BWT condensate outlet (AKO)                      |
| 3 | Flow                    | 8  | Flue gas condensate drainage system              |
| 4 | BWT return ( $R_{WT}$ ) | 9  | Boiler drain                                     |
| 5 | BWT flow ( $V_{WT}$ )   | 1) | BWT connections (also possible on the r.h. side) |

| Boiler size                         |                 | Unit | 4250               | 5250            | 6000            | 8000            | 10000           | 12000           | 14000           | 17500           |
|-------------------------------------|-----------------|------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Length                              | $L_1^{1)}$      | mm   | 5830               | 6060            | 6260            | 6720            | 7055            | 7790            | 8270            | 8720            |
|                                     | $L_2$           | mm   | 4770               | 5000            | 5200            | 5655            | 5990            | 6725            | 7170            | 7620            |
| Height                              | $H_2$           | mm   | 2415               | 2550            | 2700            | 2850            | 3000            | 3200            | 3500            | 3700            |
|                                     | $H_3$           | mm   | 2415               | 2560            | 2710            | 2900            | 3025            | 3270            | 3570            | 3770            |
| Width                               | $B_1$           | mm   | 2124               | 2274            | 2424            | 2574            | 2724            | 2924            | 3224            | 3424            |
| Burner door                         | Depth           | mm   | 257                | 257             | 257             | 259             | 259             | 259             | 294             | 294             |
|                                     | $H_6$           | mm   | 1200               | 1275            | 1350            | 1425            | 1500            | 1600            | 1750            | 1850            |
| Base frame                          | $L_7$           | mm   | 4280               | 4480            | 4650            | 5050            | 5320            | 6000            | 6390            | 6790            |
|                                     | $B_2$           | mm   | 1510               | 1520            | 1610            | 1630            | 1890            | 1890            | 2100            | 2100            |
|                                     | Channel section | mm   | 220                | 240             | 240             | 280             | 280             | 280             | 320             | 320             |
| BWT                                 | $H_1$           | mm   | 1360               | 1495            | 1550            | 1705            | 1750            | 1900            | 2030            | 2150            |
|                                     | $H_4$           | mm   | 497                | 572             | 697             | 797             | 872             | 897             | 997             | 1197            |
|                                     | $H_5$           | mm   | 893                | 968             | 1093            | 1193            | 1268            | 1293            | 1393            | 1593            |
|                                     | $B_3$           | mm   | 1454               | 1564            | 1754            | 1804            | 2004            | 2054            | 2204            | 2504            |
|                                     | $B_4$           | mm   | 780                | 835             | 930             | 955             | 1055            | 1080            | 1155            | 1305            |
| Flange flow/return BWT              | $V_{WT}/R_{WT}$ | –    | → Tab. 29, page 32 |                 |                 |                 |                 |                 |                 |                 |
| BWT condensate outlet               | AKO             | –    | → Tab. 29, page 32 |                 |                 |                 |                 |                 |                 |                 |
| Flue outlet                         |                 | –    | → Tab. 26, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow and return              |                 | –    | → Tab. 22, page 30 |                 |                 |                 |                 |                 |                 |                 |
| Flange flow safety line             |                 | –    | → Tag. 25, page 31 |                 |                 |                 |                 |                 |                 |                 |
| Clearance                           | $L_3$           | mm   | 3130               | 3100            | 3250            | 3430            | 3100            | 3780            | 3940            | 4340            |
|                                     | $L_4$           | mm   | 800                | 1000            | 1000            | 1200            | 1800            | 1800            | 2000            | 2000            |
|                                     | $L_5$           | mm   | 1000               | 1100            | 1100            | 1100            | 1100            | 1100            | 1200            | 1200            |
|                                     | $L_6$           | mm   | –                  | –               | 500             | 500             | 500             | 500             | 600             | 600             |
| Boiler drain                        |                 | –    | DN50               | DN50            | DN50            | DN50            | DN50            | DN50            | DN50            | DN50            |
| Flue gas condensate drainage system |                 | inch | R $\frac{3}{4}$    | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ | R $\frac{3}{4}$ |

Tab. 15 Dimensions Logano plus SB825L LN, boiler sizes 4250 to 17500  
(specification → Tab. 19, page 27)

1) Standard version with a condensing heat exchanger (BWT); for each additional BWT, the length  $L_1$  increases by 300 mm.

## 3.3.5 Specification Logano plus SB825L, boiler sizes 1000 to 5200

| Boiler size                                |                        | Unit                           | 1000                  | 1350  | 1900  | 2500  | 3050  | 3700  | 4200  | 5200  |
|--------------------------------------------|------------------------|--------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| Max. rated boiler output                   |                        | kW                             | 1000                  | 1350  | 1900  | 2500  | 3050  | 3700  | 4200  | 5200  |
| Rated output BWT                           | at 30 °C <sup>1)</sup> | kW                             | 83.1                  | 103.6 | 161.2 | 205.3 | 255.6 | 286.2 | 327.3 | 412.9 |
|                                            | at 60 °C <sup>1)</sup> | kW                             | 37.8                  | 42.3  | 76.0  | 93.1  | 119.4 | 120.8 | 142.4 | 183.7 |
| Shipping weight                            | 6 bar                  | kg                             | 2240                  | 2760  | 3290  | 4120  | 4640  | 5560  | 7100  | 7940  |
|                                            | 10 bar                 | kg                             | 2240                  | 2960  | 3490  | 4520  | 5140  | 5960  | 7400  | 8440  |
| Operating weight <sup>2)</sup>             | 6 bar                  | kg                             | 3300                  | 4160  | 5010  | 6100  | 6960  | 8180  | 10500 | 11800 |
|                                            | 10 bar                 | kg                             | 3290                  | 4350  | 5210  | 6470  | 7430  | 8570  | 10790 | 12290 |
| Boiler water capacity                      | 6 bar                  | l                              | 1040                  | 1370  | 1690  | 1940  | 2270  | 2570  | 3340  | 3790  |
|                                            | 10 bar                 | l                              | 1030                  | 1360  | 1690  | 1910  | 2240  | 2560  | 3330  | 3780  |
| Gas capacity                               |                        | l                              | 1240                  | 1610  | 2210  | 2930  | 3360  | 4080  | 5010  | 5940  |
| Flue gas temperature <sup>3)</sup>         | at 30 °C <sup>1)</sup> | °C                             | 104                   | 95    | 113   | 109   | 113   | 108   | 109   | 111   |
|                                            | at 60 °C <sup>1)</sup> | °C                             | 123                   | 113   | 131   | 127   | 132   | 125   | 126   | 128   |
| Required draught                           |                        | Pa                             | 0 (50) <sup>4)</sup>  |       |       |       |       |       |       |       |
| Max. flow rate via BWT <sup>3)</sup>       | at 30 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 39.6                  | 53.8  | 75.1  | 99.1  | 120.7 | 147.4 | 160.7 | 160.7 |
|                                            | at 60 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 42.1                  | 57.2  | 79.8  | 105.3 | 128.2 | 156.5 | 162.7 | 162.7 |
| Pressure drop on the water side BWT        | at 30 °C <sup>1)</sup> | mbar                           | 210                   | 128   | 166   | 161   | 158   | 168   | 200   | 200   |
|                                            | at 60 °C <sup>1)</sup> | mbar                           | 231                   | 141   | 183   | 177   | 174   | 185   | 200   | 200   |
| Pressure drop on hot gas side boiler + BWT |                        | mbar                           | 6.74                  | 7.45  | 9.79  | 9.03  | 11.09 | 14.25 | 11.84 | 14.69 |
| Permiss. flow temperature <sup>5)</sup>    |                        | °C                             | 110                   |       |       |       |       |       |       |       |
| Permiss. operating pressure                |                        | bar                            | 6 or 10 <sup>6)</sup> |       |       |       |       |       |       |       |
| CE designation                             |                        | –                              | CE 0085 BO 0397       |       |       |       |       |       |       |       |

Tab. 16 Specification Logano plus SB825L, boiler sizes 1000 to 5200 (dim. → Fig. 12, page 20)

- 1) Water inlet temperature into the condensing heat exchanger (BWT)
- 2) The operating weight is the sum of the boiler weight, the weight of the condensing heat exchanger, and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 3) Relative to the maximum boiler load, other boiler loads → Fig. 32, page 43; boiler reference temperatures 80/60 °C
- 4) The available pressure depends on the burner
- 5) Safety limit of the high limit safety cut-out (STB); Maximum possible operating flow temperature (→ Tab. 50, page 79)
- 6) Higher pressures on request



Other specifications and designs of condensing heat exchangers available on request.

### 3.3.6 Specification Logano plus SB825L, boiler sizes 6500 to 19200

| Boiler size                                |                        | Unit                           | 6500                  | 7700  | 9300  | 11200 | 12600 | 14700  | 16400  | 19200  |
|--------------------------------------------|------------------------|--------------------------------|-----------------------|-------|-------|-------|-------|--------|--------|--------|
| Max. rated boiler output                   |                        | kW                             | 6500                  | 7700  | 9300  | 11200 | 12600 | 14700  | 16400  | 19200  |
| Rated output BWT                           | at 30 °C <sup>1)</sup> | kW                             | 542.8                 | 608.5 | 717.7 | 844.5 | 914.7 | 1097.7 | 1114.9 | 1293.5 |
|                                            | at 60 °C <sup>1)</sup> | kW                             | 260.7                 | 276.7 | 322.2 | 377.1 | 393.4 | 503.7  | 455.5  | 555.6  |
| Shipping weight                            | 6 bar                  | kg                             | 9830                  | 12080 | 13660 | 17390 | 19650 | 24120  | 30920  | 36240  |
|                                            | 10 bar                 | kg                             | 10730                 | 12580 | 14860 | 18090 | 20750 | 25820  | 32620  | 39140  |
| Operating weight <sup>2)</sup>             | 6 bar                  | kg                             | 15390                 | 18740 | 21740 | 27420 | 31630 | 39950  | 53200  | 63490  |
|                                            | 10 bar                 | kg                             | 16290                 | 19230 | 22860 | 28100 | 32710 | 41510  | 54870  | 66200  |
| Boiler water capacity                      | 6 bar                  | l                              | 5470                  | 6560  | 7900  | 9900  | 11830 | 15650  | 22080  | 27020  |
|                                            | 10 bar                 | l                              | 5470                  | 6550  | 7880  | 9880  | 11810 | 15510  | 22050  | 26830  |
| Gas capacity                               |                        | l                              | 7770                  | 9600  | 11480 | 14100 | 17180 | 22230  | 27640  | 34460  |
| Flue gas temperature <sup>3)</sup>         | at 30 °C <sup>1)</sup> | °C                             | 114                   | 109   | 107   | 110   | 105   | 109    | 98     | 111    |
|                                            | at 60 °C <sup>1)</sup> | °C                             | 132                   | 127   | 124   | 127   | 122   | 126    | 115    | 125    |
| Required draught                           |                        | Pa                             | 0 (50) <sup>4)</sup>  |       |       |       |       |        |        |        |
| Max. flow rate via BWT <sup>3)</sup>       | at 30 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 160.7                 | 160.7 | 160.7 | 160.7 | 160.7 | 160.7  | 160.7  | 160.7  |
|                                            | at 60 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 162.7                 | 162.7 | 162.7 | 162.7 | 162.7 | 162.7  | 162.7  | 162.7  |
| Pressure drop on the water side BWT        | at 30 °C <sup>1)</sup> | mbar                           | 200                   | 200   | 200   | 200   | 200   | 200    | 200    | 200    |
|                                            | at 60 °C <sup>1)</sup> | mbar                           | 200                   | 200   | 200   | 200   | 200   | 200    | 200    | 200    |
| Pressure drop on hot gas side boiler + BWT |                        | mbar                           | 13.43                 | 13.73 | 14.78 | 16.39 | 17.32 | 16.47  | 13.6   | 13.33  |
| Permiss. flow temperature <sup>5)</sup>    |                        | °C                             | 110                   |       |       |       |       |        |        |        |
| Permiss. operating pressure                |                        | bar                            | 6 or 10 <sup>6)</sup> |       |       |       |       |        |        |        |
| CE designation                             |                        | –                              | CE 0085 BO 0397       |       |       |       |       |        |        |        |

Tab. 17 Specification Logano plus SB825L, boiler sizes 6500 to 19200 (dim. → Fig. 13, page 21)

- 1) Water inlet temperature into the condensing heat exchanger (BWT)
- 2) The operating weight is the sum of the boiler weight, the weight of the condensing heat exchanger, and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 3) Relative to the maximum boiler load, other boiler loads → Fig. 32, page 43; boiler reference temperatures 80/60 °C
- 4) The available pressure depends on the burner
- 5) Safety limit of the high limit safety cut-out (STB); maximum possible operating flow temperature (→ Tab. 50, page 79)
- 6) Higher pressures on request



Other specifications and designs of condensing heat exchangers available on request.

## 3.3.7 Specification Logano plus SB825L LN, boiler sizes 750 to 3500

| Boiler size                                |                        | Unit                           | 750                   | 1000 | 1250 | 1500  | 2000  | 2500  | 3000  | 3500  |
|--------------------------------------------|------------------------|--------------------------------|-----------------------|------|------|-------|-------|-------|-------|-------|
| Max. rated boiler output                   |                        | kW                             | 750                   | 1000 | 1250 | 1500  | 2000  | 2500  | 3000  | 3500  |
| Rated output BWT                           | at 30 °C <sup>1)</sup> | kW                             | 59.4                  | 74.3 | 97.7 | 116.4 | 156.7 | 185.9 | 228.4 | 264.5 |
|                                            | at 60 °C <sup>1)</sup> | kW                             | 25.3                  | 28.6 | 41.3 | 48.4  | 66.5  | 73.0  | 93.4  | 107.5 |
| Shipping weight                            | 6 bar                  | kg                             | 2110                  | 2540 | 3040 | 3560  | 4190  | 5020  | 6540  | 7260  |
|                                            | 10 bar                 | kg                             | 2110                  | 2740 | 3140 | 3960  | 4690  | 5420  | 6840  | 7830  |
| Operating weight <sup>2)</sup>             | 6 bar                  | kg                             | 3220                  | 4010 | 4880 | 5840  | 6720  | 7890  | 10250 | 11520 |
|                                            | 10 bar                 | kg                             | 3220                  | 4210 | 4970 | 6180  | 7190  | 8280  | 10540 | 12070 |
| Boiler water capacity                      | 6 bar                  | l                              | 1090                  | 1450 | 1820 | 2250  | 2500  | 2830  | 3660  | 4210  |
|                                            | 10 bar                 | l                              | 1090                  | 1450 | 1810 | 2190  | 2470  | 2820  | 3650  | 4200  |
| Gas capacity                               |                        | l                              | 1240                  | 1610 | 2210 | 2930  | 3360  | 4080  | 5010  | 5940  |
| Flue gas temperature <sup>3)</sup>         | at 30 °C <sup>1)</sup> | °C                             | 100                   | 92   | 105  | 99    | 105   | 97    | 101   | 103   |
|                                            | at 60 °C <sup>1)</sup> | °C                             | 119                   | 110  | 123  | 118   | 123   | 115   | 119   | 120   |
| Required draught                           |                        | Pa                             | 0 (50) <sup>4)</sup>  |      |      |       |       |       |       |       |
| Max. flow rate via BWT <sup>3)</sup>       | at 30 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 28.1                  | 40.0 | 43.2 | 58.3  | 79.6  | 99.9  | 119.7 | 139.7 |
|                                            | at 60 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 28.5                  | 42.5 | 43.7 | 28.5  | 83.4  | 106.1 | 127.1 | 148.4 |
| Pressure drop on the water side BWT        | at 30 °C <sup>1)</sup> | mbar                           | 200                   | 214  | 250  | 150   | 187   | 164   | 156   | 151   |
|                                            | at 60 °C <sup>1)</sup> | mbar                           | 200                   | 236  | 250  | 150   | 200   | 180   | 171   | 166   |
| Pressure drop on hot gas side boiler + BWT |                        | mbar                           | 5.76                  | 6.57 | 7.17 | 6.52  | 8.24  | 10.07 | 9.39  | 11.19 |
| Permiss. flow temperature <sup>5)</sup>    |                        | °C                             | 110                   |      |      |       |       |       |       |       |
| Permiss. operating pressure                |                        | bar                            | 6 or 10 <sup>6)</sup> |      |      |       |       |       |       |       |
| CE designation                             |                        | –                              | CE 0085 BO 0397       |      |      |       |       |       |       |       |

Tab. 18 Specification Logano plus SB825L LN, boiler sizes 750 to 3500 (dim. → Fig. 14, page 22)

- 1) Water inlet temperature into the condensing heat exchanger (BWT)
- 2) The operating weight is the sum of the boiler weight, the weight of the condensing heat exchanger, and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 3) Relative to the maximum boiler load, other boiler loads → Fig. 32, page 43; boiler reference temperatures 80/60 °C
- 4) The available pressure depends on the burner
- 5) Safety limit of the high limit safety cut-out (STB); Maximum possible operating flow temperature (→ Tab. 50, page 79)
- 6) Higher pressures on request



Other specifications and designs of condensing heat exchangers available on request.

### 3.3.8 Specification Logano plus SB825L LN, boiler sizes 4250 to 17500

| Boiler size                                |                        | Unit                           | 4250                  | 5250  | 6000  | 8000  | 10000 | 12000 | 14000 | 17500  |
|--------------------------------------------|------------------------|--------------------------------|-----------------------|-------|-------|-------|-------|-------|-------|--------|
| Max. rated boiler output                   |                        | kW                             | 4250                  | 5250  | 6000  | 8000  | 10000 | 12000 | 14000 | 17500  |
| Rated output BWT                           | at 30 °C <sup>1)</sup> | kW                             | 337.3                 | 397.9 | 449.8 | 593.5 | 712.4 | 867.5 | 937.6 | 1221.2 |
|                                            | at 60 °C <sup>1)</sup> | kW                             | 148.3                 | 165.9 | 185.3 | 248.2 | 287.5 | 369.3 | 362.9 | 528.2  |
| Shipping weight                            | 6 bar                  | kg                             | 8700                  | 10840 | 12330 | 16180 | 18960 | 23150 | 29610 | 34920  |
|                                            | 10 bar                 | kg                             | 9600                  | 11340 | 13330 | 16580 | 19760 | 24650 | 31010 | 37920  |
| Operating weight <sup>2)</sup>             | 6 bar                  | kg                             | 14970                 | 18300 | 21430 | 27250 | 31650 | 39900 | 53190 | 63280  |
|                                            | 10 bar                 | kg                             | 15860                 | 18790 | 22350 | 27630 | 32430 | 41270 | 54550 | 66010  |
| Boiler water capacity                      | 6 bar                  | l                              | 6200                  | 7390  | 9010  | 10970 | 12570 | 16620 | 23430 | 28160  |
|                                            | 10 bar                 | l                              | 6200                  | 7380  | 8930  | 10950 | 12550 | 16490 | 23390 | 27890  |
| Gas capacity                               |                        | l                              | 7770                  | 9600  | 11480 | 14100 | 17180 | 22230 | 27640 | 34460  |
| Flue gas temperature <sup>3)</sup>         | at 30 °C <sup>1)</sup> | °C                             | 110                   | 106   | 99    | 104   | 101   | 108   | 100   | 104    |
|                                            | at 60 °C <sup>1)</sup> | °C                             | 128                   | 123   | 116   | 121   | 118   | 125   | 116   | 121    |
| Required draught                           |                        | Pa                             | 0 (50) <sup>4)</sup>  |       |       |       |       |       |       |        |
| Max. flow rate via BWT <sup>3)</sup>       | at 30 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 160.7                 | 160.7 | 160.7 | 160.7 | 160.7 | 160.7 | 160.7 | 160.7  |
|                                            | at 60 °C <sup>1)</sup> | m <sub>N</sub> <sup>3</sup> /h | 162.7                 | 162.7 | 162.7 | 162.7 | 162.7 | 162.7 | 162.7 | 162.7  |
| Pressure drop on the water side BWT        | at 30 °C <sup>1)</sup> | mbar                           | 200                   | 200   | 200   | 200   | 200   | 200   | 200   | 200    |
|                                            | at 60 °C <sup>1)</sup> | mbar                           | 200                   | 200   | 200   | 200   | 200   | 200   | 200   | 200    |
| Pressure drop on hot gas side boiler + BWT |                        | mbar                           | 11.51                 | 11.45 | 10.98 | 12.98 | 14.53 | 14.78 | 13.74 | 13.18  |
| Permiss. flow temperature <sup>5)</sup>    |                        | °C                             | 110                   |       |       |       |       |       |       |        |
| Permiss. operating pressure                |                        | bar                            | 6 or 10 <sup>6)</sup> |       |       |       |       |       |       |        |
| CE designation                             |                        | –                              | CE 0085 BO 0397       |       |       |       |       |       |       |        |

Tab. 19 Specification Logano plus SB825L LN, boiler sizes 4250 to 17500 (dim. → Fig. 15, page 23)

- 1) Water inlet temperature into the condensing heat exchanger (BWT)
- 2) The operating weight is the sum of the boiler weight, the weight of the condensing heat exchanger, and 100 % of the water filling it (excl. the weight of the burner and pipework)
- 3) Relative to the maximum boiler load, other boiler loads → Fig. 32, page 43; boiler reference temperatures 80/60 °C
- 4) The available pressure depends on the burner
- 5) Safety limit of the high limit safety cut-out (STB); Maximum possible operating flow temperature (→ Tab. 50, page 79)
- 6) Higher pressures on request



Other specifications and designs of condensing heat exchangers available on request.

### 3.4 Flue gas heat exchanger ECO 6 SA (stand-alone)

#### 3.4.1 Function principle

In the flue gas heat exchanger, heat is recovered from the hotter boiler flue gas by channelling cooler mains return water through the heat exchanger pipe to reduce the flue gas temperature. The energy gained in this way gives a higher boiler efficiency and therefore lower fuel consumption and lower flue gas emissions.

With the fuels gas and low sulphur fuel oil, aim for as low a water inlet temperature as possible at the flue gas heat exchanger. This deliberately creates operation with condensate (flue gas condensation), so that even higher efficiency can be achieved.

If the flue gas heat exchanger is operated with fuel oil (not low sulphur quality), ensure a corresponding

minimum water inlet temperature at the flue gas heat exchanger of 60 °C to protect it from corrosion on the flue gas side. With oil operation, an optional control on the water side can be used to raise the water inlet temperature at the flue gas heat exchanger to the required minimum level by mixing in pre-heated water. With oil operation, for flue gas heat exchangers with an integral flue gas bypass, if the water inlet temperature cannot be raised to the minimum level, the entire flue gas flow from the boiler bypasses the flue gas heat exchanger, using the flue gas control valve. A flue gas temperature controller is available as an option for an additional charge.

#### 3.4.2 Specification flue gas heat exchanger ECO 6 SA

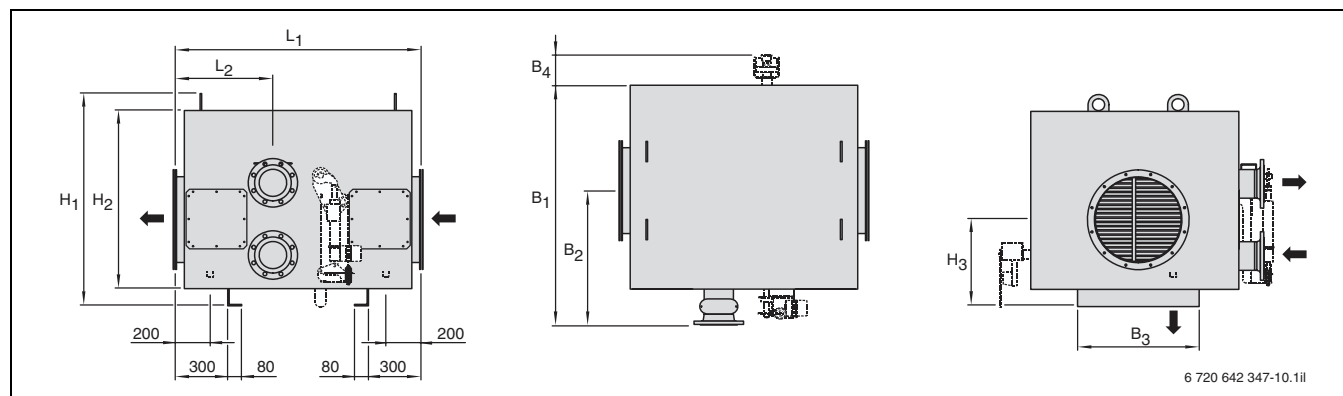


Fig. 16 Dimensions flue gas heat exchanger ECO 6 SA (dim. in mm)

| Type                                                        | Unit                         | 5    | 7    | 9     | 11    | 13    | 15    | 17    | 19    | 21    |
|-------------------------------------------------------------|------------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|
| Can be used up to max. rated boiler output                  | kW                           | 750  | 1250 | 1500  | 2000  | 2500  | 3050  | 3700  | 4250  | 5250  |
| Max. output with natural gas H $\vartheta_R = 30\text{ °C}$ | kW                           | 59.5 | 74.5 | 102.8 | 147.6 | 186.4 | 251.1 | 268.3 | 328.5 | 393.8 |
| Max. output with natural gas H $\vartheta_R = 60\text{ °C}$ | kW                           | 25.4 | 41.2 | 48.4  | 66.5  | 111.4 | 119.4 | 121.0 | 148.4 | 166.0 |
| Flow rate on the water side <sup>1)</sup>                   | m <sup>3</sup> /h            | 28.5 | 42.5 | 58.9  | 83.4  | 106.1 | 127.1 | 156.5 | 162.7 | 162.7 |
| Pressure drop on the water side <sup>1)</sup>               | mbar                         | 200  | 250  | 150   | 200   | 180   | 174   | 185   | 190   | 200   |
| Pressure drop on the hot gas side <sup>1)</sup>             | mbar                         | 0.81 | 1.24 | 0.98  | 1.32  | 1.24  | 1.37  | 1.75  | 1.71  | 1.75  |
| Width                                                       | B <sub>1</sub> <sup>2)</sup> | mm   | 914  | 1004  | 1094  | 1154  | 1254  | 1294  | 1334  | 1404  |
|                                                             | B <sub>2</sub> <sup>2)</sup> | mm   | 531  | 576   | 621   | 651   | 701   | 721   | 741   | 776   |
|                                                             | B <sub>3</sub>               | mm   | 400  | 500   | 500   | 600   | 750   | 750   | 750   | 900   |
|                                                             | B <sub>4</sub>               | mm   | 0    | 0     | 0     | 0     | 0     | 0     | 0     | 0     |
| Length                                                      | L <sub>1</sub> <sup>3)</sup> | mm   | 1120 | 1120  | 1120  | 1120  | 1120  | 1120  | 1520  | 1520  |
|                                                             | L <sub>2</sub> <sup>3)</sup> | mm   | 260  | 260   | 260   | 260   | 260   | 260   | 460   | 460   |
| Height                                                      | H <sub>1</sub>               | mm   | 949  | 899   | 874   | 899   | 974   | 1024  | 1049  | 1099  |
|                                                             | H <sub>2</sub>               | mm   | 549  | 599   | 674   | 699   | 774   | 824   | 849   | 974   |
|                                                             | H <sub>3</sub>               | mm   | 572  | 497   | 434   | 447   | 484   | 509   | 522   | 547   |
| Drainage system connection                                  | inch                         | R1   | R1   | R1    | R1    | R1    | R1    | R1    | R1    | R1    |
| Shipping weight                                             | 1 bundle                     | kg   | 130  | 160   | 190   | 220   | 260   | 290   | 310   | 420   |
| Water capacity per bundle                                   | l                            | 15   | 20   | 26    | 29    | 37    | 42    | 46    | 52    | 64    |

Tab. 20 Dimensions and specification flue gas heat exchanger ECO 6 SA

- 1) Hydraulic connection to the secondary circuit (partial flow)
- 2) For heat exchangers having a water inlet/water outlet with an internal diameter of DN150, the dimensions increase by 50 mm.
- 3) If the heat exchanger is designed to have several bundle elements, the dimensions increase by 300 mm per bundle.

| Type                                                        | Unit                         | 23    | 25    | 27    | 29    | 31    | 33     | 35     | 37     |
|-------------------------------------------------------------|------------------------------|-------|-------|-------|-------|-------|--------|--------|--------|
| Can be used up to max. rated boiler output                  | kW                           | 6500  | 8000  | 10000 | 12000 | 14000 | 14700  | 17500  | 19200  |
| Max. output with natural gas H $\vartheta_R = 30\text{ °C}$ | kW                           | 450.1 | 568.1 | 712.9 | 868.5 | 938.0 | 1098.8 | 1222.1 | 1294.5 |
| Max. output with natural gas H $\vartheta_R = 60\text{ °C}$ | kW                           | 260.9 | 277.0 | 322.1 | 377.7 | 394.0 | 503.7  | 528.2  | 555.6  |
| Flow rate on the water side <sup>1)</sup>                   | m <sup>3</sup> /h            | 162.7 |       |       |       |       |        |        |        |
| Pressure drop on the water side <sup>1)</sup>               | mbar                         | 200   |       |       |       |       |        |        |        |
| Pressure drop on the hot gas side <sup>1)</sup>             | mbar                         | 1.41  | 1.67  | 1.74  | 2.21  | 2.17  | 1.67   | 1.78   | 1.62   |
| Width                                                       | B <sub>1</sub> <sup>2)</sup> | mm    | 1704  | 1745  | 1954  | 2004  | 2154   | 2304   | 2454   |
|                                                             | B <sub>2</sub> <sup>2)</sup> | mm    | 926   | 951   | 1051  | 1076  | 1151   | 1226   | 1301   |
|                                                             | B <sub>3</sub>               | mm    | 1100  | 1100  | 1350  | 1350  | 1550   | 1700   | 2000   |
|                                                             | B <sub>4</sub>               | mm    | 0     | 0     | 0     | 250   | 250    | 250    | 250    |
| Length                                                      | L <sub>1</sub> <sup>3)</sup> | mm    | 1520  | 1520  | 1520  | 1520  | 1920   | 1920   | 1920   |
|                                                             | L <sub>2</sub> <sup>3)</sup> | mm    | 460   | 460   | 460   | 460   | 660    | 660    | 660    |
| Height                                                      | H <sub>1</sub>               | mm    | 1299  | 1399  | 1474  | 1499  | 1599   | 1699   | 1799   |
|                                                             | H <sub>2</sub>               | mm    | 1099  | 1199  | 1274  | 1299  | 1399   | 1499   | 1599   |
|                                                             | H <sub>3</sub>               | mm    | 647   | 697   | 734   | 747   | 797    | 847    | 897    |
| Drainage system connection                                  | inch                         | R1    | R1    | R1½   | R1½   | R1½   | R1½    | R1½    | R1½    |
| Shipping weight                                             | 1 bundle                     | kg    | 530   | 600   | 700   | 740   | 890    | 1020   | 1290   |
| Water capacity per bundle                                   | l                            | 85    | 98    | 119   | 125   | 148   | 173    | 200    | 228    |

Tab. 21 Dimensions and specification flue gas heat exchanger ECO 6 SA

- 1) Hydraulic connection to the secondary circuit (partial flow)
- 2) For heat exchangers having a water inlet/water outlet with an internal diameter of DN150, the dimensions increase by 50 mm.
- 3) If the heat exchanger is designed to have several bundle elements, the dimensions increase by 300 mm per bundle.

These dimensions are designed for 100 mm thick insulation. The water inlet and outlet connections can be made on the r.h. or l.h. side.  
Pipe thread to DIN 2999.



Dimensions given with  $\pm 1\%$  tolerance;  
weights given with  $\pm 3\%$  tolerance

## 3.5 Connections

### 3.5.1 Flow and return

| At design spread and rated output |                                   |                                   |                                   | Suggested internal diameter <sup>1)</sup> |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------------------|
| $\Delta T = 15 \text{ K}$<br>[kW] | $\Delta T = 20 \text{ K}$<br>[kW] | $\Delta T = 30 \text{ K}$<br>[kW] | $\Delta T = 40 \text{ K}$<br>[kW] |                                           |
| > 175 ≤ 275                       | > 235 ≤ 367                       | > 352 ≤ 550                       | > 470 ≤ 734                       | DN50                                      |
| > 275 ≤ 465                       | > 367 ≤ 620                       | > 550 ≤ 931                       | > 734 ≤ 1241                      | DN65                                      |
| > 465 ≤ 705                       | > 620 ≤ 940                       | > 931 ≤ 1410                      | > 1241 ≤ 1881                     | DN80                                      |
| > 705 ≤ 1102                      | > 940 ≤ 1469                      | > 1410 ≤ 2204                     | > 1881 ≤ 2938                     | DN100                                     |
| > 1102 ≤ 1722                     | > 1469 ≤ 2296                     | > 2204 ≤ 3444                     | > 2938 ≤ 4592                     | DN125                                     |
| > 1722 ≤ 2479                     | > 2296 ≤ 3306                     | > 3444 ≤ 4959                     | > 4592 ≤ 6612                     | DN150                                     |
| > 2479 ≤ 4408                     | > 3306 ≤ 5877                     | > 4959 ≤ 8816                     | > 6612 ≤ 11755                    | DN200                                     |
| > 4408 ≤ 6887                     | > 5877 ≤ 9183                     | > 8816 ≤ 13775                    | > 11755 ≤ 18367                   | DN250                                     |
| > 6887 ≤ 9918                     | > 9183 ≤ 13224                    | > 13775 ≤ 19200                   | > 18367 ≤ 19200                   | DN300                                     |
| > 9918 ≤ 13500                    | > 13224 ≤ 18000                   | –                                 | –                                 | DN350                                     |
| > 13500 ≤ 17633                   | > 18000 ≤ 19200                   | –                                 | –                                 | DN400                                     |

Tab. 22 Internal diameters of flow and return connections subject to design spread and rated output

1) Flanged connections designed as PN16 to DIN 2633; the internal diameters given should be taken as suggestions but can be determined individually.

| Logano S825L<br>Logano plus SB825L<br>Boiler size | Logano S825L LN<br>Logano S825L LN (standardised)<br>Logano plus SB825L LN<br>Boiler size | Maximum possible internal diameters of flow<br>and return connections |
|---------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| –                                                 | 750                                                                                       | DN100                                                                 |
| 1000                                              | –                                                                                         | DN100                                                                 |
| 1350                                              | 1000–1500                                                                                 | DN125                                                                 |
| 1900                                              | 2000                                                                                      | DN150                                                                 |
| 2500–4200                                         | 2500–4250                                                                                 | DN200                                                                 |
| 5200–7700                                         | 5250–6000                                                                                 | DN250                                                                 |
| 9300–12600                                        | 8000–12000                                                                                | DN300                                                                 |
| 14700–16400                                       | 14000                                                                                     | DN350                                                                 |
| 19200                                             | 17500                                                                                     | DN400                                                                 |

Tab. 23 Internal diameters of flow and return connections subject to the boiler size;  
larger internal diameters available on request

| Logano S825L<br>Standardised boiler size | Fixed internal diameters of flow and return connections |
|------------------------------------------|---------------------------------------------------------|
| 650                                      | DN80                                                    |
| 1000                                     | DN100                                                   |
| 1350                                     | DN125                                                   |
| 1900                                     | DN150                                                   |

Tab. 24 Fixed internal diameters of flow and return connections for Logano S825L (standardised);  
subject to the boiler size

### 3.5.2 Flow safety line and safety valve connections

| Maximum response pressure<br>[bar] | Maximum boiler output with a safety valve from ARI, figure 903<br>with an internal diameter of the flow safety line of <sup>1)</sup> |              |              |              |              |              |              |               |               |               |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
|                                    | DN20<br>[kW]                                                                                                                         | DN25<br>[kW] | DN32<br>[kW] | DN40<br>[kW] | DN50<br>[kW] | DN65<br>[kW] | DN80<br>[kW] | DN100<br>[kW] | DN125<br>[kW] | DN150<br>[kW] |
| 2.5                                | 217                                                                                                                                  | 340          | 565          | 870          | 1360         | 2300         | 3480         | 5440          | 7120          | 9900          |
| 3.0                                | 250                                                                                                                                  | 391          | 649          | 1000         | 1560         | 2640         | 4000         | 6250          | 8190          | 11400         |
| 4.0                                | 312                                                                                                                                  | 488          | 810          | 1250         | 1950         | 3300         | 5000         | 7800          | 10200         | 14200         |
| 5.0                                | 370                                                                                                                                  | 578          | 960          | 1480         | 2310         | 3900         | 5910         | 9240          | 12100         | 16900         |
| 6.0                                | 426                                                                                                                                  | 666          | 1100         | 1700         | 2660         | 4500         | 6820         | 10600         | 14000         | 19400         |
| 8.0                                | 536                                                                                                                                  | 837          | 1390         | 2140         | 3350         | 5660         | 8580         | 13400         | 17600         | 24500         |
| 10.0                               | 643                                                                                                                                  | 1000         | 1670         | 2570         | 4010         | 6790         | 10300        | 16000         | 21100         | 29300         |

Tab. 25 Flow safety line and safety valve connections

1) Several connectors for flow safety line on request

### 3.5.3 Flue outlet connection

| Rated output <sup>1)</sup><br>[kW] | Flue outlet internal diameter <sup>2)3)</sup> D <sub>1</sub><br>– | Flue outlet D <sub>1</sub> (external) <sup>3)</sup><br>[mm] |
|------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------|
| ≤ 827                              | DN200                                                             | 213                                                         |
| > 827 ≤ 1350                       | DN250                                                             | 256                                                         |
| > 1350 ≤ 2050                      | DN315                                                             | 322                                                         |
| > 2051 ≤ 3307                      | DN400                                                             | 400                                                         |
| > 3308 ≤ 5167                      | DN500                                                             | 503                                                         |
| > 5168 ≤ 8203                      | DN630                                                             | 634                                                         |
| > 8204 ≤ 10403                     | DN710                                                             | 711                                                         |
| > 10404 ≤ 13227                    | DN800                                                             | 797                                                         |
| > 13228 ≤ 16712                    | DN900                                                             | 894                                                         |
| > 16713 ≤ 19200                    | DN1000                                                            | 1003                                                        |

Tab. 26 Flue outlet connection subject to the rated output

1) Actual output (according to type plate)

2) Dimensions to EN 12220

3) Guide values; exact diameter is calculated for each specific project

| Logano S825L<br>Standardised boiler size | Fixed internal diameters of flue outlet |
|------------------------------------------|-----------------------------------------|
| 650                                      | DN200                                   |
| 1000                                     | DN315                                   |
| 1350                                     | DN315                                   |
| 1900                                     | DN400                                   |

Tab. 27 Fixed internal diameters of flue outlet for S825L (standardised); subject to the boiler size

### 3.5.4 Condensing heat exchanger connection for integral version (Logano plus SB825) and stand-alone version (ECO 6 SA)

| Integrated into<br>SB825L | Stand-alone<br>ECO 6 SA | Condensing heat exchanger (BWT) connection |                                            |                                    |
|---------------------------|-------------------------|--------------------------------------------|--------------------------------------------|------------------------------------|
|                           |                         | Flue inlet /<br>flue outlet<br>[DN]        | Flow $V_{WT}$ /<br>return $R_{WT}$<br>[DN] | Condensate<br>outlet AKO<br>[inch] |
| Boiler size               | Type                    |                                            |                                            |                                    |
| 650                       | BG5                     | 200                                        | 80                                         | R1                                 |
| 1000                      | BG7                     | 250 (315)                                  | 100                                        | R1                                 |
| 1350                      | BG9                     | 250                                        | 100                                        | R1                                 |
| 1900                      | BG11                    | 315                                        | 125                                        | R1                                 |
| 2500                      | BG13                    | 400                                        | 125                                        | R1                                 |
| 3050                      | BG15                    | 400                                        | 150                                        | R1                                 |
| 3700                      | BG17                    | 500                                        | 150                                        | R1                                 |
| 4200                      | BG19                    | 500                                        | 150                                        | R1                                 |
| 5200                      | BG21                    | 630                                        | 150                                        | R1                                 |
| 6500                      | BG23                    | 630                                        | 150                                        | R1                                 |
| 7700                      | BG25                    | 630                                        | 150                                        | R1                                 |
| 9300                      | BG27                    | 710                                        | 150                                        | R1½                                |
| 11200                     | BG29                    | 800                                        | 150                                        | R1½                                |
| 12600                     | BG31                    | 800                                        | 150                                        | R1½                                |
| 14700                     | BG33                    | 900                                        | 150                                        | R1½                                |
| 16400                     | BG35                    | 900                                        | 150                                        | R1½                                |
| 19200                     | BG37                    | 1000                                       | 150                                        | R1½                                |

Tab. 28 Condensing heat exchanger connection for the Logano plus SB825L, subject to the rated output

| Integrated into<br>SB825L LN | Stand-alone<br>ECO 6 SA | Condensing heat exchanger (BWT) connection |                                            |                                    |
|------------------------------|-------------------------|--------------------------------------------|--------------------------------------------|------------------------------------|
|                              |                         | Flue inlet /<br>flue outlet<br>[DN]        | Flow $V_{WT}$ /<br>return $R_{WT}$<br>[DN] | Condensate<br>outlet AKO<br>[inch] |
| Boiler size                  | Type                    |                                            |                                            |                                    |
| 750                          | BG5                     | 200                                        | 80                                         | R1                                 |
| 1000                         | BG7                     | 250                                        | 100                                        | R1                                 |
| 1250                         | BG7                     | 250                                        | 100                                        | R1                                 |
| 1500                         | BG9                     | 315                                        | 100                                        | R1                                 |
| 2000                         | BG11                    | 315                                        | 125                                        | R1                                 |
| 2500                         | BG13                    | 400                                        | 125                                        | R1                                 |
| 3000                         | BG15                    | 400                                        | 150                                        | R1                                 |
| 3500                         | BG17                    | 500                                        | 150                                        | R1                                 |
| 4250                         | BG19                    | 500                                        | 150                                        | R1                                 |
| 5250                         | BG21                    | 500                                        | 150                                        | R1                                 |
| 6000                         | BG23                    | 630                                        | 150                                        | R1                                 |
| 8000                         | BG25                    | 630                                        | 150                                        | R1                                 |
| 10000                        | BG27                    | 710                                        | 150                                        | R1½                                |
| 12000                        | BG29                    | 800                                        | 150                                        | R1½                                |
| 14000                        | BG31                    | 900                                        | 150                                        | R1½                                |
| 17500                        | BG35                    | 1000                                       | 150                                        | R1½                                |

Tab. 29 Condensing heat exchanger connection for the Logano plus SB825L LN, subject to the rated output

### 3.5.5 Connector

All Logano S825L and S825L LN conventional boilers, as well as Logano plus SB825L and SB825L LN gas condensing boilers, are factory-fitted with suitable flow

and return connectors. A temperature sensor and temperature controller can be connected to them.

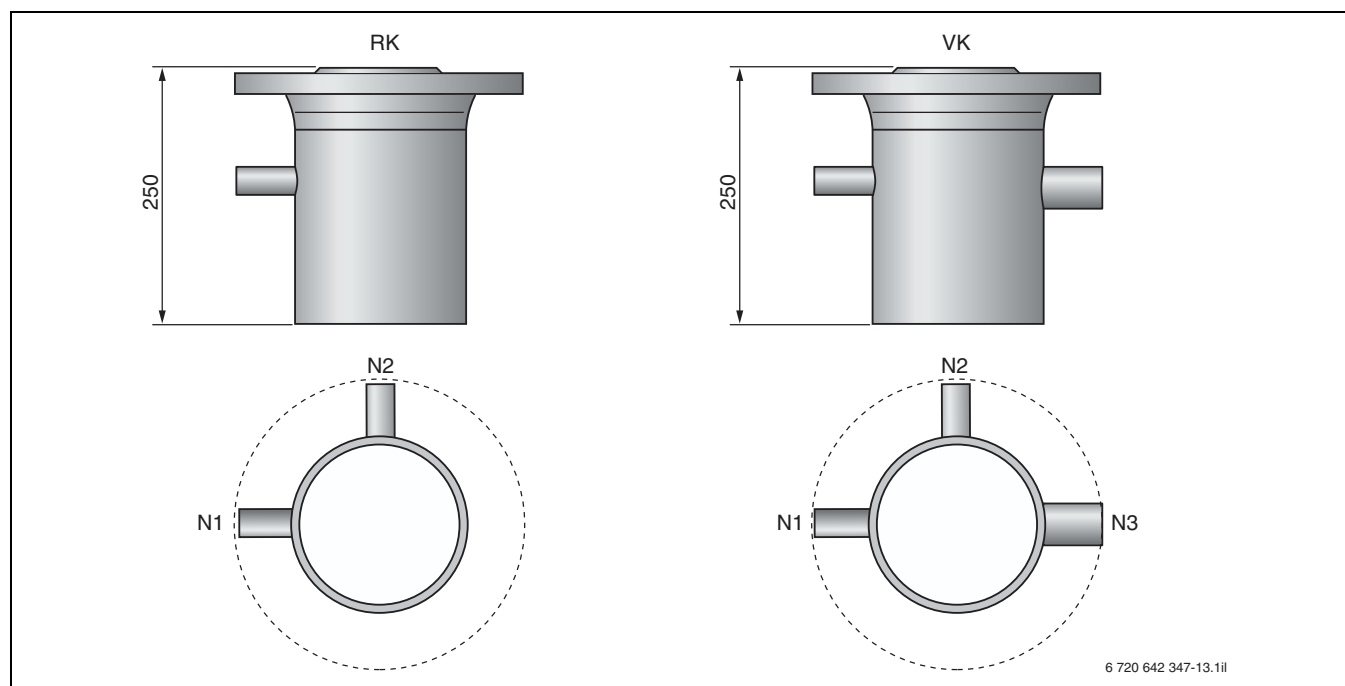


Fig. 17 Connectors for Logano S825L/L LN and Logano plus SB825L/L LN with test ports for safety equipment (dim. in mm; internal diameters → Tab. 22, page 30, Tab. 28, page 32 and Tab. 29, page 32)

- N1** Female connections with cylindrical female thread  $R\frac{1}{2}$ , 120 mm long (with connectors DN 32–150)  
Female connections with cylindrical female thread  $R\frac{1}{2}$ , 60 mm long (with connectors DN 200–400)
- N2** Female connections with cylindrical female thread  $R\frac{1}{2}$ , 60 mm long (with connectors DN 65–80)  
Female connections with cylindrical female thread  $R\frac{1}{2}$ , 75 mm long (with connectors DN 32–50)  
Female connections with cylindrical female thread  $R\frac{1}{2}$ , 40 mm long (with connectors DN 100–400)
- N3** Female connections with cylindrical female thread  $R\frac{3}{4}$ , 75 mm long (with connectors DN 32–150)  
Female connections with cylindrical female thread  $R\frac{3}{4}$ , 50 mm long (with connectors DN 200–400)
- RK** Return
- VK** Flow

## 3.6 Parameters

### 3.6.1 Pressure drop on the water side

The pressure drop on the water side is the pressure differential between the boiler flow and return connections. It depends on the boiler size (and the internal diameter of the connectors) and the heating water flow rate. The graph in Fig. 18 shows the pressure drop on the water side for the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers. For the pressure drop on the water side of the condensing heat exchangers in the Logano plus SB825L and SB825L LN gas condensing boilers, see pages 24 ff.

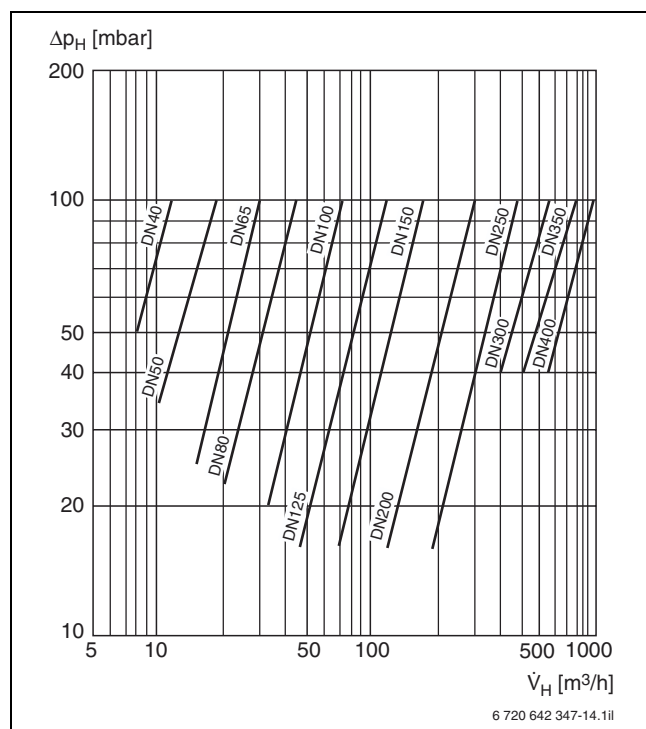


Fig. 18 Pressure drop on the water side for Logano S825L/L LN and Logano plus SB825L/L LN; (for internal diameters of flow and return connections → page 30)

$\Delta p_H$  Pressure drop on heating water side

$\dot{V}_H$  Heating water flow rate

### 3.6.2 Pressure drop on the hot gas side

#### Logano S825L

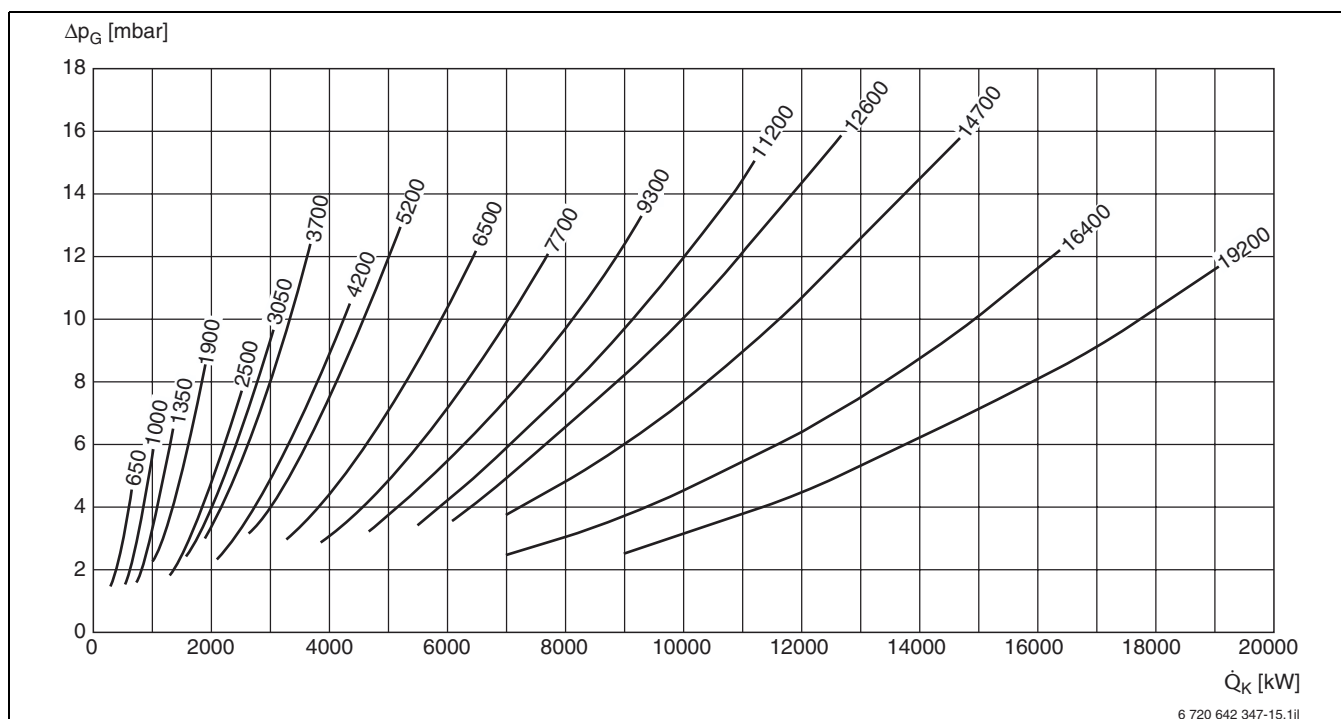


Fig. 19 Pressure drop on the hot gas side Logano S825L

$\Delta p_G$  Pressure drop on the hot gas side

$\dot{Q}_K$  Rated output

#### Logano S825L LN

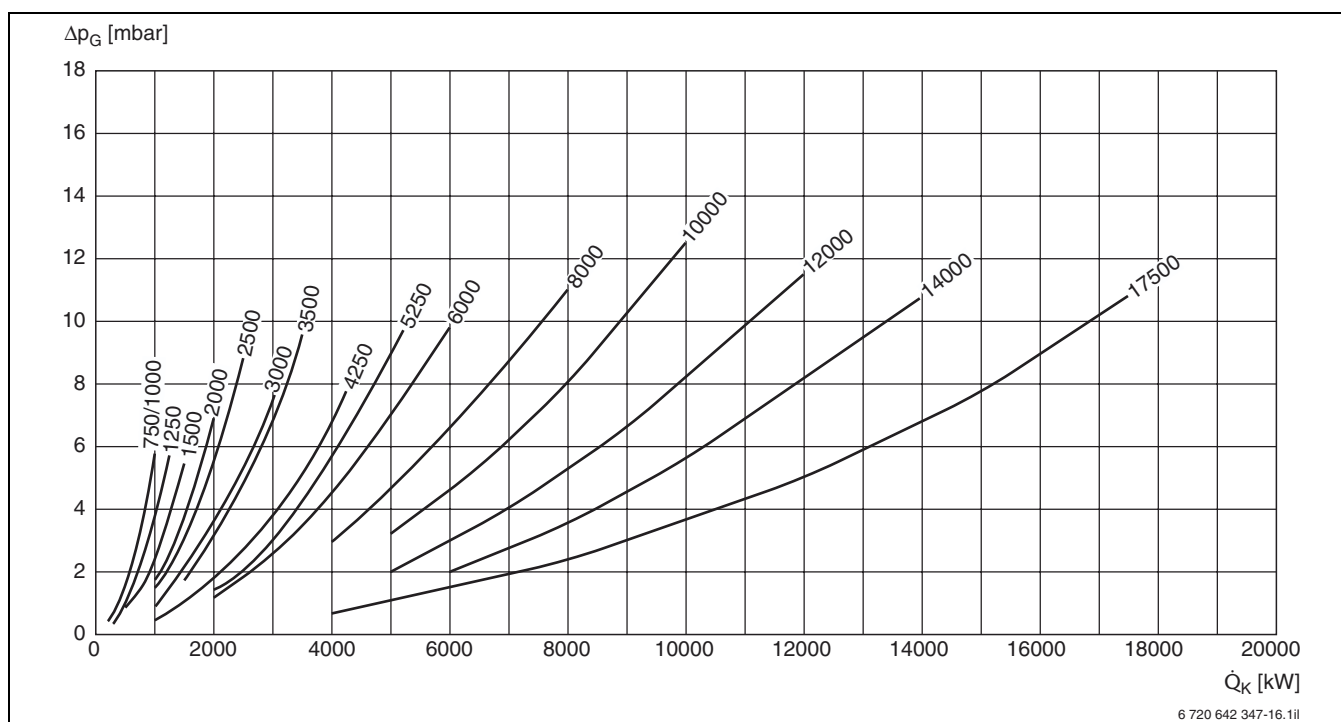


Fig. 20 Pressure drop on the hot gas side Logano S825L LN

$\Delta p_G$  Pressure drop on the hot gas side

$\dot{Q}_K$  Rated output

### Logano plus SB825L

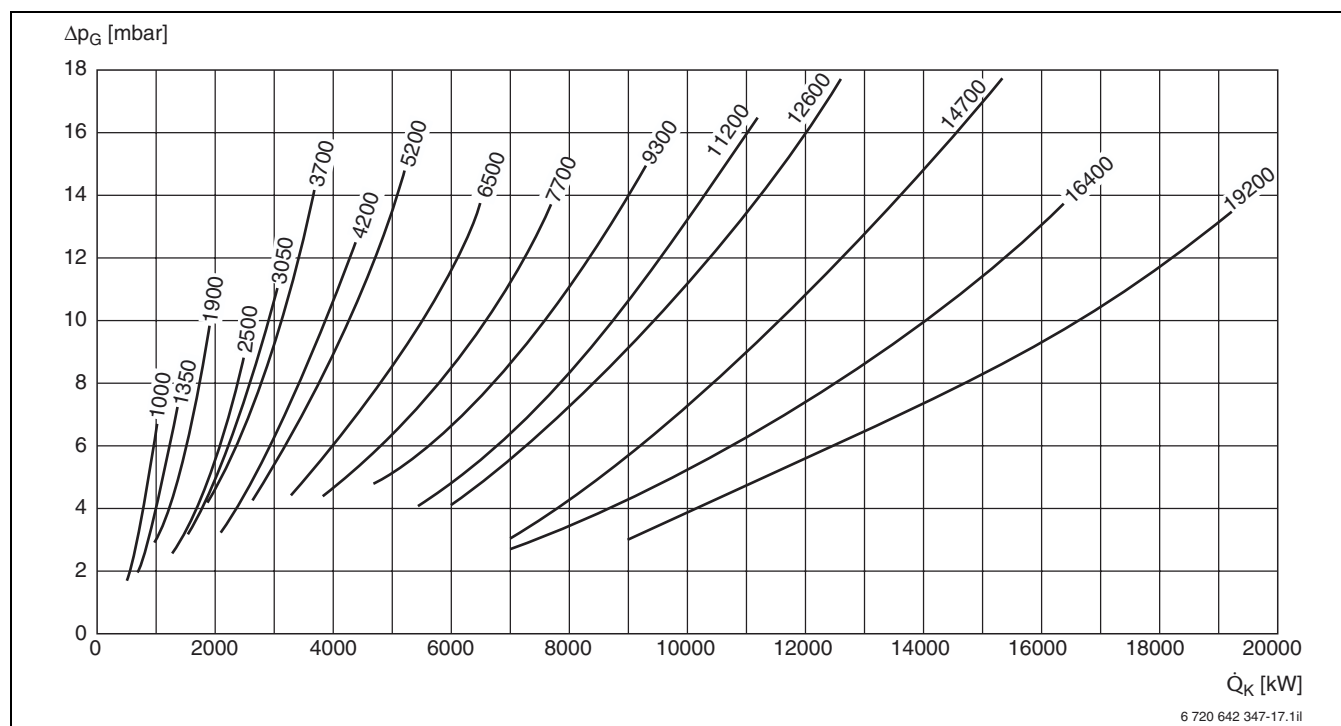


Fig. 21 Pressure drop on the hot gas side Logano plus SB825L

### Logano plus SB825L LN

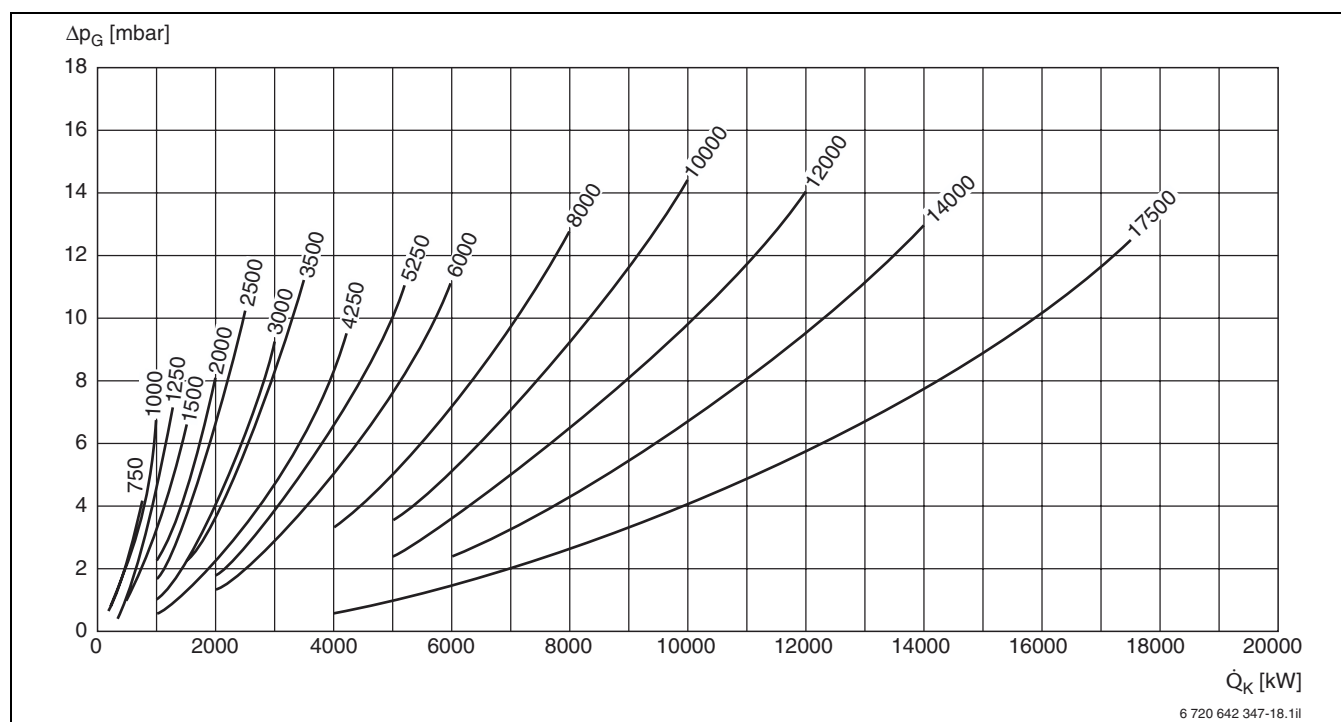


Fig. 22 Pressure drop on the hot gas side Logano plus SB825L LN

$\dot{Q}_K$  Rated output

$\Delta p_G$  Pressure drop on the hot gas side

### 3.6.3 Combustion chamber volume load

To guarantee emissions values, some burner manufacturers define aspects such as a maximum combustion chamber volume load. Using the graphs in Fig. 23 and Fig. 24, the most suitable boiler size for a

given combustion chamber volume load can be selected for the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers.

#### Logano S825L and Logano plus SB825L

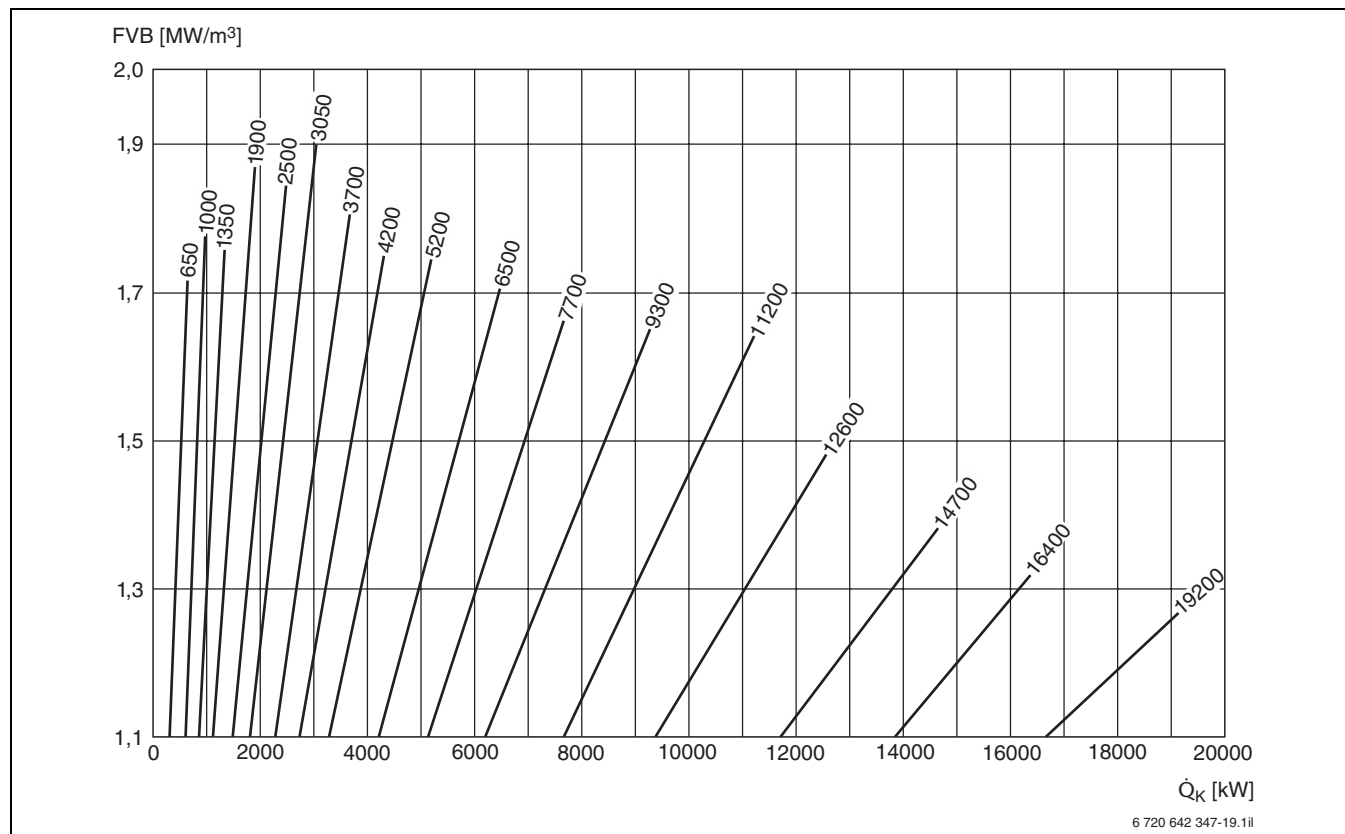


Fig. 23 Combustion chamber volume load Logano S825L and Logano plus SB825L, subject to the boiler output

**FVB** Combustion chamber volume load

**$\dot{Q}_K$**  Rated output

### Logano S825L LN and Logano plus SB825L LN

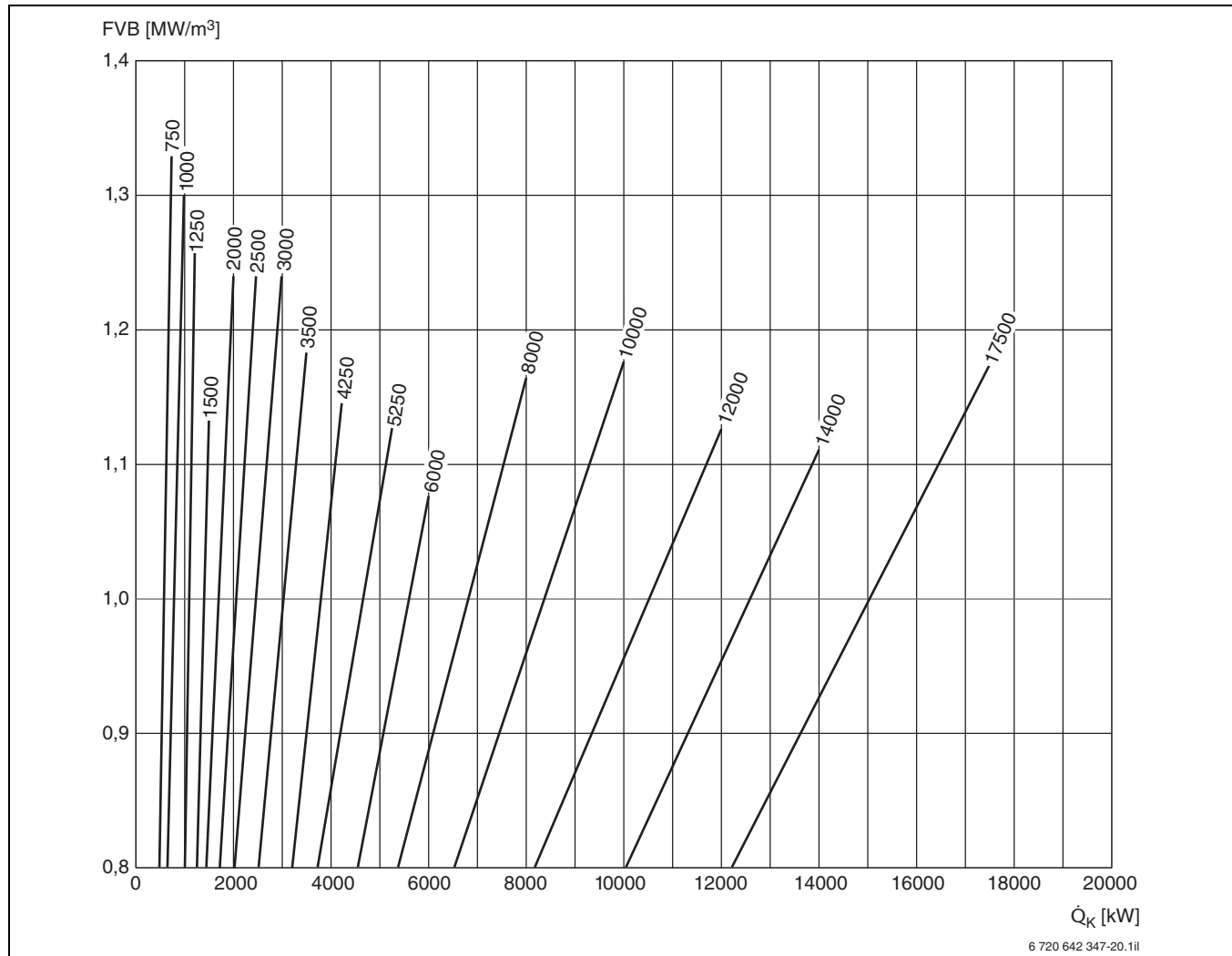


Fig. 24 Combustion chamber volume load Logano S825L LN and Logano plus SB825L LN, subject to the boiler output

**FVB** Combustion chamber volume load  
 **$\dot{Q}_K$**  Rated output

### 3.6.4 Boiler efficiency, standard seasonal efficiency [to DIN] and standby loss

#### Boiler efficiency and standard seasonal efficiency [to DIN]

The **boiler efficiency** denotes the ratio of generated output compared to combustion output, subject to the boiler load and system temperature.

$$\eta_K = \frac{Q}{Q_B}$$

**$\eta_K$**  Boiler efficiency  
**Q** Generated output in kW  
 **$Q_B$**  Combustion output in kW

The graph in Fig. 25 (page 39) shows the boiler efficiency subject to the boiler load, to EN 303 relative to a system temperature of 80/60 °C (→ Fig. 30, page 42 and Fig. 31, page 43). Fig. 26 shows the boiler efficiency subject to the average boiler water temperature.

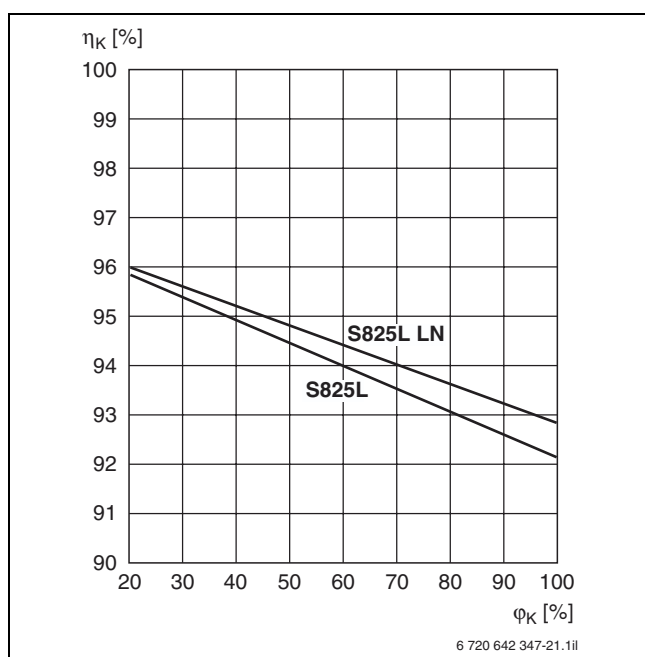


Fig. 25 Boiler efficiency Logano S825L/L LN subject to boiler load (averages for the series); system temperature 80/60 °C

$\eta_K$  Boiler efficiency  
 $\phi_K$  Relative boiler load

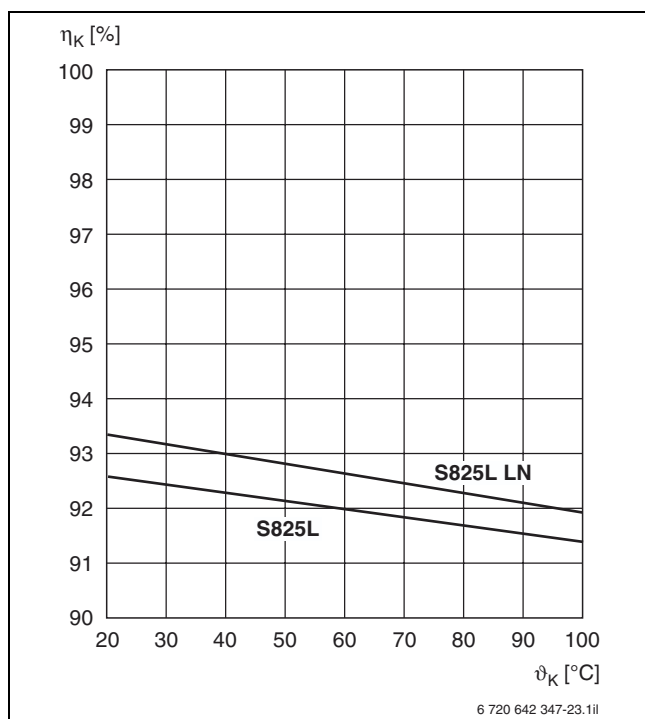


Fig. 26 Boiler efficiency Logano S825L/L LN subject to the average boiler water temperature (averages for the series)

$\eta_K$  Boiler efficiency  
 $t_K$  Average boiler water temperature

The **standard seasonal efficiency** (to DIN 4702, part 8) is measured from the partial load efficiency levels at five fixed points in the relative boiler output ratings. The values measured for efficiency at partial load subject to the relative boiler output ratings should be entered accordingly. The standard seasonal efficiency [to DIN] for heating operation is calculated from the values derived in this way using the following equation:

$$\eta_N = \frac{5}{\sum_{i=1}^5 \frac{1}{\eta_{\phi_i}}}$$

$\eta_N$  Standard seasonal efficiency [to DIN]  
 $\phi_i$  Relative boiler output

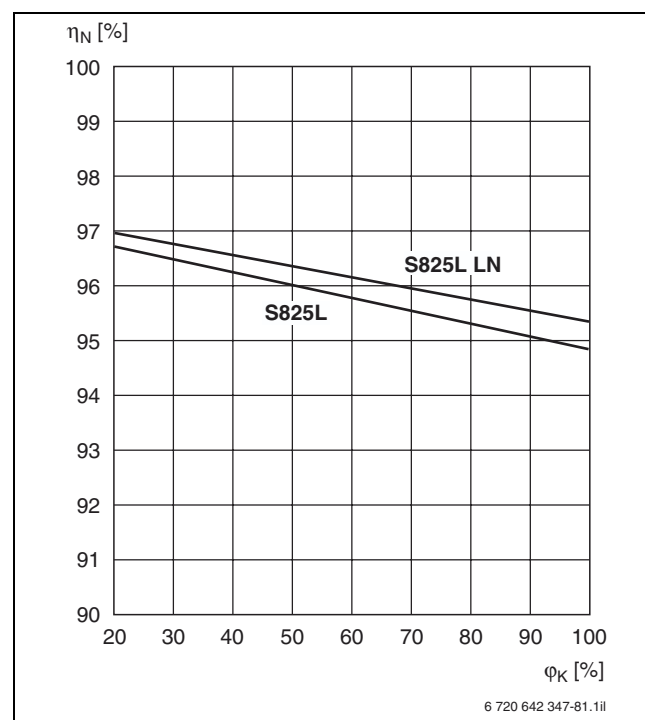


Fig. 27 Standard seasonal efficiency [to DIN] for Logano S825L/L LN, subject to the boiler load (averages for the series)

$\eta_N$  Standard seasonal efficiency [to DIN]  
 $\phi_K$  Relative boiler load

For boiler efficiency and standard seasonal efficiency [to DIN] for the various sizes of Logano L825 L/L LN boiler, see also Tab. 30 on page 40.

| Boiler type            | Boiler size | Boiler efficiency $\eta_K^{1)2)}$ | Standard seasonal efficiency [to DIN] $\eta_N^{1)2)}$ |
|------------------------|-------------|-----------------------------------|-------------------------------------------------------|
| <b>Logano S825L</b>    | 650         | 92.2                              | 94.9                                                  |
|                        | 1000        | 91.8                              | 94.9                                                  |
|                        | 1350        | 92.9                              | 95.6                                                  |
|                        | 1900        | 91.4                              | 94.8                                                  |
|                        | 2500        | 91.7                              | 95.0                                                  |
|                        | 3050        | 91.3                              | 94.8                                                  |
|                        | 3700        | 92.3                              | 95.4                                                  |
|                        | 4200        | 92.0                              | 95.2                                                  |
|                        | 5200        | 91.9                              | 95.2                                                  |
|                        | 6500        | 91.3                              | 94.9                                                  |
|                        | 7700        | 92.0                              | 95.2                                                  |
|                        | 9300        | 92.2                              | 95.4                                                  |
|                        | 11200       | 92.2                              | 95.4                                                  |
|                        | 12600       | 92.7                              | 95.6                                                  |
|                        | 14700       | 92.2                              | 95.4                                                  |
|                        | 16400       | 93.4                              | 96.0                                                  |
|                        | 19200       | 92.8                              | 95.7                                                  |
| <b>Logano S825L LN</b> | 750         | 92.4                              | 95.2                                                  |
|                        | 1000        | 93.3                              | 95.7                                                  |
|                        | 1250        | 92.4                              | 95.3                                                  |
|                        | 1500        | 92.6                              | 95.5                                                  |
|                        | 2000        | 92.3                              | 95.3                                                  |
|                        | 2500        | 93.1                              | 95.8                                                  |
|                        | 3000        | 92.7                              | 95.6                                                  |
|                        | 3500        | 92.7                              | 95.6                                                  |
|                        | 4250        | 92.0                              | 95.2                                                  |
|                        | 5250        | 92.6                              | 95.6                                                  |
|                        | 6000        | 93.0                              | 95.8                                                  |
|                        | 8000        | 92.8                              | 95.6                                                  |
|                        | 10000       | 93.1                              | 95.8                                                  |
|                        | 12000       | 92.6                              | 95.6                                                  |
|                        | 14000       | 93.5                              | 96.0                                                  |
|                        | 17500       | 92.9                              | 95.7                                                  |

Tab. 30 Boiler efficiency and standard seasonal efficiency [to DIN] for Logano S825L/L LN

- 1) Relative to a system temperature of 80/60 °C. For other system temperatures, the boiler efficiency changes according to Fig. 26, page 39.
- 2) Relative to the maximum rated output; for reduced rated output levels, the boiler efficiency rises according to Fig. 25, page 39.

### Standby loss

The **standby loss** is the proportion of combustion output required to maintain the specified boiler water temperature. The cause of this loss is the cooling down of the boiler through radiation and convection during the standby time (burner idle time).

| Boiler type                  | Boiler size | Standby loss $q_B^{1)}$ |                 |
|------------------------------|-------------|-------------------------|-----------------|
|                              |             | [kW]                    | % <sup>2)</sup> |
| <b>Logano S825L</b>          | 650         | 0.97                    | 0.150           |
|                              | 1000        | 1.23                    | 0.123           |
|                              | 1350        | 1.43                    | 0.106           |
|                              | 1900        | 1.64                    | 0.086           |
|                              | 2500        | 1.82                    | 0.073           |
|                              | 3050        | 2.04                    | 0.067           |
|                              | 3700        | 2.18                    | 0.059           |
|                              | 4200        | 2.46                    | 0.059           |
|                              | 5200        | 2.69                    | 0.052           |
| <b>Logano plus SB825L</b>    | 6500        | 3.33                    | 0.051           |
|                              | 7700        | 3.87                    | 0.050           |
|                              | 9300        | 3.98                    | 0.043           |
|                              | 11200       | 4.83                    | 0.043           |
|                              | 12600       | 5.36                    | 0.043           |
|                              | 14700       | 6.15                    | 0.042           |
|                              | 16400       | 7.37                    | 0.045           |
|                              | 19200       | 8.23                    | 0.043           |
| <b>Logano S825L LN</b>       | 750         | 1.04                    | 0.139           |
|                              | 1000        | 1.14                    | 0.114           |
|                              | 1250        | 1.24                    | 0.099           |
|                              | 1500        | 1.36                    | 0.091           |
|                              | 2000        | 1.56                    | 0.078           |
|                              | 2500        | 1.68                    | 0.067           |
|                              | 3000        | 1.88                    | 0.063           |
|                              | 3500        | 2.10                    | 0.060           |
| <b>Logano plus SB825L LN</b> | 4250        | 2.40                    | 0.056           |
|                              | 5250        | 2.82                    | 0.054           |
|                              | 6000        | 3.04                    | 0.051           |
|                              | 8000        | 3.86                    | 0.048           |
|                              | 10000       | 4.60                    | 0.046           |
|                              | 12000       | 5.42                    | 0.045           |
|                              | 14000       | 7.20                    | 0.051           |
|                              | 17500       | 7.52                    | 0.043           |

Tab. 31 Standby loss Logano S825L/L LN and Logano plus SB825L/L LN

- 1) Relative to a system temperature of 80/60 °C
- 2) Relative to the maximum rated output

### 3.6.5 Rated output of the condensing heat exchanger

All details given below regarding the condensing heat exchanger (BWT) for the Logano plus SB825L and SB825L LN gas condensing boilers are based on a design with a pipe bundle element. The specification for a design with two pipe bundle elements can be obtained from your local Buderus sales office.

An approximate calculation of the rated output of the condensing heat exchanger can be made.

$$\dot{Q}_{\text{BWT, real}} \approx f_{\varphi K} \times f_{\vartheta R} \times \dot{Q}_{\text{BWT, 30}}$$

*Form. 3 Calculation of the rated output of the condensing heat exchanger*

$f_{\varphi K}$  Conversion factor → Fig. 28

$f_{\vartheta R}$  Conversion factor → Fig. 29

$\dot{Q}_{\text{BWT, 30}}$  Rated output of the condensing heat exchanger (BWT) at a water inlet temperature of 30 °C (→ page 24 ff.)

$\dot{Q}_{\text{BWT, real}}$  Actual rated output BWT

#### Example

- Given
  - Logano plus SB825L-2500 gas condensing boiler
  - Rated output  $\dot{Q}_K = 2300 \text{ kW}$
  - Boiler load  $\varphi_K = 2300 \text{ kW} / 2500 \text{ kW} = 92 \%$
  - Water inlet temperature into the BWT  $\vartheta_{\text{BWT}} = 40 \text{ °C}$
- Read off
  - Conversion factors  $f_{\varphi K} = 0.9$  (→ Fig. 28)  
 $f_{\vartheta R} = 0.825$  (→ Fig. 29)
  - Rated output of the BWT at 30 °C  $\dot{Q}_{\text{BWT, 30}} = 212 \text{ kW}$  (→ Tab. 16, page 24)
- Result
  - Rated output of the BWT acc. to formula 3:  
 $\dot{Q}_{\text{BWT, real}} \approx 0.9 \times 0.825 \times 212 \text{ kW} \approx 157 \text{ kW}$
  - Total rated output  $\dot{Q} \approx 2300 \text{ kW} + 157 \text{ kW} \approx 2457 \text{ kW}$

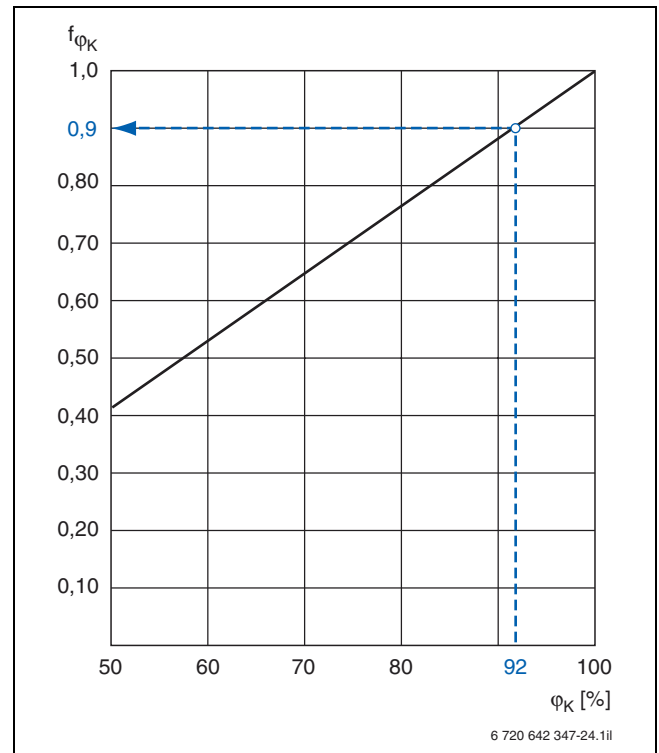


Fig. 28 Conversion factor for calculating the rated output of the condensing heat exchanger, relative to a 30 °C water inlet temperature

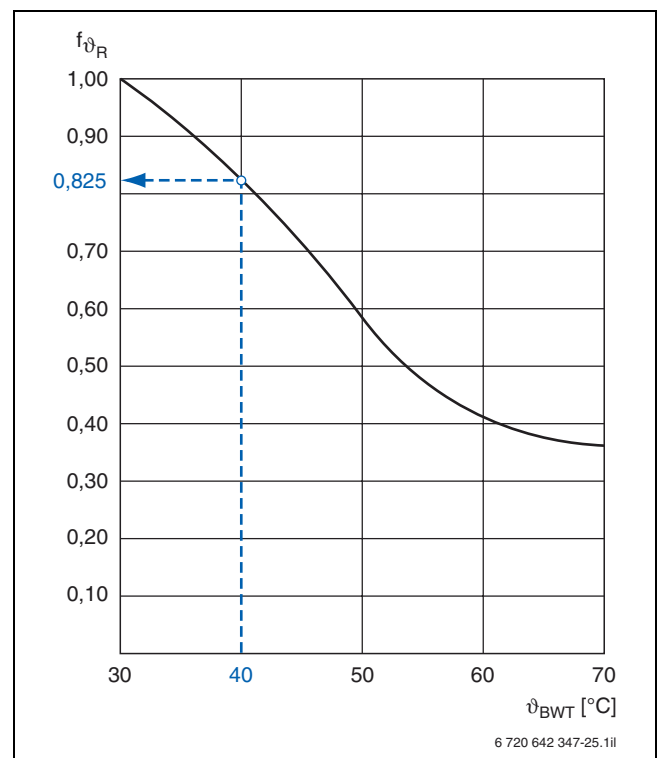


Fig. 29 Conversion factor for calculating the rated output at other inlet temperatures

### 3.6.6 Flue gas temperature

The flue gas temperature is the temperature measured inside the flue pipe, specifically at the boiler flue outlet. It depends on the boiler loads and the system temperature (→ Fig. 30 to Fig. 32). The minimum possible flue gas temperature should generally be used to calculate the chimney size. This will be approx. 7.5 K below the specified flue gas temperature, relative to an average boiler water temperature of 70 °C.

#### Change in the flue gas temperature

The flue gas temperature depends on the average boiler water temperature. The flue gas temperatures in the graphs in Fig. 30 to Fig. 32 are relative to a temperature pair of 80/60 °C in accordance with EN 303, i.e. the average boiler water temperature is 70 °C (for conversion to other temperature pairs → Tab. 32).

| Average boiler water temperature<br>[ °C] | Change in the flue gas temperature<br>[K] |
|-------------------------------------------|-------------------------------------------|
| 60                                        | -7.5                                      |
| 70                                        | 0                                         |
| 80                                        | 7.5                                       |
| 90                                        | 15                                        |
| 100                                       | 22.5                                      |

Tab. 32 Change in the flue gas temperature subject to the average boiler water temperature

#### Example

- Given
  - Logano S825L-6500 conventional boiler
  - Rated output  $\dot{Q}_K = 6000$  kW
  - System temperatures 100/80 °C
- Read off
  - Change of 15 K in the flue gas temperature (→ Tab. 32)
  - Flue gas temperature read off  $\vartheta_A = 198$  °C (→ Fig. 30)
- Result
  - Flue gas temperature at full boiler load  
= 198 °C + 15 K = 213 °C

### Logano S825L

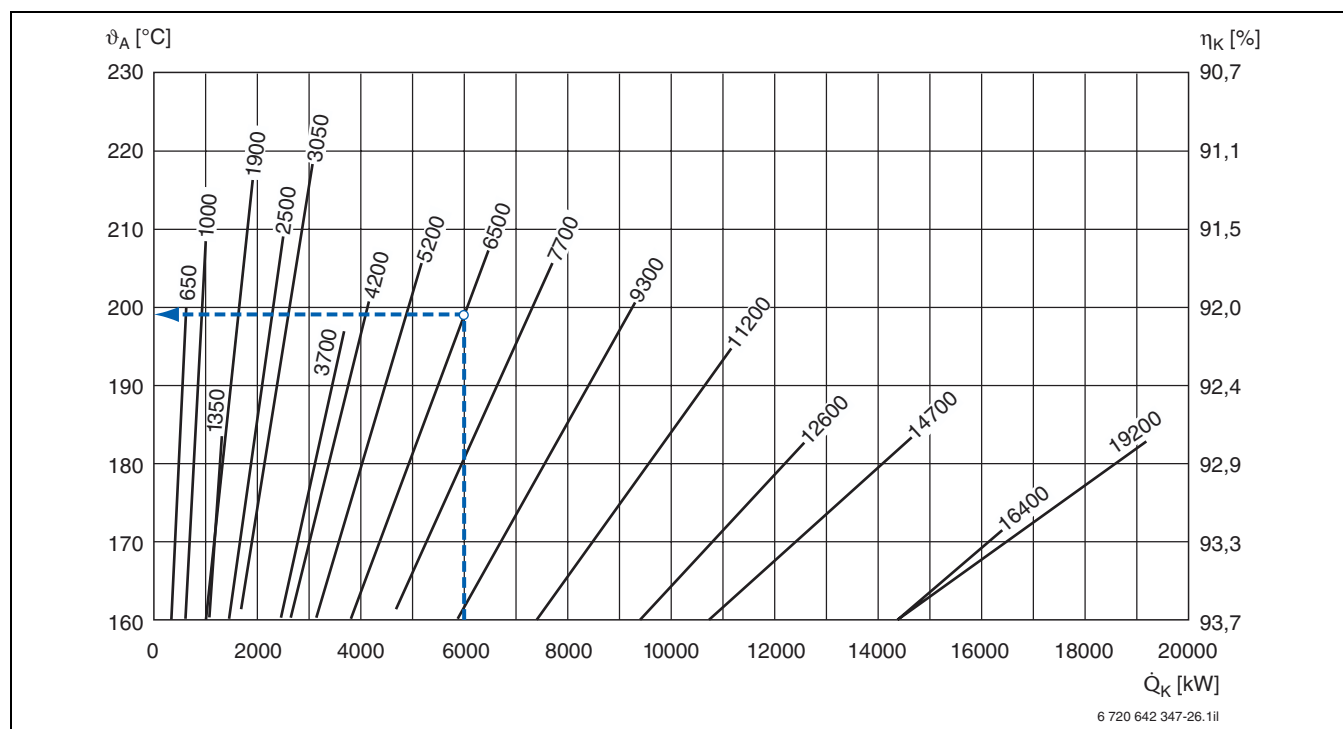


Fig. 30 Logano S825L flue gas temperatures subject to the boiler load

$\eta_K$  Boiler efficiency  
 $\vartheta_A$  Flue gas temperature

$\varphi_K$  Boiler load  
 $\dot{Q}_K$  Rated output

# Logano S825L LN

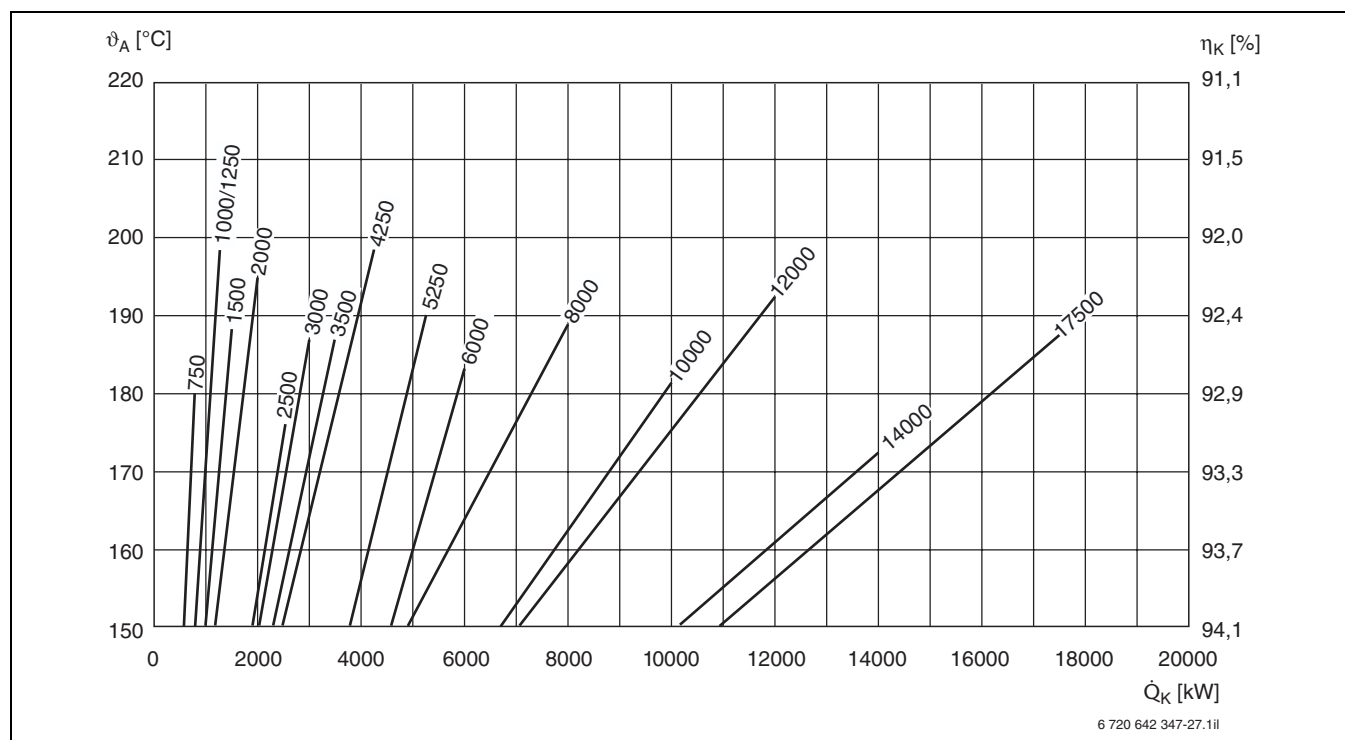


Fig. 31 Logano S825L LN flue gas temperatures subject to the boiler load

$\eta_K$  Boiler efficiency  
 $\theta_A$  Flue gas temperature  
 $Q_K$  Rated output

# Logano plus SB825L and SB825L LN

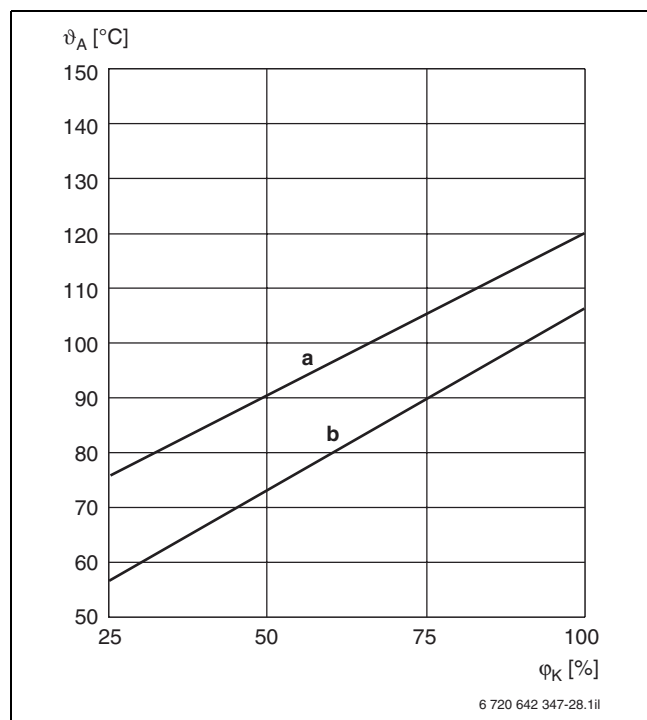


Fig. 32 Logano plus SB825L/L LN flue gas temperatures subject to the boiler load and the water inlet temperature into the condensing heat exchanger (averages for the series)

**a** Water inlet temperature into the condensing heat exchanger of 60 °C  
**b** Water inlet temperature into the condensing heat exchanger of 30 °C  
 $\theta_A$  Flue gas temperature  
 $\phi_K$  Boiler load

## 4 Burners

### 4.1 General requirements

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, can be operated with any tested pressure-jet oil or gas burner. The pressure-jet oil burners must be type-tested in accordance with the requirements of DIN-EN 267; the pressure-jet gas burners in accordance with DIN-EN 676. Observe the requirements for oil and gas combustion equipment, as well as the applicable guidelines and regulations.

When combining a boiler with a burner, check whether the burner manufacturer's requirements with regard to the combustion chamber geometry are fulfilled for the selected boiler.

### 4.2 Information on burner selection

The burner must reliably overcome the pressure drop on the hot gas side of the boiler (→ page 35 f.). With gas combustion, ensure that the local gas network can provide the required supply pressure for the burner.

If ordering a Logano S825L, S825L LN or S825L LN (standardised) conventional boiler, or a Logano plus SB825L or SB825L LN gas condensing boiler, please specify the required burner type.

The burner fixing equipment and door lining are prepared for the relevant burner at the factory.

With boiler version S825L "standardised", the door lining is designed for any type of burner. A range of adaptor plates are available for fixing the required burner (→ latest Buderus catalogue).

Fill the gap between the door lining and blast tube with fireproof, flexible material.

The burner door must be able to be opened and pivoted out unimpeded. In the case of oil combustion, size the oil hoses and cables accordingly.

In the case of gas combustion, provide a gas line compensator in the longitudinal direction of the boiler. With this, the gas train can be separated at this point when the door is opened, and the door can be pivoted out together with the burner.

The burner head is equipped subject to the burner manufacturer's stipulations. The blast tube should protrude into the combustion chamber. Observe the burner manufacturer's installation instructions.

### 4.3 Matched pressure-jet burners

Optimum combustion requires the boiler and burner to be individually matched. Together with suitable burners, the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, are suitable for systems where lower emissions are required.



To select the optimum burner, please contact your local Buderus sales office. Guaranteed emissions levels can be obtained from the burner supplier or sales offices of Buderus-Heiztechnik GmbH.



To select the optimum boiler/burner combination, please contact your local Buderus sales office.

## 4.4 Combustion details for the Logano S825L and S825L LN conventional boilers

### 4.4.1 Combustion details for the Logano S825L, boiler sizes 650 to 5200

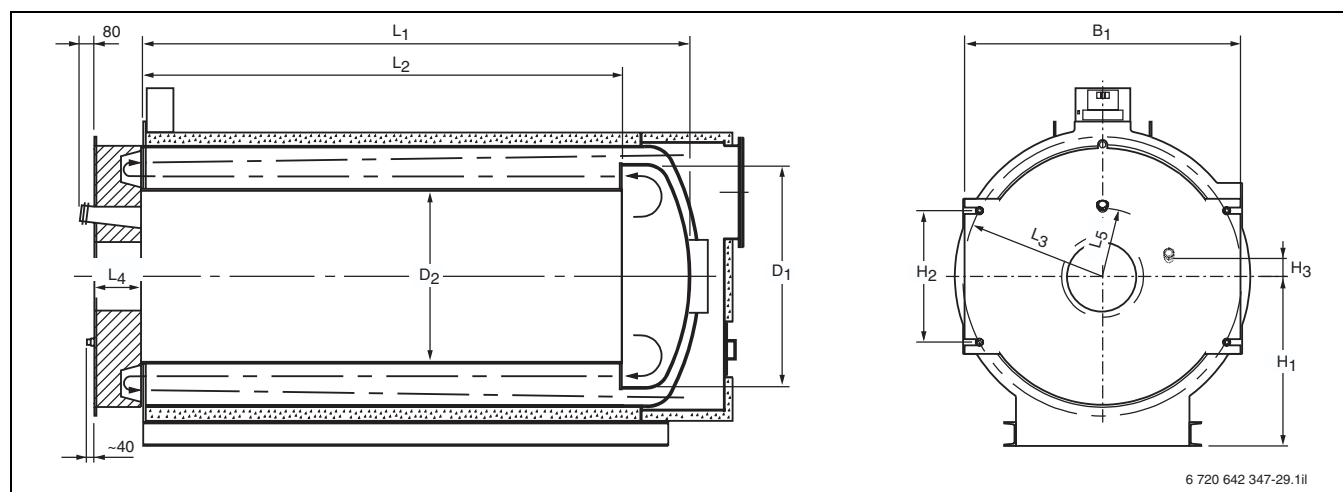


Fig. 33 Combustion chamber dimensions Logano S825L, boiler sizes 650 to 5200 (dim. in mm)

| Boiler size <sup>1)</sup>         |                              | Unit           | 650  | 1000 | 1350 | 1900 | 2500 | 3050 | 3700 | 4200 | 5200 |
|-----------------------------------|------------------------------|----------------|------|------|------|------|------|------|------|------|------|
| Hot gas volume <sup>2)</sup>      |                              |                |      |      |      |      |      |      |      |      |      |
| Combustion chamber                |                              | m <sup>3</sup> | 0.45 | 0.68 | 0.89 | 1.21 | 1.58 | 1.90 | 2.37 | 2.86 | 3.46 |
| Boiler                            |                              | m <sup>3</sup> | 0.71 | 1.09 | 1.40 | 1.98 | 2.58 | 3.05 | 3.67 | 4.61 | 5.44 |
| Combustion chamber                | D <sub>1</sub>               | mm             | 788  | 888  | 988  | 1086 | 1136 | 1236 | 1284 | 1384 | 1482 |
|                                   | 6 bar D <sub>2</sub>         | mm             | 534  | 604  | 664  | 734  | 780  | 850  | 905  | 936  | 1016 |
|                                   | 6 bar L <sub>1</sub>         | mm             | 1821 | 2201 | 2470 | 2668 | 3148 | 3195 | 3552 | 3986 | 4105 |
|                                   | 6 bar L <sub>2</sub>         | mm             | 1570 | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
|                                   | 10 bar D <sub>2</sub>        | mm             | –    | 604  | 660  | 730  | 780  | 846  | 901  | 932  | 1012 |
|                                   | 10 bar L <sub>1</sub>        | mm             | –    | 2201 | 2465 | 2668 | 3144 | 3189 | 3547 | 3983 | 4105 |
|                                   | 10 bar L <sub>2</sub>        | mm             | –    | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
|                                   |                              |                |      |      |      |      |      |      |      |      |      |
| Front hot gas reversing chamber   | L <sub>3</sub>               | mm             | 535  | 625  | 685  | 745  | 775  | 835  | 860  | 900  | 960  |
|                                   | L <sub>4</sub>               | mm             | 190  | 190  | 190  | 190  | 190  | 190  | 190  | 257  | 257  |
|                                   | L <sub>5</sub>               | mm             | 225  | 260  | 290  | 325  | 350  | 385  | 412  | 430  | 470  |
|                                   | H <sub>1</sub>               | mm             | 725  | 800  | 850  | 900  | 925  | 975  | 1000 | 1050 | 1100 |
|                                   | H <sub>2</sub>               | mm             | 460  | 560  | 620  | 685  | 720  | 785  | 815  | 795  | 855  |
|                                   | H <sub>3</sub> <sup>3)</sup> | mm             | –    | –    | –    | –    | –    | –    | –    | 111  | 122  |
|                                   | B <sub>1</sub>               | mm             | 1050 | 1200 | 1300 | 1400 | 1450 | 1550 | 1600 | 1700 | 1800 |
| Maximum door load from the burner |                              | kNm            | 4    | 5    | 5    | 5    | 5    | 5    | 5    | 6    | 6    |

Tab. 33 Combustion details for the Logano S825L, boiler sizes 650 to 5200

- 1) Boilers with an output between 650 kW and 1900 kW are also available as unit versions (boiler + burner) or as standardised versions with fixed internal connection diameters (equipment overview → page 11). The permissible operating pressure is 6 bar.
- 2) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.
- 3) From boiler size 4200, the flame inspection port is located on the side.

## 4.4.2 Combustion details Logano S825L, boiler sizes 6500 to 19200

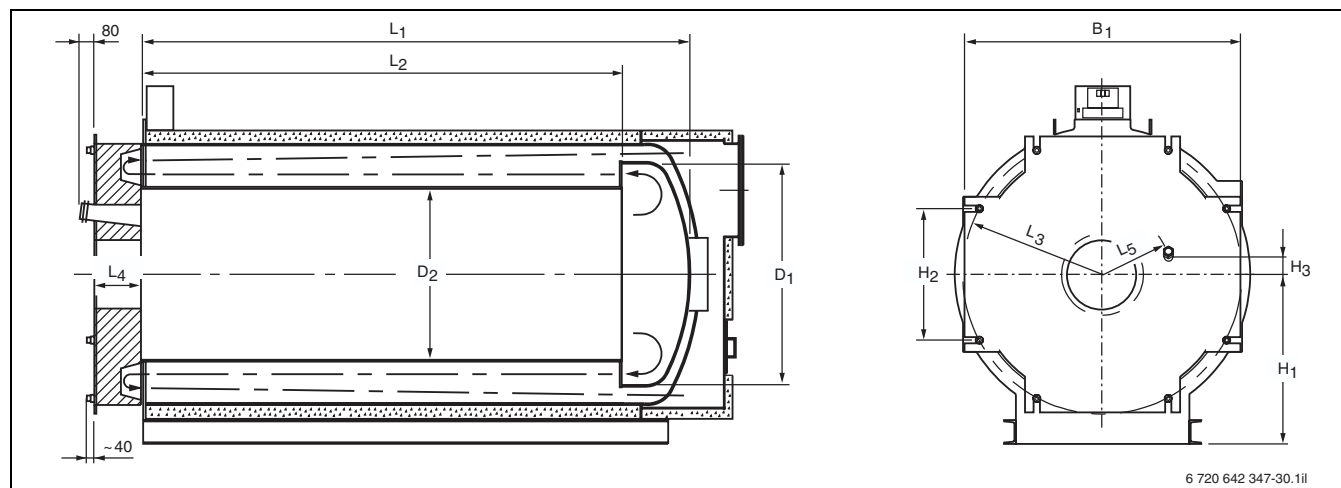


Fig. 34 Combustion chamber dimensions Logano S825L, boiler sizes 6500 to 19200 (dim. in mm)

| Boiler size                       |                       | Unit           | 6500 | 7700 | 9300  | 11200 | 12600 | 14700 | 16400 | 19200 |
|-----------------------------------|-----------------------|----------------|------|------|-------|-------|-------|-------|-------|-------|
| Hot gas volume <sup>1)</sup>      |                       |                |      |      |       |       |       |       |       |       |
| Combustion chamber                |                       | m <sup>3</sup> | 4.42 | 5.50 | 6.48  | 7.92  | 9.73  | 12.32 | 14.52 | 17.50 |
| Boiler                            |                       | m <sup>3</sup> | 7.13 | 8.91 | 10.55 | 13.04 | 15.62 | 20.41 | 25.27 | 31.76 |
| Combustion chamber                | D <sub>1</sub>        | mm             | 1632 | 1780 | 1880  | 1978  | 2128  | 2326  | 2474  | 2672  |
|                                   | 6 bar D <sub>2</sub>  | mm             | 1096 | 1182 | 1272  | 1347  | 1457  | 1534  | 1614  | 1710  |
|                                   | 6 bar L <sub>1</sub>  | mm             | 4483 | 4712 | 4911  | 5359  | 5658  | 6399  | 6829  | 7263  |
|                                   | 6 bar L <sub>2</sub>  | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
|                                   | 10 bar D <sub>2</sub> | mm             | 1087 | 1177 | 1267  | 1344  | 1450  | 1530  | 1606  | 1704  |
|                                   | 10 bar L <sub>1</sub> | mm             | 4481 | 4710 | 4910  | 5356  | 5653  | 6397  | 6824  | 7259  |
|                                   | 10 bar L <sub>2</sub> | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
| Front hot gas reversing chamber   | L <sub>3</sub>        | mm             | 1075 | 1165 | 1250  | 1340  | 1425  | 1540  | 1715  | 1830  |
|                                   | L <sub>4</sub>        | mm             | 257  | 257  | 257   | 259   | 259   | 259   | 294   | 294   |
|                                   | L <sub>5</sub>        | mm             | 510  | 560  | 600   | 640   | 695   | 735   | 775   | 825   |
|                                   | H <sub>1</sub>        | mm             | 1200 | 1275 | 1350  | 1425  | 1500  | 1600  | 1750  | 1850  |
|                                   | H <sub>2</sub>        | mm             | 975  | 1065 | 1150  | 1250  | 1330  | 1450  | 1630  | 1745  |
|                                   | H <sub>3</sub>        | mm             | 132  | 145  | 155   | 166   | 180   | 190   | 201   | 214   |
|                                   | B <sub>1</sub>        | mm             | 2000 | 2150 | 2300  | 2450  | 2600  | 2800  | 3100  | 3300  |
| Maximum door load from the burner |                       | kNm            | 6    | 6    | 6     | 6     | 5     | 4     | 3     | 3     |

Tab. 34 Combustion details Logano S825L, boiler sizes 6500 to 19200

- 1) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.

#### 4.4.3 Combustion details for the Logano S825L LN, boiler sizes 750 to 3500

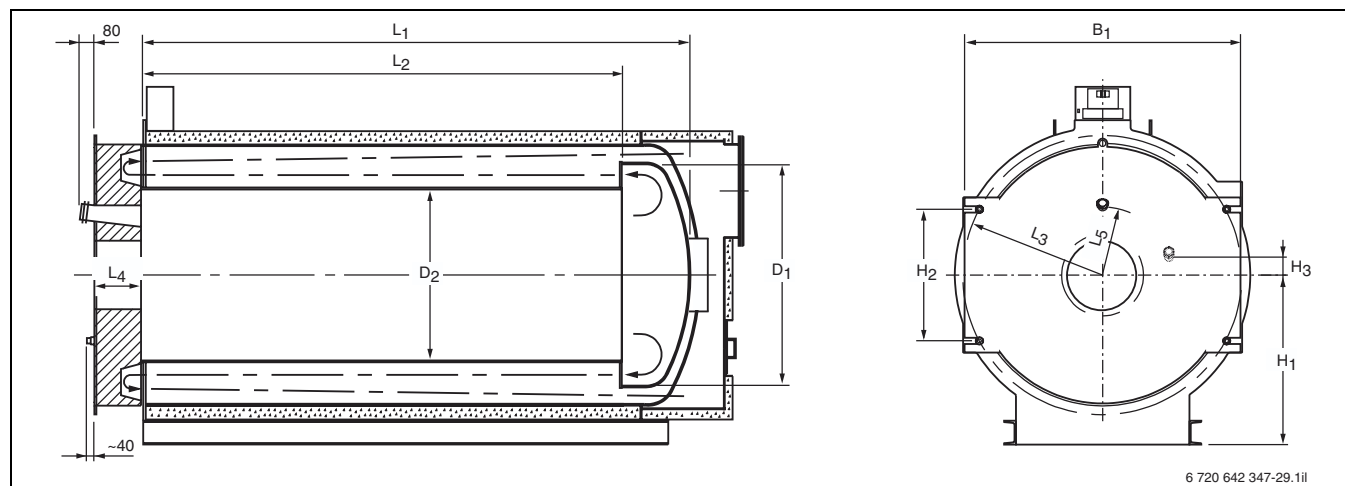


Fig. 35 Combustion chamber dimensions Logano S825L LN, boiler sizes 750 to 3500 (dim. in mm)

| Boiler size <sup>1)</sup>         |                              | Unit           | 750  | 1000 | 1250 | 1500 | 2000 | 2500 | 3000 | 3500 |
|-----------------------------------|------------------------------|----------------|------|------|------|------|------|------|------|------|
| Hot gas volume <sup>2)</sup>      |                              |                |      |      |      |      |      |      |      |      |
| Combustion chamber                |                              | m <sup>3</sup> | 0.68 | 0.89 | 1.21 | 1.58 | 1.90 | 2.37 | 2.86 | 3.46 |
| Boiler                            |                              | m <sup>3</sup> | 1.09 | 1.40 | 1.98 | 2.58 | 3.05 | 3.67 | 4.61 | 5.44 |
| Combustion chamber                | D <sub>1</sub>               | mm             | 888  | 988  | 1086 | 1136 | 1236 | 1284 | 1384 | 1482 |
|                                   | 6 bar D <sub>2</sub>         | mm             | 604  | 664  | 734  | 780  | 850  | 905  | 936  | 1016 |
|                                   | 6 bar L <sub>1</sub>         | mm             | 2201 | 2470 | 2668 | 3148 | 3195 | 3552 | 3986 | 4105 |
|                                   | 6 bar L <sub>2</sub>         | mm             | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
|                                   | 10 bar D <sub>2</sub>        | mm             | 604  | 660  | 730  | 780  | 846  | 901  | 932  | 1012 |
|                                   | 10 bar L <sub>1</sub>        | mm             | 2201 | 2465 | 2668 | 3144 | 3189 | 3547 | 3983 | 4105 |
|                                   | 10 bar L <sub>2</sub>        | mm             | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
|                                   |                              |                |      |      |      |      |      |      |      |      |
| Front hot gas reversing chamber   | L <sub>3</sub>               | mm             | 625  | 685  | 745  | 775  | 835  | 860  | 900  | 960  |
|                                   | L <sub>4</sub>               | mm             | 190  | 190  | 190  | 190  | 190  | 190  | 257  | 257  |
|                                   | L <sub>5</sub>               | mm             | 260  | 290  | 325  | 350  | 385  | 412  | 430  | 470  |
|                                   | H <sub>1</sub>               | mm             | 800  | 850  | 900  | 925  | 975  | 1000 | 1050 | 1100 |
|                                   | H <sub>2</sub>               | mm             | 560  | 620  | 685  | 720  | 785  | 815  | 795  | 855  |
|                                   | H <sub>3</sub> <sup>3)</sup> | mm             | –    | –    | –    | –    | –    | –    | 111  | 122  |
|                                   | B <sub>1</sub>               | mm             | 1200 | 1300 | 1400 | 1450 | 1550 | 1600 | 1700 | 1800 |
| Maximum door load from the burner |                              |                | kNm  | 5    | 5    | 5    | 5    | 5    | 6    | 6    |

Tab. 35 Combustion details for the Logano S825L LN, boiler sizes 750 to 3500

- 1) Boilers with an output between 750 kW and 1500 kW are also available as standardised versions (equipment overview → page 11).  
The permissible operating pressure is 6 bar.
- 2) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.
- 3) From boiler size 3000, the flame inspection port is located on the side.

#### 4.4.4 Combustion details for the Logano S825L LN, boiler sizes 4250 to 17500

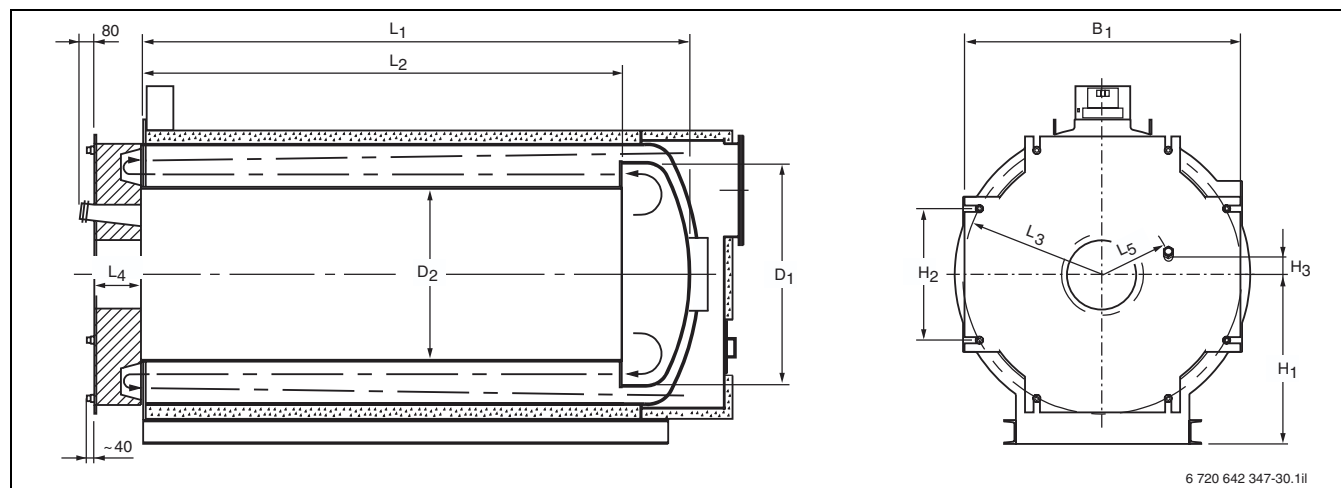


Fig. 36 Combustion chamber dimensions Logano S825L LN, boiler sizes 4250 to 17500 (dim. in mm)

| Boiler size                       |                       | Unit           | 4250 | 5250 | 6000  | 8000  | 10000 | 12000 | 14000 | 17500 |
|-----------------------------------|-----------------------|----------------|------|------|-------|-------|-------|-------|-------|-------|
| Hot gas volume <sup>1)</sup>      |                       |                |      |      |       |       |       |       |       |       |
| Combustion chamber                |                       | m <sup>3</sup> | 4.42 | 5.50 | 6.48  | 7.92  | 9.73  | 12.32 | 14.52 | 17.50 |
| Boiler                            |                       | m <sup>3</sup> | 7.13 | 8.91 | 10.55 | 13.04 | 15.62 | 20.41 | 25.27 | 31.76 |
| Combustion chamber                | D <sub>1</sub>        | mm             | 1632 | 1780 | 1880  | 1978  | 2128  | 2326  | 2474  | 2672  |
|                                   | 6 bar D <sub>2</sub>  | mm             | 1096 | 1182 | 1272  | 1347  | 1457  | 1534  | 1614  | 1710  |
|                                   | 6 bar L <sub>1</sub>  | mm             | 4483 | 4712 | 4911  | 5359  | 5658  | 6399  | 6829  | 7263  |
|                                   | 6 bar L <sub>2</sub>  | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
|                                   | 10 bar D <sub>2</sub> | mm             | 1087 | 1177 | 1267  | 1344  | 1450  | 1530  | 1606  | 1704  |
|                                   | 10 bar L <sub>1</sub> | mm             | 4481 | 4710 | 4910  | 5356  | 5653  | 6397  | 6824  | 7259  |
|                                   | 10 bar L <sub>2</sub> | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
|                                   |                       |                |      |      |       |       |       |       |       |       |
| Front hot gas reversing chamber   | L <sub>3</sub>        | mm             | 1075 | 1165 | 1250  | 1340  | 1425  | 1540  | 1715  | 1830  |
|                                   | L <sub>4</sub>        | mm             | 257  | 257  | 257   | 259   | 259   | 259   | 294   | 294   |
|                                   | L <sub>5</sub>        | mm             | 510  | 560  | 600   | 640   | 695   | 735   | 775   | 825   |
|                                   | H <sub>1</sub>        | mm             | 1200 | 1275 | 1350  | 1425  | 1500  | 1600  | 1750  | 1850  |
|                                   | H <sub>2</sub>        | mm             | 975  | 1065 | 1150  | 1250  | 1330  | 1450  | 1630  | 1745  |
|                                   | H <sub>3</sub>        | mm             | 132  | 145  | 155   | 166   | 180   | 190   | 201   | 214   |
|                                   | B <sub>1</sub>        | mm             | 2000 | 2150 | 2300  | 2450  | 2600  | 2800  | 3100  | 3300  |
| Maximum door load from the burner |                       |                | kNm  | 6    | 6     | 6     | 6     | 5     | 4     | 3     |

Tab. 36 Combustion details for the Logano S825L LN, boiler sizes 4250 to 17500

- 1) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.

## 4.5 Combustion details for the Logano plus SB825L and SB825L LN gas condensing boilers

### 4.5.1 Combustion details for the Logano plus SB825L, boiler sizes 1000 to 5200

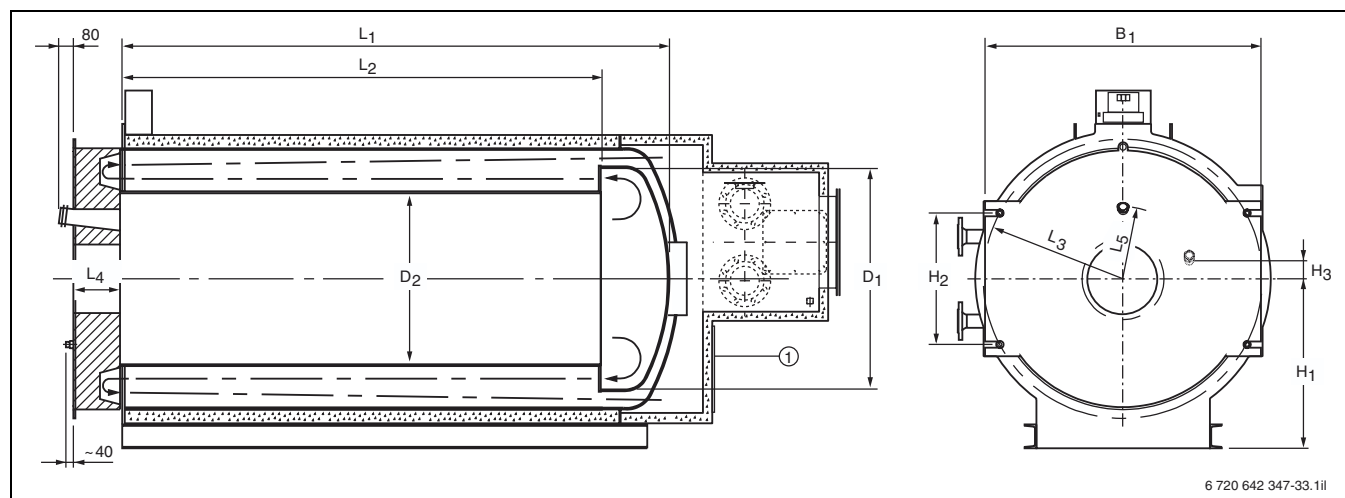


Fig. 37 Combustion chamber dimensions Logano plus SB825L, boiler sizes 1000 to 5200 (dim. in mm)

1 Inspection aperture on the hot gas side

| Boiler size                       |                              | Unit           | 1000 | 1350 | 1900 | 2500 | 3050 | 3700 | 4200 | 5200 |
|-----------------------------------|------------------------------|----------------|------|------|------|------|------|------|------|------|
| Hot gas volume <sup>1)</sup>      |                              |                |      |      |      |      |      |      |      |      |
| Combustion chamber                |                              | m <sup>3</sup> | 0.68 | 0.89 | 1.21 | 1.58 | 1.90 | 2.37 | 2.86 | 3.46 |
| Boiler                            |                              | m <sup>3</sup> | 1.24 | 1.61 | 2.21 | 2.93 | 3.36 | 4.08 | 5.01 | 5.94 |
| Combustion chamber                | D <sub>1</sub>               | mm             | 888  | 988  | 1086 | 1136 | 1236 | 1284 | 1384 | 1482 |
|                                   | 6 bar D <sub>2</sub>         | mm             | 604  | 664  | 734  | 780  | 850  | 905  | 936  | 1016 |
|                                   | 6 bar L <sub>1</sub>         | mm             | 2201 | 2470 | 2668 | 3148 | 3195 | 3552 | 3986 | 4105 |
|                                   | 6 bar L <sub>2</sub>         | mm             | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
|                                   | 10 bar D <sub>2</sub>        | mm             | 604  | 660  | 730  | 780  | 846  | 901  | 932  | 1012 |
|                                   | 10 bar L <sub>1</sub>        | mm             | 2201 | 2465 | 2668 | 3144 | 3189 | 3547 | 3983 | 4105 |
|                                   | 10 bar L <sub>2</sub>        | mm             | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
| Front hot gas reversing chamber   | L <sub>3</sub>               | mm             | 625  | 685  | 745  | 775  | 835  | 860  | 900  | 960  |
|                                   | L <sub>4</sub>               | mm             | 190  | 190  | 190  | 190  | 190  | 190  | 257  | 257  |
|                                   | L <sub>5</sub>               | mm             | 260  | 290  | 325  | 350  | 385  | 412  | 430  | 470  |
|                                   | H <sub>1</sub>               | mm             | 800  | 850  | 900  | 925  | 975  | 1000 | 1050 | 1100 |
|                                   | H <sub>2</sub>               | mm             | 560  | 620  | 685  | 720  | 785  | 815  | 795  | 855  |
|                                   | H <sub>3</sub> <sup>2)</sup> | mm             | –    | –    | –    | –    | –    | –    | 111  | 122  |
|                                   | B <sub>1</sub>               | mm             | 1200 | 1300 | 1400 | 1450 | 1550 | 1600 | 1700 | 1800 |
| Maximum door load from the burner |                              | kNm            | 5    | 5    | 5    | 5    | 5    | 5    | 6    | 6    |

Tab. 37 Combustion details for the Logano plus SB825L, boiler sizes 1000 to 5200

- 1) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.
- 2) From boiler size 4200, the flame inspection port is located on the side.

### 4.5.2 Combustion details for the Logano plus SB825L, boiler sizes 6500 to 19200

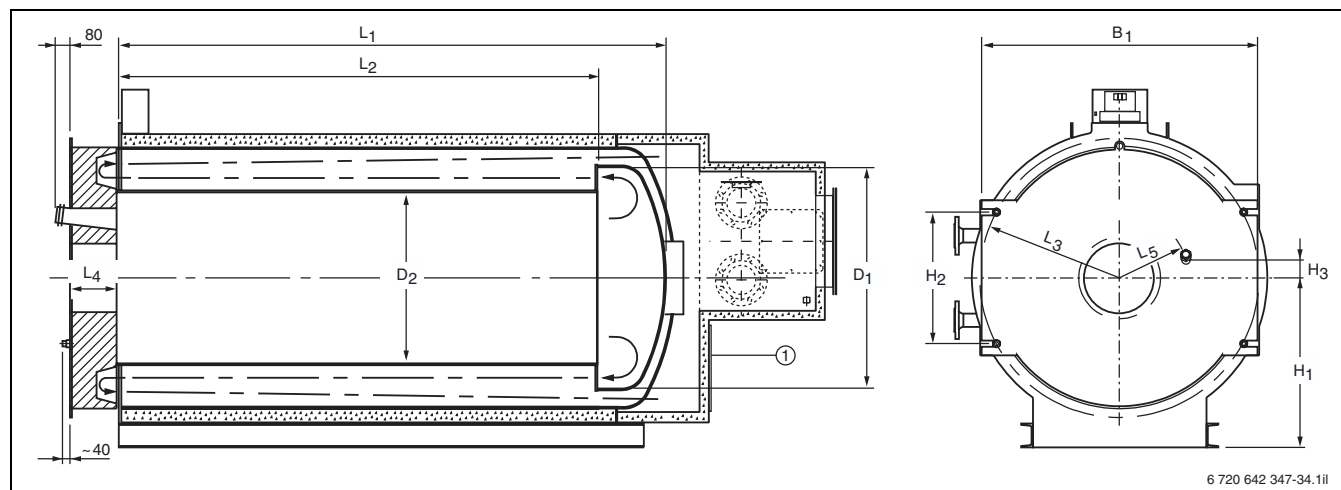


Fig. 38 Combustion chamber dimensions Logano plus SB825L, boiler sizes 6500 to 19200 (dim. in mm)

1 Inspection aperture on the hot gas side

| Boiler size                       |                       | Unit           | 6500 | 7700 | 9300  | 11200 | 12600 | 14700 | 16400 | 19200 |
|-----------------------------------|-----------------------|----------------|------|------|-------|-------|-------|-------|-------|-------|
| Hot gas volume <sup>1)</sup>      |                       |                |      |      |       |       |       |       |       |       |
| Combustion chamber                |                       | m <sup>3</sup> | 4.42 | 5.50 | 6.48  | 7.92  | 9.73  | 12.32 | 14.52 | 17.50 |
| Boiler                            |                       | m <sup>3</sup> | 7.77 | 9.60 | 11.48 | 14.10 | 17.18 | 22.23 | 27.64 | 34.46 |
| Combustion chamber                | D <sub>1</sub>        | mm             | 1632 | 1780 | 1880  | 1978  | 2128  | 2326  | 2474  | 2672  |
|                                   | 6 bar D <sub>2</sub>  | mm             | 1096 | 1182 | 1272  | 1347  | 1457  | 1534  | 1614  | 1710  |
|                                   | 6 bar L <sub>1</sub>  | mm             | 4483 | 4712 | 4911  | 5359  | 5658  | 6399  | 6829  | 7263  |
|                                   | 6 bar L <sub>2</sub>  | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
|                                   | 10 bar D <sub>2</sub> | mm             | 1087 | 1177 | 1267  | 1344  | 1450  | 1530  | 1606  | 1704  |
|                                   | 10 bar L <sub>1</sub> | mm             | 4481 | 4710 | 4910  | 5356  | 5653  | 6397  | 6824  | 7259  |
|                                   | 10 bar L <sub>2</sub> | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
| Front hot gas reversing chamber   | L <sub>3</sub>        | mm             | 1075 | 1165 | 1250  | 1340  | 1425  | 1540  | 1715  | 1830  |
|                                   | L <sub>4</sub>        | mm             | 257  | 257  | 257   | 259   | 259   | 259   | 294   | 294   |
|                                   | L <sub>5</sub>        | mm             | 510  | 560  | 600   | 640   | 695   | 735   | 775   | 825   |
|                                   | H <sub>1</sub>        | mm             | 1200 | 1275 | 1350  | 1425  | 1500  | 1600  | 1750  | 1850  |
|                                   | H <sub>2</sub>        | mm             | 975  | 1065 | 1150  | 1250  | 1330  | 1450  | 1630  | 1745  |
|                                   | H <sub>3</sub>        | mm             | 132  | 145  | 155   | 166   | 180   | 190   | 201   | 214   |
|                                   | B <sub>1</sub>        | mm             | 2000 | 2150 | 2300  | 2450  | 2600  | 2800  | 3100  | 3300  |
| Maximum door load from the burner |                       | kNm            | 6    | 6    | 6     | 6     | 5     | 4     | 3     | 3     |

Tab. 38 Combustion details for the Logano plus SB825L, boiler sizes 6500 to 19200

1) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.

### 4.5.3 Combustion details for the Logano plus SB825L LN, boiler sizes 750 to 3500

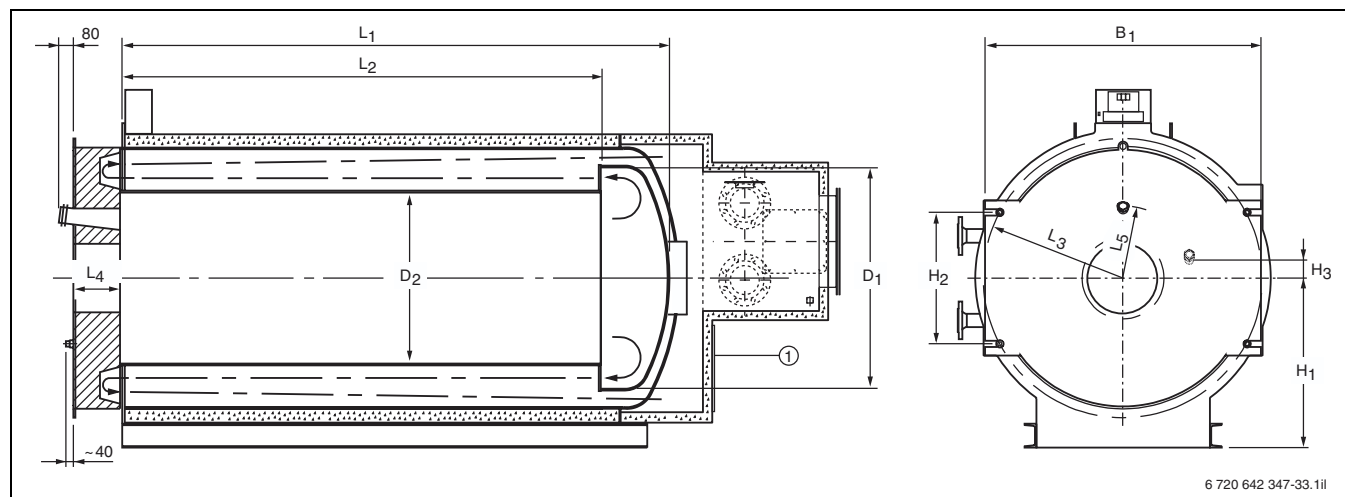


Fig. 39 Combustion chamber dimensions Logano plus SB825L LN, boiler sizes 750 to 3500 (dim. in mm)

1 Inspection aperture on the hot gas side

| Boiler size                       |                              | Unit           | 750  | 1000 | 1250 | 1500 | 2000 | 2500 | 3000 | 3500 |
|-----------------------------------|------------------------------|----------------|------|------|------|------|------|------|------|------|
| Hot gas volume <sup>1)</sup>      |                              |                |      |      |      |      |      |      |      |      |
| Combustion chamber                |                              | m <sup>3</sup> | 0.68 | 0.89 | 1.21 | 1.58 | 1.90 | 2.37 | 2.86 | 3.46 |
| Boiler                            |                              | m <sup>3</sup> | 1.24 | 1.61 | 2.21 | 2.93 | 3.36 | 4.08 | 5.01 | 5.94 |
| Combustion chamber                | D <sub>1</sub>               | mm             | 888  | 988  | 1086 | 1136 | 1236 | 1284 | 1384 | 1482 |
|                                   | 6 bar D <sub>2</sub>         | mm             | 604  | 664  | 734  | 780  | 850  | 905  | 936  | 1016 |
|                                   | 6 bar L <sub>1</sub>         | mm             | 2201 | 2470 | 2668 | 3148 | 3195 | 3552 | 3986 | 4105 |
|                                   | 6 bar L <sub>2</sub>         | mm             | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
|                                   | 10 bar D <sub>2</sub>        | mm             | 604  | 660  | 730  | 780  | 846  | 901  | 932  | 1012 |
|                                   | 10 bar L <sub>1</sub>        | mm             | 2201 | 2465 | 2668 | 3144 | 3189 | 3547 | 3983 | 4105 |
|                                   | 10 bar L <sub>2</sub>        | mm             | 1930 | 2180 | 2378 | 2850 | 2878 | 3235 | 3650 | 3750 |
|                                   |                              |                |      |      |      |      |      |      |      |      |
| Front hot gas reversing chamber   | L <sub>3</sub>               | mm             | 625  | 685  | 745  | 775  | 835  | 860  | 900  | 960  |
|                                   | L <sub>4</sub>               | mm             | 190  | 190  | 190  | 190  | 190  | 190  | 257  | 257  |
|                                   | L <sub>5</sub>               | mm             | 260  | 290  | 325  | 350  | 385  | 412  | 430  | 470  |
|                                   | H <sub>1</sub>               | mm             | 800  | 850  | 900  | 925  | 975  | 1000 | 1050 | 1100 |
|                                   | H <sub>2</sub>               | mm             | 560  | 620  | 685  | 720  | 785  | 815  | 795  | 855  |
|                                   | H <sub>3</sub> <sup>2)</sup> | mm             | –    | –    | –    | –    | –    | –    | 111  | 122  |
|                                   | B <sub>1</sub>               | mm             | 1200 | 1300 | 1400 | 1450 | 1550 | 1600 | 1700 | 1800 |
| Maximum door load from the burner |                              | kNm            | 5    | 5    | 5    | 5    | 5    | 5    | 6    | 6    |

Tab. 39 Combustion details for the Logano plus SB825L LN, boiler sizes 750 to 3500

1) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.

2) From boiler size 3000, the flame inspection port is located on the side.

#### 4.5.4 Combustion details for the Logano plus SB825L LN, boiler sizes 4250 to 17500

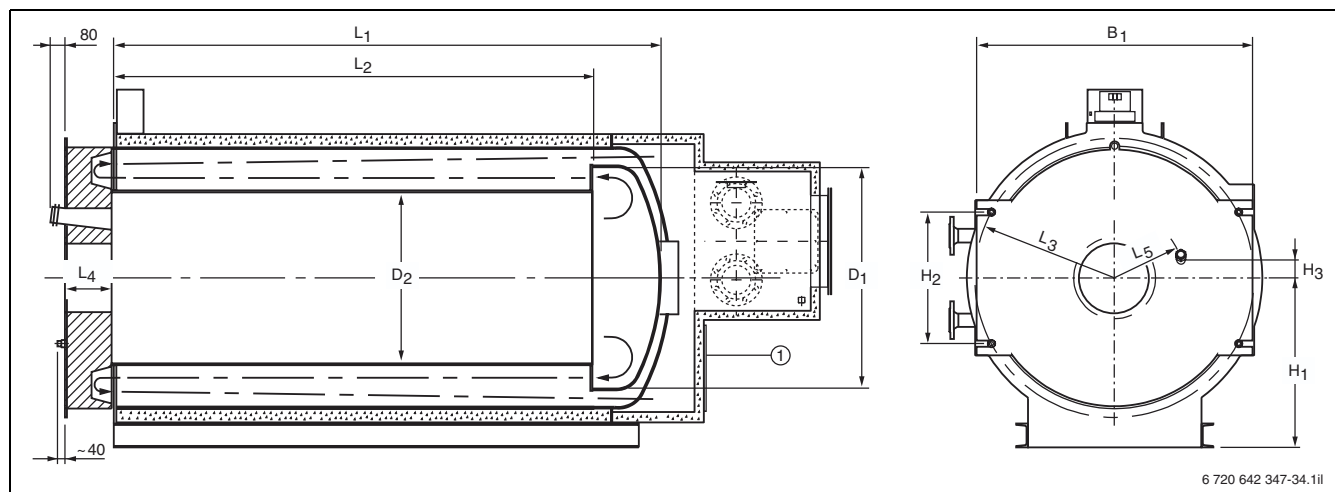


Fig. 40 Combustion chamber dimensions Logano plus SB825L LN, boiler sizes 4250 to 17500 (dim. in mm)

1 Inspection aperture on the hot gas side

| Boiler size                       |                       | Unit           | 4250 | 5250 | 6000  | 8000  | 10000 | 12000 | 14000 | 17500 |
|-----------------------------------|-----------------------|----------------|------|------|-------|-------|-------|-------|-------|-------|
| Hot gas volume <sup>1)</sup>      |                       |                |      |      |       |       |       |       |       |       |
| Combustion chamber                |                       | m <sup>3</sup> | 4.42 | 5.50 | 6.48  | 7.92  | 9.73  | 12.32 | 14.52 | 17.50 |
| Boiler                            |                       | m <sup>3</sup> | 7.77 | 9.60 | 11.48 | 14.10 | 17.18 | 22.23 | 27.64 | 34.46 |
| Combustion chamber                | D <sub>1</sub>        | mm             | 1632 | 1780 | 1880  | 1978  | 2128  | 2326  | 2474  | 2672  |
|                                   | 6 bar D <sub>2</sub>  | mm             | 1096 | 1182 | 1272  | 1347  | 1457  | 1534  | 1614  | 1710  |
|                                   | 6 bar L <sub>1</sub>  | mm             | 4483 | 4712 | 4911  | 5359  | 5658  | 6399  | 6829  | 7263  |
|                                   | 6 bar L <sub>2</sub>  | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
|                                   | 10 bar D <sub>2</sub> | mm             | 1087 | 1177 | 1267  | 1344  | 1450  | 1530  | 1606  | 1704  |
|                                   | 10 bar L <sub>1</sub> | mm             | 4481 | 4710 | 4910  | 5356  | 5653  | 6397  | 6824  | 7259  |
|                                   | 10 bar L <sub>2</sub> | mm             | 4100 | 4300 | 4500  | 4930  | 5200  | 5900  | 6300  | 6700  |
|                                   | L <sub>3</sub>        | mm             | 1075 | 1165 | 1250  | 1340  | 1425  | 1540  | 1715  | 1830  |
| Front hot gas reversing chamber   | L <sub>4</sub>        | mm             | 257  | 257  | 257   | 259   | 259   | 259   | 294   | 294   |
|                                   | L <sub>5</sub>        | mm             | 510  | 560  | 600   | 640   | 695   | 735   | 775   | 825   |
|                                   | H <sub>1</sub>        | mm             | 1200 | 1275 | 1350  | 1425  | 1500  | 1600  | 1750  | 1850  |
|                                   | H <sub>2</sub>        | mm             | 975  | 1065 | 1150  | 1250  | 1330  | 1450  | 1630  | 1745  |
|                                   | H <sub>3</sub>        | mm             | 132  | 145  | 155   | 166   | 180   | 190   | 201   | 214   |
|                                   | B <sub>1</sub>        | mm             | 2000 | 2150 | 2300  | 2450  | 2600  | 2800  | 3100  | 3300  |
| Maximum door load from the burner |                       | kNm            | 6    | 6    | 6     | 6     | 5     | 4     | 3     | 3     |

Tab. 40 Combustion details for the Logano plus SB825L LN, boiler sizes 4250 to 17500

1) To determine the pre-purge time: The hot gas volume is the sum of the flame tube volume (first pass) and the inner hot gas reversing chamber volume. The hot gas volume of the boiler is the sum of the hot gas volume of the combustion chamber, the volume of the secondary heating surface and the volume of the flue gas collector.

## 5 Regulations and operating conditions

### 5.1 Extracts from the regulations

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, are built in accordance with EN 303 and with reference to the relevant TRD 300. They are approved for an operating pressure of 6 bar or 10 bar and for heating systems compliant with the requirements of DIN-EN 12828.

Observe the following regarding creation and operation of the system:

- Technical building regulations
- Legal regulations **and**
- Local regulations

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

#### Notification and permit obligations

Subject to the Building Regulations of each country, boiler systems may require notification to or approval from appropriate authorities. Observe country-specific requirements.

#### Maintenance

We recommend having the system serviced regularly, inspected at least every six months and cleaned as required. As part of this, it should be checked that the entire system is working properly.

We recommend system operators take out a maintenance and inspection contract with the heating contractor or burner manufacturer. Regular maintenance is a prerequisite for reliable and economical operation. In general, burner manufacturers only furnish the warranty if a maintenance and inspection contract has been concluded.

#### Emissions regulations

Observe country-specific emissions regulations.

## 5.2 German Immissions Act (BImSchG)

### 5.2.1 Table extracted from the 1st BImSchV "Small and medium-sized combustion systems"



Combustion equipment is to be operated in such a way that the limits specified in the 1st BImSchV and the TA Luft are not exceeded.

| Fuels                                                                                            | Natural gas, LPG, hydrogen gas, gases from the public mains supply                       | Sewer gas, biogas, coke oven gas, marsh gas, furnace gas, refinery gas, synthetic gas | Fuel oil EL, vegetable oil, vegetable methyl ester, methanol, ethanol | Heavy oil       |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------|
| Combustion output of the Q <sub>FA</sub> system                                                  | < 20 MW                                                                                  | < 10 MW                                                                               | < 20 MW                                                               | Not permissible |
| Flue via chimney                                                                                 | Derived conditions acc. to 1st BImSchV para. 18 for Q <sub>FA</sub> ≥ 1 MW               |                                                                                       |                                                                       |                 |
| Soot indicator                                                                                   | –                                                                                        | –                                                                                     | RZ ≤ 1                                                                |                 |
| Nitrogen oxides NO <sub>x</sub> at rated boiler output <sup>1)2)</sup>                           |                                                                                          |                                                                                       |                                                                       |                 |
| Q <sub>K</sub> < 120 kW                                                                          | 60 mg/m <sup>3</sup> <sub>n</sub>                                                        | 60 mg/m <sup>3</sup> <sub>n</sub>                                                     | 110 mg/m <sup>3</sup> <sub>n</sub>                                    |                 |
| 120 kW ≤ Q <sub>K</sub> < 400 kW                                                                 | 80 mg/m <sup>3</sup> <sub>n</sub>                                                        | 80 mg/m <sup>3</sup> <sub>n</sub>                                                     | 120 mg/m <sup>3</sup> <sub>n</sub>                                    |                 |
| 400 kW ≤ Q <sub>K</sub> < 10000 kW                                                               | 120 mg/m <sup>3</sup> <sub>n</sub>                                                       | 120 mg/m <sup>3</sup> <sub>n</sub>                                                    | 185 mg/m <sup>3</sup> <sub>n</sub>                                    |                 |
| With dual combustion, if oil operation is ≤ 300 h/a, the following NO <sub>x</sub> limit applies | –                                                                                        | –                                                                                     | 250 mg/m <sup>3</sup> <sub>n</sub>                                    |                 |
| Nitrogen oxides NO <sub>x</sub> in steam boilers                                                 | Keep to a minimum, no fixed stipulations, "latest available technology"                  |                                                                                       |                                                                       |                 |
| Efficiency at rated boiler output <sup>2)</sup>                                                  |                                                                                          |                                                                                       |                                                                       |                 |
| Q <sub>K</sub> > 400 kW                                                                          | ≥ 94 %                                                                                   |                                                                                       |                                                                       |                 |
| Flue gas losses                                                                                  |                                                                                          |                                                                                       |                                                                       |                 |
| 4 kW ≤ Q <sub>FA</sub> ≤ 25 kW                                                                   | 11 %                                                                                     |                                                                                       |                                                                       |                 |
| 25 kW < Q <sub>FA</sub> 50 kW                                                                    | 10 %                                                                                     |                                                                                       |                                                                       |                 |
| Q <sub>FA</sub> > 50 kW                                                                          | 9 %                                                                                      |                                                                                       |                                                                       |                 |
| Repeat tests as per para. 15                                                                     | Newer systems <sup>3)</sup> : every 3 years; older systems <sup>4)</sup> : every 2 years |                                                                                       |                                                                       |                 |
| Emissions monitored by                                                                           | Flue gas inspector                                                                       |                                                                                       |                                                                       |                 |

#### Emissions specifications for individual combustion output $\geq 10 \text{ MW} < 20 \text{ MW}$

| Fuels                                                                                                                    | Natural gas, LPG, gases from the public mains supply                   | Hydrogen gas                       | Fuel oil EL, vegetable oil, vegetable methyl ester, methanol, ethanol |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------|
| Combustion output from individual combustion                                                                             | $\geq 10 < 20$ MW                                                      |                                    |                                                                       |
| $Q_{FE}$                                                                                                                 |                                                                        |                                    |                                                                       |
| Flue via chimney                                                                                                         | Derived conditions acc. to TA Luft                                     |                                    |                                                                       |
| Carbon monoxide $CO^{5)}$                                                                                                | 80 mg/m <sup>3</sup> <sub>n</sub>                                      |                                    |                                                                       |
| Nitrogen oxide $NO_x$ at boiler operating temperature <sup>4)6)</sup>                                                    |                                                                        |                                    |                                                                       |
| $< 110$ °C ( $< 0.5$ bar)                                                                                                | 100 mg/m <sup>3</sup> <sub>n</sub>                                     | 200 mg/m <sup>3</sup> <sub>n</sub> | 180 mg/m <sup>3</sup> <sub>n</sub>                                    |
| $\geq 110$ °C $\leq 210$ °C ( $\geq 0.5$ bar $\leq 18$ bar)                                                              | 110 mg/m <sup>3</sup> <sub>n</sub>                                     | 200 mg/m <sup>3</sup> <sub>n</sub> | 200 mg/m <sup>3</sup> <sub>n</sub>                                    |
| $> 210$ °C ( $> 18$ bar)                                                                                                 | 150 mg/m <sup>3</sup> <sub>n</sub>                                     | 200 mg/m <sup>3</sup> <sub>n</sub> | 250 mg/m <sup>3</sup> <sub>n</sub>                                    |
| With dual combustion, if oil operation is $\leq 300$ h/a, the following $NO_x$ limit applies for all boiler temperatures | –                                                                      | –                                  | 250 mg/m <sup>3</sup> <sub>n</sub>                                    |
| Repeat test acc. to para. 18(1)–(3)                                                                                      | –                                                                      | –                                  | Flue gas opacity                                                      |
| First test acc. to para. 18(4) <sup>7)</sup>                                                                             | No sooner than 3 months and no later than 6 months after commissioning |                                    |                                                                       |

1) Emissions calculation to EN 267

2) Boiler definition: heat carrier water; used for heating buildings and rooms

3) Systems that were commissioned or that underwent major modifications (boiler replacement or fuel conversion) 12 years ago or less

4) Systems that were commissioned or that underwent major modifications (boiler replacement or fuel conversion) more than 12 years ago

5)  $CO$  and  $NO_x$  levels relative to 3 %  $O_2$  content. Half hour average acc. to para. 11(1). Three individual tests (low/medium and full) are to be carried out in acc. with para. 18(4). With fuel oil EL, the  $NO_x$  levels are relative to a nitrogen content of 140 mg/kg in acc. with para. 11(1).

6) The relevant saturated steam operating pressure levels are given in brackets

7) The tests must be carried out by a test body recognised by para. 26 of the BImSchG.

## 5.2.2 Information on flue gas tests pursuant to BImSchV/TA Luft

### First tests or system tests following major modifications

In the case of systems that have not yet been tested, have not been tested successfully or have been modified since testing, we recommend conducting sample tests at least two months before the planned inspection date.

This procedure should enable any necessary action to be taken with regard to the combustion equipment in order to adhere to the specified emissions levels. A Buderus customer service engineer can be requested to perform these advance tests; based on the test results, this engineer will also be able to make suggestions on how to adhere to the legal levels.

### Repeat tests on systems

In the case of systems on which a test has already been carried out in accordance with BImSchV/TA Luft, depending on the size and controllability of the combustion system, it is generally sufficient to make adjustments either on the day of the official test in the presence of the testing engineer, or for larger and more complex systems with several fuel types, one or two days before this test.

### Preparing the system

For the tests to be conducted successfully, it is necessary to ensure sufficient load reduction, so that constant operation under steady conditions is possible. If this cannot be guaranteed, for example due to the weather in the case of heating systems, we recommend postponing the test until it can be carried out without interruption.

### Fuels

The fuels to be burned must comply with the notice of approval and be available in the quality determined for the system. Since the level of nitrogen in light fuel oil has a significant effect on the formation of  $\text{NO}_x$ , the nitrogen content of light fuel oil must be known in order to assess the  $\text{NO}_x$  test levels. The fuel oil supplier may be able to provide this information for the relevant deliveries. To calculate this value precisely, take an oil sample (1 litre) from the tank in question at the time of the emissions test. A test lab can determine the nitrogen content of the fuel.

### Cleaning the boiler

We recommend cleaning the boiler combustion chamber thoroughly at least one or two days before the test.

### Conducting the test

A Buderus customer service engineer should be requested to conduct the test. If levels exceeding the limits are registered during the test, it may be possible to modify the combustion settings so that the test can be conducted again with success.

Support personnel should be available to assist.

A table and chair should be prepared in the boiler room for the testing engineer to complete the test reports.

### 5.3 Operating requirements



The operating conditions given in Tab. 41 are part of the **warranty conditions** for the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers.

These operating conditions are ensured through an appropriate hydraulic circuit and boiler circuit control (hydraulic connection → page 74).

Operating conditions for special applications are available on request.

The requirements of boiler water quality are also part of the warranty conditions (→ page 58).

#### 5.3.1 Operating conditions

| Boiler type               |                                         | Operating conditions (warranty conditions) |                                 |                           |                                       |                                                                         |                                       |
|---------------------------|-----------------------------------------|--------------------------------------------|---------------------------------|---------------------------|---------------------------------------|-------------------------------------------------------------------------|---------------------------------------|
|                           |                                         | Minimum flow rate [m <sup>3</sup> /h]      | Minimum return temperature [°C] | Minimum boiler output [%] | Minimum boiler water temperature [°C] | Boiler water temperature if operation is interrupted <sup>1)</sup> [°C] | Maximum design temperature spread [K] |
| <b>Logano S825L</b>       |                                         | — <sup>2)3)</sup>                          | 50                              | 10                        | 70                                    | 70                                                                      | 15–50                                 |
| <b>S825L LN</b>           |                                         |                                            |                                 |                           |                                       |                                                                         |                                       |
| <b>Logano plus SB825L</b> | Boiler                                  | — <sup>2)3)</sup>                          | 50                              | 10                        | 70                                    | 70                                                                      | 15–50                                 |
| <b>SB825L LN</b>          | Condensing heat exchanger <sup>4)</sup> | — <sup>5)</sup>                            | — <sup>4)</sup>                 | —                         | —                                     | —                                                                       | —                                     |

Tab. 41 Operating conditions for the Logano S825L/L LN and Logano plus SB825L/L LN

- 1) The lag boiler in a multi boiler system can be shut down completely
- 2) Sizing the boiler circuit pump → page 79; minimum flow rate with burner in ON mode (→ Tab. 42 and Tab. 43)
- 3) With the burner in ON mode, the heat exchanger pump must also start
- 4) The condensing effect can only be utilised with gas combustion. With oil combustion (e.g. with a combi burner), maintain a return temperature of 60 °C
- 5) The maximum flow rate is limited. If the nominal flow rate of the system is higher, only a partial flow can be routed via the condensing heat exchanger. To make optimum use of the condensing effect, the partial flow rate must be at least 20 % of the nominal flow rate.

#### Logano S825L minimum flow rate

| Boiler type         | Boiler size | Minimum water flow rate <sup>1)</sup> [m <sup>3</sup> /h] |
|---------------------|-------------|-----------------------------------------------------------|
| <b>Logano S825L</b> | 650         | 4.30                                                      |
|                     | 1000        | 6.50                                                      |
|                     | 1350        | 8.77                                                      |
|                     | 1900        | 12.35                                                     |
|                     | 2500        | 16.25                                                     |
|                     | 3050        | 19.82                                                     |
|                     | 3700        | 24.05                                                     |
|                     | 4200        | 26.97                                                     |
|                     | 5200        | 33.80                                                     |
|                     | 6500        | 42.25                                                     |
|                     | 7700        | 50.05                                                     |
|                     | 9300        | 60.45                                                     |
|                     | 11200       | 72.80                                                     |
|                     | 12600       | 81.90                                                     |
|                     | 14700       | 95.55                                                     |
|                     | 16400       | 106.60                                                    |
|                     | 19200       | 124.80                                                    |

Tab. 42 Logano S825L minimum flow rate with the burner in ON mode

- 1) Pumps with a fault message output or flow limiters can be used for monitoring.

#### Logano S825L LN minimum flow rate

| Boiler type            | Boiler size | Minimum water flow rate <sup>1)</sup> [m <sup>3</sup> /h] |
|------------------------|-------------|-----------------------------------------------------------|
| <b>Logano S825L LN</b> | 750         | 4.87                                                      |
|                        | 1000        | 6.50                                                      |
|                        | 1250        | 8.12                                                      |
|                        | 1500        | 9.75                                                      |
|                        | 2000        | 13.00                                                     |
|                        | 2500        | 16.25                                                     |
|                        | 3000        | 19.50                                                     |
|                        | 3500        | 22.75                                                     |
|                        | 4250        | 27.62                                                     |
|                        | 5250        | 34.12                                                     |
|                        | 6000        | 39.00                                                     |
|                        | 8000        | 52.00                                                     |
|                        | 10000       | 65.00                                                     |
|                        | 12000       | 78.00                                                     |
|                        | 14000       | 91.00                                                     |
|                        | 17500       | 113.75                                                    |

Tab. 43 Logano S825L LN minimum flow rate with the burner in ON mode

- 1) Pumps with a fault message output or flow limiters can be used for monitoring.

### 5.3.2 Fuel

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, can be operated with natural gas E, EL and LPG. The gas quality must comply with the requirements of the DVGW Code of Practice G 260. To be able to adjust the gas throughput install a gas meter that can be checked even in the lower load range of the burner.

Combustion with fuel oil EL to DIN 51603 is also possible. However, the Logano plus SB825L and SB825L LN gas condensing boilers must only be operated briefly with fuel oil and the conditions outlined below must be maintained.

#### Operating the Logano plus SB825L and SB825L LN gas condensing boilers with fuel oil EL

- Use a gas/oil combi burner.
- Maintain a minimum return temperature of 60 °C for the condensing heat exchanger.
- Only heat with oil for a maximum of four weeks per heating season.
- Clean the boiler and condensing heat exchanger carefully at least twice per year.

Route away the condensate that occurs in the flue pipe separately and neutralise it.

### 5.3.3 Corrosion protection in heating systems

#### Corrosion protection on the boiler water side

Corrosion in the heating system can be the result of poor water quality or air-borne oxygen in the system. Negative pressure allows oxygen to enter the heating system. Possible causes of oxygen ingress include leaks in the heating system, regions of negative pressure, an inadequately sized expansion vessel or plastic pipes with no oxygen barrier.

If the ingress of oxygen into the heating system cannot be prevented, we recommend separating the heating circuit by means of a heat exchanger.

#### Protecting the heating surfaces against corrosion

The combustion chamber and secondary heating surfaces can be damaged by heavy dust loads or halogen compounds in the combustion air. Halogen compounds are highly corrosive. They are contained, for example, in spray cans, thinners, cleaning & degreasing agents and in solvents. Design the combustion air supply so that, for example, no extract air is drawn in from chemical cleaners or paint shops.

### Prevention of corrosion damage

Corrosion damage has occurred if the function of the heating system is impaired by corrosion. This may become apparent through blockages, boiling noises, poor circulation, rust perforations, reduced output or the formation of cracks. This usually only occurs if oxygen continually enters the heating water. In order to prevent this, design the heating system as a sealed system from a corrosion point of view. If the system is sealed from a corrosion point of view, the selection of materials used becomes less significant.

If the system cannot be sealed from a corrosion point of view, special corrosion protection measures must be provided by treating the heating water. Alongside the option of filling the heating system with desalinated water, the heating water can also have chemicals added to it. These chemicals either bind the free oxygen or form a corrosion-resistant coating on the surface of the material.

The pH value of the heating water should be between 8.2 and 9.5 (→ Tab. 44, page 59). If the heating system does not contain any aluminium components, we recommend adding chemicals (e.g. trisodium phosphate) to the heating water to alkalinise it.

Regular maintenance is required to give the heating system a long, damage-free service life. As well as checking the pressure, check the pH value of the heating water and adjust it if required. If corrosion protection agents are used, check the heating water in accordance with the manufacturer's instructions. Heating systems that have antifreeze in the heating water should also be checked in accordance with the manufacturer's instructions. The concentration of antifreeze in the heating water should not exceed 40 volume-percent.

### 5.3.4 Corrosion protection if system out of use for long periods

Airborne oxygen that enters the system causes corrosion in a cooled and depressurised boiler. Suitable preventive measures should therefore be taken. Suitable protective measures should be taken whenever a boiler has been idle for longer than three days. Buderus recommends the following options:

#### 1. Preservation on the water side through pressure maintenance (any time period)

If one or more boilers in a boiler system are shut down and it is ensured that one boiler or at least the pressure maintaining system remains operational, no further preservation measures on the water side are required. Ensure that the boiler remains connected to the mains via the open flow shut-off device so that the mains pressure builds up. This prevents oxygen entering the boiler as a result of positive pressure.

As an alternative, the return shut-off device can also be opened. However, do not have both shut-off devices open at the same time as this can result in heat losses due to unwanted circulation.

#### 2. Wet preservation on the water side for shutdowns of up to 3 months

The boiler is completely filled with water, an excess of oxygen binders is added and the boiler water content is circulated at defined intervals. For more information on wet preservation, please see the operating instructions "G012 Wet and dry preservation".

#### Carrying out preservation

Regular circulation is necessary to ensure the metered additive is evenly mixed with the boiler water. For this, install a pump that is connected to the outlet connection downstream of the outlet shut-off valve via a tee on the inlet side, and to the return between the boiler and return shut-off device on the pressure side. The additive can be topped up via the dosing station on the pressure side of the pump. After this, tightly seal all boiler valves to prevent the ingress of airborne oxygen during the idle time. To ensure the preservative solution is thoroughly mixed in, the water must be circulated 5 times every 3 days using the pump.

For more information, please see the operating instructions "G012 Wet and dry preservation".

#### 3. Dry preservation on the water side for shutdowns of longer than 3 months

The system is fully drained, filled with a special drying agent, and then resealed. Compared to wet preservation, it takes around 1-2 days to prepare the system for operation. We recommend involving a Buderus service engineer.

For precise information on carrying out dry preservation, please see the operating instructions "G012 Wet and dry preservation".

### 5.3.5 Guidelines for water quality

#### Chemical additives in the heating water

If plastic pipes that are permeable to oxygen are installed in an underfloor heating system, the corrosion process can be prevented by adding chemical additives to the heating water. In this case, request certification from the manufacturer of the chemical additives as to the effectiveness and harmlessness to other system components and materials in the heating system.



Chemical additives that are not certified as harmless by the manufacturer must not be used.

#### Water treatment

Boiler operators must take account of the fact that there is no such thing as pure water as a heat transfer medium. For this reason, particular attention should be paid to the water quality. Constant monitoring of the water quality is an important factor in achieving economical and trouble-free operation of the heating system. Water treatment also makes a contribution to energy savings and to preserving the value of the entire system. It is an essential factor for increasing the economic viability, functional reliability, service life and, last but not least, the maintenance of the constant operational availability of the heating system.

#### Prevention of damage due to scaling

Scaling means that stubborn calcium carbonate deposits occur in the boiler. These deposits can cause local overheating and a limited formation of cracks in the boiler. The impaired heat transfer caused by scaling can lead to a significant drop in boiler output and to an increase in flue gas loss. Boiling noises may also occur under certain circumstances.

Minimum requirements of water analyses for designing a water treatment system → page 60.



For the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, adhere to the requirements of the latest VdTÜV Directive (VdTÜV 1466).

### Low pressure hot water boilers with operating temperatures up to 110 °C

Subject to the total boiler output, the requirements of water quality from Tab. 44 are to be followed. If these requirements are not maintained, water treatment is necessary.

In systems with a total boiler output of above 100 kW, the volume of fill and top-up water should be measured. Furthermore, records should be kept when top-up water is added. The concentration of calcium hydrogen carbonate in the top-up water should also be noted.

| Logano S825L and S825L LN<br>Logano plus SB825L and SB825L LN    |        | Boilers in Group II                                  |                  |            |
|------------------------------------------------------------------|--------|------------------------------------------------------|------------------|------------|
| Water-chemical operating mode <sup>1)</sup>                      |        | Low salt content                                     | Low salt content | Saline     |
| Electrical conductivity of the circulating water                 | µS/cm  | 10–30                                                | > 30–100         | > 100–1500 |
| <b>Fill and top-up water</b>                                     |        |                                                      |                  |            |
| General requirements                                             |        | Colourless, clear and free of undissolved substances |                  |            |
| pH value at 25 °C                                                |        | 8–10                                                 | 8–10.5           | 8.5–10.5   |
| Alkaline earths (total hardness)                                 | mmol/l | < 0.02                                               | < 0.02           | < 0.02     |
|                                                                  | dH     | < 0.1                                                | < 0.1            | < 0.1      |
| Oxygen (O <sub>2</sub> )                                         | mg/l   | < 0.1                                                | < 0.1            | < 0.1      |
| <b>Circulating water</b>                                         |        |                                                      |                  |            |
| General requirements                                             |        | Colourless, clear and free of undissolved substances |                  |            |
| pH value <sup>2)</sup> at 25 °C                                  |        | 9–10                                                 | 9–10.5           | 9.5–10.5   |
| Acidic capacity K <sub>S 8.2</sub> <sup>2)</sup> (p value)       | mmol/l | –                                                    | 0.1–0.5          | 0.5–5      |
| Alkaline earths (total hardness)                                 | mmol/l | < 0.02                                               | < 0.02           | < 0.02     |
|                                                                  | dH     | < 0.1                                                | < 0.1            | < 0.1      |
| Oxygen <sup>3)</sup> (O <sub>2</sub> )                           | mg/l   | < 0.1                                                | < 0.05           | < 0.02     |
| Phosphate <sup>2)3)</sup> (PO <sub>4</sub> )                     | mg/l   | 3–6                                                  | 5–10             | 5–15       |
| Electrical conductivity at 25 °C                                 | µS/cm  | 10–30                                                | > 30–100         | > 100–1500 |
| Diamide <sup>3)</sup> (N <sub>2</sub> H <sub>4</sub> )           | mg/l   | 0.2–1                                                | 0.2–2            | 0.3–3      |
| Sodium sulphite <sup>3)</sup> (Na <sub>2</sub> SO <sub>3</sub> ) | mg/l   | –                                                    | –                | 5–10       |

Tab. 44 Water quality requirements for Logano S825L/L LN and Logano plus SB825L/L LN

- 1) Systems with heavily branched pipework, i.e. in industrial and district heating systems, those with longer stagnation periods (even for parts of the heating network), those operating at strongly fluctuating pressures and temperatures as well as systems with components made from diverse materials, should ideally be operated with water of a low salt content.
- 2) For operation with a low salt content, adjust the pH value or the p value with trisodium phosphate. For saline operation, the alkalinity usually adjusts itself by the composition of the fill water. If this is not the case, adjust the pH value with trisodium phosphate and, if required, by adding sodium hydroxide. Never use ammonia. If copper components are installed in the hot water network, the pH value of the circulating water must not be above 9.5.
- 3) In constant heating mode, the limits are usually maintained automatically. If this is the case, oxygen binders are not obligatory. If the limits are exceeded, a range of physical and chemical processes are available. Typical chemical agents are diamide and sodium sulphite. Amines that form a film are not oxygen binders. Establish the application and type of oxygen binder for each specific system.

### 5.3.6 Minimum requirements of water analyses for designing a water treatment system

When enquiring about water treatment, as a minimum the information in sections 1 and 2.1 should be provided. For a detailed design of a reverse osmosis system, a full analysis corresponding to section 2.2 is required no later than when the order is placed.

If a detailed water analysis with the specified parameters is available, the form does not need to be completely filled out again, as long as the information in section 1 is provided.

| 1. System details                                                                                  |        |  |                                  |        |
|----------------------------------------------------------------------------------------------------|--------|--|----------------------------------|--------|
| Project number/name                                                                                |        |  |                                  |        |
| Specification for performance of the water treatment (will be checked)                             |        |  |                                  |        |
| Boiler type                                                                                        |        |  |                                  |        |
| Steam output                                                                                       |        |  |                                  |        |
| Average operating pressure                                                                         |        |  |                                  |        |
| Condensation rate                                                                                  |        |  |                                  |        |
| Special features<br>(e.g. sterile steam, existing treatment system, other on-site consumers, etc.) |        |  |                                  |        |
| 2. Details of untreated water analysis                                                             |        |  |                                  |        |
| 2.1 Minimum details for designing a softening system                                               |        |  |                                  |        |
| Total hardness                                                                                     | mmol/l |  | Electrical conductivity          | µS/cm  |
|                                                                                                    | Or °dH |  | Or salt content (TDS)            | mg/l   |
| Or calcium Ca <sup>2+</sup>                                                                        | mg/l   |  | Carbonate hardness               | °dH    |
| And magnesium Mg <sup>2+</sup>                                                                     | mg/l   |  | Or K <sub>S4.3</sub> figure      | mmol/l |
| Iron Fe total                                                                                      | mg/l   |  | Or alkalinity                    | mmol/l |
| Manganese Mn <sup>2+</sup>                                                                         | mg/l   |  | Or HCO <sub>3</sub> <sup>-</sup> | mg/l   |
| Silicate SiO <sub>2</sub> or Si                                                                    | mg/l   |  |                                  |        |
| Chloride Cl <sup>-</sup>                                                                           | mg/l   |  |                                  |        |
| 2.2 Further details for designing/ordering a reverse osmosis system                                |        |  |                                  |        |
| Cations                                                                                            |        |  | Anions                           |        |
| Ca <sup>2+</sup>                                                                                   | mg/l   |  | SO <sub>4</sub> <sup>2-</sup>    | mg/l   |
| Mg <sup>2+</sup>                                                                                   | mg/l   |  | Cl <sup>-</sup>                  | mg/l   |
| K <sup>+</sup>                                                                                     | mg/l   |  | NO <sub>3</sub> <sup>-</sup>     | mg/l   |
| Na <sup>+</sup>                                                                                    | mg/l   |  | HCO <sub>3</sub> <sup>-</sup>    | mg/l   |
| Fe <sup>2+</sup>                                                                                   | mg/l   |  | F <sup>-</sup>                   | mg/l   |
| Ba <sup>2+</sup>                                                                                   | mg/l   |  | CO <sub>3</sub> <sup>-</sup>     | mg/l   |
| Sr <sup>2+</sup>                                                                                   | mg/l   |  | SiO <sub>2</sub> <sup>-</sup>    | mg/l   |
| NH <sub>4</sub> <sup>+</sup>                                                                       | mg/l   |  | PO <sub>4</sub> <sup>-</sup>     | mg/l   |
|                                                                                                    |        |  | CO <sub>2</sub> <sup>-</sup>     | mg/l   |

## 6 Sound pressure level from noise in the boiler system

### 6.1 Sound emissions from the boiler system

The noise in the installation room caused by a boiler system and the noise transmitted to the surrounding area are subject to regional regulations which must be taken into account when designing a boiler system.

The overall sound emissions from a boiler system are influenced by a range of sources. The various noises include:

- Machine noise (e.g. burner, fan, pumps, drive motors for valves)
- Flow and combustion noises caused by hot flue gas created during combustion, which is routed by the boiler through the flue system to the chimney. From an acoustic point of view, the heat source itself is not a source of sound, but acts as a resonating body for noise that comes from the combustion reactions within the combustion chamber.

There can be a range of other sound sources (structure-borne noise due to rotational movement of machines, flow noises in valves etc.) which must also be taken into account.

### 6.2 Noise in the installation room

Individual sound pressure levels can be specified for machine noises that are the main cause of sound impact in the installation room. The individual sound pressure level of a machine can only be specified for "free field" conditions at a distance of 1 m (without any influence from other sound emitters). When calculating the overall sound pressure level in the installation room, take the reciprocal influence of the various sound sources and local conditions (e.g. sound absorption characteristics of the installation room wall) into account.

Machine noise can be reduced by encasing the machines, e.g. with a burner silencer hood or a silencer housing for the fan.

### 6.3 Noise at the chimney outlet

A significant proportion of the noise development in the combustion chamber is transmitted along the flue system to the chimney. This sound is emitted via the surface of the flue system as airborne noise and escapes at the chimney. The noise from a boiler system predominantly contains low frequency sound.

These sound emissions can be effectively reduced with a flue gas silencer. To design a flue gas silencer (to maintain the prescribed sound immissions levels), the frequency spectrum of the sound at the chimney outlet from the boiler system must be known.

The graph in Fig. 41 shows the average sound pressure level of a boiler system, measured at the chimney outlet at a distance of 1 m and an angle of 45°, with no flue gas silencer in the flue system. As the combustion system (e.g. due to the burner construction or the flow profile that occurs in the combustion chamber) and flue system (e.g. due to the numbers of bends, length and diameter of the flue) have a considerable influence on the values that occur, only averages can be given here for the sound pressure level. The sound levels calculated in the flue pipe, directly downstream of the boiler, are up to 15 % higher than the sound levels at the chimney head.

Giving the levels directly in the flue pipe and directly downstream of the boiler is not helpful as the influences mentioned above as well as sound reflection and resonance (e.g. standing waves) mean a correct calculation is not possible, or is very difficult to achieve. Furthermore, a flue gas silencer is designed for the boiler system using the sound levels that occur at the chimney head.

Due to the complexity of the subject of sound, we recommend involving an acoustician or sound expert to design the flue gas silencer.

If possible, the sound levels that actually occur in the boiler system should be calculated first. These values can be used to design a flue gas silencer which can be retrofitted to the boiler system. The pressure drop of the silencer (approx. 1 mbar to 3 mbar) should initially be taken into account when sizing the burner.

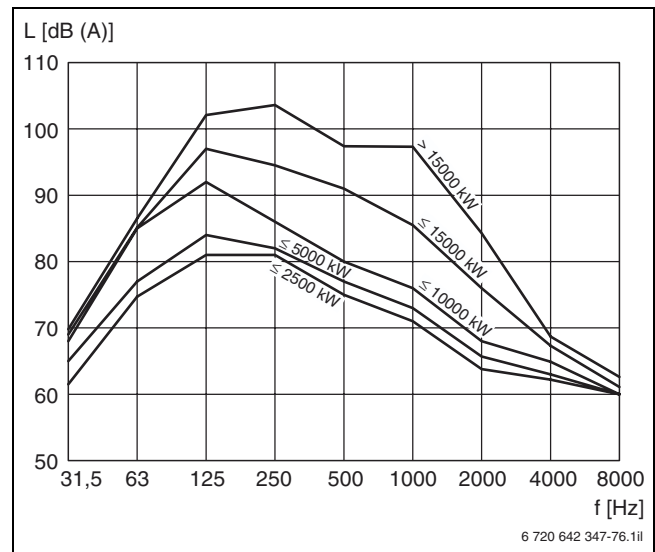


Fig. 41 Frequency analysis of noise at the chimney outlet, subject to the boiler output

**f** Frequency  
**L** Sound pressure level

The following comments apply to the values specified:

- Sound pressure level measured in accordance with DIN-EN 60804, DIN-EN 60651 and DIN 45635
- Frequency assessment curve A to DIN-EN 60561
- Flue system routed with favourable flow characteristics
- Suitable anti-vibration mounts installed in the boiler system



The values specified are only a guide and approximate values. They depend on the fuel, burner manufacturer, burner construction and design of the entire flue system.

## 7 Heating controls

### 7.1 Control systems

A control unit is required to operate the Logano S825L and S825L LN conventional boilers, and the Logano plus SB825L and SB825L LN gas condensing boilers. Buderus Logamatic control systems are designed as modules. This enables the selection of well-matching and economical units for all applications and stages of development in the proposed heating system.

Depending on the requirements and structure of the heating system, the following options are available to control the boiler:

- Control units in the Logamatic 4212 series
- Control units in the Logamatic 43xx series
- DA... display and control units

A burner control panel may be required for the contactors controlled by the control unit. Alternatively, the contactors can be integrated into the Buderus control panel system.



For more details on the Logamatic 4212, 4321 and 4322 control units, see the technical guide "Logamatic 4000 modular control system".

#### 7.1.1 Logamatic 4212 control unit with ZM427 auxiliary module

##### Brief description of possible applications

The Logamatic 4212 analogue control unit is suitable for controlling a floorstanding oil or gas boiler with constant boiler water temperature, without operating conditions, or in conjunction with an overriding control system (e.g. DDC/GLT). The Logamatic 4212 analogue control unit can control single stage, 2-stage or modulating burners.

The ZM427 auxiliary module is only intended for use in the Logamatic 4212 analogue control unit, and is suitable for safeguarding boiler operating conditions in conventionally operated boilers. Only one can be fitted in each controller.

##### Boiler safety functions

By actuating a boiler circuit pump and a boiler circuit actuator (3-way mixer), the ZM427 auxiliary module safeguards the required boiler operating conditions for low temperature boilers with a minimum return temperature.

In conjunction with the appropriate plumbing configuration, compliance with the required boiler operating conditions is guaranteed. When the boiler circuit is in automatic mode, appropriate adjustments should be made on the ZM427 auxiliary module PCB

(service level). The ZM427 can also be used to hydraulically shut off lag boilers in multi boiler systems, by actuating the boiler circuit actuator.

##### Burner control

The ZM427 auxiliary module controls single stage, 2-stage, modulating or 2 × single stage burners.

There are two ways to control the burner which can be adjusted via manual mode level:

- Direct, potential-free enabling of stages in an overriding control system (AUT), e.g. DDC/GLT **or**
- Enabling of all burner stages by the Logamatic control unit (hand or full load symbol), in which case burner modulation may also be manually adjustable



According to the Energy Saving Ordinance (EnEV, para. 12), the Logamatic 4212 control unit must be operated in conjunction with an automatic device for weather-compensated or room temperature-dependent mode with time programs.

##### Return temperature control

With return temperature control mode, the boiler is operated with a fixed figure for the return temperature. This return temperature can be set on the PCB (service level) of the module with potentiometer P1 to 50–60 °C.

Return temperature control is constantly active:

- Via a separate boiler circuit actuator (3-way mixer) and with bypass pump (without hydraulic separation)
- Via a separate boiler circuit actuator (3-way mixer) with a boiler circuit pump (with hydraulic separation via low loss header)

When the burner starts, the boiler circuit pump PK is switched on. After the burner has shut down, the boiler circuit pump PK is stopped after a delay. This pump run-on time can be set with potentiometer P2 to between 30 and 60 minutes for the lead boiler or to 5 minutes (potentiometer limit) for the lag boiler in a multi boiler system. The boiler circuit actuator SR for the lag boiler closes.

### 7.1.2 Logamatic 4321 und 4322 control units

#### Brief description of possible applications

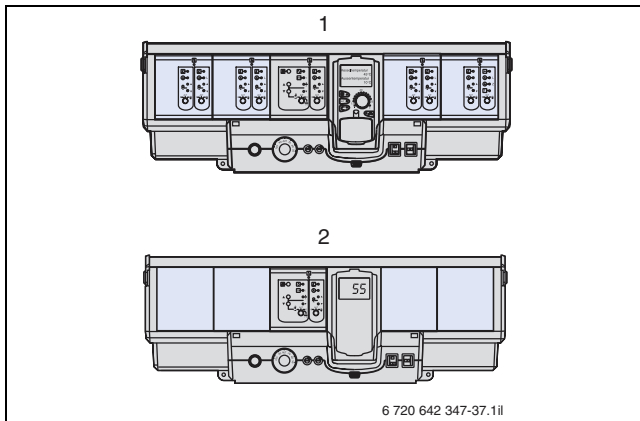


Fig. 42 Logamatic 4321 und 4322 control units

- 1 Logamatic 4321 (optional full equipment level); blue: additional equipment
- 2 Logamatic 4322 (standard equipment level); blue: slots for additional equipment

The Logamatic 4321 and 4322 digital control units can control a floorstanding Buderus oil or gas boiler with a single stage, 2-stage or modulating burner. They also support operation of dual-fuel burners. These control units may be extended with up to four function modules to provide an optimum match to an individual heating system. Multi boiler systems can be controlled with the FM458 strategy module in the Logamatic 4321 control unit.

#### Boiler safety functions

Low temperature boilers and gas condensing boilers with optional boiler protection functions can be adjusted at the service level of the MEC2 programming unit to safeguard the operating conditions.

The correct settings in conjunction with the appropriate plumbing configuration guarantee that the required boiler operating conditions are maintained.

#### Burner control

The central module in the control unit controls single stage, 2-stage or modulating burners subject to output. With dual-fuel burners, it can switch between oil and gas.

They are generally controlled via burner cable stage 1 and burner cable stage 2.

Alternatively the burner can be controlled via a 0-10 V signal, in which case the burner cable stage 2 is no longer required.

#### Multi boiler systems

Fitting the FM458 function module to the Logamatic 4321 control unit (maximum of two per system) enables up to eight boilers to be controlled according to a strategy. One Logamatic 4322 or Logamatic EMS control unit is required per lag boiler.

#### Special functions for single and multi stage boiler systems

- Separate boiler curve can be adjusted with third party control of the consumers
- Control of a boiler circuit pump for systems with depressurised headers or low-loss headers
- Output-dependent control of a boiler circuit pump via a 0-10 V signal in conjunction with modulating burners
- Application of a potential-free signal for an external fault message or for switching between gas and oil operation in the case of dual fuel burners

#### Special functions for multi stage boiler systems in conjunction with the FM458 strategy module

- Parallel or serial operation can be set
- Automatic sequence reversal, can be daily, by hours run, by outside temperature or via a floating contact
- Freely configurable load limit subject to the outside temperature or via a floating input
- Definable boiler sequences
- Lag boilers can be hydraulically shut off, taking account of automatic sequence reversal
- Adjustable boiler circuit pump run-on to utilise residual heat in the lag boilers
- 0-10 V input for external set value hook-up as set temperature value or output specification (heat demand) with third party heating circuit control units
- 0-10 V or 0-20 mA output for issuing an external set temperature value (heat demand) to an overriding control system (DDC/GLT)
- Indication of status of individual boilers
- Floating output for central fault message
- Floating input for hooking up an external heat meter
- Outside temperature sensor FA (only Logamatic 4321)
- Boiler water temperature sensor FK
- Additional temperature sensor FZ for low loss header or as return temperature sensor
- Burner cable stage 2

## Boiler safety functions

### Low temperature boilers

- If the minimum boiler water temperature is not reached, the boiler circuit pump, heating circuit pumps and cylinder primary pump are shut down and restarted with a switching differential when the boiler water temperature rises. This boiler protection function is designated "pump logic". The switching threshold depends on the burner type and is preset at the factory.
- The following boiler protection functions are available to control the operating flow temperature:
  - Overriding control of the heating circuit actuators for single boiler systems:  
The heating circuit actuators are closed if the operating flow temperature is not reached, independent of the heat demand of the heating circuits. For this setting, all heating circuits must be fitted with an actuator and controlled by the Logamatic controller.
  - Control of a separate boiler circuit actuator:  
If the operating flow temperature of the boiler is not reached, the boiler circuit actuator (3-way mixer) is closed.  
This setting is advisable when supplying heat to externally controlled heating circuits or for heating circuits without actuators.
  - Relevant function of a third party control unit:  
Condition: During burner ON mode, an operating flow temperature of 50 °C must be reached within 10 minutes and maintained as the minimum temperature, e.g. by limiting the flow rate.

### Low temperature boiler with minimum return temperature

- For this type of low temperature boiler, a fixed minimum return temperature is ensured at the factory. If this minimum return temperature (captured at the return temperature sensor FR or in multi boiler systems at the strategy return temperature sensor FRS), the flow rate is automatically reduced via actuators. To support this control function, the boiler circuit pump, heating circuit pumps and cylinder primary pumps are shut down if high load conditions suddenly occur.  
The following options are available to control the minimum return temperature:
  - Overriding control of the heating circuit actuators:  
The heating circuit actuators are closed if the minimum return temperature is not reached, independent of the heat demand of the heating circuits. For this setting, all heating circuits must be fitted with an actuator and controlled by the Logamatic controller.
  - Control of a separate boiler circuit actuator:  
If the minimum return temperature of the boiler (sensor FR) is not reached, the boiler circuit actuator (3-way mixer) is closed. This setting is advisable when supplying heat to externally controlled heating circuits or for heating circuits without actuator.

### Gas condensing boiler

- If this boiler type is selected, there are no required boiler operating conditions to be maintained. No boiler safety functions are required.

### 7.1.3 Side control unit retainer

For the Logano S825L and S825L LN, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, in conjunction with Logamatic control units, the side control unit retainer is required as an accessory. With the S825L and S825L LN "standardised" versions, the control unit retainer is part of the standard delivery and is prefitted. It enables convenient operation of the Logamatic 4212, 4321 and 4322 control units at eye level. The side retainer can be fitted on the r.h. or l.h. side

of the boiler block. Mount the control unit on an adaptor plate on the side control unit retainer (→ Fig. 43 and Fig. 44).

To install the Logamatic 4212, 4321 and 4322 control units, the following additional equipment will be required:

- Burner cable
- Sensor well

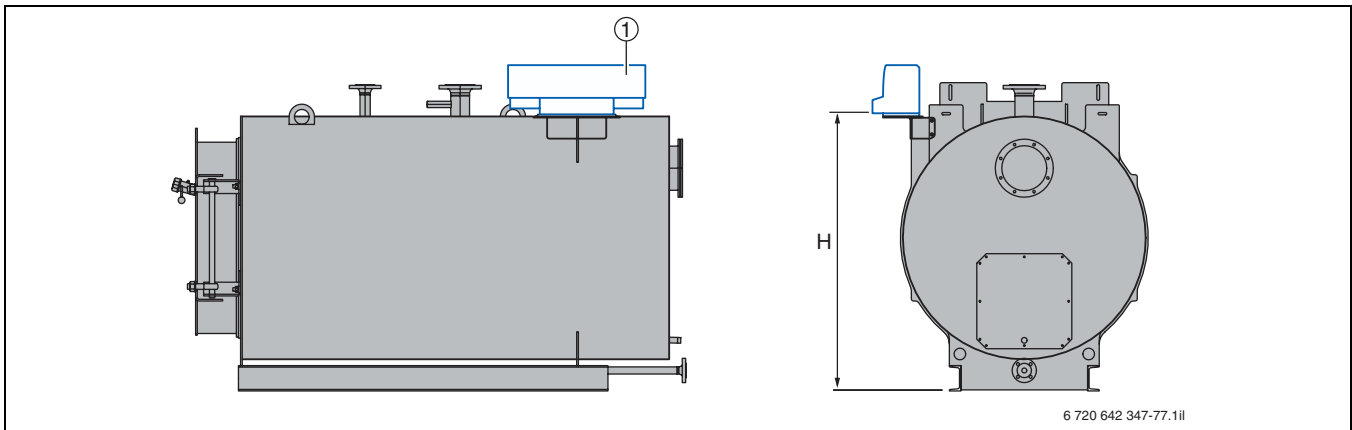


Fig. 43 Side control unit retainer Logano S825L/L LN (standardised)  
(6-bar version; dim. H → Tab. 45, page 67)

- 1 Side control unit retainer  
(part of standard delivery with S825L/L LN "standardised" version)

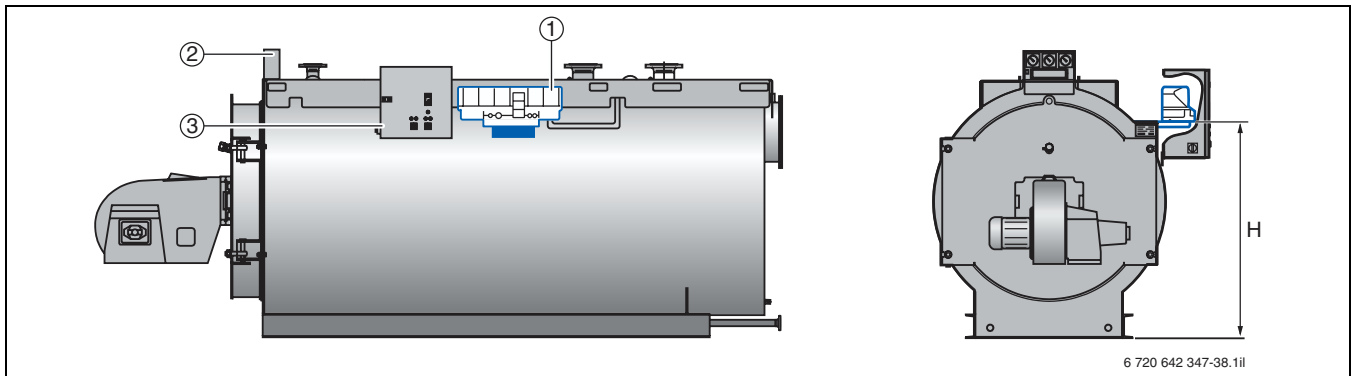


Fig. 44 Side control unit retainer Logano S825L/L LN and Logano plus SB825L/L LN  
(dim. H → Tab. 46, page 67)

- 1 Side control unit retainer
- 2 DA... display and control unit (→ Fig. 45, page 68)
- 3 Burner control panel

| <b>Logano<br/>S825L<sup>1)</sup></b> | <b>Logano<br/>S825L LN<sup>1)</sup></b> | <b>Side control unit retainer H<sup>2)</sup><br/>(6-bar version)</b> |
|--------------------------------------|-----------------------------------------|----------------------------------------------------------------------|
| <b>Boiler size</b>                   | <b>Boiler size</b>                      | <b>[mm]</b>                                                          |
| 650                                  | –                                       | 1300                                                                 |
| 1000                                 | 750                                     | 1450                                                                 |
| 1350                                 | 1000                                    | 1550                                                                 |
| 1900                                 | 1250                                    | 1600                                                                 |
| –                                    | 1500                                    | 1600                                                                 |

*Tab. 45 Dimensions of the side control unit retainer  
Logano S825L/L LN, 6-bar version*

1) Logano S825L/L LN "standardised version"

2) Bottom edge of control unit (H → Fig. 43, page 66)

| <b>Logano (plus)<br/>S(B)825L</b> | <b>Logano (plus)<br/>S(B)825L LN</b> | <b>Side control unit retainer H<sup>1)</sup></b> |
|-----------------------------------|--------------------------------------|--------------------------------------------------|
| <b>Boiler size</b>                | <b>Boiler size</b>                   | <b>[mm]</b>                                      |
| 1000                              | 750                                  | 1350                                             |
| 1350                              | 1000                                 | 1450                                             |
| 1900                              | 1250                                 | 1500                                             |
| 2500                              | 1500                                 | 1550                                             |
| 3050                              | 2000                                 | 1600                                             |
| 3700                              | 2500                                 | 1600                                             |
| 4200                              | 3000                                 | 1600                                             |
| 5200                              | 3500                                 | 1600                                             |
| 6500                              | 4250                                 | 1600                                             |
| 7700                              | 5250                                 | 1600                                             |
| 9300                              | 6000                                 | 1600                                             |
| 11200                             | 8000                                 | 1600                                             |
| 12600                             | 10000                                | 1600                                             |
| 14700                             | 12000                                | 1600                                             |
| 16400                             | 14000                                | 1600                                             |
| 19200                             | 17500                                | 1600                                             |

*Tab. 46 Dimensions of the side control unit retainer  
Logano S825L/L LN and  
Logano plus SB825L/L LN*

1) Bottom edge of control unit (H → Fig. 44, page 66)

### 7.1.4 DA... display and control units

With the standard equipment level of the DA... display and control units, the digital display shows the flow, return or flue gas temperature with an accuracy level of  $\pm 2$  K. LEDs indicate which temperature is currently being shown. The measured values can be passed on via three outputs for 4 to 20 mA. The keypad enables temperature limits to be set. If a limit is exceeded, the associated diode flashes and a signal is issued to one of the three floating outputs. The control unit with the standard equipment level (DA) is therefore an ideal supplement to the Logamatic control units.

The DAZ, DAM and DAD also enable constant control of the boiler. They can be used instead of the Logamatic 4212 control unit.

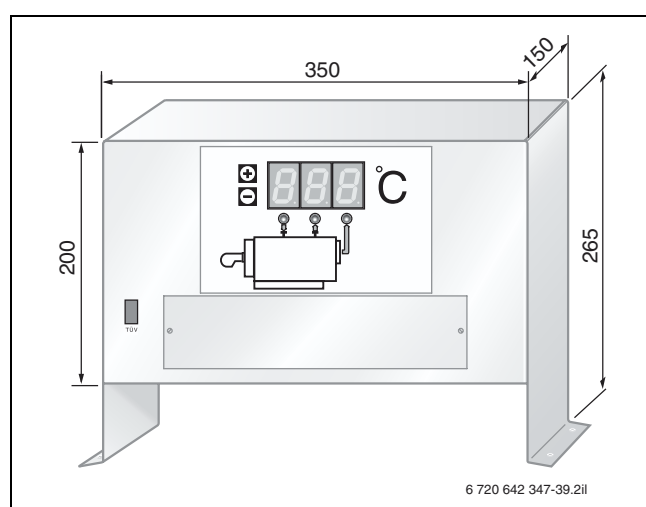


Fig. 45 DA... display and control units  
Logano S825L/L LN and  
Logano plus SB825L/L LN (dim. in mm)

| Component                 | Type of instrument casing |     |     |     |
|---------------------------|---------------------------|-----|-----|-----|
|                           | DA                        | DAZ | DAM | DAD |
| Temperature display       | +                         | +   | +   | +   |
| Temperature limiter       | –                         | +   | +   | +   |
| Burner control (stages)   | –                         | 2   | 1)  | 3   |
| High limit safety cut-out | –                         | +   | +   | +   |
| Temperature controller    | –                         | +   | –   | +   |
| Stage II                  | –                         | +   | –   | +   |
| Stage III                 | –                         | –   | –   | +   |

Tab. 47 Equipment level of the DA... display and control units

1) Excess temperature protection for modulating burner

+ Available  
– Not available

### 7.1.5 Burner control panel

If the boiler has been equipped with a burner control panel by the burner supplier, a mounting plate can be fitted to the boiler at the factory. It is fitted on either the r.h. or l.h. side of the boiler or on the front door (→ Fig. 44, page 66).

### 7.1.6 Buderus control panel system Logamatic 4411

The Buderus control panel system Logamatic 4411 offers comprehensive control solutions for medium and large-scale systems that require system-specific controls. The control technology department of your local Buderus sales office will advise you on design and prepare the most suitable system solution for your individual project. This also applies to programmable logic control and building management systems.



For more detailed information, see the technical guide "Logamatic control panel systems 4411".

## 7.2 Logamatic telecontrol system



Below you will find a brief overview of the Logamatic telecontrol system. For further information, see the technical guide "Logamatic telecontrol system".

The Buderus telecontrol modem sends automatic notification of operating faults to any destination - by email, fax, SMS, etc. The service engineer can repair the system remotely using a convenient PC program. All parameters can be checked and modified via telecommunications channels.

If required, a visit to the site can be planned efficiently: What action is necessary, what spare parts are required, do specialists need to be brought in?

A telecontrol system from Buderus is ideal for many applications, e.g. in rented houses, apartment buildings without a caretaker, holiday homes, municipal facilities, hospitals or swimming pools. Remote monitoring is also the top choice for heat supply contracts or inspection and maintenance contracts.

### Benefits

- High level of security due to 24-hour monitoring
- Fault displays in plain text; different message recipients can be combined
- Simple control options
- Operating mode changeover via telephone (holiday home function)
- Check and modify control unit parameters remotely
- Display control unit data and record faults
- Suitable for heat sources with Logamatic EMS or Logamatic 4000

## 7.2.1 Overview of the Logamatic telecontrol system

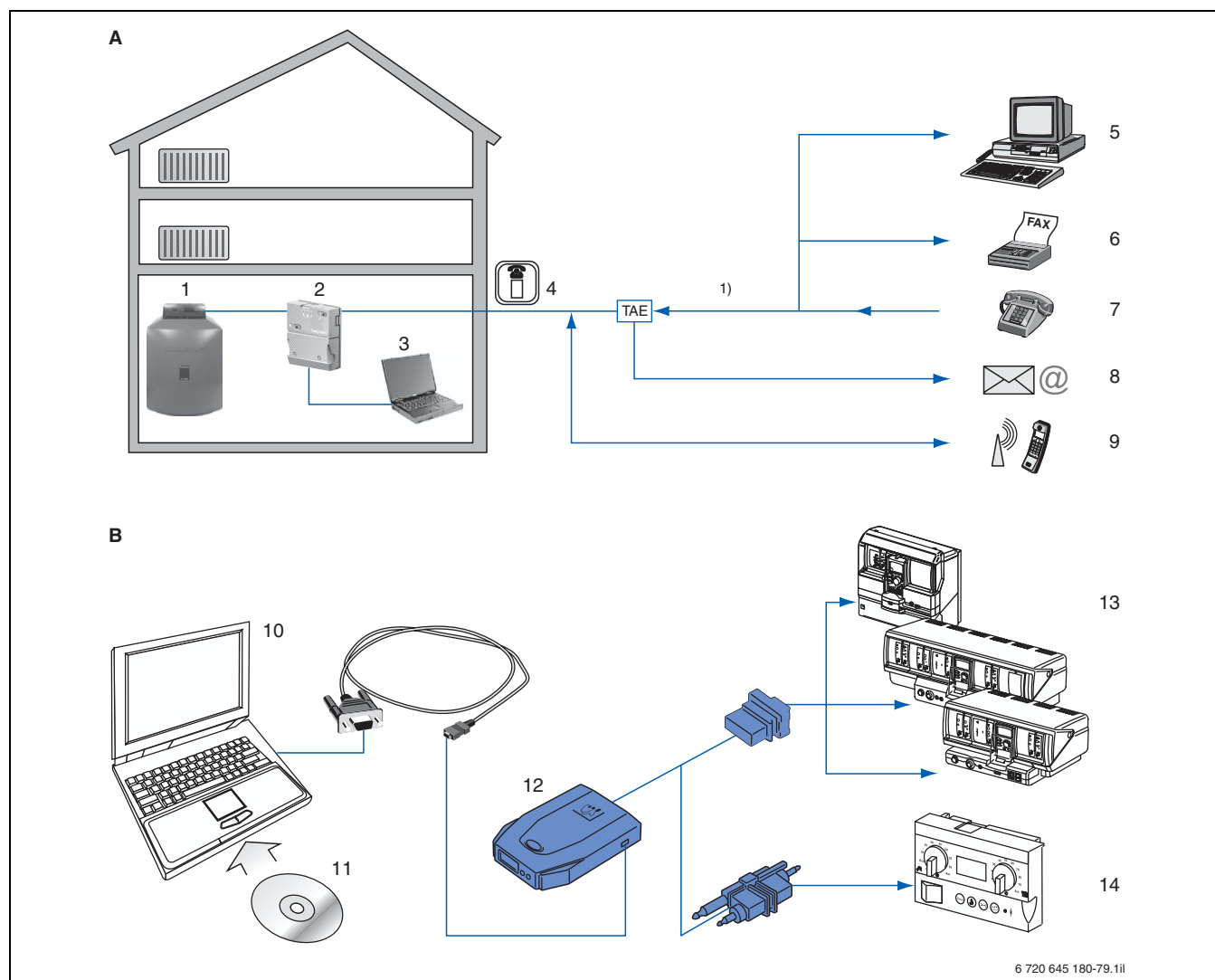


Fig. 46 Logamatic telecontrol system

- A** Modem connection with control unit  
**B** Direct connection with control unit  
**1** Control unit  
**2** Telecontrol modem  
**3** Notebook (service on-site)  
**4** Analogue telephone connection  
**5** PC with software (ECO-SOFT 4000/EMS, ECO-MASTERSOFT)  
**6** Fax (group 3)  
**7** Telephone (DTMF telecontrol)  
**8** Email  
**9** SMS  
**10** PC with USB or RS232 interface (USB-RS232 converter cable available as accessory)  
**11** Logamatic ECO-SOFT 4000/EMS service software  
**12** Logamatic Service Key  
**13** Possibility for connection to digital control units in the Logamatic 4000 system  
**14** Possibility for connection to digital control units in the Logamatic EMS system (Logamatic BC10 base controller)

- 1)** Communication, monitoring and service via telephone and modem

### 7.2.2 Telecontrol modem for optimum service connections

The Logamatic Easycom or Logamatic Easycom PRO telecontrol modems are at the heart of the Logamatic telecontrol system. They connect the control system to external devices and forward messages about operating faults or conditions to one or more different message recipients, depending on the time and day. For example, messages can be sent to email addresses, fax machines, mobile phones, PC control centres – wherever required.

Furthermore, via digital and analogue inputs, further devices for heating technology and building management can be hooked up, e.g. heat and gas meters, pressure switches or alarm systems. In the opposite direction, the telecontrol modem enables complete monitoring and configuration of the control system.

### 7.2.3 Logamatic Easycom

#### Benefits

- Reduced costs for smaller to medium-sized heating systems
- Compatible with all Logamatic control systems
- Monitoring and configuration of the entire heating system
- Up to three message recipients, including email addresses
- One digital input to monitor external components
- User friendly software, even for use on site



Fig. 47 Logamatic Easycom telecontrol modem

### 7.2.4 Logamatic Easycom PRO

#### Benefits

- Even for larger heating systems
- Compatible with third party control units and components
- Up to 16 different message recipients
- Memory for long term data recording
- Digital inputs for monitoring external components
- Meters can be hooked up to record consumption (gas, oil, heat, hours run)
- Can be extended with further modules
- Emergency power module for operation independent of mains power supply
- Operation also possible via mobile networks (GSM)

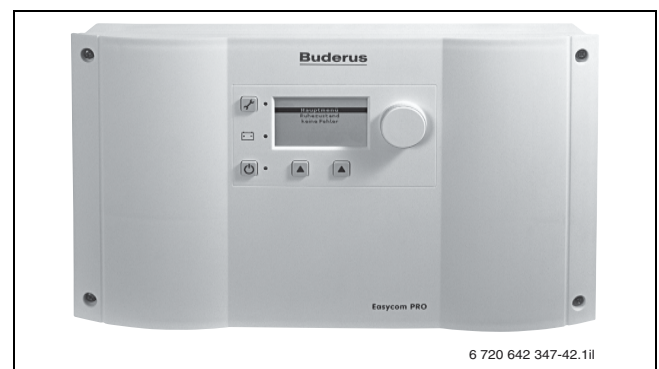


Fig. 48 Logamatic Easycom PRO telecontrol modem

### 7.2.5 Logamatic Service Key

Make the most of all the options for convenient and powerful control software - not just from the office, but also on site. The Logamatic Service Key is the mobile high performance connection from your computer to the heating system. Thanks to a variety of adaptors, it is easy to connect to Buderus products with Logamatic control systems. With a few clicks of the mouse, all operating data can be called up and the entire system can be configured.



Fig. 49 Logamatic Service Key

## 8 DHW heating

### 8.1 Systems for DHW heating

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, can be used for central DHW heating. They can be combined with any Buderus DHW cylinder. The Logalux cylinders are available as horizontal or vertical versions in different sizes with up to 6000 l capacity. Subject to application, they are equipped with an internal indirect coil or external heat exchanger.

The DHW cylinders can be used singly or in combination with other cylinders. With the primary store system, different cylinder sizes and different heat exchanger sets can be combined. This means system solutions are available for any demand and many applications.

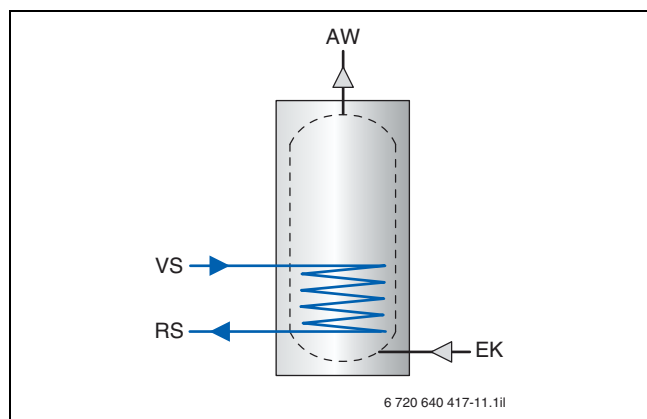


Fig. 50 DHW heating according to the cylinder principle with an internal indirect coil

- AW** DHW outlet
- EK** Cold water inlet
- RS** Cylinder return
- VS** Cylinder flow

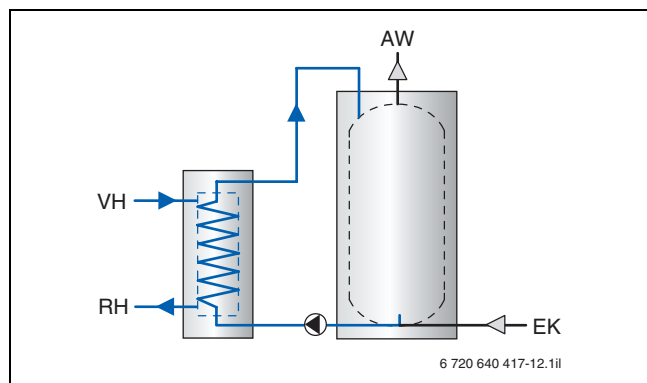


Fig. 51 DHW heating according to the primary store principle with an external heat exchanger

- AW** DHW outlet
- EK** Cold water inlet
- RH** Heating medium return (to the boiler)
- VH** Heating medium flow (from the boiler)

### 8.2 DHW temperature control

The DHW temperature is adjusted and controlled either by the Logamatic 4000 control system or by a special Buderus control unit for DHW heating. Both versions are matched to the heating circuit control unit and offer many application options.



More detailed information on this can be found in the technical guides "Sizing and selecting DHW cylinders" and "Logamatic 4000 modular control system".

## 9 System examples

### 9.1 Information regarding all system examples

The system examples in this chapter show options for the hydraulic connection of the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers. In addition, the examples show important control and electrical connections for the relevant application.

Detailed information regarding the number, controls, equipment level and design of further heating circuits, as well as the installation of DHW cylinders and other consumers, can be found in the relevant technical guides.

Information regarding further options for system layout and engineering aids are available from Buderus technical consultants. Specialists at your local sales office can create a control panel layout tailored to your needs. In this way, Buderus offers an entire matching concept right through to commissioning the heating system.

The diagrams and associated design information for the system examples with the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, offer non-binding information regarding a possible hydraulic connection. No claim is made as to their completeness.

Each system example is a non-binding recommendation for a certain version of the heating system. The practical implementation is subject to currently applicable technical rules.

#### List of abbreviations

| Abbr.     | Explanation                                                                 |
|-----------|-----------------------------------------------------------------------------|
| BR / BRII | Burner (stage I / stage II)                                                 |
| DDC       | Direct Digital Control (overriding control unit)                            |
| GLT       | Building management control (overriding control unit)                       |
| FK        | Boiler water temperature sensor                                             |
| FR        | Return temperature sensor                                                   |
| FRS       | Strategy return temperature sensor                                          |
| FV        | Flow temperature sensor                                                     |
| FVS       | Strategy flow temperature sensor                                            |
| FZ        | Additional sensor for the return temperature                                |
| HK        | Heating circuit                                                             |
| HB        | High temperature heating circuit                                            |
| KR        | Check valve                                                                 |
| LT        | Low temperature heating circuit                                             |
| PH        | Heating circuit pump                                                        |
| PK        | Boiler circuit pump                                                         |
| PWT       | Heat exchanger pump                                                         |
| RK        | Boiler return                                                               |
| RWT       | Condensing heat exchanger return                                            |
| SH        | Heating circuit actuator (3-way mixer)                                      |
| SR        | Actuator for return temperature raising facility                            |
| SRWT      | Actuator for return temperature raising facility, condensing heat exchanger |
| THV       | Thermostatic valve                                                          |
| VK        | Boiler flow                                                                 |
| VR        | Return distributor                                                          |
| VV        | Flow distributor                                                            |
| VWT       | Condensing heat exchanger flow                                              |
| WH        | Low loss header (hydraulic balancing line)                                  |

Tab. 48 Summary of frequently used abbreviations

### 9.1.1 Hydraulic connection

#### Heating circuit pumps

Size pumps in central heating systems in accordance with current technical rules.

#### Temperature sensor

A strategy flow temperature sensor (FVS) should be positioned as close as possible to the boiler system. This stipulation does not apply if hydraulic balancing has been provided via a low loss header. Long distances between the boiler system and the strategy flow temperature sensor have a negative effect on the control characteristics, especially in the case of boilers with modulating burners.

The temperature sensors for return temperature raising should be designed as immersion sensors.

#### Dirt traps

Deposits in the heating system can lead to local overheating, noise and corrosion. Any resulting boiler damage falls outside the warranty obligations.

To remove dirt and sludge, flush an existing heating system thoroughly prior to installing and commissioning a boiler. In addition, we recommend the installation of dirt traps or a blow-down facility.

Dirt traps retain contaminants and thereby prevent operating faults in control devices, pipework and boilers. Fit these near the lowest point of the heating system in an easily accessible position. Clean the dirt traps every time the heating system is serviced.



The function of a dirt trap can be fulfilled by a hydraulic balancing line (low loss header) (→ page 82).

---

### 9.1.2 Control

The operating temperatures should be controlled with a Buderus Logamatic control unit in weather-compensated mode. It is also possible to control individual heating circuits in room temperature-dependent mode (with a room temperature sensor in a reference room). For this, the actuators and heating circuit pumps are constantly actuated by the Logamatic control unit. The number and version of heating circuits that can be controlled depend on the control unit.

The Logamatic control system can also actuate the burners, whether they are 2-stage or modulating pressure-jet burners. Different types of burners can also be combined in multi burner systems.

The electrical connection of 3-phase burners and 3-phase pumps must be made on site. The Logamatic control unit provides control (230 V).

For more detailed information, see the technical guides to the control units.

### 9.1.3 DHW heating

If the DHW temperature is controlled with a Logamatic control unit and it is designed accordingly, special functions are possible, such as the actuation of a DHW circulation pump or thermal disinfection to prevent the growth of legionella.

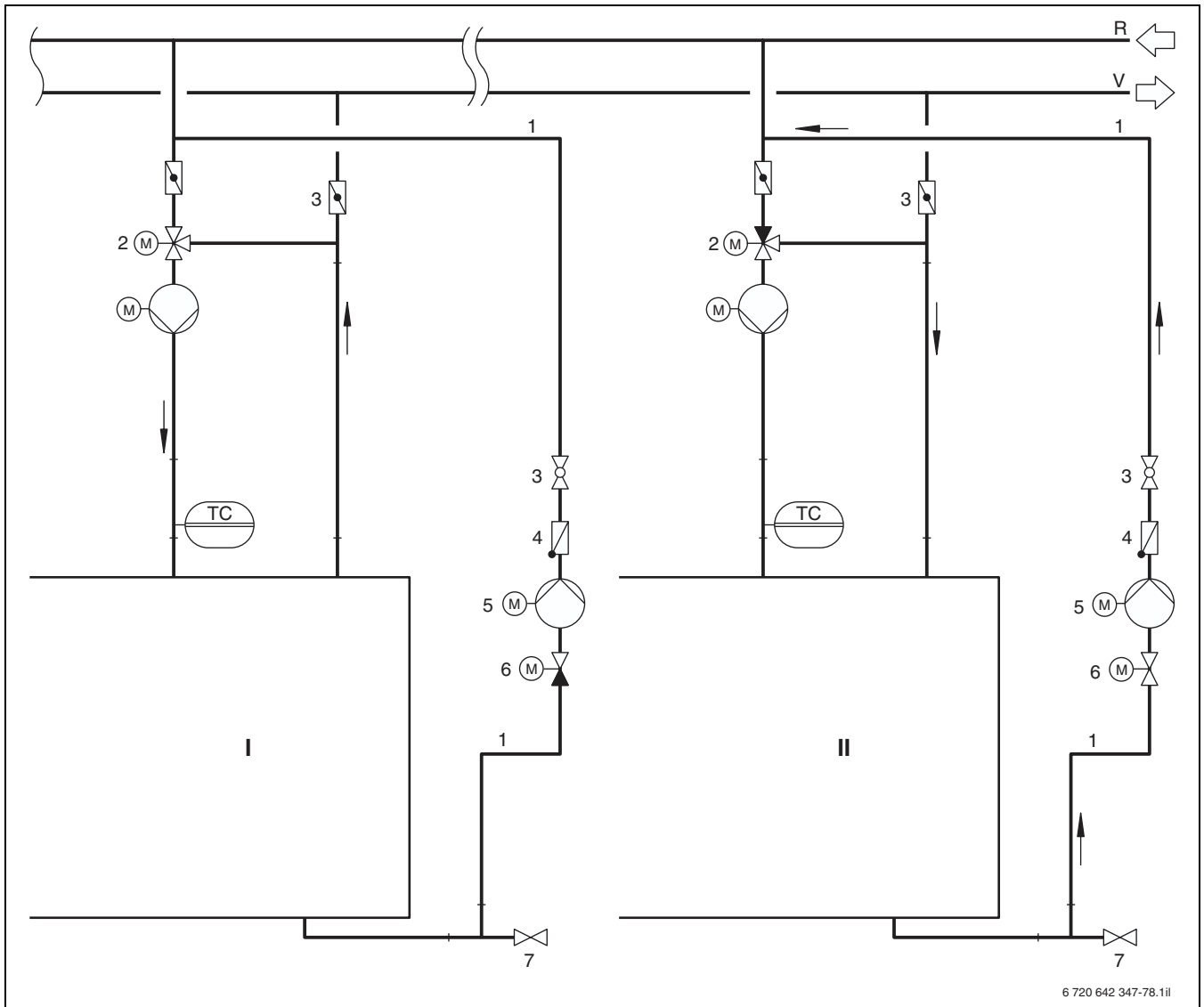


For more detailed information on this subject, see the technical guide "Sizing and selecting DHW cylinders".

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### 9.1.4 Pipework schemes

#### Temperature maintaining: Version with return temperature maintaining RTH



6 720 642 347-78.1ll

Fig. 52 Return temperature maintaining RTH

- I** Boiler mode
- II** Temperature maintaining mode
- R** Return
- V** Flow
- 1** Temperature maintaining line
- 2** 3-way valve (motorised)
- 3** Shut-off valve
- 4** Check valve
- 5** Temperature maintaining pump
- 6** Shut-off valve (motorised)
- 7** Drainage shut-off valve

In temperature maintaining mode, the shut-off valve in the flow is open and the 3-way valve in the return is closed.

In boiler mode, the temperature maintaining pump is stopped and the shut-off valve on the inlet side is closed.

### Temperature maintaining: Version with return temperature raising RTA

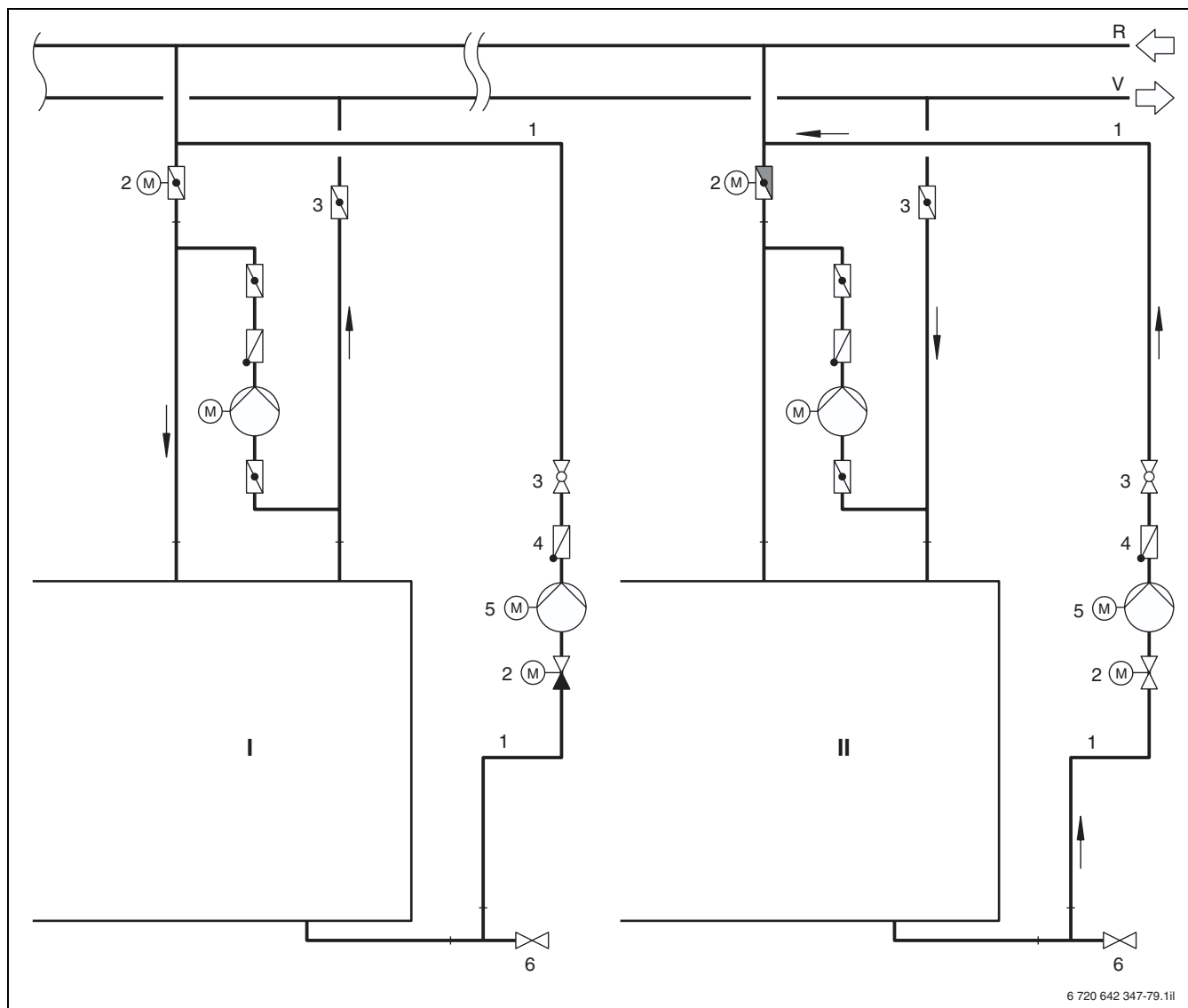
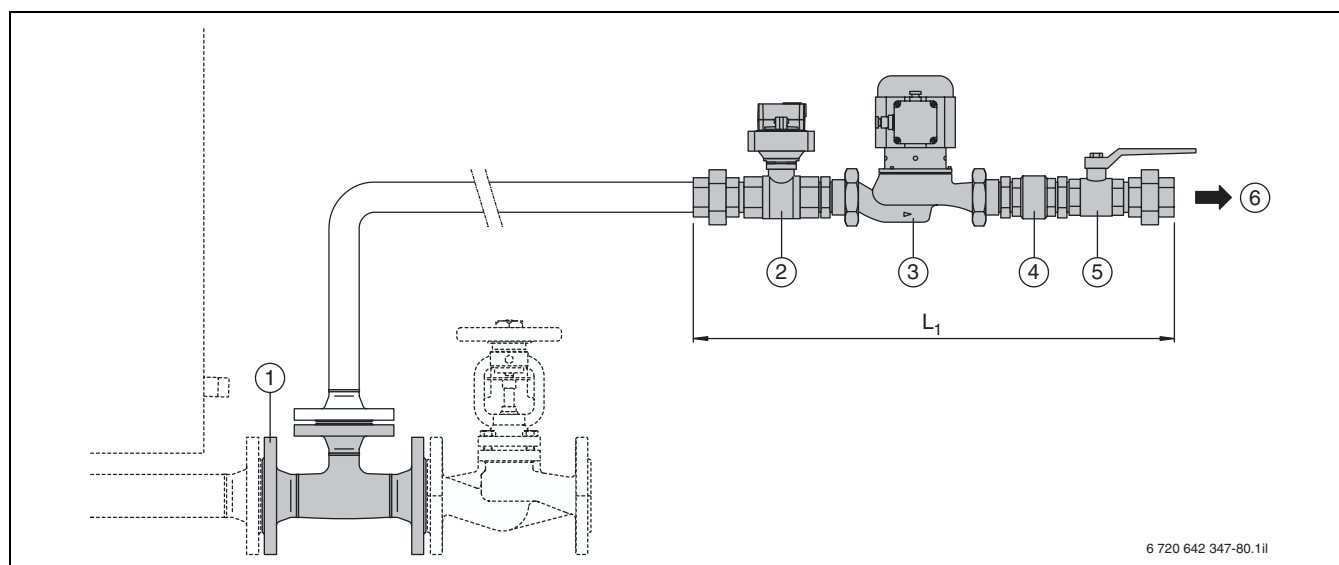


Fig. 53 Return temperature raising RTA

- I** Boiler mode
- II** Temperature maintaining mode
- R** Return
- V** Flow
- 1** Temperature maintaining line
- 2** Shut-off valve (motorised)
- 3** Shut-off valve
- 4** Check valve
- 5** Temperature maintaining pump
- 6** Drainage shut-off valve

In temperature maintaining mode, the shut-off valve in the flow is open and the 3-way valve in the return is closed.

In boiler mode, the temperature maintaining pump is stopped and the shut-off valve on the inlet side is closed.

**Temperature maintaining: mains pressure  $\leq 10$  bar; DHW temperature  $\leq 110$  °C**

**Fig. 54** Temperature maintaining

- 1** Tee in drainage shut-off valve
- 2** Shut-off valve (motorised)
- 3** Temperature maintaining pump
- 4** Check valve
- 5** Shut-off valve
- 6** Temperature maintaining line

| Temperature maintaining | Can be used up to boiler output | Motorised output of temperature maintaining pump | Internal diameter |                 |                 |                 |                 | Length $L_1$ | Shipping weight |
|-------------------------|---------------------------------|--------------------------------------------------|-------------------|-----------------|-----------------|-----------------|-----------------|--------------|-----------------|
|                         |                                 |                                                  | 1 <sup>1)</sup>   | 2 <sup>2)</sup> | 3 <sup>2)</sup> | 4 <sup>2)</sup> | 5 <sup>2)</sup> |              |                 |
| Type                    | [kW]                            | [kW]                                             | -                 | -               | -               | -               | -               | [mm]         | [kg]            |
| WH 1                    | 1000                            | 0.06                                             | DN25/20           | DN20            | DN40            | DN20            | DN20            | 579          | 8               |
| WH 2                    | 5200                            | 0.07                                             | DN32/25           | DN25            | DN40            | DN25            | DN25            | 631          | 10              |
| WH 3                    | 12600                           | 0.19                                             | DN50/32           | DN32            | DN50            | DN32            | DN32            | 676          | 16              |
| WH 4                    | 19200                           | 0.40                                             | DN50/40           | DN40            | DN50            | DN40            | DN40            | 721          | 20              |

**Tab. 49** Specification for temperature maintaining in the Logano S825L/L LN and Logano plus SB825L/L LN

1) Internal diameter for flanges to DIN 2633, DIN 2634 and DIN 2635

2) Pipe thread to DIN 2999



Dimensions given with  $\pm 1$  % tolerance;  
Transport weights given with  $\pm 3$  % tolerance.

## 9.2 Safety equipment to DIN-EN 12828

### 9.2.1 Requirements

No claim is made as to the completeness of the diagrams or the corresponding design information for the system examples. Each system example is a non-binding recommendation for certain versions of the heating system. The practical implementation is subject to currently applicable technical rules. Safety equipment shall be installed in accordance with local regulations.

DIN EN 12828 determines the safety equipment level.

The schematic illustration in Fig. 55 can be referred to as an engineering aid.

### 9.2.2 Layout of safety components to DIN-EN 12828

**Boiler > 300 kW; operating temperature  $\leq 105^\circ\text{C}$ ; shutdown temperature (STB)  $\leq 110^\circ\text{C}$  - direct heating**

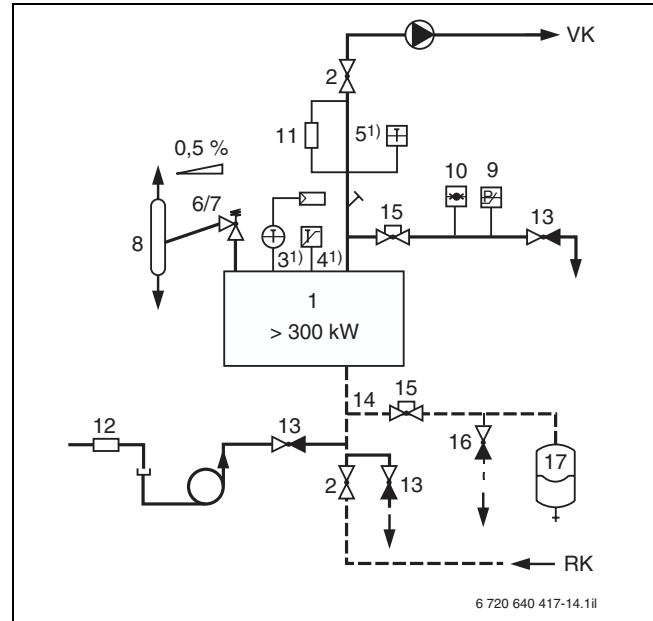


Fig. 55 Safety equipment to DIN-EN 12828 with direct heating

- RK** Return
  - VK** Flow
  - 1** Heat source
  - 2** Shut-off valve, flow/return
  - 3** Temperature controller (TR)
  - 4** High limit safety cut-out (STB)
  - 5** Temperature capturing facility
  - 6** Diaphragm safety valve MSV 2.5 bar/3.0 bar
  - 7** Lift spring safety valve HFS  $\geq 2.5$  bar
  - 8** Flash trap (ET); not required if a high limit safety cut-out with a limit  $\leq 110^\circ\text{C}$  and a maximum pressure limiter are additionally provided for each boiler
  - 9** Maximum pressure limiter
  - 10** Pressure gauge
  - 11** Low water indicator (WMS) or a minimum pressure limiter
  - 12** Non-return valve
  - 13** Boiler drain & fill valve (KFE)
  - 14** Expansion line
  - 15** Shut-off valve – protected against unintentional closure, e.g. by sealed cap valve
  - 16** Drain upstream of diaphragm expansion vessel
  - 17** Diaphragm expansion vessel (DIN-EN 13831)
- 1)** The maximum achievable flow temperature in combination with Logamatic control units is approx. 18 K below the shutdown temperature (high limit safety cut-out)

### 9.2.3 Safety equipment for the condensing heat exchanger

The condensing heat exchanger requires an additional safety valve with pressure gauge and venting facility if a shut-off device is installed between the boiler and condensing heat exchanger. If the heat exchanger is connected to the boiler without a shut-off device, there is no need for additional safety equipment.

### 9.2.4 Maximum operating flow temperatures

In combination with the various control units, the boilers can reach different, maximum possible operating flow temperatures (maximum adjustable value of the controller). When these temperatures are reached, the burner is shut down by the controller. The (re)start temperature is higher by the specific hysteresis. In general, this results in the maximum achievable average operating flow temperatures, according to Tab. 50.

The boiler water temperature must be at least 70 °C. It can be modulating or kept constant.

| Control unit                      | Maximum adjustable value of the controller<br>[ °C] | Maximum achievable flow temperature at STB 110 °C<br>[ °C] |
|-----------------------------------|-----------------------------------------------------|------------------------------------------------------------|
| Logamatic 4212                    | 105/95                                              | 92                                                         |
| Logamatic 4321/4322 <sup>1)</sup> | 105/95                                              | 92                                                         |
| DAZ/DAM/DAD                       | 110/100                                             | 100                                                        |

Tab. 50 Achievable temperatures subject to control unit

1) Applies only for boiler circuit control; heating circuits can be operated up to a maximum of 90 °C

## 9.3 Sizing and installation information

### 9.3.1 Boiler circuit pump in the bypass as shunt pump

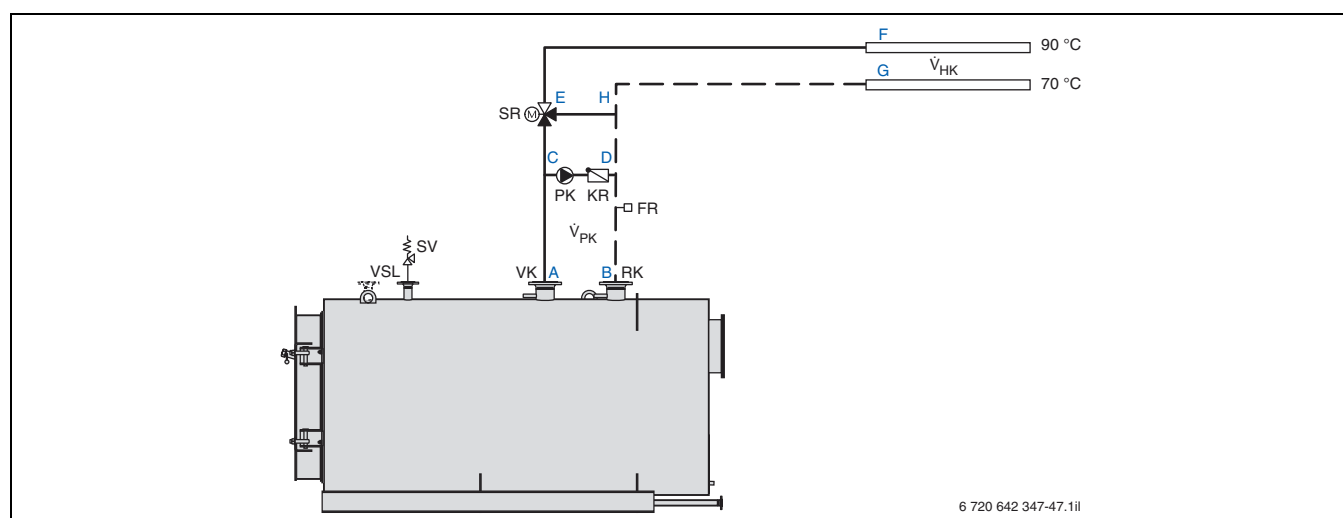


Fig. 56 Example of a hydraulic circuit for a single boiler system with boiler circuit pump in the bypass for Logano S825L/L LN or Logano plus SB825L/L LN

- FR** Return temperature sensor
- KR** Check valve
- PK** Boiler circuit pump
- RK** Boiler return
- SR** Actuator for return temperature raising facility
- SV** Safety valve
- VK** Boiler flow
- VSL** Safety flow

### Flow rate of the boiler circuit pump $\dot{V}_{PK}$

The boiler circuit pump, also known as a shunt pump, is required to control the return temperature (flow past the sensor). The control characteristics can also be optimised using the boiler circuit pump. This makes it possible to minimise switching during the heat-up phase. This results in lower emissions.

$$\dot{V}_{PK} = \frac{\dot{Q}_K}{\Delta\vartheta_K \times c}$$

*Form. 4 Calculating the flow rate of the boiler circuit pump*

- c** Specific heat capacity  
 $c = 1.16 \times 10^{-3} \text{ kWh}/(\text{l} \times \text{K}) = 1/860 \text{ kWh}/(\text{l} \times \text{K})$   
 $\Delta\vartheta_K$  Temperature differential for sizing the boiler circuit pump  
 30 to 50 K (30 K for optimised heat-up characteristics)  
 $\dot{Q}_K$  Rated output in kW  
 $\dot{V}_{PK}$  Flow rate of the boiler circuit pump in l/h

### Flow rate of the heating circuits $\dot{V}_{HK}$

$$\dot{V}_{HK} = \frac{\dot{Q}_{HK}}{(\vartheta_V - \vartheta_R) \times c}$$

*Form. 5 Calculating the flow rate of the heating circuits*

- c** Specific heat capacity  
 $c = 1.16 \times 10^{-3} \text{ kWh}/(\text{l} \times \text{K}) = 1/860 \text{ kWh}/(\text{l} \times \text{K})$   
 $\vartheta_R/\vartheta_V$  Return/flow temperature of the heating circuits in °C  
 $\dot{Q}_{HK}$  Heat demand of the heating circuits in kW  
 $\dot{V}_{HK}$  Flow rate of the heating circuits in l/h

### Total boiler flow rate $\dot{V}_{Kges}$

The head of the boiler circuit pump is the result of:

- The pressure drop of the boiler at the selected flow rate  $\dot{V}_{PK}$
- The pressure drop in the pipework **and**
- All individual pressure drop levels in the boiler circuit (path: A–C–D–B, → Fig. 56)

Due to the pump and system curves, the total flow rate via the boiler cannot be calculated simply by adding up the individual flow rates. However, as an initial estimate, the simple addition is adequate for a rough calculation.



Base the sizing of the pipework in the boiler circuit on a flow velocity of 1 m/s to 2.3 m/s.

$$\dot{V}_{Kges} \leq \dot{V}_{PK} + \dot{V}_{HK}$$

*Form. 6 Calculating the total flow rate of the boiler*

- $\dot{V}_{HK}$  Flow rate of the heating circuits in l/h  
 $\dot{V}_{Kges}$  Maximum total flow rate through the boiler in l/h (estimate)  
 $\dot{V}_{PK}$  Flow rate of the boiler circuit pump in l/h

### Example

Given

- Rated output  $\dot{Q}_K = 2500 \text{ kW}$
- Heating system flow temperature  $\vartheta_V = 90 \text{ °C}$
- Heating system return temperature  $\vartheta_R = 70 \text{ °C}$
- Temperature differential (selected)  $\Delta\vartheta_K = 50 \text{ K}$

Result

- $\dot{V}_{PK} = 43000 \text{ l/h}$  (path: C–D, → Fig. 56)
- $\dot{V}_{HK} = 107500 \text{ l/h}$   
 (paths: C–F, D–G und E–H, → Fig. 56)
- $\dot{V}_{Kges} \approx 150500 \text{ l/h}$   
 (paths: A–C und B–D, → Fig. 56)

### 9.3.2 Boiler circuit pump as primary circuit pump

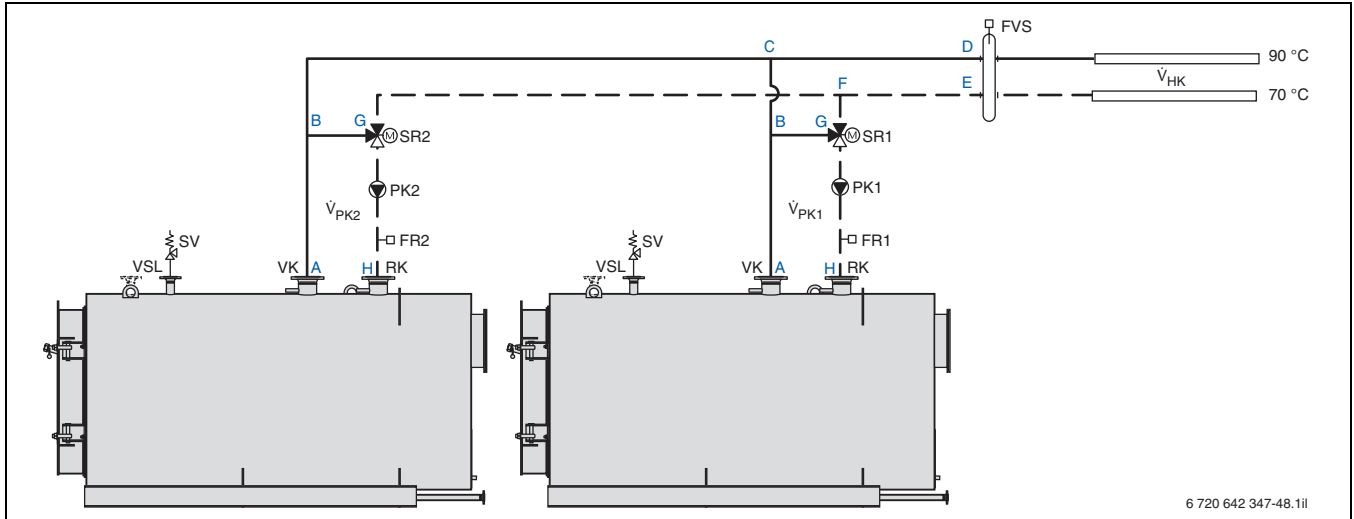


Fig. 57 Example of a hydraulic circuit for a 2-boiler system with boiler circuit pump as primary circuit pump for Logano S825L/L LN or Logano plus SB825L/L LN

- FVS** Strategy flow temperature sensor  
**FR** Return temperature sensor  
**PK** Boiler circuit pump  
**RK** Boiler return  
**SR** Actuator for return temperature raising facility  
**SV** Safety valve  
**VK** Boiler flow  
**VSL** Safety flow

#### Flow rate of the boiler circuit pump $\dot{V}_{PK}$

In systems with primary circuit pumps (e.g. with hydraulic balancing lines or depressurised distributors), we recommend installing the boiler circuit pump in the boiler return.

$$\dot{V}_{Kges, 1} = \dot{V}_{HK} \times (1,0...1,2)$$

**Form. 7** Formula with sizing factor for estimating the flow rate of the boiler circuit pump in a single boiler system

- $\dot{V}_{HK}$  Flow rate of the heating circuits in l/h  
 $\dot{V}_{Kges}$  Total boiler circuit flow rate in l/h

$$\dot{V}_{Kges, 1} = \dot{V}_{HK} \times (1,2...1,5)$$

**Form. 8** Formula with sizing factor for estimating the flow rate of the boiler circuit pump in a 2-boiler system

- $\dot{V}_{HK}$  Flow rate of the heating circuits in l/h  
 $\dot{V}_{Kges}$  Total boiler circuit flow rate in l/h

In 2-boiler systems, distribute the pump rates of the boiler circuit pumps according to the boiler outputs. If several heating circuits are constantly operated with high flow temperatures and the maximum flow rate, the flow rate of every boiler circuit pump should correspond to the flow rate of the heating circuit pumps. For systems with gas condensing boilers, there are special requirements to be

followed, e.g. maintaining as low a return temperature as possible. The pump rate of the boiler circuit pump may then need to be matched to the pump rate of the heating circuits.

#### Sizing the 3-way valve

Size the 3-way valve for the flow rate that has been calculated. When doing so, observe the pressure drop when the valve is fully open, as the control quality is influenced by the proportional pressure drop.

#### Head of the primary circuit pump

The head of the boiler circuit pump is the result of:

- The pressure drop of the boiler at the selected flow rate  $\dot{V}_{PK}$
- The pressure drop in the pipework **and**
- All individual pressure drop levels in the boiler circuit (path: A–D–E–H, → Fig. 57)

#### Example

Given

- Heat demand of the heating circuits  $\Sigma \dot{Q}_{HK} = 4000 \text{ kW}$
- Heating system flow temperature  $\vartheta_V = 90 \text{ °C}$
- Heating system return temperature  $\vartheta_R = 70 \text{ °C}$
- Total flow rate with selected sizing factor (→ formula 8)  
 $\dot{V}_{Kges} = \dot{V}_{HK} \times 1.3$

Result

- $\dot{V}_{HK} = 172000 \text{ l/h}$  (→ formula 5)
- $\dot{V}_{Kges} = 223600 \text{ l/h}$   
(paths: C–D and E–F, → Fig. 57)

Divide the total flow rate calculated for the boiler circuit side according to the rated outputs (here 50/50 %):

- $\dot{V}_{PK} = 111800 \text{ l/h}$   
(paths: A–C, B–G and F–H, → Fig. 57)

### 9.3.3 Hydraulic balancing line

A hydraulic balancing line (low loss header) is used to hydraulically separate the boiler circuit and the heating circuits.

Installing a hydraulic balancing line has many advantages:

- Trouble-free sizing of the boiler circuit pump and actuators
- Prevention of mutual influence of the heating water flow rates in the heat source and heat consumer circuits
- Heat sources and heat consumers are only supplied with the allocated water flow rates
- Can be used in single and multi boiler systems, independently of the heating circuit control system
- Actuators on both sides of the hydraulic balancing line work best when correctly sized
- The hydraulic balancing line can also be used as a sludge trap if sized accordingly (→ page 74)
- Divided into primary and secondary sides if there is a large pressure drop on the water side and long distances between the boiler and heating circuits

#### Sizing the low loss header

Correct sizing is very important if the hydraulic balancing line is to function correctly. To ensure good separation with the simultaneous function as a blow-down facility, size the line in such a way that there is virtually no pressure drop between the flow and return. With the nominal water volume, flow velocities of 0.1 m/s to 0.2 m/s can be expected. This makes simultaneous usage as a blow-down facility possible. In order that the heating circuit flow temperature can be captured, provide a sensor well, 200 mm to 300 mm long, in the upper area of the hydraulic balancing line on the heating circuit side.

$$D = \sqrt{\frac{\dot{V}_{Kges}}{v} \times \frac{1}{2827}}$$

Form. 9 Formula for sizing the low loss header

**D** Diameter of the hydraulic balancing line in m

$\dot{V}_{Kges}$  Total boiler circuit flow rate in m<sup>3</sup>/h

**v** Total boiler circuit flow rate in m/s

### Example

Given

- Total flow rate  $\dot{V}_{Kges} = 223.6 \text{ m}^3/\text{h}$
- Flow velocity (assumed)  $v = 0.2 \text{ m/s}$

Result

- Diameter of the hydraulic balancing line  $D \approx 0.63 \text{ m}$

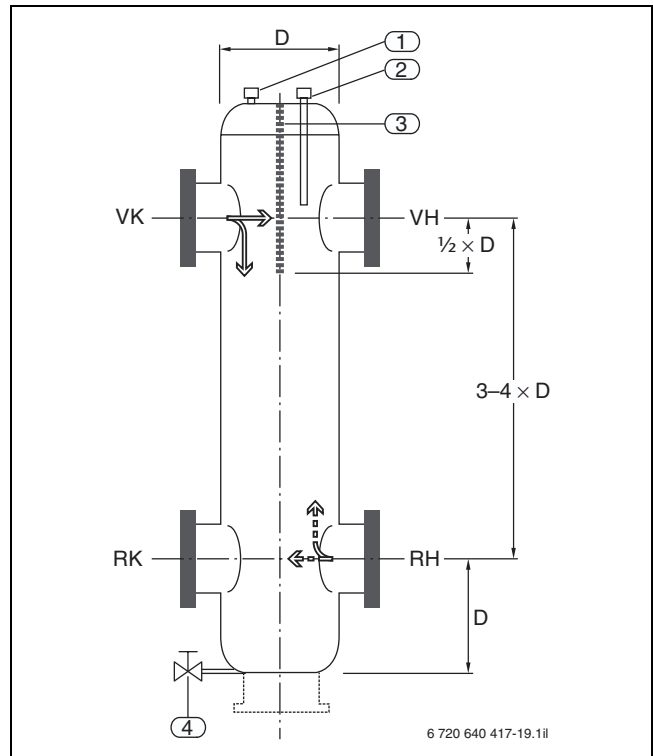


Fig. 58 Schematic diagram of a hydraulic balancing line

**RH** Heating circuit return

**RK** Boiler return

**VH** Heating circuit flow

**VK** Boiler flow

**1** Female connection for an air vent valve

**2** Female connection for a sensor well 1/2 "

**3** Perforated partition

**4** Quick-acting valve

## 9.4 Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler and heating circuit control unit

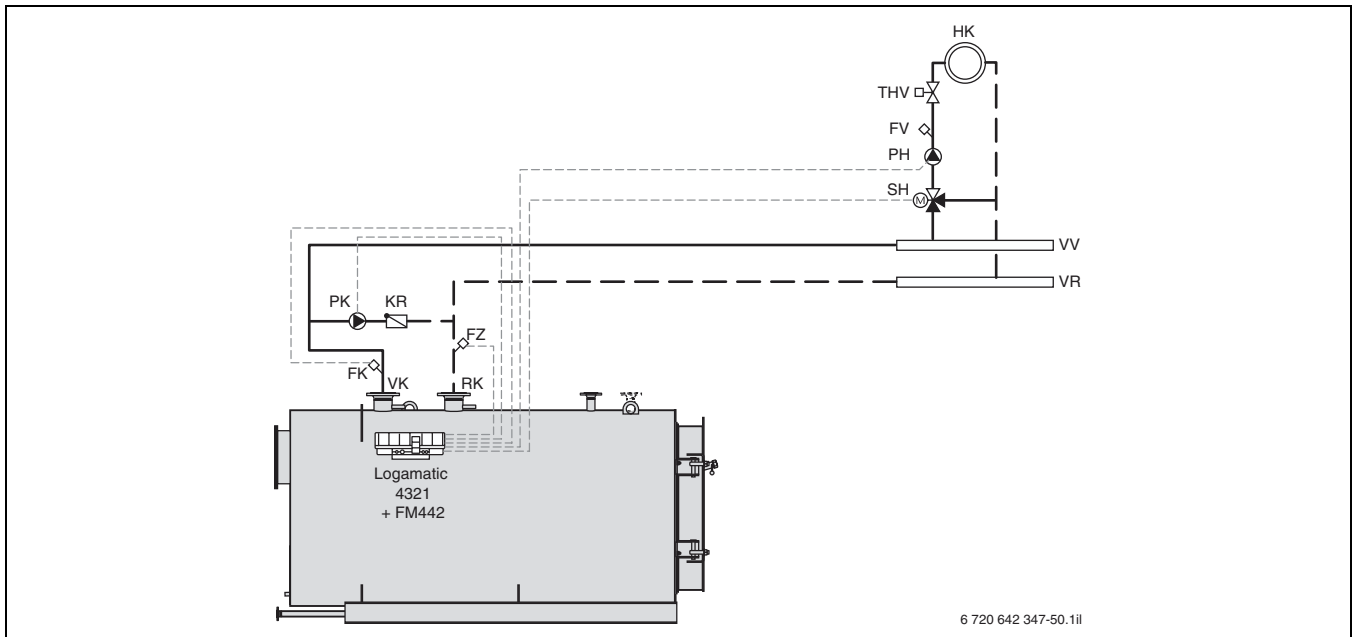


Fig. 59 System example for Logano S825L/L LN with Logamatic boiler and heating circuit control unit  
(List of abbreviations → page 73)



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

### Application area

- Logano S825L and S825L LN conventional boilers
- Logamatic boiler **and** heating circuit control unit

### Brief description of the system

- Control of the minimum return temperature by overriding the heating circuit actuators
- 2-stage or modulating burner mode
- Simple layout

### Function description

The heating circuits are controlled via the heating circuit modules. The boiler circuit pump provides hot flow water to the boiler return. This increases the boiler return temperature. To raise the return temperature, the heating circuit actuators are regulated with overriding control. The heating water flow rate to the boiler is restricted until the set value for return temperature control has been reached by mixing in flow water. Once the set value for the return temperature has been reached, heating circuit control is re-enabled.

### Special design information

- If a check valve is installed, the boiler circuit pump run-on time should be five minutes. If no check valve is installed, set a run-on time of 60 minutes.
- In conjunction with the Logamatic control units, the maximum possible flow temperature of a heating circuit with mixer is 90 °C.

## 9.5 Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler and heating circuit control unit with hydraulic separation

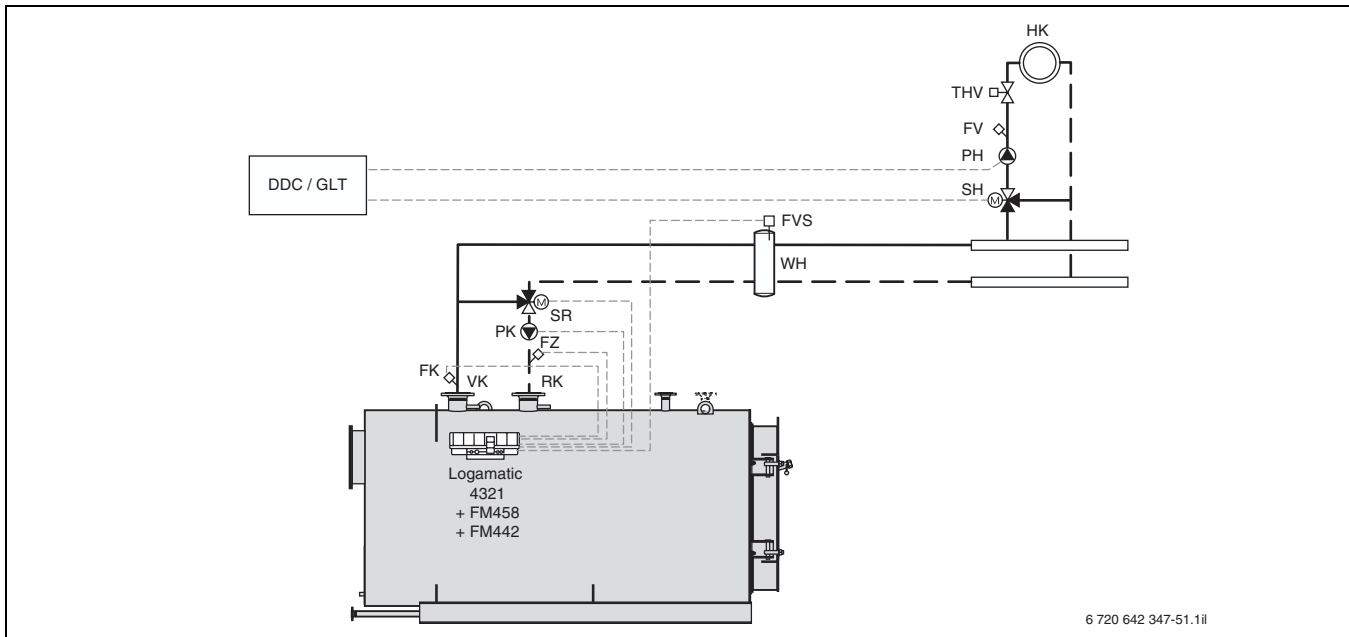


Fig. 60 System example for Logano S825L/L LN with Logamatic boiler and heating circuit control unit and hydraulic separation (List of abbreviations → page 73)



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

### Application area

- Logano S825L and S825L LN conventional boilers
- Logamatic boiler **and** heating circuit control unit
- Hydraulic separation
- System structure in this form if a feed pump is required, e.g. through sizing the heating circuit pumps, or if several distributor stations are required, or if the distributor stations are installed far apart

### Brief description of the system

- Minimum return temperature controlled via a separate actuator in the boiler circuit and a boiler circuit pump
- 2-stage or modulating burner mode
- Automatic or weather-compensated load limitation
- Heating circuit control with Logamatic control unit or on-site control unit

### Function description

The 3-way valve is actuated to control the return temperature. The return temperature sensor measures the boiler return temperature. If this falls below the set value, the heating water flow rate to the boiler return is constantly restricted by actuating the 3-way valve. If the return temperature rises above the set value, the 3-way valve is reopened and the flow rate to the heating circuit increases.

### Special design information

- Size the boiler circuit pump for the maximum calculated flow rate and the pressure drop in the boiler circuit. Switch it to constant mode or set a run-on time of 60 minutes.
- Allow for a low loss header or a distributor with bypass and non-return valve.
- In conjunction with the Logamatic control units, the maximum possible flow temperature of a heating circuit with mixer is 90 °C.

## 9.6 Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler circuit control unit

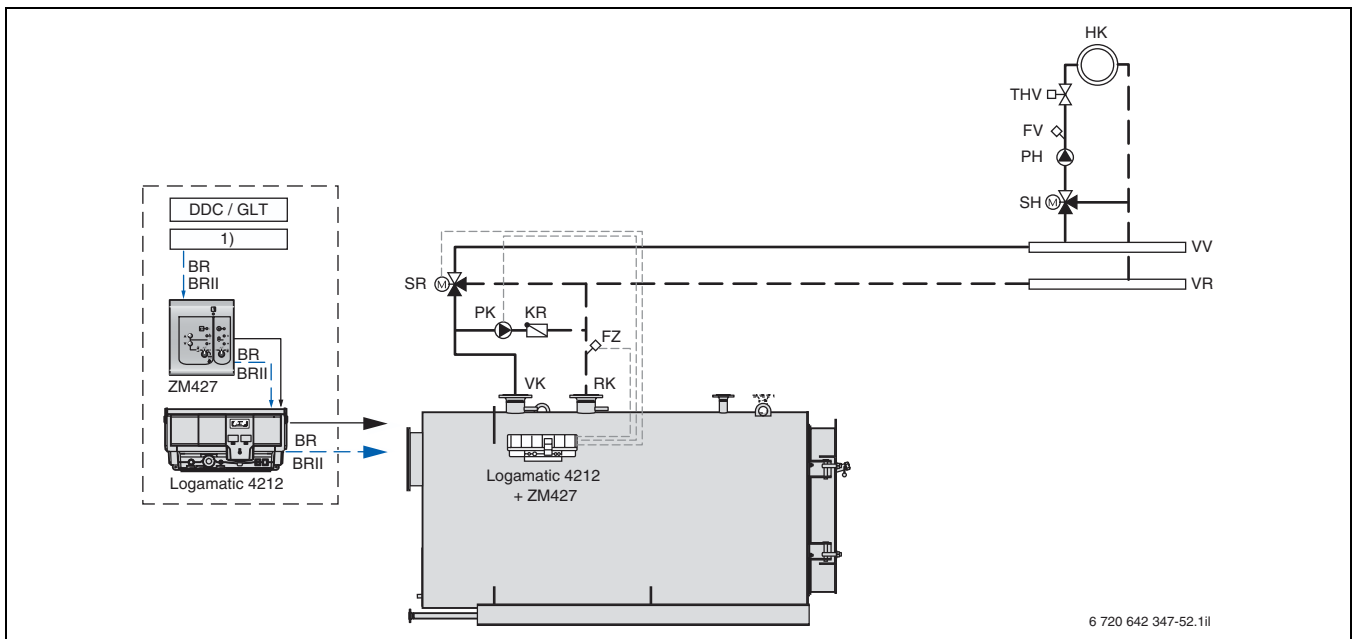


Fig. 61 System example for Logano S825L/L LN with Logamatic boiler circuit control unit  
(List of abbreviations → page 73)

- 1) Enabling (potential-free)  
→ Burner stage I  
→ Burner stage II or modulation



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

### Application area

- Logano S825L and S825L LN conventional boilers
- Logamatic boiler circuit control unit
  - Maintaining the operating conditions
  - Enabling of burner stages

### Brief description of the system

- Minimum return temperature controlled via a separate actuator in the boiler circuit and a boiler circuit pump as a shunt pump
- 2-stage or modulating burner mode
- Heating circuit control with Logamatic control unit or on-site control unit

### Function description

To control the return temperature, the 3-way valve is actuated, as is the boiler circuit pump which is installed in the bypass line to the boiler. The return temperature sensor measures the boiler return temperature. If this falls below the set value, the heating water flow rate to the boiler return is constantly restricted and the bypass from the heating return to the heating flow is opened. The heating circuit flow rate remains almost constant even during this operating phase. The boiler circuit pump safeguards the optimum flow rate in the boiler circuit.

### Special design information

- If a check valve is installed, the boiler circuit pump run-on time should be five minutes. If no check valve is installed, set a run-on time of 60 minutes.

## 9.7 Single boiler system with Logano S825L and S825L LN boiler: Logamatic boiler circuit control unit with hydraulic separation

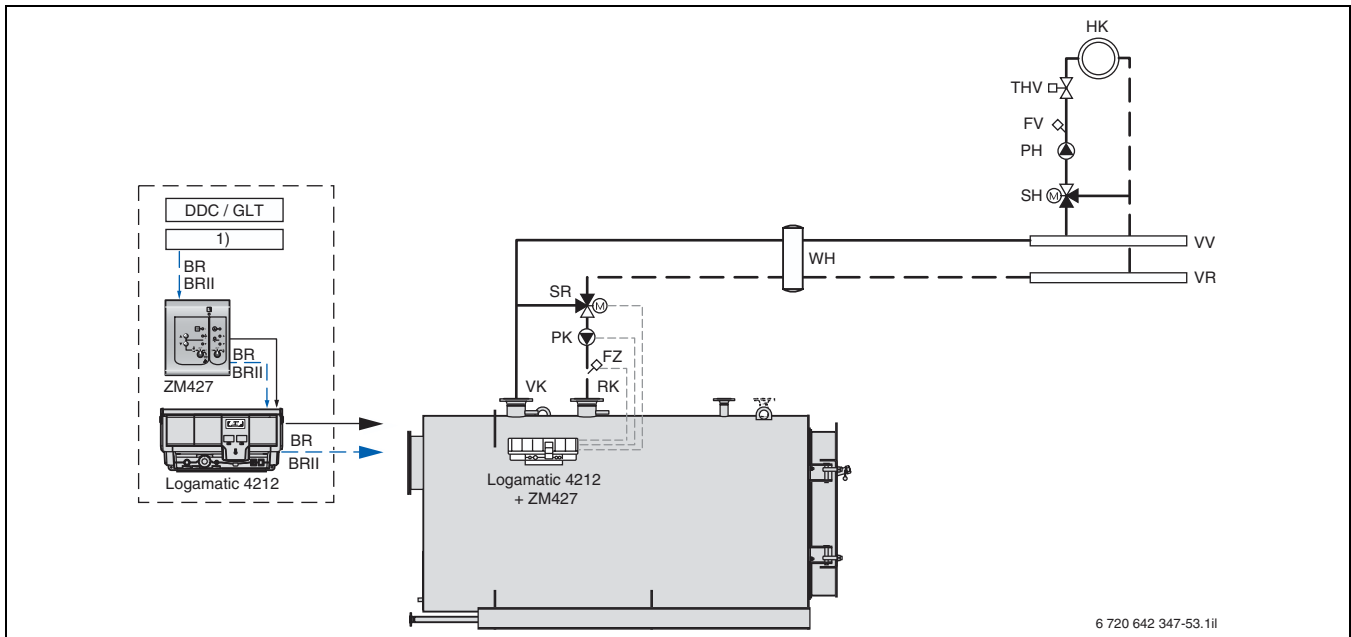


Fig. 62 System example for Logano S825L/L LN with Logamatic boiler circuit control unit and hydraulic separation  
(List of abbreviations → page 73)

- 1) Enabling (potential-free)  
→ Burner stage I  
→ Burner stage II or modulation



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

### Application area

- Logano S825L and S825L LN conventional boilers
- Logamatic boiler circuit control unit
  - Maintaining the operating conditions
  - Enabling of burner stages
- Hydraulic separation
- System structure in this form if a feed pump is required, e.g. through sizing the heating circuit pumps, or if several distributor stations are required, or if the distributor stations are installed far apart

### Brief description of the system

- Minimum return temperature controlled via a separate actuator in the boiler circuit and a boiler circuit pump as a primary circuit pump
- 2-stage or modulating burner mode
- Heating circuit control with Logamatic control unit or on-site control unit

### Function description

The 3-way valve is actuated to control the return temperature. The return temperature sensor measures the boiler return temperature. If this falls below the set value, the heating water flow rate to the boiler return is constantly restricted by actuating the 3-way valve. If the return temperature rises above the set value, the 3-way valve is reopened and the flow rate to the heating circuit increases.

### Special design information

- Allow for a low loss header.
- Switch the boiler circuit pump to constant mode or set a run-on time of 60 minutes.

## 9.8 2-boiler system with two Logano S825L and S825L LN boilers: Logamatic boiler circuit control unit with hydraulic separation

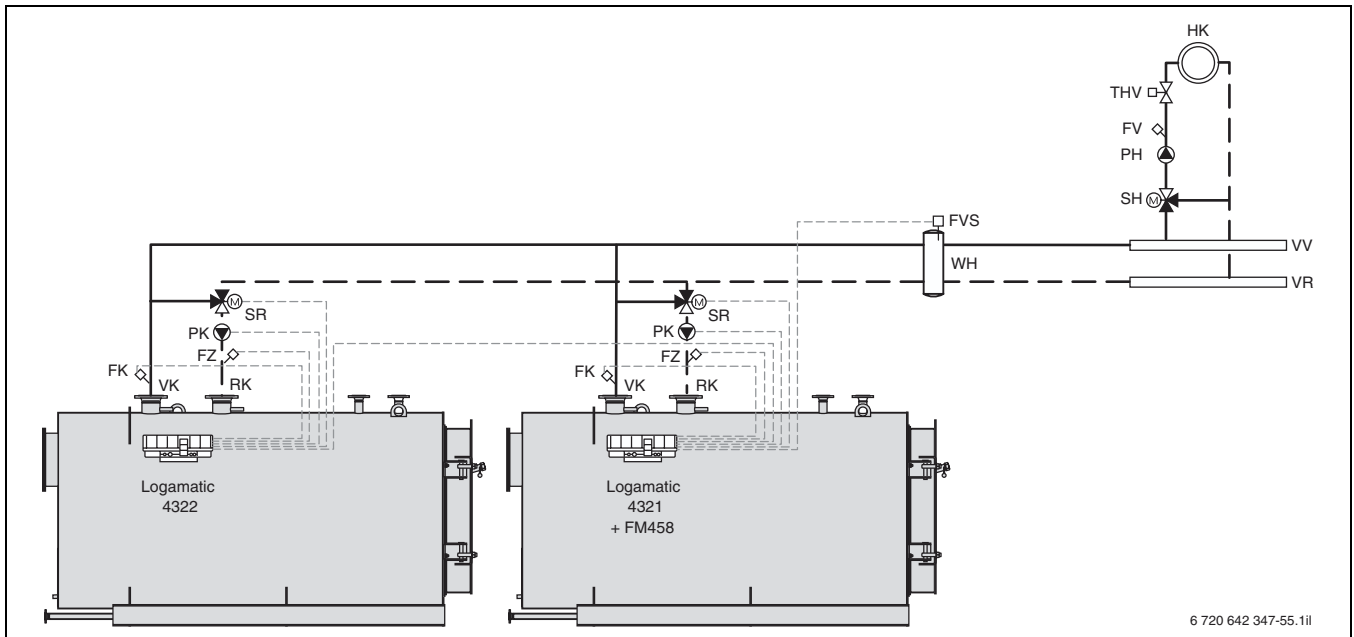


Fig. 63 System example for a 2-boiler system with two Logano S825L/L Ns and Logamatic boiler circuit control unit with hydraulic separation (List of abbreviations → page 73)



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

### Application area

- Logano S825L and S825L LN conventional boilers
- Logamatic boiler circuit control unit
  - Maintaining the operating conditions
  - Enabling of burner stages
- Hydraulic separation

### Brief description of the system

- Minimum return temperature controlled via a separate actuator in the boiler circuit and a boiler circuit pump
- Either serial or parallel operating mode
- 2-stage or modulating burner mode
- Boiler sequence can be reversed
- Hydraulic shut-off of the lag boiler with time delay
- Automatic or weather-compensated load limitation
- Heating circuit control with Logamatic control unit or on-site control unit

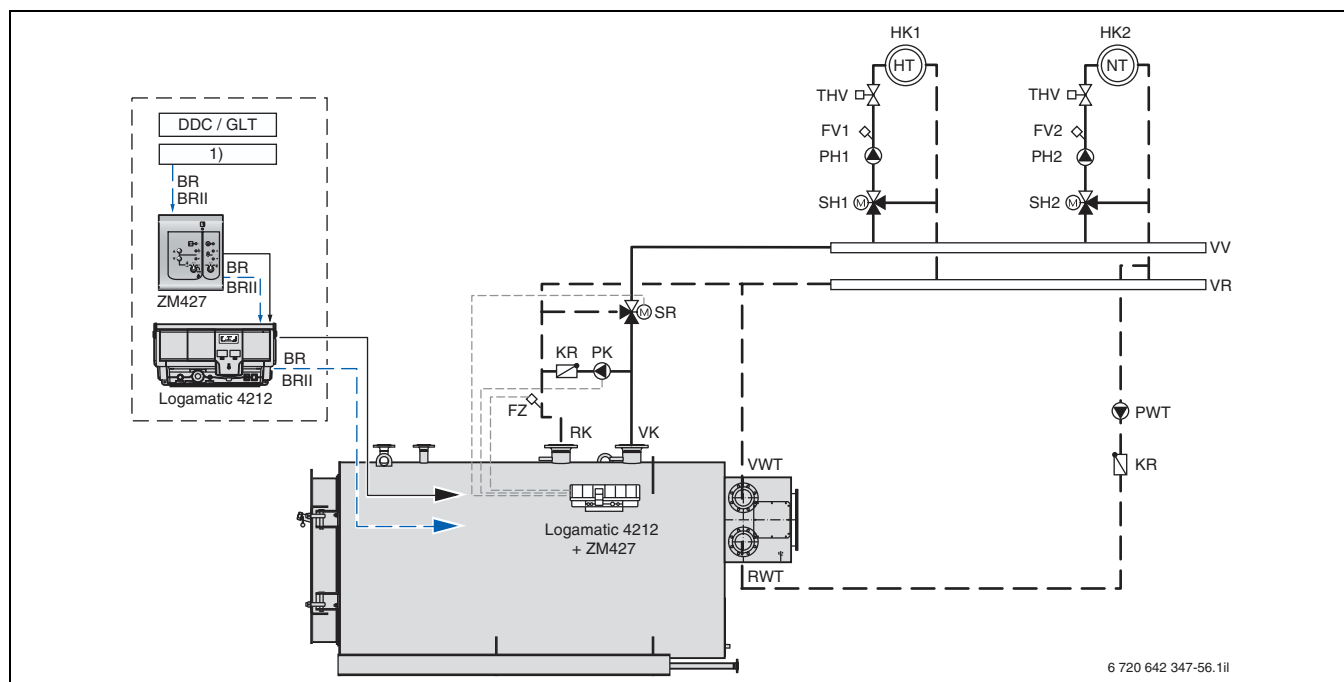
### Function description

The 3-way valve is actuated to control the return temperature. The return temperature sensor measures the boiler return temperature. If this falls below the set value, the heating water flow rate to the boiler return is constantly restricted by actuating the 3-way valve. If the return temperature rises above the set value, the 3-way valve is reopened and the flow rate to the heating circuit increases. Any boilers not in operation are hydraulically shut off.

### Special design information

- Allow for a low loss header.
- The boiler circuit pump run-on time after burner shutdown should be five minutes for the lag boiler, and 30-60 minutes for the lead boiler.
- We recommend distributing the total output between the boilers so each has 50 % (maximum 60/40 %).
- This scheme can also be used if a third boiler is connected.

### 9.9 Single boiler system with Logano plus SB825L and SB825L LN gas condensing boiler: Logamatic boiler circuit control unit



*Fig. 64 System example for Logano plus SB825/L LN with Logamatic boiler circuit control unit  
(List of abbreviations → page 73)*

- 1) Enabling (potential-free)
  - Burner stage I
  - Burner stage II or modulation

The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

## Application area

- Logano plus SB825L and SB825L LN gas condensing boilers with gas combustion
- Logamatic boiler circuit control unit
  - Maintaining the operating conditions
  - Enabling of burner stages
- Partial flow of the condensing heat exchanger (BWT)

### Brief description of the system

- Minimum return temperature controlled via a separate actuator in the boiler circuit and a boiler circuit pump
- 2-stage or modulating burner mode
- Heating circuit control with Logamatic control unit or on-site control unit

### Function description

To control the return temperature, the 3-way valve is actuated, as is the boiler circuit pump which is installed in the bypass line to the boiler. If the return temperature at the return temperature sensor falls below the set value, the heating water flow rate to the boiler return is constantly restricted and the bypass from the heating return to the heating flow is opened.

The heating circuit flow rate remains almost constant even during this operating phase. The boiler circuit pump safeguards the optimum flow rate in the boiler circuit. Targeted utilisation of the condensing effect is possible with the condensing heat exchanger connected separately to the low temperature heating circuit.

### Special design information

- If a check valve is installed, the boiler circuit pump run-on time should be five minutes. If no check valve is installed, set a run-on time of 60 minutes.
- The condensing heat exchanger pump should be actuated in parallel to the burner. Match the delivery head to the pressure drop of the condensing heat exchanger and the connection pipework.
- The flow rate via the condensing heat exchanger must be more than 20 % of the total flow rate and must not exceed the maximum flow rate give in Chapters 3.3.5 to 3.3.8.
- If there are shut-off valves between the boiler and condensing heat exchanger, an additional safety valve and pressure gauge are required at the condensing heat exchanger.
- Protect the condensing heat exchanger with an on-site safety temperature limiter or high limit safety cut-out.

## 9.10 Single boiler system with Logano plus SB825L and SB825L LN gas condensing boiler: Logamatic boiler circuit control unit with hydraulic separation

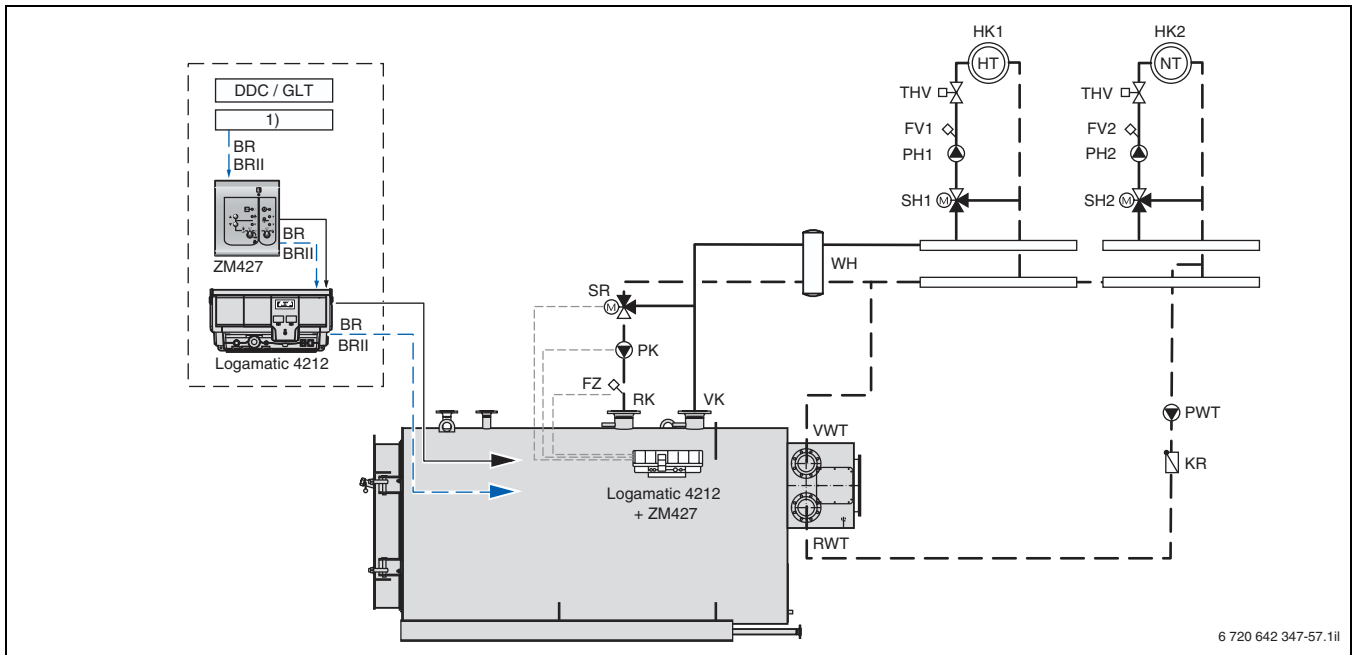


Fig. 65 System example for Logano plus SB825L/LN with Logamatic boiler circuit control unit and hydraulic separation (List of abbreviations → page 73)

- 1) Enabling (potential-free)  
 → Burner stage I  
 → Burner stage II or modulation



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

### Application area

- Logano plus SB825L and SB825L LN gas condensing boilers with gas combustion
- Logamatic boiler circuit control unit
  - Maintaining the operating conditions
  - Enabling of burner stages
- System structure in this form if a feed pump is required, e.g. through sizing the heating circuit pumps, or if several distributor stations are required, or if the distributor stations are installed far apart

### Brief description of the system

- Minimum return temperature controlled via a separate actuator in the boiler circuit and a boiler circuit pump as a primary circuit pump
- 2-stage or modulating burner mode
- Heating circuit control with Logamatic control unit or on-site control unit

### Function description

The 3-way valve is actuated to control the return temperature. The return temperature sensor measures the boiler return temperature. If this falls below the set value, the heating water flow rate to the boiler return is constantly restricted by actuating the 3-way valve. If the return temperature rises above the set value, the 3-way valve is reopened and the flow rate to the heating circuit increases. Targeted utilisation of the condensing effect is possible with the condensing heat exchanger (BWT) connected separately to the low temperature heating circuit.

### Special design information

- If shut-off valves are installed between the boiler and condensing heat exchanger, an additional safety valve and pressure gauge are required at the condensing heat exchanger.
- Allow for a low loss header.
- Switch the boiler circuit pump to constant mode or set a run-on time of 60 minutes.
- The condensing heat exchanger pump should be actuated in parallel to the burner. Match the delivery head to the pressure drop of the condensing heat exchanger and the connection pipework.
- The flow rate via the condensing heat exchanger must be more than 20 % of the total flow rate and must not exceed the maximum flow rate give in Chapters 3.3.5 to 3.3.8.
- Protect the condensing heat exchanger with an on-site safety temperature limiter or high limit safety cut-out.

### 9.11 2-boiler system with Logano S825L and S825L LN conventional boiler and Logano plus SB825L and SB825L LN gas condensing boiler: Logamatic boiler circuit control unit with hydraulic separation

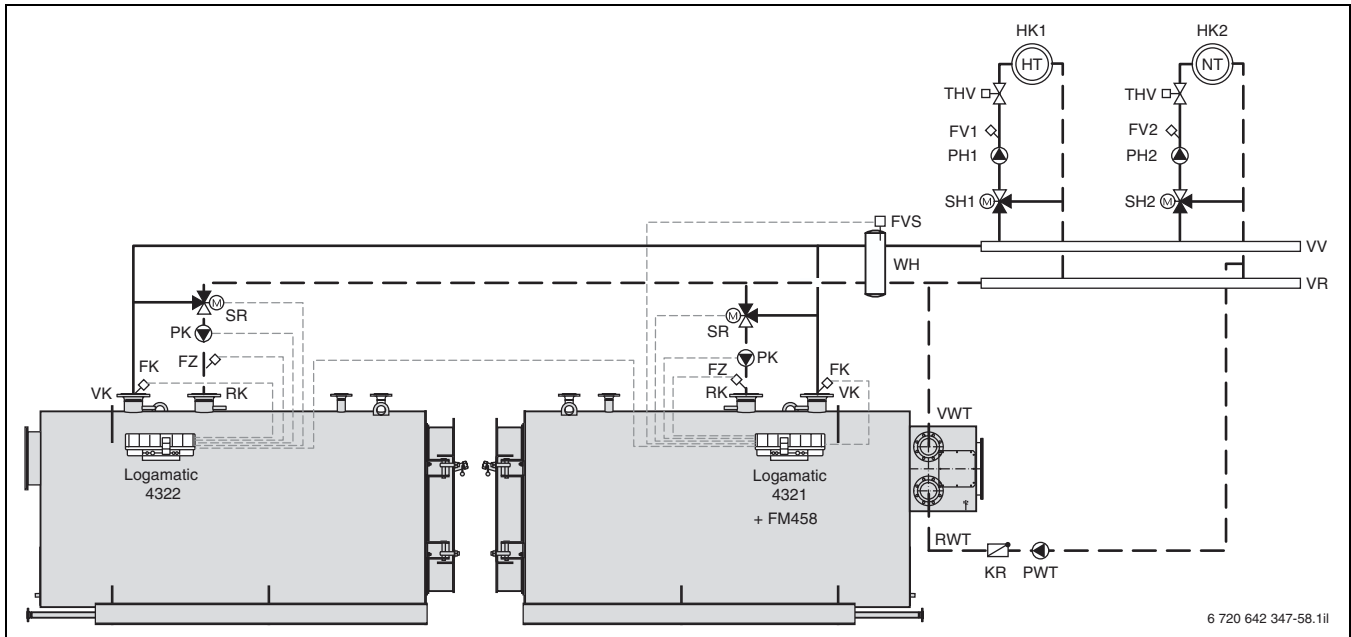


Fig. 66 System example of a 2-boiler system with Logano S825L/L LN and Logano plus SB825L/L LN; Logamatic boiler circuit control unit with hydraulic separation (List of abbreviations → page 73)



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

#### Application area

- Logano plus SB825L and SB825L LN gas condensing boilers and Logano S825L and S825L LN conventional boilers with gas combustion
- Logamatic boiler circuit control unit
  - Maintaining the operating conditions
  - Enabling of burner stages
- Hydraulic separation

#### Brief description of the system

- Lead boiler is the gas condensing boiler
- 2-stage or modulating burner mode
- Boiler sequence can be reversed, but is not recommended
- Hydraulic shut-off of the lag boiler with time delay
- Automatic or weather-compensated load limitation

#### Function description

The 3-way valve is actuated to control the return temperature. The return temperature sensor measures the boiler return temperature. If this falls below the set value, the heating water flow rate to the boiler return is constantly restricted by actuating the 3-way valve. If the return temperature rises above the set value, the 3-way valve is reopened and the flow rate to the heating circuit increases.

Any boilers not in operation are hydraulically shut off. Targeted utilisation of the condensing effect is possible with the condensing heat exchanger (BWT) connected separately to the low temperature heating circuit.

#### Special design information

- The boiler circuit pump run-on times are set to 30-60 minutes for the lead boiler and five minutes for the lag boiler.
- We recommend distributing the total output between the boilers so each has 50 % (maximum 60/40 %).
- The condensing heat exchanger pump should be actuated in parallel to the burner. Match the delivery head to the pressure drop of the condensing heat exchanger and the connection pipework.
- The flow rate via the condensing heat exchanger must be more than 20 % of the total boiler flow rate and must not exceed the maximum flow rate give in Chapters 3.3.5 to 3.3.8.
- If there are shut-off valves between the boiler and condensing heat exchanger, an additional safety valve and pressure gauge are required at the condensing heat exchanger.
- Protect the condensing heat exchanger with an on-site safety temperature limiter or high limit safety cut-out.
- This scheme can also be used if a third boiler is connected.

## 9.12 Logano plus SB825L and SB825L LN gas condensing boiler: dual fuel combustion with condensing heat exchanger

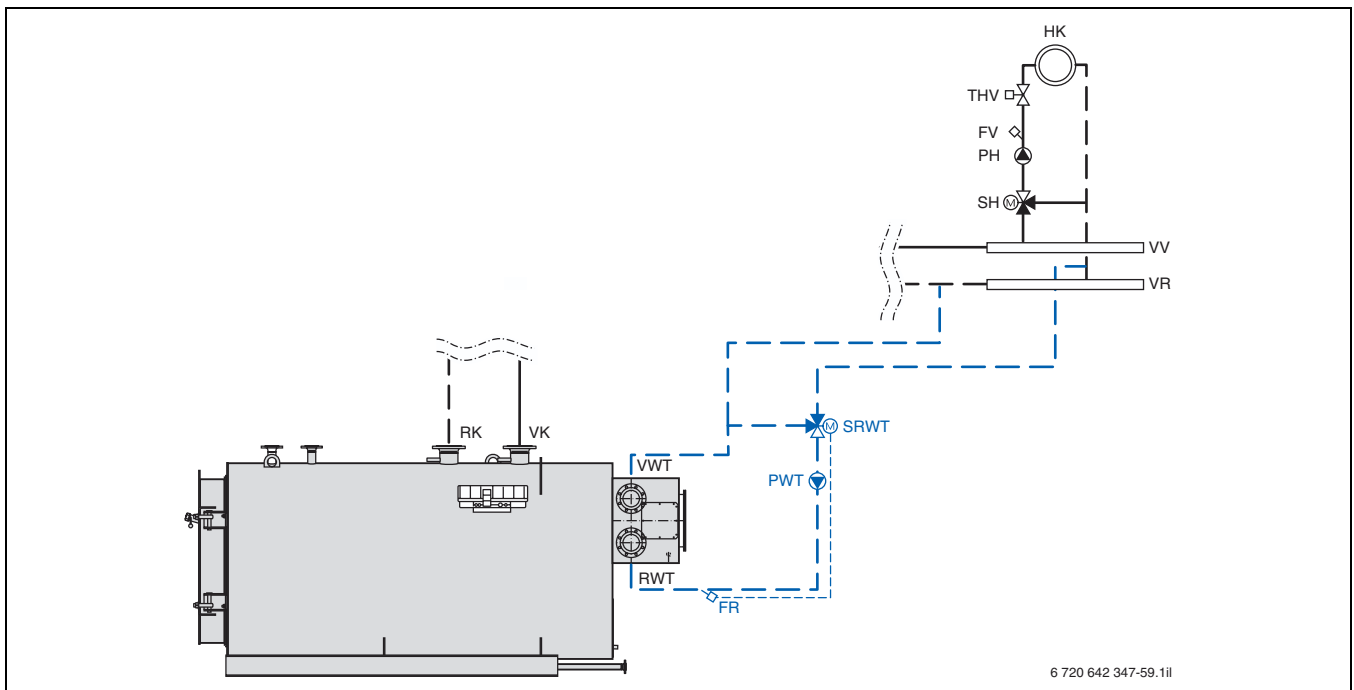


Fig. 67 Installation of the condensing heat exchanger in the Logano plus SB825L/L LN with dual fuel combustion  
(List of abbreviations → page 73)



The circuit diagram is only a schematic illustration. Information regarding all system examples → page 73 ff.

### Application area

- Logano plus SB825L and SB825L LN gas condensing boilers
- Oil/gas combi burners
- Systems with a gas cut-off contract

### Brief description of the system

- Combustion with gas, for brief periods with oil
- The operating conditions of the condensing heat exchanger (BWT) are safeguarded with oil combustion by a separate actuator in conjunction with a return temperature controller

### Function description

With gas combustion, the additional return actuator SRWT is fully opened in the connection pipework of the condensing heat exchanger on the water side. After changing to oil combustion, the return temperature control with 3-point output is enabled via a temperature controller. If the temperature falls below the minimum return temperature of 60 °C, the mixer closes. The cold return water cannot enter the condensing heat exchanger. If the temperature in this circuit rises above 60 °C, the mixer enables the system return.

### Special design information

- If the actuator SRWT is installed between the boiler and condensing heat exchanger, an additional safety valve and pressure gauge are required at the condensing heat exchanger.
- Control of the actuator SRWT should be arranged on site or in conjunction with a control panel.
- Size the pump for the condensing heat exchanger according to its pressure drop and the pressure drop in the circuit.
- Route away the condensate that occurs in the flue system with oil combustion separately and neutralise it (→ page 112 f.).
- Special operating conditions must be observed with oil combustion. Your local Buderus sales office will advise you on suitable return temperature controllers.
- The condensing heat exchanger pump is actuated in parallel to the burner.
- The flow rate via the condensing heat exchanger must be more than 20 % of the total flow rate and must not exceed the maximum flow rate give in Chapters 3.3.5 to 3.3.8.

## 10 Installation

### 10.1 Transport and handling

#### 10.1.1 Delivery method and transport options

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, are delivered in a transport unit.

#### Transport

To transport the boiler block with a crane, only use the two lifting eyes. These are fitted at the top of the boiler pressure body, at the front and back.

The boiler block can be transported on level ground on its base frame, e.g. on rollers.

#### Standard delivery

- Logano S825L and S825L LN conventional boilers
  - Boiler block with thermal insulation
  - Burner door
  - Welded flue gas collector
  - Mating flange on the flue gas side (not in the “standardised” boiler version)
  - Fireproof filling material (commonly called tamping clay)
  - Technical documentation

- Also part of the standard delivery for standardised boiler versions:
  - Control unit retainer for Logano S825L/L LN “standardised”
  - Foil packaging for Logano S825L “standardised”

- Logano plus SB825L and SB825L LN gas condensing boilers
  - Boiler block with thermal insulation
  - Burner door
  - Welded flue gas collector with condensing flue gas heat exchanger
  - Fireproof filling material (commonly called tamping clay)
  - Technical documentation

#### 10.1.2 Handling dimensions

For handling the boiler, it is essential to size the entrance to the installation room slightly larger than the boiler dimensions. See Tab. 51 for the minimum handling

dimensions. If the minimum dimensions cannot be achieved, please contact your local Buderus sales office.

| Logano S825L<br>Logano plus SB825L<br>Boiler size | Logano S825L LN<br>Logano plus SB825L LN<br>Boiler size | Entrance                  |                        |                                  |                        |
|---------------------------------------------------|---------------------------------------------------------|---------------------------|------------------------|----------------------------------|------------------------|
|                                                   |                                                         | Logano S825L and S825L LN |                        | Logano plus SB825L and SB825L LN |                        |
|                                                   |                                                         | Minimum width<br>[mm]     | Minimum height<br>[mm] | Minimum width<br>[mm]            | Minimum height<br>[mm] |
| 650                                               | –                                                       | 1350                      | 1850                   | 1500                             | 1865                   |
| 1000                                              | 750                                                     | 1500                      | 2000                   | 1650                             | 2015                   |
| 1350                                              | 1000                                                    | 1600                      | 2100                   | 1755                             | 2115                   |
| 1900                                              | 1250                                                    | 1700                      | 2200                   | 1855                             | 2215                   |
| 2500                                              | 1500                                                    | 1750                      | 2250                   | 1910                             | 2265                   |
| 3050                                              | 2000                                                    | 1850                      | 2350                   | 1995                             | 2365                   |
| 3700                                              | 2500                                                    | 1900                      | 2400                   | 2060                             | 2415                   |
| 4200                                              | 3000                                                    | 2000                      | 2500                   | 2155                             | 2515                   |
| 5200                                              | 3500                                                    | 2100                      | 2600                   | 2250                             | 2615                   |
| 6500                                              | 4250                                                    | 2300                      | 2800                   | 2435                             | 2800                   |
| 7700                                              | 5250                                                    | 2450                      | 2950                   | 2605                             | 2950                   |
| 9300                                              | 6000                                                    | 2600                      | 3100                   | 2750                             | 3100                   |
| 11200                                             | 8000                                                    | 2750                      | 3300                   | 2905                             | 3250                   |
| 12600                                             | 10000                                                   | 2900                      | 3400                   | 3045                             | 3400                   |
| 14700                                             | 12000                                                   | 3100                      | 3650                   | 3240                             | 3600                   |
| 16400                                             | 14000                                                   | 3400                      | 3950                   | 3555                             | 3900                   |
| 19200                                             | 17500                                                   | 3600                      | 4150                   | 3750                             | 4100                   |

Tab. 51 Minimum handling dimensions of Logano S825L/L LN and Logano plus SB825L/L LN

## 10.2 Design of installation rooms and combustion air supply

### 10.2.1 Installation room

#### Fundamental requirements

The following fundamental requirements of the installation room must be fulfilled:

- Only install the boiler system in a room that complies with relevant local regulations.
- Keep the installation room clean and free of dust and dripping water. The inside temperature must be between 5 °C and 40 °C.
- Entry to the boiler installation room must be forbidden to unauthorised personnel by noticeable, permanent signs.
- Depending on the boiler parameters (water content, pressure, output) and national regulations, less stringent installation or monitoring conditions may apply.
- Ensure sound insulation measures comply with local regulations.
- Install the control panels in such a way that no vibrations or shaking of the system components can be transmitted to the control panels. Install in areas where the control panels will be protected from impermissible heat radiation and ensure safe accessibility even in potentially dangerous circumstances.
- Free access to inspection apertures on boilers and system components must be ensured.

#### Requirements of the building

The following requirements of the building must be fulfilled:

- The installation location must be constructed in such a way that vibrations as a result of operation cannot cause any damage to buildings or adjacent systems.
- The static of the building structure must be taken into account for all fixings.
- Every boiler installation room must have a continuous or nearly continuous, free external wall or ceiling area of at least 1/10 the floor area (or as per local regulations), that will yield much more easily than the other surrounding walls if overpressure occurs in the boiler installation room.
- Design the entrance to the boiler installation room according to the dimensions of the individual components.
- Provide suitable lifting gear in the boiler installation room to move heavy equipment.
- The internal height and width of all walk-on surfaces must be sufficient. Access to the system must be ensured in line with local regulations. If the internal height of the installation room is lower than required for structural reasons, determine the minimum height together with the local responsible authorities.
- Suitable and designated escape routes must be available.
- The boiler installation room, especially around the valves and safety equipment, as well as the escape routes, must be illuminated.
- System components that are to be operated must be easily accessible and there must be enough space to open doors (including inspection apertures).

### 10.2.2 Combustion air supply

The design of installation rooms and the installation of boilers must comply with the relevant national regulations.

#### Fundamental requirements

- Combustion air apertures and lines must never be closed or covered unless there is special safety equipment that ensures the combustion equipment can only be operated if the flow cross-section is unobstructed.
- The required cross-section must not be restricted by a closure or grille.
- An adequate supply of combustion air must be verified.
- The ventilation air supply to the combustion equipment should come from the boiler installation room to compensate for outside temperature fluctuations. The maximum temperature fluctuation must not exceed 30 K.
- Combustion air temperature:
  - Minimum: + 5 °C  
or as specified by burner manufacturer
  - Maximum: + 40 °C  
or as specified by burner manufacturer

#### Arrangement of ventilation and extract air apertures

- Ideally, ventilation air apertures are arranged near the back of the boiler. If this is not possible for structural reasons, install air baffles or sheet metal channels inside the boiler installation room to deflect the inlet air.
- When designing the ventilation air apertures, the arrangement of frost-sensitive system components must also be taken into account (e.g. water treatment) if they cannot be installed in the direct path of the ventilation air.
- Furthermore, install the ventilation air apertures in the boiler installation room in such a way that the ventilation air does not flow over boiler doors or reversing chambers (to prevent condensation).
- Extract air apertures should also be provided.
- Ventilation air apertures should be fitted 500 mm above the boiler room floor; extract air apertures should be fitted at the highest point of the installation room. Ensure cross venting.

#### Sizing ventilation and extract air apertures

- Size ventilation and extract air apertures to obtain a pressure of  $\pm 0$  mbar in the boiler installation room.
- If the combustion air is routed via air inlet channels to the burner, ensure an optimised flow path and adequate sizing with regard to the pressure drop.
- The side ratio of the aperture must not be more than 1:2.
- Extract air cross-sections correspond to 60 % of the ventilation air cross-sections.

The calculation formulae below are a **non-binding recommendation**. It is essential that the system installer seeks the agreement of the responsible approval or building regulations body. Take into account additional consumers of ventilation air (e.g. compressors) when sizing.

| For outputs ...                 | ... the following calculation applies for the free ventilation air cross-section <sup>1)</sup> |
|---------------------------------|------------------------------------------------------------------------------------------------|
| $\leq 2000 \text{ kW}$          | $A = 300 + [(Q - 50) \times 2.5]$                                                              |
| $> 2000, \leq 20000 \text{ kW}$ | $A = 5175 + [(Q - 2000) \times 1.75]$                                                          |
| $> 20000 \text{ kW}$            | $A = 36675 + [(Q - 20000) \times 0.88]$                                                        |

Tab. 52 Calculating free ventilation air cross-sections

1) A = free cross-section (net) in  $\text{cm}^2$ , Q = output in kW

## 10.3 Installed dimensions

### 10.3.1 Installation room dimensions for the Logano S825L and S825L LN conventional boilers

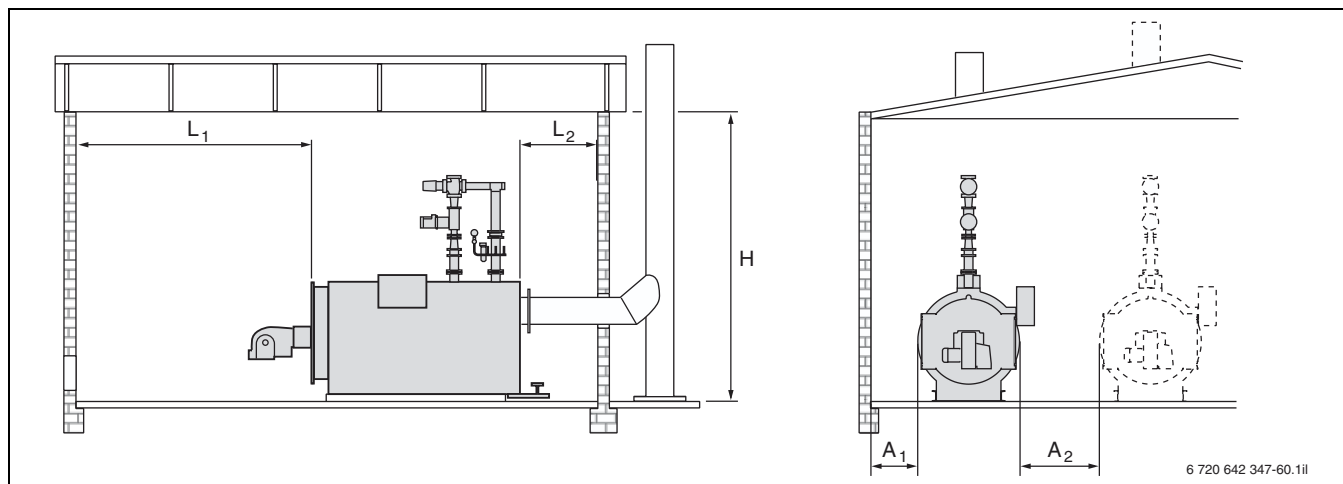


Fig. 68 Installation room dimensions Logano S825L/L LN

Allow extra space for sound insulation measures. Maintain the specified wall clearances to facilitate installation, service and maintenance work. If it is not possible to keep

to the recommended clearances, consult your local Buderus sales office to ensure the functional reliability of the system can be ensured.

| Logano S825L<br>Boiler size | Logano S825L LN<br>Boiler size | Installation room dimensions <sup>1)</sup> |                        |            |                              |                        |
|-----------------------------|--------------------------------|--------------------------------------------|------------------------|------------|------------------------------|------------------------|
|                             |                                | Length                                     |                        | Height     | Side clearance <sup>2)</sup> |                        |
|                             |                                | L <sub>1</sub><br>[mm]                     | L <sub>2</sub><br>[mm] | H<br>[mm]  | A <sub>1</sub><br>[mm]       | A <sub>2</sub><br>[mm] |
| 650                         | –                              | 2100                                       | 1000                   | 3300       | 500                          | 1200                   |
| 1000                        | 750                            | 2500                                       | 1000                   | 3500       | 500                          | 1300                   |
| 1350                        | 1000                           | 2750                                       | 1000                   | 3800       | 500                          | 1300                   |
| 1900                        | 1250                           | 3000                                       | 1000                   | 4100       | 500                          | 1300                   |
| 2500                        | 1500                           | 3500                                       | 1000                   | 4100       | 500                          | 1300                   |
| 3050                        | 2000                           | 3500                                       | 1000                   | 4400       | 500                          | 1500                   |
| 3700                        | 2500                           | 3850                                       | 1000                   | 4400       | 500                          | 1500                   |
| 4200                        | 3000                           | 4250                                       | 1000                   | 4600       | 500                          | 1550                   |
| 5200                        | 3500                           | 4400                                       | 1000                   | 5100       | 500                          | 1650                   |
| 6500                        | 4250                           | 4800                                       | 1000                   | 5600       | 500                          | 1800                   |
| 7700                        | 5250                           | 5000                                       | 1000                   | on request | 500                          | 1800                   |
| 9300                        | 6000                           | 5200                                       | 1000                   | on request | 500                          | on request             |
| 11200                       | 8000                           | 5650                                       | 1000                   | on request | 500                          | on request             |
| 12600                       | 10000                          | 5950                                       | 1000                   | on request | 500                          | on request             |
| 14700                       | 12000                          | 6700                                       | 1000                   | on request | 500                          | on request             |
| 16400                       | 14000                          | 7150                                       | 1000                   | on request | 500                          | on request             |
| 19200                       | 17500                          | 7600                                       | 1000                   | on request | 500                          | on request             |

Tab. 53 Installation room dimensions Logano S825L/L LN (dim. of the boiler foundation → Tab. 63, page 105)

1) The values given are a guide. They may differ subject to the individual system.

2) Subject to the burner; the values given are a guide. The burner door can pivot either to the right or left.

### 10.3.2 Installation room dimensions for the Logano plus SB825L and SB825L LN gas condensing boilers

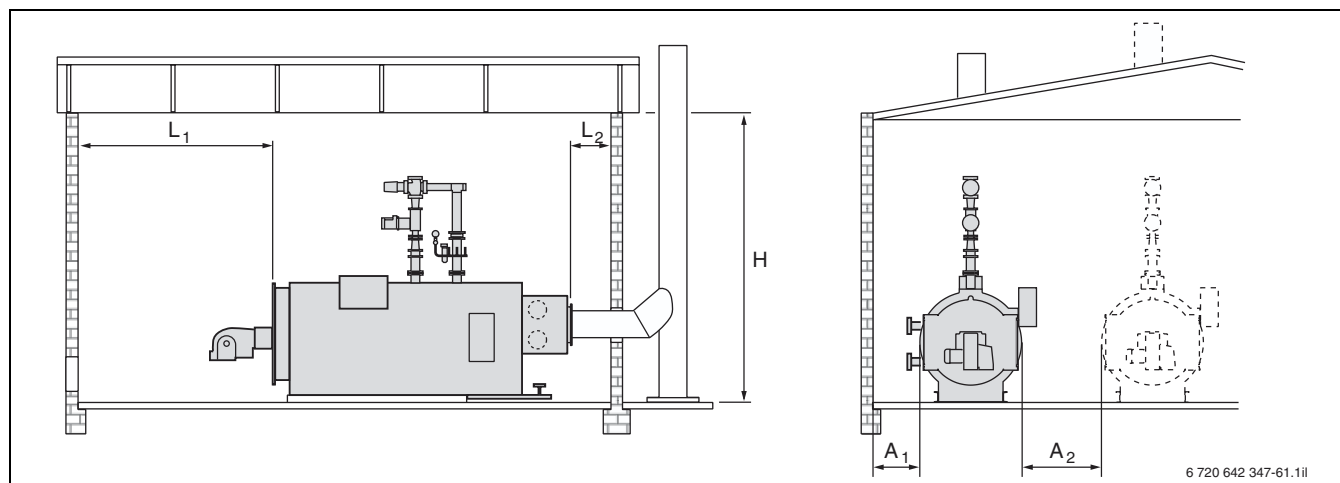


Fig. 69 Installation room dimensions Logano plus SB825L/L LN

Allow extra space for sound insulation measures. Maintain the specified wall clearances to facilitate installation, service and maintenance work. If it is not possible to keep

to the recommended clearances, consult your local Buderus sales office to ensure the functional reliability of the system can be ensured.

| Logano plus<br>SB825L<br>Boiler size | Logano plus<br>SB825L LN<br>Boiler size | Installation room dimensions <sup>1)</sup> |                        |                     |                              |                        |
|--------------------------------------|-----------------------------------------|--------------------------------------------|------------------------|---------------------|------------------------------|------------------------|
|                                      |                                         | Length <sup>2)</sup>                       |                        | Height<br>H<br>[mm] | Side clearance <sup>3)</sup> |                        |
|                                      |                                         | L <sub>1</sub><br>[mm]                     | L <sub>2</sub><br>[mm] |                     | A <sub>1</sub><br>[mm]       | A <sub>2</sub><br>[mm] |
| 1000                                 | 750                                     | 2700                                       | 500                    | 3500                | 700                          | 1300                   |
| 1350                                 | 1000                                    | 2950                                       | 500                    | 3800                | 700                          | 1300                   |
| 1900                                 | 1250                                    | 3200                                       | 500                    | 4100                | 800                          | 1300                   |
| 2500                                 | 1500                                    | 3700                                       | 500                    | 4100                | 900                          | 1300                   |
| 3050                                 | 2000                                    | 3700                                       | 500                    | 4400                | 900                          | 1500                   |
| 3700                                 | 2500                                    | 4050                                       | 500                    | 4400                | 950                          | 1500                   |
| 4200                                 | 3000                                    | 4450                                       | 500                    | 4600                | 950                          | 1550                   |
| 5200                                 | 3500                                    | 4600                                       | 500                    | 5100                | 950                          | 1650                   |
| 6500                                 | 4250                                    | 5000                                       | 500                    | 5600                | 950                          | 1800                   |
| 7700                                 | 5250                                    | 5200                                       | 500                    | on request          | 1000                         | 1800                   |
| 9300                                 | 6000                                    | 5450                                       | 500                    | on request          | 1000                         | on request             |
| 11200                                | 8000                                    | 5900                                       | 500                    | on request          | 1000                         | on request             |
| 12600                                | 10000                                   | 6200                                       | 500                    | on request          | 1000                         | on request             |
| 14700                                | 12000                                   | 6950                                       | 500                    | on request          | 1000                         | on request             |
| 16400                                | 14000                                   | 7400                                       | 500                    | on request          | 1050                         | on request             |
| 19200                                | 17500                                   | 7850                                       | 500                    | on request          | 1050                         | on request             |

Tab. 54 Installation room dimensions Logano plus SB825L/L LN  
(dim. of the boiler foundation → Tab. 63, page 105)

- 1) The values given are a guide. They may differ subject to the individual system.
- 2) Length L<sub>1</sub> relative to a condensing heat exchanger with a tube bundle element; with a condensing heat exchanger with two tube bundle elements, the length increases by 300 mm.
- 3) Subject to the burner; the values given are a guide. The burner door can pivot either to the right or left.

## 10.4 Additional safety equipment to DIN-EN 12828

### 10.4.1 Safety equipment

| Safety equipment version                            | High limit safety cut-out (STB) with shutdown temperature $\leq 110\text{ °C}$<br>Heat source $> 300\text{ kW}$ |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Safety equipment assembly, standard equipment level | Required                                                                                                        |
| Set with STB and maximum pressure limiter           | Required <sup>1)</sup>                                                                                          |
| Minimum pressure limiter                            | Alternative to low water indicator                                                                              |

Tab. 55 Safety equipment versions for Logano S825L/L LN and Logano plus SB825L/L LN

1) As an alternative to a flash trap, the set with STB and maximum pressure limiter can be used

| Safety component          | Make                                                            | Component designation |
|---------------------------|-----------------------------------------------------------------|-----------------------|
| Low water indicator       | Sasserath SYR 0933.20.011 <sup>1)</sup>                         | TÜV HWB-96-190        |
| Maximum pressure limiter  | Sauter DSH 143 F 001 <sup>2)</sup> / DSH 146 F001 <sup>3)</sup> | TÜV SDB-00-331        |
| Minimum pressure limiter  | Sauter DSL 143 F 001 <sup>4)</sup> / DSL 152 F001 <sup>5)</sup> | TÜV SDBF-00-330       |
| High limit safety cut-out | Sauter RAK 13.4040 <sup>6)</sup>                                | STB 1006 98           |

Tab. 56 Approval designation of safety components Logano S825L/L LN and Logano plus SB825L/L LN

1) As an alternative, a minimum pressure limiter can be used

2) Setting range 0.5 bar to 6 bar

3) Setting range 1 bar to 10 bar

4) Setting range 0 bar to 6 bar

5) Setting range 6 bar to 16 bar

6) Setting range 95 °C to 120 °C

### 10.4.2 Boiler safety equipment assembly to DIN-EN 12828

An intermediate flow piece and valve distributor are required to install the safety equipment.

Versions flange PN16 to DIN 2633:

- DN32/40/50/65/80/100/125/150/200/250/300/350

The safety equipment assembly for “standardised” boiler versions consists of:

- Intermediate flow piece
- Shut-off valve
- Valve distributor
- Minimum pressure limiter
- Pressure gauge
- Pressure gauge shut-off valve with test connection

The safety equipment assembly in the standard equipment level consists of:

- Intermediate flow piece
- Shut-off valve
- Valve distributor
- Minimum pressure limiter or low water indicator
- Pressure gauge
- Pressure gauge shut-off valve with test connection
- Maximum pressure limiter

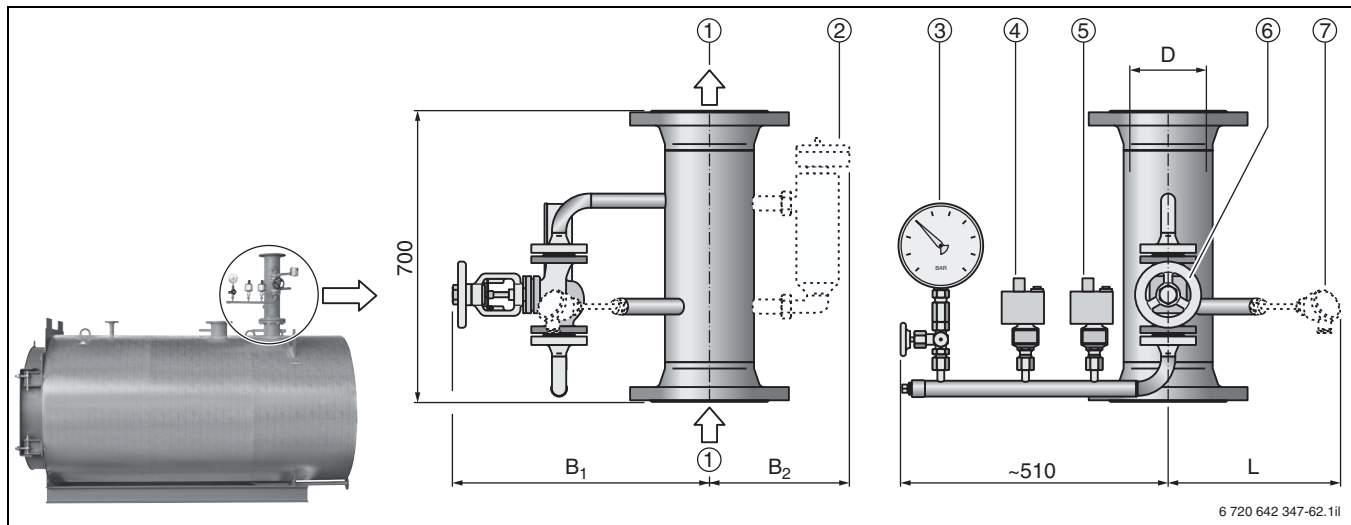


Fig. 70 Boiler safety equipment assembly for Logano S825L/L LN and Logano plus SB825L/L LN (intermediate flow piece with valve distributor and valves; dim. in mm)

- |   |                                                              |   |                                                           |
|---|--------------------------------------------------------------|---|-----------------------------------------------------------|
| 1 | Flow                                                         | 5 | Level limiter (designed as minimum pressure switch)       |
| 2 | Level limiter<br>(designed as low water indicator, optional) | 6 | Shut-off valve DN20                                       |
| 3 | Pressure indicator (with test function)                      | 7 | Temperature sensor<br>(variable output control, optional) |
| 4 | Maximum pressure limiter                                     |   |                                                           |

| Intermediate flow piece<br>Type | Internal<br>diameter <sup>1)</sup><br>D | Length<br>L<br>[mm] | Dimensions<br>Width    |                        | Volume<br>[l] | Shipping weight<br>[kg] |
|---------------------------------|-----------------------------------------|---------------------|------------------------|------------------------|---------------|-------------------------|
|                                 |                                         |                     | B <sub>1</sub><br>[mm] | B <sub>2</sub><br>[mm] |               |                         |
| VZ 50                           | DN50                                    | 300                 | 450                    | 225                    | 3.8           | 25                      |
| VZ 65                           | DN65                                    | 300                 | 450                    | 225                    | 3.3           | 24                      |
| VZ 80                           | DN80                                    | 300                 | 450                    | 225                    | 4.3           | 27                      |
| VZ 100                          | DN100                                   | 310                 | 460                    | 240                    | 6.3           | 33                      |
| VZ 125                          | DN125                                   | 320                 | 475                    | 250                    | 9.3           | 38                      |
| VZ 150                          | DN150                                   | 330                 | 490                    | 265                    | 13.8          | 44                      |
| VZ 200                          | DN200                                   | 345                 | 515                    | 290                    | 23.3          | 59                      |
| VZ 250                          | DN250                                   | 365                 | 540                    | 320                    | 38.0          | 77                      |
| VZ 300                          | DN300                                   | 385                 | 565                    | 345                    | 53.0          | 94                      |
| VZ 350                          | DN350                                   | 395                 | 580                    | 360                    | 62.0          | 130                     |
| VZ 400                          | DN400                                   | 415                 | 610                    | 385                    | 83.0          | 141                     |

Tab. 57 Specification of the intermediate flow piece for Logano S825L/L LN and Logano plus SB825L/L LN

1) Design of the flange connections: PN16 to DIN 2633 ( $\leq 16$  bar,  $\leq 120$  °C)

### 10.4.3 Intermediate return piece

An intermediate return piece can be provided for installing the safety expansion line and for height compensation of the intermediate flow piece (→ Tab. 57, page 98).  
A further temperature sensor can be connected to this.

A fully functioning intermediate return piece is already integrated into the return temperature raising set (→ page 102).

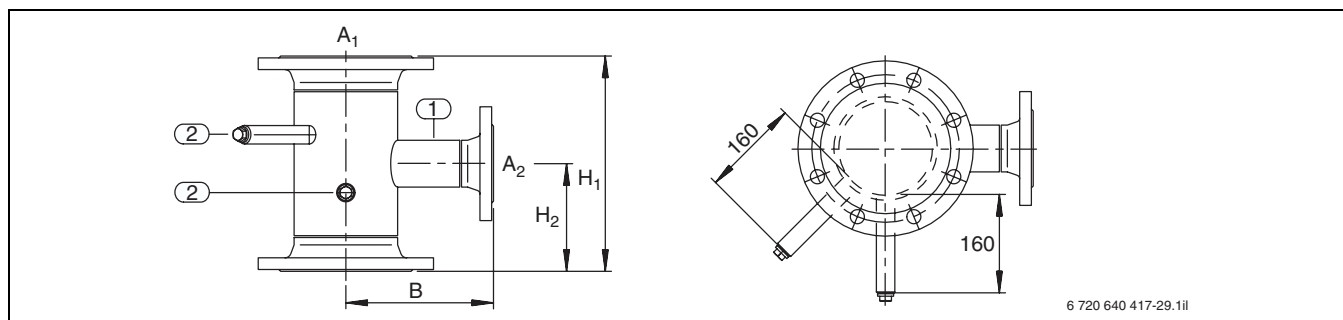


Fig. 71 Intermediate return piece for Logano S825L/L LN and Logano plus SB825L/L LN (dim. in mm)

- 1 Flange connection for expansion line
- 2 Thermometer or temperature sensor connection

| Intermediate<br>return piece<br>Type | Internal diameter            |                              | Dimensions             |                        |                    | Volume | Shipping weight |      |      |
|--------------------------------------|------------------------------|------------------------------|------------------------|------------------------|--------------------|--------|-----------------|------|------|
|                                      |                              |                              | Height                 |                        | Width<br>B<br>[mm] |        | PN16            | PN25 | PN40 |
|                                      | A <sub>1</sub> <sup>1)</sup> | A <sub>2</sub> <sup>2)</sup> | H <sub>1</sub><br>[mm] | H <sub>2</sub><br>[mm] |                    |        | [l]             | [kg] | [kg] |
| RZ 50                                | DN50                         | DN25                         | 350                    | 175                    | 125                | 1      | –               | –    | 10   |
| RZ 65                                | DN65                         | DN32                         | 350                    | 175                    | 135                | 2      | 12              | –    | 13   |
| RZ 80                                | DN80                         | DN40                         | 350                    | 175                    | 145                | 3      | 13              | –    | 15   |
| RZ 100                               | DN100                        | DN50                         | 350                    | 175                    | 160                | 4      | 18              | –    | 21   |
| RZ 125                               | DN125                        | DN65                         | 350                    | 175                    | 225                | 5      | 24              | –    | 30   |
| RZ 150                               | DN150                        | DN65                         | 350                    | 175                    | 240                | 7      | 32              | –    | 40   |
| RZ 200                               | DN200                        | DN80                         | 400                    | 200                    | 270                | 13     | 48              | 58   | 66   |
| RZ 250                               | DN250                        | DN100                        | 450                    | 225                    | 305                | 23     | 67              | 83   | 101  |
| RZ 300                               | DN300                        | DN125                        | 500                    | 250                    | 335                | 37     | 92              | 110  | 142  |
| RZ 350                               | DN350                        | DN150                        | 550                    | 275                    | 405                | 50     | 125             | 156  | 192  |
| RZ 400                               | DN400                        | DN150                        | 550                    | 275                    | 430                | 65     | 147             | 189  | 251  |
| RZ 500                               | DN500                        | DN200                        | 650                    | 325                    | 500                | 123    | 228             | 278  | 331  |

Tab. 58 Specification of the intermediate return piece for the Logano S825L/L LN and Logano plus SB825L/L LN

- 1) Internal diameter for flanges to DIN 2633/2634/2635
- 2) Internal diameter for flanges to DIN 2633/2635



Dimensions given with  $\pm 1$  % tolerance;  
Transport weights given with  $\pm 4$  % tolerance.

#### 10.4.4 Safety valve to DIN-EN 12828

The safety valve from ARI, Figure 903, can be fitted directly to the boiler connector VSL (→ Fig. 8, page 14). The internal connector diameter of the boiler is matched to the required internal diameter of the safety valve during manufacture. For the outlet side of the safety valve, suitable mating flanges are available as accessories.

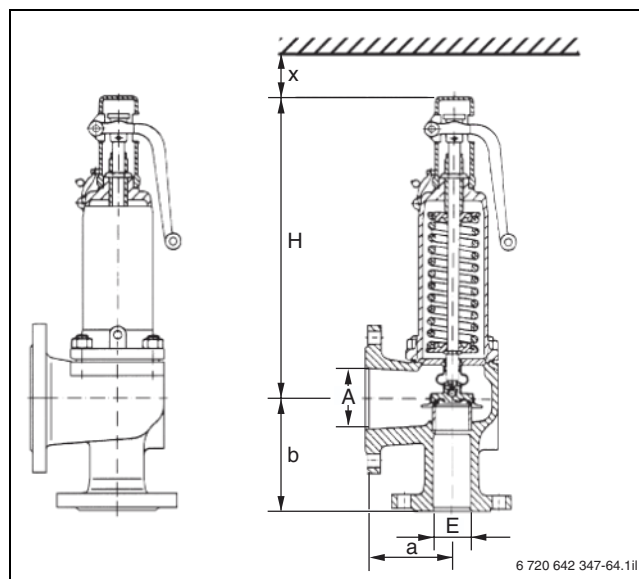


Fig. 72 Safety valve for heating systems with Logano S825L/L LN and Logano plus SB825L/L LN

- A** Outlet
- a** Leg length
- b** Leg height
- E** Inlet
- H** Height
- x** Clearance above

| ARI safety valve,<br>Figure 903        |   | Unit | Internal diameter, valve size <sup>1)</sup> |      |      |       |       |       |       |       |
|----------------------------------------|---|------|---------------------------------------------|------|------|-------|-------|-------|-------|-------|
|                                        |   |      | DN32                                        | DN40 | DN50 | DN65  | DN80  | DN100 | DN125 | DN150 |
| Internal diameter outlet <sup>1)</sup> | A | –    | DN50                                        | DN65 | DN80 | DN100 | DN125 | DN150 | DN200 | DN250 |
| Maximum response pressure              | – | bar  | 10                                          | 10   | 10   | 10    | 10    | 10    | 10    | 10    |
| Leg length                             | a | mm   | 110                                         | 115  | 120  | 140   | 160   | 180   | 200   | 225   |
| Leg height                             | b | mm   | 115                                         | 140  | 150  | 170   | 195   | 220   | 250   | 285   |
| Height                                 | H | mm   | 330                                         | 390  | 435  | 545   | 610   | 690   | 845   | 890   |
| Clearance above                        | x | mm   | 200                                         | 250  | 300  | 350   | 400   | 500   | 500   | 500   |

Tab. 59 Specification and dimensions of the safety valve for Logano S825L/L LN and Logano plus SB825L/L LN

1) Version of the flange connections: PN16 to DIN 2633

| ARI safety valve,<br>Figure 903    | Internal diameter, valve size <sup>1)</sup> |      |      |      |       |       |       |       |
|------------------------------------|---------------------------------------------|------|------|------|-------|-------|-------|-------|
|                                    | DN32                                        | DN40 | DN50 | DN65 | DN80  | DN100 | DN125 | DN150 |
| Maximum response pressure<br>[bar] | [kW]                                        | [kW] | [kW] | [kW] | [kW]  | [kW]  | [kW]  | [kW]  |
| 2.5                                | 565                                         | 870  | 1360 | 2300 | 3480  | 5440  | 7120  | 9900  |
| 3.0                                | 649                                         | 1000 | 1560 | 2640 | 4000  | 6250  | 8190  | 11400 |
| 4.0                                | 810                                         | 1250 | 1950 | 3300 | 5000  | 7800  | 10200 | 14200 |
| 5.0                                | 960                                         | 1480 | 2310 | 3900 | 5910  | 9240  | 12100 | 16900 |
| 6.0                                | 1100                                        | 1700 | 2660 | 4500 | 6820  | 10600 | 14000 | 19400 |
| 8.0                                | 1390                                        | 2140 | 3350 | 5660 | 8580  | 13400 | 17600 | 24500 |
| 10.0                               | 1670                                        | 2570 | 4010 | 6790 | 10300 | 16000 | 21100 | 29300 |

Tab. 60 Output of the safety valve for Logano S825L/L LN and Logano plus SB825L/L LN

1) Version of the flange connections: PN16 to DIN 2633

### 10.4.5 Flash trap to DIN-EN 12828

In accordance with DIN-EN 12828, flash traps are to be provided for boilers with a rated output > 300 kW. It is not necessary to install a flash trap in heating systems. This applies as long as an additional high limit safety cut-out and an additional maximum pressure limiter are installed. Install flash traps in the discharge pipe from the safety valves. These separate the steam and the water phases. Install a water drain line at the lowest point of the flash trap. This enables escaping heating water to be routed away safely and visibly. Route the discharge pipe for steam to the outside at the highest point of the flash trap.

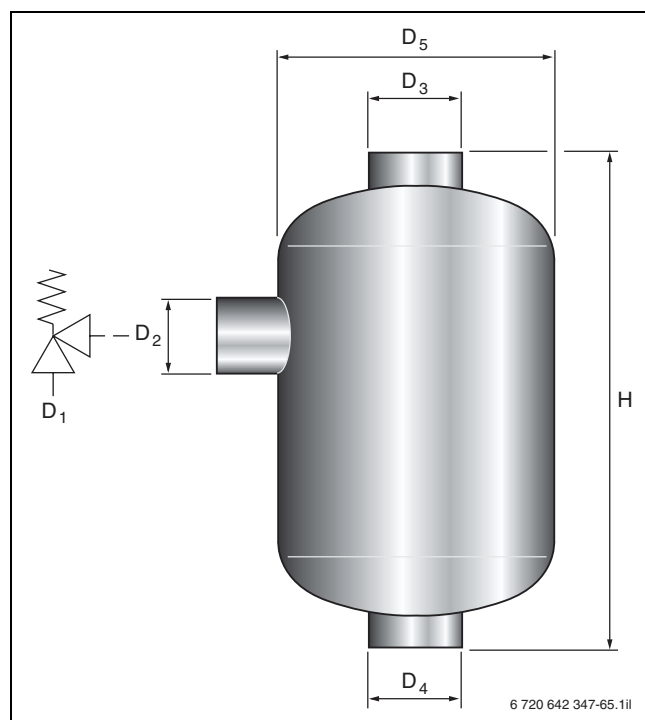


Fig. 73 Flash trap for Logano S825L/L LN and Logano plus SB825L/L LN

**D<sub>1-5</sub>** Diameter  
**H** Height

| Safety valve | Flash trap<br>Type | Dimensions     |                |                |                |                        |                     | Discharge pressure<br>[bar] | Weight<br>[kg] | Line between safety valve and flash trap |                 | Discharge pipe |                 |
|--------------|--------------------|----------------|----------------|----------------|----------------|------------------------|---------------------|-----------------------------|----------------|------------------------------------------|-----------------|----------------|-----------------|
|              |                    | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub><br>[mm] | Height<br>H<br>[mm] |                             |                | Length<br>[m]                            | Number of bends | Length<br>[m]  | Number of bends |
| DN25/40      | et 40              | DN25           | DN40           | DN50           | DN50           | 165                    | 346                 | ≤ 5                         | 2.0            | ≤ 5                                      | ≤ 2             | ≤ 10           | ≤ 3             |
|              | et 50              | DN32           | DN50           | DN65           | DN65           | 165                    | 346                 | > 5 ≤ 10                    | 2.2            |                                          |                 |                |                 |
| DN32/50      | et 50              | DN32           | DN50           | DN65           | DN65           | 165                    | 346                 | ≤ 5                         | 2.2            |                                          |                 |                |                 |
|              | et 65              | DN40           | DN65           | DN80           | DN80           | 283                    | 440                 | > 5 ≤ 10                    | 6.8            |                                          |                 |                |                 |
| DN40/65      | et 65              | DN40           | DN65           | DN80           | DN80           | 283                    | 440                 | ≤ 5                         | 6.8            |                                          |                 |                |                 |
|              | et 80              | DN50           | DN80           | DN100          | DN100          | 283                    | 440                 | > 5 ≤ 10                    | 7.2            |                                          |                 |                |                 |
| DN50/80      | et 80              | DN50           | DN80           | DN100          | DN100          | 283                    | 440                 | ≤ 5                         | 7.2            |                                          |                 |                |                 |
|              | et 100             | DN65           | DN100          | DN125          | DN125          | 391                    | 616                 | > 5 ≤ 10                    | 14.2           |                                          |                 |                |                 |
| DN65/100     | et 100             | DN65           | DN100          | DN125          | DN125          | 391                    | 616                 | ≤ 5                         | 14.2           |                                          |                 |                |                 |
|              | et 125             | DN80           | DN125          | DN150          | DN150          | 450                    | 776                 | > 5 ≤ 10                    | 19.5           |                                          |                 |                |                 |
| DN80/125     | et 125             | DN80           | DN125          | DN150          | DN150          | 450                    | 776                 | ≤ 5                         | 19.5           |                                          |                 |                |                 |
|              | et 150             | DN100          | DN150          | DN200          | DN200          | 500                    | 896                 | > 5 ≤ 10                    | 28.0           |                                          |                 |                |                 |
| DN100/150    | et 150             | DN100          | DN150          | DN200          | DN200          | 500                    | 896                 | ≤ 5                         | 28.0           |                                          |                 |                |                 |

Tab. 61 Selection table for a flash trap for Logano S825L/L LN and Logano plus SB825L/L LN for installation downstream of the safety valves with the identification letters D/G/H

### 10.4.6 Return temperature raising set

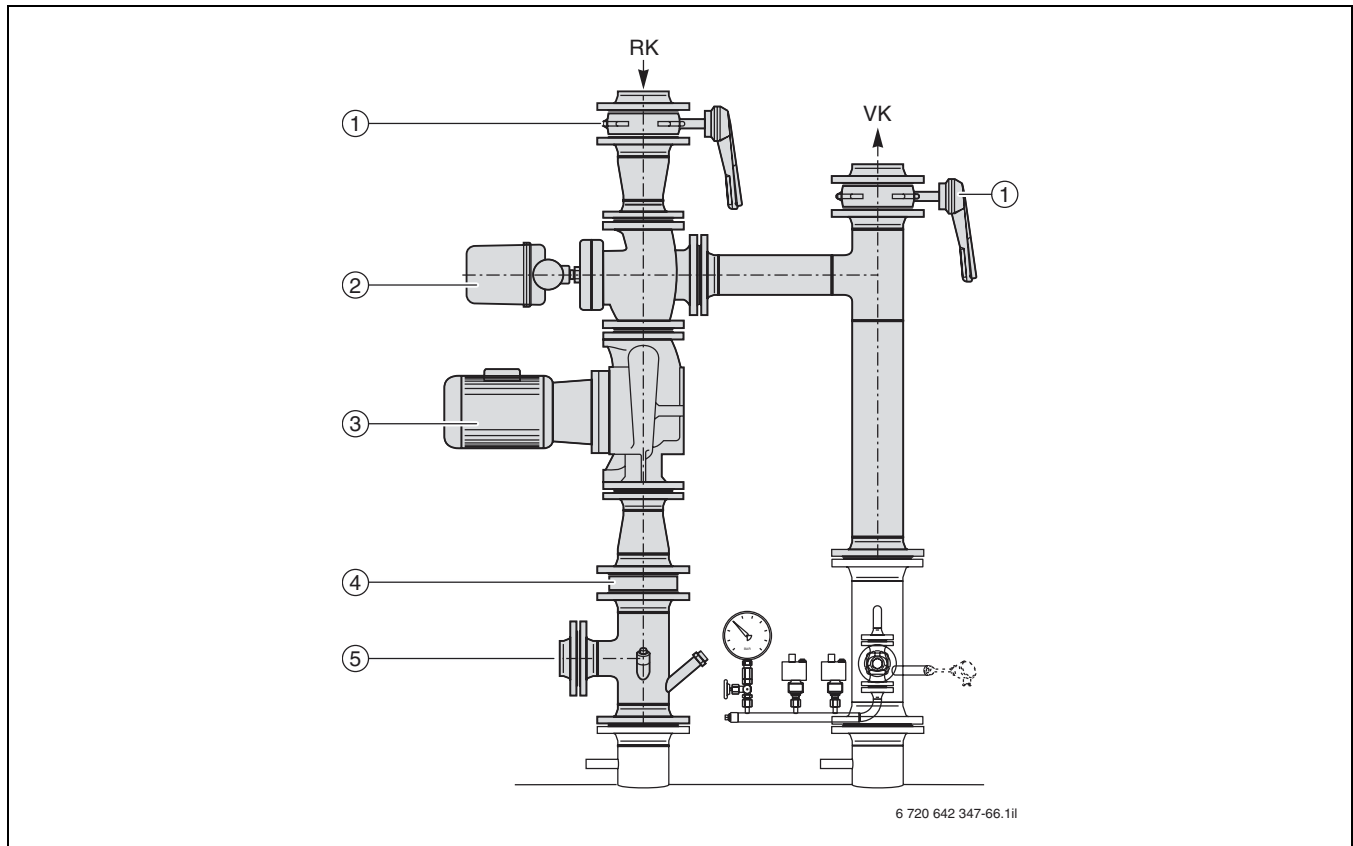


Fig. 74 Standard delivery of the return temperature raising set (coloured grey) for Logano S825L/L LN and Logano plus SB825L/L LN

- RK** Return  
**VK** Flow  
**1** Shut-off damper with notched lever  
**2** 3-way valve with actuator  
**3** Pump  
**4** Non-return valve or check valve  
**5** Connection for pressure maintaining device

The return temperature raising set, available as an accessory, can be used to maintain a required minimum return temperature. It can be installed in heating systems that have either a low loss header or a low-pressure distributor (system examples → Fig. 62 to Fig. 65, page 86 ff.).

The set is delivered fully fitted which considerably reduces the time required to complete the boiler system. The boiler system can therefore be completed simply and easily with the set.

- The intermediate return piece (→ Fig. 71, page 99) is integrated ready for operation and can therefore not be used in addition.
- Other versions of the return temperature raising set (e.g. with bypass pump, horizontal connection layout etc.) are available on request.
- When planning the system, ensure the set matches the system-specific conditions.
- Dimensions and specification of the return temperature raising set are available on request.

## 10.5 Additional devices for sound insulation

### 10.5.1 Requirements

The necessity and scope of measures for sound insulation are based on the sound level and the noise disturbance this causes. Buderus offers three sound insulation devices that are specially matched to the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers. They can be supplemented with additional on-site sound insulation measures.

On-site measures include fixing the pipework to attenuate structure-borne noise, compensators in the connection lines and flexible connections with the building. The devices for sound insulation require extra space, which should be factored in at the planning stage.

The use of sound insulation measures depends on the purpose of the building and the requirements made of adjacent rooms and the surrounding area.

### 10.5.2 Flue gas silencer

A large proportion of the noise caused by combustion can be transferred via the flue system to the building. Specially adapted flue gas silencers can significantly reduce the sound level.

### 10.5.3 Burner silencer hood

The airborne noise created by the burner during operation can be attenuated with a burner silencer hood.

When designing the installation room, allow extra space to remove the silencer hood.

Buderus offers burner silencer hoods matched to the relevant project. The space required, dimensions and attenuation values are available on request from your local Buderus sales office.

### 10.5.4 Boiler mounts to attenuate structure-borne noise

Boiler mounts to attenuate structure-borne noise can be used to prevent the transmission of structure-borne noise to the foundation and the building. For the Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, they are made of 12 mm thick polyurethane (PUR). To achieve the required attenuation, the boiler installation surface must be perfectly even (foundation dimensions → page 105).

When designing boiler mounts to attenuate structure-borne noise, bear in mind that the installation height of the boiler and therefore the position of the pipework connections can vary. To compensate for the spring

deflection of the boiler mounts and to minimise sound transmission via the water connections, we also recommend installing pipe compensators in the heating water lines.

The boiler mounts to attenuate structure-borne noise must be designed for the boiler in question.

The vibration dampers are no longer positioned right under the supports. Instead, the vibration dampers are positioned as strips, as they work best with a certain spring compression. Sound insulating strips are therefore supplied for the specific order. One exception is the "standardised" boiler version in which the sound insulating strips have a fixed size (→ Tab. 62).

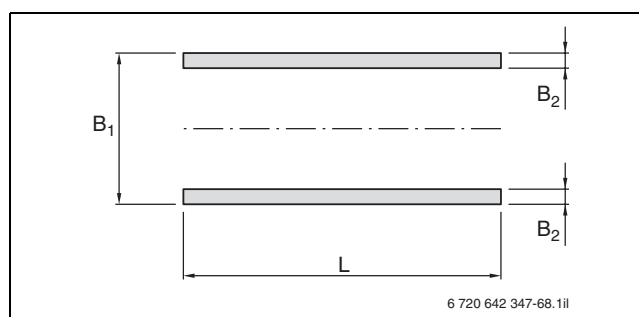


Fig. 75 Boiler mounts to attenuate structure-borne noise for the Logano S825L "standardised"

| Logano S825L "standardised" |                     | Dimensions             |                        | Max. possible operating weight |
|-----------------------------|---------------------|------------------------|------------------------|--------------------------------|
| Boiler size                 | Length<br>L<br>[mm] | B <sub>1</sub><br>[mm] | B <sub>2</sub><br>[mm] |                                |
| 650                         | 1750                | 710                    | 55                     | 5.8                            |
| 1000                        | 2100                | 910                    | 55                     | 6.9                            |
| 1350                        | 2350                | 910                    | 55                     | 7.8                            |
| 1900                        | 2560                | 930                    | 65                     | 10.0                           |

Tab. 62 Dimensions of the boiler mounts to attenuate structure-borne noise for the Logano S825L "standardised"

### 10.5.5 Boiler foundation

The Logano S825L and S825L LN conventional boilers, as well as the Logano plus SB825L and SB825L LN gas condensing boilers, are equipped with robust base supports consisting of channel sections for even load distribution. If a foundation is planned, it should not go as far as the side walls of the boiler room because of this sound insulation.

If suitable boiler mounts are planned for sound insulation (→ page 104), ensure the foundation is level to within  $\pm 1$  mm. This guarantees an even load on the boiler mounts.

The following requirements of the foundation must be met:

- Ensure that the floor of the installation area is perfectly even (tolerance with reference to DIN 18202) and has sufficient load-bearing capacity.
- Cover any floor channels and provide drainage facilities.
- When calculating the load-bearing capacity of the foundation, take account of the maximum operating weight of the components concerned. When determining the operating weight, take account of additional components (e.g. control panel, burner, silencer, flue pipes etc.) and include their weight. The operating weight is the weight of the components when filled.
- Measure the operating weight of the boiler at the front and back feet of the foundation. Please note that the back boiler foot (seen from the burner side) is designed as a fixed point on the longitudinal support. The front

boiler foot is designed as a movable bearing, i.e. the boiler expands towards the front when heating up.

- Every component must be levelled.
- If separation is required between the installation space and the system for sound insulation, place sound insulating strips below before installing the system.
- If the boiler or system components are installed on a support base, use suitable spring systems as supports and to absorb operational vibrations.

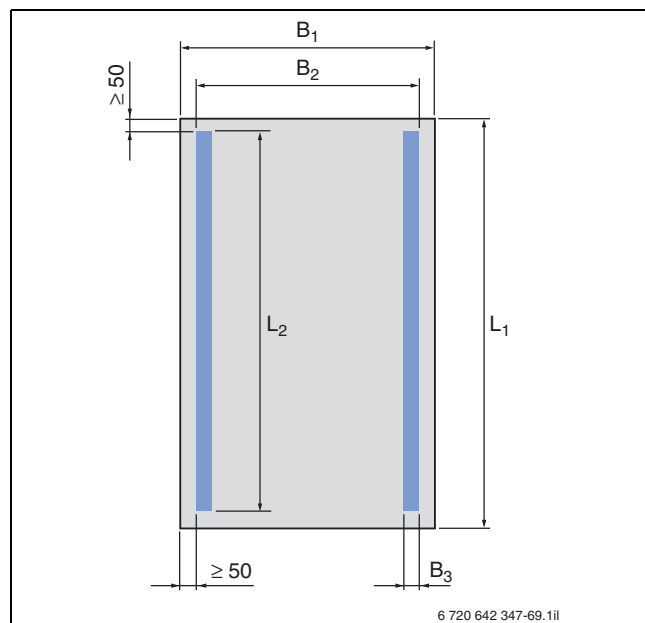


Fig. 76 Boiler foundation for Logano S825L/L LN and Logano plus SB825L/L LN

| Logano S825L<br>Logano plus SB825L | Logano S825L LN<br>Logano plus SB825L LN | Foundation                       |                                 | Base frame                       |                                 | Channel section     |                                 |
|------------------------------------|------------------------------------------|----------------------------------|---------------------------------|----------------------------------|---------------------------------|---------------------|---------------------------------|
| Boiler size                        | Boiler size                              | Length<br>L <sub>1</sub><br>[mm] | Width<br>B <sub>1</sub><br>[mm] | Length<br>L <sub>2</sub><br>[mm] | Width<br>B <sub>2</sub><br>[mm] | Height<br>H<br>[mm] | Width<br>B <sub>3</sub><br>[mm] |
| 650                                | –                                        | 1850                             | 810                             | 1750                             | 710                             | 120                 | 55                              |
| 1000                               | 750                                      | 2200                             | 1010                            | 2100                             | 910                             | 120                 | 55                              |
| 1350                               | 1000                                     | 2450                             | 1010                            | 2350                             | 910                             | 120                 | 55                              |
| 1900                               | 1250                                     | 2660                             | 1030                            | 2560                             | 930                             | 160                 | 65                              |
| 2500                               | 1500                                     | 3130                             | 1230                            | 3030                             | 1130                            | 160                 | 65                              |
| 3050                               | 2000                                     | 3160                             | 1250                            | 3060                             | 1150                            | 200                 | 75                              |
| 3700                               | 2500                                     | 3510                             | 1250                            | 3410                             | 1150                            | 200                 | 75                              |
| 4200                               | 3000                                     | 3920                             | 1350                            | 3820                             | 1250                            | 200                 | 75                              |
| 5200                               | 3500                                     | 4020                             | 1610                            | 3920                             | 1510                            | 220                 | 80                              |
| 6500                               | 4250                                     | 4380                             | 1610                            | 4280                             | 1510                            | 220                 | 80                              |
| 7700                               | 5250                                     | 4580                             | 1620                            | 4480                             | 1520                            | 240                 | 85                              |
| 9300                               | 6000                                     | 4750                             | 1710                            | 4650                             | 1610                            | 240                 | 85                              |
| 11200                              | 8000                                     | 5150                             | 1730                            | 5050                             | 1630                            | 280                 | 95                              |
| 12600                              | 10000                                    | 5420                             | 1990                            | 5320                             | 1890                            | 280                 | 95                              |
| 14700                              | 12000                                    | 6100                             | 1990                            | 6000                             | 1890                            | 280                 | 95                              |
| 16400                              | 14000                                    | 6490                             | 2200                            | 6390                             | 2100                            | 320                 | 100                             |
| 19200                              | 17500                                    | 6890                             | 2200                            | 6790                             | 2100                            | 320                 | 100                             |

Tab. 63 Dimensions of the boiler foundation for Logano S825L/L LN and Logano plus SB825L/L LN

## 10.6 Additional accessories

### 10.6.1 Drain connection and blow-down valve assembly

To enable the boiler to be drained quickly and, if required, the boiler sludge to be removed, we recommend a drain connection as shown in Fig. 77.

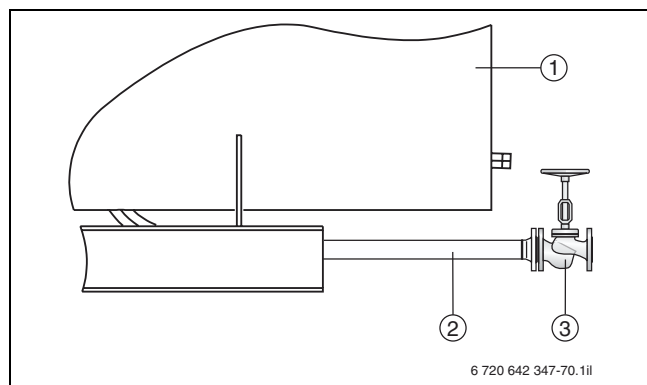


Fig. 77 Design of the drain connection for Logano S825L/L LN and Logano plus SB825L/L LN

- 1 Logano S825L/L LN or Logano plus SB825L/L LN
- 2 Boiler drain
- 3 Drain valve

### 10.6.2 Walk-on boiler cover

As additional equipment, Buderus offers a walk-on boiler cover. Also available with this are a ladder and safety rail with toe board. The walk-on boiler cover is already fitted when the boiler is delivered. The safety rail and ladder are to be fitted on site. The ladder can be mounted on the l.h. or r.h. side of the boiler. Please specify which side when ordering the walk-on boiler cover. In the case of gas combustion, the ladder should be fitted opposite the gas train.



Fig. 78 Walk-on boiler cover

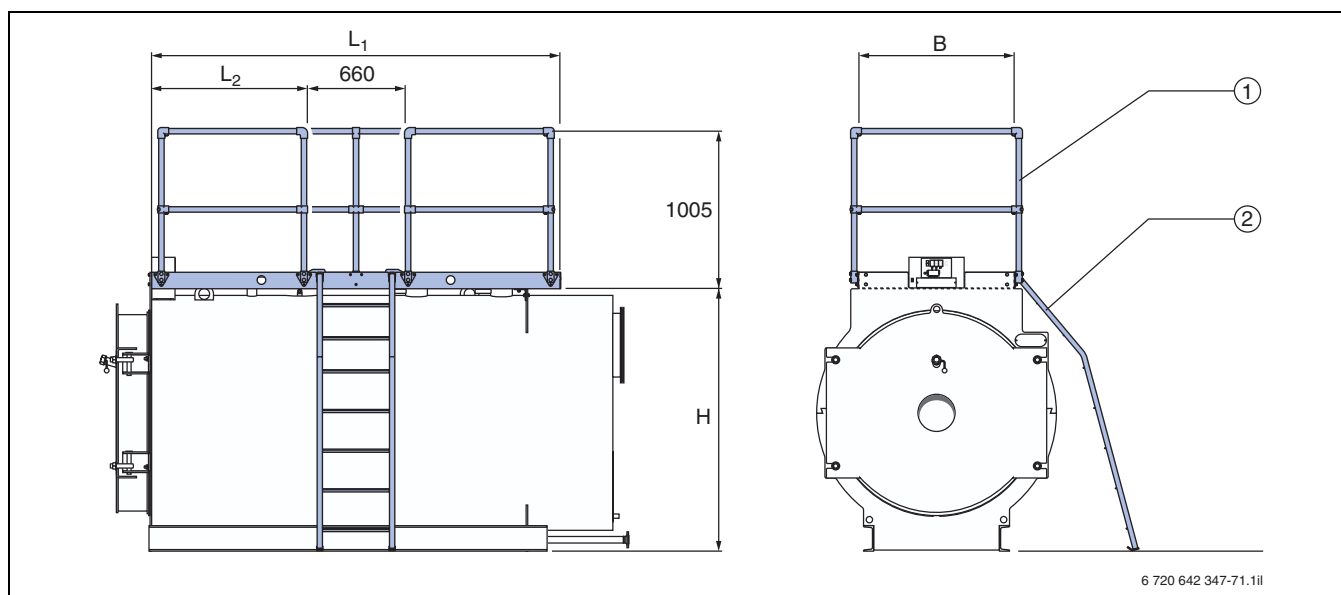


Fig. 79 Dimensions of the walk-on boiler cover for Logano S825L/L LN and Logano plus SB825L/L LN; rail and ladder are optional (dim. in mm)

- 1 Rail (optional)
- 2 Ladder on either the l.h. or r.h. side (optional)

| Logano S825L<br>Logano plus SB825L | Logano S825L LN<br>Logano plus SB825L LN | Dimensions             |                        |           |           | Weight <sup>1)</sup> |
|------------------------------------|------------------------------------------|------------------------|------------------------|-----------|-----------|----------------------|
|                                    |                                          | Length                 |                        | Width     | Height    |                      |
| Boiler size                        | Boiler size                              | L <sub>1</sub><br>[mm] | L <sub>2</sub><br>[mm] | B<br>[mm] | H<br>[mm] | [kg]                 |
| 1000                               | 750                                      | 2150                   | 745                    | 900       | 1505      | 155                  |
| 1350                               | 1000                                     | 2400                   | 870                    | 900       | 1605      | 165                  |
| 1900                               | 1250                                     | 2600                   | 970                    | 1000      | 1705      | 195                  |
| 2500                               | 1500                                     | 3100                   | 1220                   | 1100      | 1755      | 235                  |
| 3050                               | 2000                                     | 3100                   | 1220                   | 1100      | 1855      | 235                  |
| 3700                               | 2500                                     | 3450                   | 1395                   | 1100      | 1905      | 255                  |
| 4200                               | 3000                                     | 3800                   | 1570                   | 1200      | 2005      | 305                  |
| 5200                               | 3500                                     | 3950                   | 1645                   | 1200      | 2105      | 315                  |
| 6500                               | 4250                                     | 4300                   | 1820                   | 1400      | 2305      | 405                  |
| 7700                               | 5250                                     | 4500                   | 1910                   | 1400      | 2455      | 420                  |
| 9300                               | 6000                                     | 4800                   | 2070                   | 1600      | 2605      | 490                  |
| 11200                              | 8000                                     | 5100                   | 2220                   | 1800      | 2755      | 590                  |
| 12600                              | 10000                                    | 5400                   | 2370                   | 1800      | 2905      | 610                  |
| 14700                              | 12000                                    | 6100                   | 2720                   | 1800      | 3105      | 680                  |
| 16400                              | 14000                                    | 6600                   | 2970                   | 2000      | 3405      | 900                  |
| 19200                              | 17500                                    | 7000                   | 3170                   | 2000      | 3605      | 980                  |

Tab. 64 Specification of the walk-on boiler cover for Logano S825L/L LN and Logano plus SB825L/L LN

1) Including rail and ladder

# 11 Flue system

## 11.1 Requirements

### 11.1.1 General information

As a basis for calculation and for sizing the flue system, please refer to EN 13384. The following formulae can be used to calculate the flue gas mass flow rates.

With oil combustion (CO<sub>2</sub> content 13,5 %):

$$\dot{m}_{\text{Abg, Öl}} = \dot{Q}_F \times \frac{4,104 \text{ kg}}{10000 \text{ kW}}$$

*Form. 10 Calculation of the flue gas mass flow rate with oil combustion*

$\dot{m}_{\text{Abg, Öl}}$  Flue gas mass flow rate with oil combustion in kg/s  
 $\dot{Q}_F$  Combustion output in kW

With gas combustion (CO<sub>2</sub> content 10,5 %):

$$\dot{m}_{\text{Abg, Gas}} = \dot{Q}_F \times \frac{4,082 \text{ kg}}{10000 \text{ kW}}$$

*Form. 11 Calculation of the flue gas mass flow rate with gas combustion*

$\dot{m}_{\text{Abg, Gas}}$  Flue gas mass flow rate with gas combustion in kg/s  
 $\dot{Q}_F$  Combustion output in kW

See the following pages for clear tables with the required parameters for the Logano S825L and S825L LN series, as well as the Logano plus SB825L and SB825L LN.

The combustion output is the result of the selected rated output and the associated efficiency (→ page 38).

$$\dot{Q}_F = \frac{\dot{Q}_N}{\eta_K} \times 100 \%$$

*Form. 12 Calculation of the combustion output*

$\eta_K$  Boiler efficiency in %  
 $\dot{Q}_F$  Combustion output in kW  
 $\dot{Q}_N$  Rated output in kW

The requirements of the flue system and flue gas routing can be derived from the results of the calculations.

### 11.1.2 Special information for flue systems with gas condensing boilers

A correctly sized flue system is essential for the function and operation of the gas condensing boiler. Only flue pipes approved according to Building Regulations are permissible. When selecting the flue system, also consider the requirements in the approval document.

If positive pressure is to be expected within the flue system and if the flue system is routed through frequently used rooms, the entire flue must be installed in a duct with secondary ventilation. Observe country-specific requirements.

### 11.1.3 Material requirements for flue systems with gas condensing boilers

The material of the flue pipe must be heat-resistant with regard to the flue temperature that will occur, moisture-resistant and resistant to acidic condensate. Among other materials, stainless steel flues or other moisture-resistant chimneys are suitable.

Flues are categorised into groups depending on their maximum flue gas temperature (80 °C, 120 °C, 160 °C and 200 °C). With gas condensing boilers, the flue gas temperature can be below 40 °C, independent of the maximum flue gas temperature. Moisture-resistant chimneys must therefore also be suitable for temperatures below 40 °C. A suitable flue must be approved by the "Deutsches Institut für Bautechnik" in Berlin.

With moisture-resistant chimneys, the draught must not be more than 0 Pa at the chimney inlet.

## 11.2 Parameters for sizing flue systems

| Boiler type                               | Average boiler water temperature in °C         |       |       |       |
|-------------------------------------------|------------------------------------------------|-------|-------|-------|
|                                           | 60                                             | 70    | 80    | 90    |
|                                           | Maximum flue gas temperature (at rated output) |       |       |       |
|                                           | [ °C]                                          | [ °C] | [ °C] | [ °C] |
| <b>Logano S825L</b>                       | 217                                            | 224   | 232   | 239   |
| <b>Logano S825L LN</b>                    | 200                                            | 207   | 215   | 222   |
| <b>Logano plus SB825L</b>                 | 107                                            | 114   | 121   | 129   |
| <b>Logano plus SB825L LN<sup>1)</sup></b> | 103                                            | 110   | 117   | 125   |

Tab. 65 Maximum flue gas temperature at rated output subject to the average boiler water temperature

1) At 30 °C water inlet temperature to the condensing heat exchanger

### 11.2.1 Logano S825L and S825L LN conventional boilers

| Logano          | Boiler size | Output <sup>1)</sup> | Combustion output | Flue outlet <sup>2)</sup> | Required draught | Min. flue gas temperature | Gas as fuel                 |                                |
|-----------------|-------------|----------------------|-------------------|---------------------------|------------------|---------------------------|-----------------------------|--------------------------------|
|                 |             | [kW]                 | [kW]              | [mm]                      | [Pa]             | [ °C]                     | CO <sub>2</sub> content [%] | Flue gas mass flow rate [kg/s] |
| <b>S825L</b>    | 650         | 650                  | 707               |                           | 0                | 200                       | 10.5                        | 0.2808                         |
|                 | 1000        | 1000                 | 1084              | 250                       | 0                | 209                       | 10.5                        | 0.4325                         |
|                 | 1350        | 1350                 | 1453              | 250                       | 0                | 184                       | 10.5                        | 0.5767                         |
|                 | 1900        | 1900                 | 2083              | 315                       | 0                | 209                       | 10.5                        | 0.8267                         |
|                 | 2500        | 2500                 | 2726              | 400                       | 0                | 212                       | 10.5                        | 1.0819                         |
|                 | 3050        | 3050                 | 3340              | 400                       | 0                | 221                       | 10.5                        | 1.3258                         |
|                 | 3700        | 3700                 | 4011              | 500                       | 0                | 199                       | 10.5                        | 1.5917                         |
|                 | 4200        | 4200                 | 4509              | 500                       | 0                | 193                       | 10.5                        | 1.7897                         |
|                 | 5200        | 5200                 | 5661              | 500                       | 0                | 209                       | 10.5                        | 2.2472                         |
|                 | 6500        | 6500                 | 7128              | 630                       | 0                | 224                       | 10.5                        | 2.8294                         |
|                 | 7700        | 7700                 | 8382              | 630                       | 0                | 209                       | 10.5                        | 3.3275                         |
|                 | 9300        | 9300                 | 10096             | 800                       | 0                | 203                       | 10.5                        | 4.0078                         |
|                 | 11200       | 11200                | 12163             | 800                       | 0                | 204                       | 10.5                        | 4.8281                         |
|                 | 12600       | 12600                | 13607             | 800                       | 0                | 193                       | 10.5                        | 5.4017                         |
|                 | 14700       | 14700                | 15965             | 1000                      | 0                | 204                       | 10.5                        | 6.3375                         |
|                 | 16400       | 16400                | 17587             | 1000                      | 0                | 178                       | 10.5                        | 6.9811                         |
| <b>S825L LN</b> | 19200       | 19200                | 20720             | 1000                      | 0                | 191                       | 10.5                        | 8.2247                         |
|                 | 750         | 750                  | 812               | 200                       | 0                | 195                       | 10.5                        | 0.3228                         |
|                 | 1000        | 1000                 | 1070              | 250                       | 0                | 175                       | 10.5                        | 0.4255                         |
|                 | 1250        | 1250                 | 1354              | 250                       | 0                | 198                       | 10.5                        | 0.5375                         |
|                 | 1500        | 1500                 | 1619              | 315                       | 0                | 191                       | 10.5                        | 0.6427                         |
|                 | 2000        | 2000                 | 2167              | 315                       | 0                | 199                       | 10.5                        | 0.8602                         |
|                 | 2500        | 2500                 | 2686              | 400                       | 0                | 181                       | 10.5                        | 1.0661                         |
|                 | 3000        | 3000                 | 3236              | 400                       | 0                | 190                       | 10.5                        | 1.2847                         |
|                 | 3500        | 3500                 | 3776              | 400                       | 0                | 190                       | 10.5                        | 1.4988                         |
|                 | 4250        | 4250                 | 4624              | 500                       | 0                | 207                       | 10.5                        | 1.8355                         |
|                 | 5250        | 5250                 | 5676              | 500                       | 0                | 195                       | 10.5                        | 2.2530                         |
|                 | 6000        | 6000                 | 6462              | 630                       | 0                | 187                       | 10.5                        | 2.5650                         |
|                 | 8000        | 8000                 | 8635              | 630                       | 0                | 191                       | 10.5                        | 3.4275                         |
|                 | 10000       | 10000                | 10749             | 800                       | 0                | 183                       | 10.5                        | 4.2669                         |
|                 | 12000       | 12000                | 12973             | 800                       | 0                | 195                       | 10.5                        | 5.1497                         |
|                 | 14000       | 14000                | 14989             | 800                       | 0                | 175                       | 10.5                        | 5.9500                         |
|                 | 17500       | 17500                | 18869             | 1000                      | 0                | 189                       | 10.5                        | 7.4900                         |

Tab. 66 Parameters of the Logano S825L/L LN conventional boilers

1) Parameters for the (highest) rated output

2) For a lower rated output, reduce the internal diameter of the flue outlet accordingly

## 11.2.2 Logano plus SB825L and SB825L LN gas condensing boilers

System temperature 80/60 °C, inlet temperature to the condensing heat exchanger 30 °C

| Logano plus | Boiler size | Output | Combustion output | Flue outlet <sup>1)</sup> | Available draught <sup>2)</sup> | Min. flue gas temperature | Gas as fuel                 |                                |
|-------------|-------------|--------|-------------------|---------------------------|---------------------------------|---------------------------|-----------------------------|--------------------------------|
|             |             | [kW]   | [kW]              | [mm]                      | [Pa]                            |                           | CO <sub>2</sub> content [%] | Flue gas mass flow rate [kg/s] |
| SB825L      | 1000        | 1000   | 1077              | 250                       | 3)                              | 104                       | 10.5                        | 0.3947                         |
|             | 1350        | 1350   | 1441              | 250                       | 3)                              | 95                        | 10.5                        | 0.5305                         |
|             | 1900        | 1900   | 2057              | 315                       | 3)                              | 113                       | 10.5                        | 0.7527                         |
|             | 2500        | 2500   | 2696              | 400                       | 3)                              | 109                       | 10.5                        | 0.9886                         |
|             | 3050        | 3050   | 3301              | 400                       | 3)                              | 113                       | 10.5                        | 1.2086                         |
|             | 3700        | 3700   | 3971              | 400                       | 3)                              | 108                       | 10.5                        | 1.4627                         |
|             | 4200        | 4200   | 4462              | 500                       | 3)                              | 109                       | 10.5                        | 1.6416                         |
|             | 5200        | 5200   | 5601              | 500                       | 3)                              | 111                       | 10.5                        | 2.0594                         |
|             | 6500        | 6500   | 7042              | 630                       | 3)                              | 114                       | 10.5                        | 2.5800                         |
|             | 7700        | 7700   | 8294              | 630                       | 3)                              | 109                       | 10.5                        | 3.0511                         |
|             | 9300        | 9300   | 9997              | 630                       | 3)                              | 107                       | 10.5                        | 3.6833                         |
|             | 11200       | 11200  | 12044             | 800                       | 3)                              | 110                       | 10.5                        | 4.4458                         |
|             | 12600       | 12600  | 13490             | 800                       | 3)                              | 105                       | 10.5                        | 4.9916                         |
|             | 14700       | 14700  | 15812             | 800                       | 3)                              | 109                       | 10.5                        | 5.8408                         |
|             | 16400       | 16400  | 17459             | 1000                      | 3)                              | 98                        | 10.5                        | 6.4877                         |
| SB825L LN   | 19200       | 19200  | 20554             | 1000                      | 3)                              | 111                       | 10.5                        | 7.6458                         |
|             | 750         | 750    | 804               | 200                       | 3)                              | 100                       | 10.5                        | 0.2955                         |
|             | 1000        | 1000   | 1063              | 200                       | 3)                              | 92                        | 10.5                        | 0.3927                         |
|             | 1250        | 1250   | 1342              | 250                       | 3)                              | 105                       | 10.5                        | 0.4936                         |
|             | 1500        | 1500   | 1604              | 250                       | 3)                              | 99                        | 10.5                        | 0.5908                         |
|             | 2000        | 2000   | 2146              | 315                       | 3)                              | 105                       | 10.5                        | 0.7897                         |
|             | 2500        | 2500   | 2664              | 400                       | 3)                              | 97                        | 10.5                        | 0.9836                         |
|             | 3000        | 3000   | 3207              | 400                       | 3)                              | 101                       | 10.5                        | 1.1827                         |
|             | 3500        | 3500   | 3742              | 400                       | 3)                              | 103                       | 10.5                        | 1.3805                         |
|             | 4250        | 4250   | 4575              | 500                       | 3)                              | 110                       | 10.5                        | 1.6825                         |
|             | 5250        | 5250   | 5624              | 500                       | 3)                              | 106                       | 10.5                        | 2.0747                         |
|             | 6000        | 6000   | 6407              | 500                       | 3)                              | 99                        | 10.5                        | 2.3644                         |
|             | 8000        | 8000   | 8559              | 630                       | 3)                              | 104                       | 10.5                        | 3.1619                         |
|             | 10000       | 10000  | 10664             | 800                       | 3)                              | 101                       | 10.5                        | 3.9502                         |
|             | 12000       | 12000  | 12860             | 800                       | 3)                              | 108                       | 10.5                        | 4.7602                         |
|             | 14000       | 14000  | 14885             | 800                       | 3)                              | 100                       | 10.5                        | 5.5363                         |
|             | 17500       | 17500  | 18715             | 1000                      | 3)                              | 104                       | 10.5                        | 6.9444                         |

Tab. 67 Parameters of the Logano SB825L/L LN gas condensing boilers

- 1) For a lower rated output, reduce the internal diameter of the flue outlet accordingly
- 2) With gas condensing boilers with free burner allocation, consider the specified positive pressure at the boiler end when selecting the burner, as well as considering the hot gas pressure drop. Varying positive pressure available on request.  
For flue systems and chimneys only approved for negative pressure operation, the maximum draught at the inlet to the flue system must not be above 0 Pa.
- 3) Subject to burner

## System temperature 80/60 °C, inlet temperature to the condensing heat exchanger 60 °C

| Logano plus | Boiler size | Output | Combustion output | Flue outlet <sup>1)</sup> | Available draught <sup>2)</sup> | Min. flue gas temperature | Gas as fuel                 |                                |
|-------------|-------------|--------|-------------------|---------------------------|---------------------------------|---------------------------|-----------------------------|--------------------------------|
|             |             | [kW]   | [kW]              | [mm]                      | [Pa]                            | [ °C]                     | CO <sub>2</sub> content [%] | Flue gas mass flow rate [kg/s] |
| SB825L      | 1000        | 1000   | 1084              | 250                       | <sup>3)</sup>                   | 123                       | 10.5                        | 0.4152                         |
|             | 1350        | 1350   | 1446              | 250                       | <sup>3)</sup>                   | 113                       | 10.5                        | 0.5577                         |
|             | 1900        | 1900   | 2070              | 315                       | <sup>3)</sup>                   | 132                       | 10.5                        | 0.7913                         |
|             | 2500        | 2500   | 2711              | 400                       | <sup>3)</sup>                   | 127                       | 10.5                        | 1.0392                         |
|             | 3050        | 3050   | 3320              | 400                       | <sup>3)</sup>                   | 132                       | 10.5                        | 1.2705                         |
|             | 3700        | 3700   | 3992              | 500                       | <sup>3)</sup>                   | 125                       | 10.5                        | 1.5366                         |
|             | 4200        | 4200   | 4487              | 500                       | <sup>3)</sup>                   | 126                       | 10.5                        | 1.7247                         |
|             | 5200        | 5200   | 5577              | 500                       | <sup>3)</sup>                   | 128                       | 10.5                        | 2.1630                         |
|             | 6500        | 6500   | 7084              | 630                       | <sup>3)</sup>                   | 132                       | 10.5                        | 2.7086                         |
|             | 7700        | 7700   | 8340              | 630                       | <sup>3)</sup>                   | 127                       | 10.5                        | 3.2005                         |
|             | 9300        | 9300   | 10049             | 800                       | <sup>3)</sup>                   | 124                       | 10.5                        | 3.8611                         |
|             | 11200       | 11200  | 12106             | 800                       | <sup>3)</sup>                   | 127                       | 10.5                        | 4.6558                         |
|             | 12600       | 12600  | 13553             | 800                       | <sup>3)</sup>                   | 122                       | 10.5                        | 5.2238                         |
|             | 14700       | 14700  | 15890             | 1000                      | <sup>3)</sup>                   | 126                       | 10.5                        | 6.1075                         |
|             | 16400       | 16400  | 17532             | 1000                      | <sup>3)</sup>                   | 115                       | 10.5                        | 6.7783                         |
|             | 19200       | 19200  | 20644             | 1000                      | <sup>3)</sup>                   | 125                       | 10.5                        | 7.9741                         |
| SB825L LN   | 750         | 750    | 808               | 200                       | <sup>3)</sup>                   | 119                       | 10.5                        | 0.3108                         |
|             | 1000        | 1000   | 1069              | 250                       | <sup>3)</sup>                   | 110                       | 10.5                        | 0.4127                         |
|             | 1250        | 1250   | 1348              | 250                       | <sup>3)</sup>                   | 123                       | 10.5                        | 0.5188                         |
|             | 1500        | 1500   | 1612              | 315                       | <sup>3)</sup>                   | 118                       | 10.5                        | 0.6211                         |
|             | 2000        | 2000   | 2158              | 315                       | <sup>3)</sup>                   | 123                       | 10.5                        | 0.8300                         |
|             | 2500        | 2500   | 2677              | 400                       | <sup>3)</sup>                   | 115                       | 10.5                        | 1.0336                         |
|             | 3000        | 3000   | 3223              | 400                       | <sup>3)</sup>                   | 119                       | 10.5                        | 1.2427                         |
|             | 3500        | 3500   | 3762              | 400                       | <sup>3)</sup>                   | 120                       | 10.5                        | 1.4505                         |
|             | 4250        | 4250   | 4601              | 500                       | <sup>3)</sup>                   | 128                       | 10.5                        | 1.7675                         |
|             | 5250        | 5250   | 5653              | 500                       | <sup>3)</sup>                   | 123                       | 10.5                        | 2.1780                         |
|             | 6000        | 6000   | 6437              | 630                       | <sup>3)</sup>                   | 116                       | 10.5                        | 2.4819                         |
|             | 8000        | 8000   | 8601              | 630                       | <sup>3)</sup>                   | 121                       | 10.5                        | 3.3155                         |
|             | 10000       | 10000  | 10712             | 800                       | <sup>3)</sup>                   | 118                       | 10.5                        | 4.1383                         |
|             | 12000       | 12000  | 12921             | 800                       | <sup>3)</sup>                   | 125                       | 10.5                        | 4.9827                         |
|             | 14000       | 14000  | 14947             | 800                       | <sup>3)</sup>                   | 116                       | 10.5                        | 5.7888                         |
|             | 17500       | 17500  | 18798             | 1000                      | <sup>3)</sup>                   | 121                       | 10.5                        | 7.2522                         |

Tab. 68 Parameters of the Logano SB825L/L LN gas condensing boilers

- 1) For a lower rated output, reduce the internal diameter of the flue outlet accordingly
- 2) With gas condensing boilers with free burner allocation, consider the specified positive pressure at the boiler end when selecting the burner, as well as considering the hot gas pressure drop. Varying positive pressure available on request.  
For flue systems and chimneys only approved for negative pressure operation, the maximum draught at the inlet to the flue system must not be above 0 Pa.
- 3) Subject to burner

## 12 Condensate drainage

### 12.1 Condensate

#### 12.1.1 Creation

When fuels containing hydrogen are burned, water vapour condenses in the condensing heat exchanger and flue system. The volume of condensate created per kilowatt hour is determined by the ratio of carbon to hydrogen in the fuel. The volume of condensate depends on the return temperature, the amount of excess air during combustion and the loading of the heat source.

#### 12.1.2 Condensate disposal

Route the condensate from the condensing boiler into the public sewer system in accordance with local waste water regulations. As the rated output levels of the Logano plus SB825L and SB825L LN gas condensing boilers are above 200 kW, check whether the condensate needs neutralising before disposal. With dual fuel combustion, ensure the neutralising system is suitable for oil combustion.

To calculate the precise volume of condensate created per year, use the following formula:

$$\dot{V}_K = \dot{Q}_F \times m_K \times b_{VH}$$

*Form. 13 Calculation of the annual condensate volume*

**b<sub>VH</sub>** Hours of full utilisation (to VDI 2067) in h/a

**m<sub>K</sub>** Specific condensate volume in kg/kWh  
(assumed density  $\rho = 1$  kg/l)

**$\dot{Q}_F$**  Combustion output of the heat source in kW

**$\dot{V}_K$**  Condensate volume in l/a



It is advisable to find out about local regulations regarding condensate disposal prior to installation.

### 12.2 Neutralising system NE 2.0

#### 12.2.1 Siting

In the case of gas combustion, the neutralising system NE 2.0 can be used. It should be installed between the condensate outlet from the gas condensing boiler and the connection to the public sewer system. Site the neutralising system behind or adjacent to the gas condensing boiler. To enable the condensate to drain freely, install the neutralising system at the same height as the boiler. As an alternative, it can also be installed at a lower height.



Design the condensate hose in accordance with country-specific requirements using suitable materials, e.g. PP plastic.

| Dimensions and connections | Unit | Neutralising system NE 2.0 <sup>1)</sup> |
|----------------------------|------|------------------------------------------|
| Width                      | mm   | 545                                      |
| Depth                      | mm   | 840                                      |
| Height                     | mm   | 275                                      |
| Inlet                      | –    | DN40/DN20 <sup>2)</sup>                  |
| Outlet                     | –    | DN20                                     |
| Drain                      | –    | DN20                                     |

*Tab. 69 Dimensions and connections of the neutralising system NE 2.0*

1) Weight in operation approx. 60 kg

2) Option for hose connection

### 12.2.2 Equipment level

The neutralising system NE 2.0 consists of a rectangular plastic casing with separate chambers for the neutralising agent and the neutralised condensate, a level-controlled condensate pump and an integral electronic control unit.

The level-controlled condensate pump has a head of approx. 2 m. If required, the head can be increased to approx. 4.5 m with a pressure raising module.

The integral electronic control unit has functions for monitoring and service:

- Burner safety shutdown in conjunction with Logamatic control units from Buderus
- Overflow protection
- Display for changing the neutralising granulate
- Display of the operating status
- Forwarding fault signals (e.g. to the Logamatic telecontrol system)

### 12.2.3 Neutralising agent

Fill the neutralising system NE 2.0 with 17.5 kg neutralising granulate. The pH value of the condensate is raised from 6.5 to 10 through its contact with the neutralising agent. With this pH value, the neutralised condensate can be routed into the domestic sewer system. The volume of condensate affects how long the granulate filling will last. The used neutralising granulate needs replacing when the pH value of the neutralised condensate drops below 6.5. Refill with granulate when the signal lamp illuminates.

### 12.2.4 Pump output graph

The graph in Fig. 80 shows the head of the neutralising system NE 2.0 subject to the pump rate. If the pressure raising module is used for the neutralising system NE 2.0, the heads are added together, as two pumps with the same characteristics are connected downstream of one another. When calculating the actual pump head, take the pipework pressure drop on the pressure side into consideration.

The limited start duration of the condensate pump means the neutralising system NE 2.0 can be used for maximum condensate volumes of approx. 200 litres per hour.

For larger condensate volumes, two neutralising systems NE 2.0 can be connected in parallel. For systems with a higher output and therefore larger condensate volumes, or for systems with dual fuel combustion, Buderus offers a further range of neutralising systems. For such cases, please contact your local Buderus sales office.

### Example

For a Logano plus SB825L gas condensing boiler, boiler size 3050 (DHW inlet temperature into the condensing heat exchanger 30 °C), approx. 200 litres of condensate are created per hour of heating operation. A neutralising system NE 2.0 is sufficient for this.

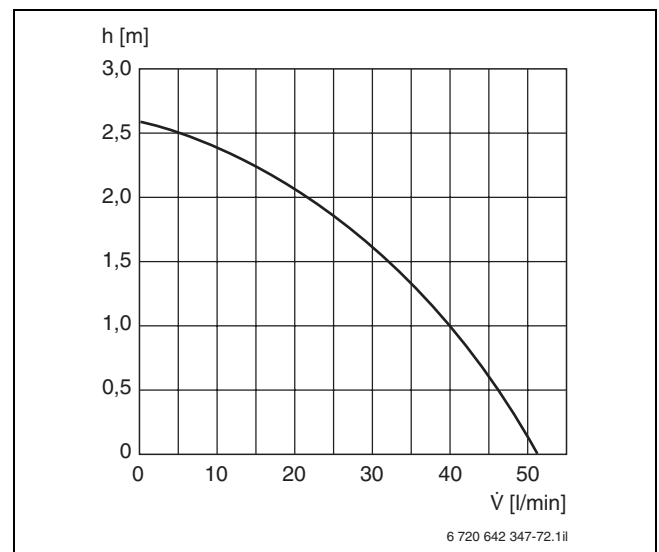


Fig. 80 Pump output graph for the neutralising system NE 2.0

**h** Delivery head  
 **$\dot{V}$**  Pump rate

## 13 Selection aids

### 13.1 Boiler selection

Select the most suitable boiler type and boiler size depending on the requirements of the intended project.

Project-specific requirements may include:

- Favourable price/performance ratio
- High economic viability
- High emissions targets

Use the boiler selection questionnaire to help you choose a Logano S825L and S825L LN or a Logano plus SB825L and SB825L LN. Specific requirements of the planned project can be clearly set out here.



A completed sample questionnaire is shown in Fig. 81. A template for copying can be found on page 116.

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### 13.2 Boiler selection questionnaire

Subject to the required values ❶, the specifications for the Logano S825L and S825L LN conventional boilers (→ page 14 ff.) or the Logano plus SB825L and SB825L LN gas condensing boilers (→ page 20 ff.) are used to determine a suitable boiler size ❷ for the relevant value. The largest boiler size calculated determines the boiler type to be used for all stated requirements.

The following example from 'Musterhaus Müller' shows that, according to the stated requirements ❶, either the Logano S825L-3050 conventional boiler with a burner from company A ❸ or a Logano S825L-2500 with a burner from company B ❹ is suitable. According to the stated requirements, the Logano S825L-2500 conventional boiler with a burner from company B should be used.

| Fragebogen zur Kesselauswahl für<br>Logano S825L und S825L LN sowie<br>Logano plus SB825L und SB825L LN                         |                                                                      |                                                                        |                                       | Projekt: <input type="text" value="Musterhaus Müller"/> |  | Buderus                                                       |                                     |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------------|--|---------------------------------------------------------------|-------------------------------------|
|                                                                                                                                 |                                                                      |                                                                        |                                       | Datum: <input type="text" value="01. Juni 2010"/>       |  | Bearbeiter: <input type="text" value="R. Meier"/>             |                                     |
| <b>Objektdaten:</b>                                                                                                             |                                                                      |                                                                        |                                       | <b>❶ Geforderte Werte</b>                               |  | <b>❷ Einzusetzende Kesselgröße</b>                            |                                     |
| Nennleistung                                                                                                                    | kW                                                                   | <input type="text" value="1800"/>                                      |                                       |                                                         |  | <input type="text" value="Logano S825L-1900"/>                |                                     |
| Brennstoff                                                                                                                      | Heizöl EL                                                            | kWh/kg                                                                 | <input type="text"/>                  |                                                         |  |                                                               |                                     |
|                                                                                                                                 | Erdgas                                                               | kWh/m³                                                                 | <input type="text" value="9,0"/>      |                                                         |  |                                                               |                                     |
| Kombifeuerung mit Heizöl EL und Erdgas                                                                                          | <input type="checkbox"/> ja <input checked="" type="checkbox"/> nein |                                                                        |                                       |                                                         |  |                                                               |                                     |
| Betriebstemperaturen                                                                                                            | °C                                                                   | <input type="text" value="100/70"/>                                    |                                       |                                                         |  | <input type="text" value="Logano S825L-1900"/>                |                                     |
| Betriebsdruck                                                                                                                   | bar                                                                  | <input type="text" value="9"/>                                         |                                       |                                                         |  | <input type="text" value="Logano S825L-1900/10"/>             |                                     |
| Sonstiges                                                                                                                       | <input type="text"/>                                                 |                                                                        |                                       |                                                         |  |                                                               |                                     |
| <b>Emissionen und Umweltschutz:</b>                                                                                             |                                                                      |                                                                        |                                       | <b>1. BImSchV</b>                                       |  | <b>TA Luft</b>                                                |                                     |
| Einhaltende Anforderungen                                                                                                       | Abgasverlust                                                         | %                                                                      | <input checked="" type="checkbox"/> 9 |                                                         |  | <input type="checkbox"/> 1/2 TA Luft                          |                                     |
|                                                                                                                                 | LRV                                                                  |                                                                        | <input type="checkbox"/>              |                                                         |  | Regionale Richtlinie                                          | <input checked="" type="checkbox"/> |
|                                                                                                                                 |                                                                      |                                                                        |                                       | <b>Geforderte Werte</b>                                 |  |                                                               |                                     |
| NO <sub>x</sub>                                                                                                                 | mg/m³                                                                | <input type="text" value="80"/>                                        |                                       |                                                         |  |                                                               |                                     |
| CO                                                                                                                              | mg/m³                                                                | <input type="text"/>                                                   |                                       |                                                         |  |                                                               |                                     |
| SO <sub>x</sub>                                                                                                                 | mg/m³                                                                | <input type="text"/>                                                   |                                       |                                                         |  |                                                               |                                     |
| Staub                                                                                                                           | mg/m³                                                                | <input type="text"/>                                                   |                                       |                                                         |  |                                                               |                                     |
| O <sub>2</sub> -Gehalt (Bezugswert)                                                                                             | Vol-%                                                                | <input type="text" value="3"/>                                         |                                       |                                                         |  |                                                               |                                     |
| Sonstiges                                                                                                                       | <input type="text"/>                                                 |                                                                        |                                       |                                                         |  |                                                               |                                     |
| <b>Wirtschaftlichkeit:</b>                                                                                                      |                                                                      |                                                                        |                                       | <b>❶ Geforderte Werte</b>                               |  | <b>Einzusetzende Kesselgröße – Wert</b>                       |                                     |
| Maximale Abgastemperatur                                                                                                        | °C                                                                   | <input type="text" value="190"/>                                       |                                       |                                                         |  | <input type="text" value="Logano S825L-2500 – 191 °C"/>       |                                     |
| Abgasverlust                                                                                                                    | %                                                                    | <input type="text" value="~ 7,5 (13,5 % CO&lt;sub&gt;2&lt;/sub&gt;)"/> |                                       |                                                         |  | <input type="text" value="Logano S825L-2500 – 191 °C"/>       |                                     |
| Wirkungsgrad                                                                                                                    | %                                                                    | <input type="text"/>                                                   |                                       |                                                         |  |                                                               |                                     |
| Normnutzungsgrad                                                                                                                | %                                                                    | <input type="text"/>                                                   |                                       |                                                         |  |                                                               |                                     |
| Sonstiges                                                                                                                       | <input type="text"/>                                                 |                                                                        |                                       |                                                         |  |                                                               |                                     |
| Brennwert-Wärmetauscher (nur bei Gasfeuerung) bei einer Wassereintrittstemperatur von                                           |                                                                      |                                                                        |                                       | °C <input type="text" value="35"/>                      |  |                                                               |                                     |
| Leistung                                                                                                                        | kW                                                                   | <input type="text" value="~ zusätzlich &gt; 150"/>                     |                                       |                                                         |  | <input type="text" value="Logano plus SB825L-1900 – 160 kW"/> |                                     |
| Maximale Abgastemperatur                                                                                                        | °C                                                                   | <input type="text"/>                                                   |                                       |                                                         |  |                                                               |                                     |
| Sonstiges                                                                                                                       | <input type="text" value="alternativ anbieten"/>                     |                                                                        |                                       |                                                         |  |                                                               |                                     |
| <b>Brennerdaten:</b>                                                                                                            |                                                                      |                                                                        |                                       | <b>Fabrikat A</b>                                       |  | <b>Fabrikat B</b>                                             |                                     |
|                                                                                                                                 |                                                                      |                                                                        |                                       | <b>A</b>                                                |  | <b>B</b>                                                      |                                     |
|                                                                                                                                 |                                                                      |                                                                        |                                       | <b>❶ Geforderte Werte</b>                               |  | <b>❷ Einzusetzende Kesselgröße</b>                            |                                     |
| Feuerraumlänge                                                                                                                  | mm                                                                   | <input type="text" value="2480"/>                                      | <input type="text" value="2230"/>     |                                                         |  | <input type="text" value="Logano S825L-1900"/>                | <input type="text" value="1900"/>   |
| Feuerraumdurchmesser                                                                                                            | mm                                                                   | <input type="text" value="804"/>                                       | <input type="text" value="666"/>      |                                                         |  | <input type="text" value="Logano S825L-3050 ❸"/>              | <input type="text" value="1900"/>   |
| Feuerraum-Volumenbelastung                                                                                                      | MW/m³                                                                | <input type="text" value="≤ 1,5"/>                                     | <input type="text" value="≤ 1,5"/>    |                                                         |  | <input type="text" value="Logano S825L-2500 ❹"/>              | <input type="text" value="2500"/>   |
| Sonstiges                                                                                                                       | <input type="text"/>                                                 |                                                                        | <input type="text"/>                  |                                                         |  | <input type="text"/>                                          | <input type="text"/>                |
| Die größte eingetragene Kesselgröße bestimmt den für die gestellten Anforderungen einzusetzenden Kesseltyp und die Kesselgröße. |                                                                      |                                                                        |                                       |                                                         |  |                                                               |                                     |

Fig. 81 Completed sample boiler selection questionnaire (template for copying → page 116)

| <b>Fragebogen zur Kesselauswahl für<br/>Logano S825L und S825L LN sowie<br/>Logano plus SB825L und SB825L LN</b>                |                       |                                                           |                                               | <b>Buderus</b>                            |                                           |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------|-----------------------------------------------|-------------------------------------------|-------------------------------------------|
| Projekt:                                                                                                                        |                       | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| Datum:                                                                                                                          |                       | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| Bereitgestellt:                                                                                                                 |                       | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| <b>Objektdaten:</b>                                                                                                             |                       |                                                           |                                               |                                           |                                           |
|                                                                                                                                 |                       | Geforderte Werte                                          | Einzusetzende Kesselgröße                     |                                           |                                           |
| Nennleistung                                                                                                                    | kW                    | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Brennstoff                                                                                                                      | Heizöl EL      kWh/kg | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
|                                                                                                                                 | Erdgas      kWh/m³    | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| Kombifuerung mit Heizöl EL und Erdgas                                                                                           |                       | <input type="checkbox"/> ja <input type="checkbox"/> nein |                                               |                                           |                                           |
| Betriebstemperaturen                                                                                                            | °C                    | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Betriebsdruck                                                                                                                   | bar                   | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Sonstiges                                                                                                                       |                       | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| <b>Emissionen und Umweltschutz:</b>                                                                                             |                       |                                                           |                                               |                                           |                                           |
| Einhaltende Anforderungen                                                                                                       |                       | 1. BImSchV <input type="checkbox"/>                       | TA Luft <input type="checkbox"/>              |                                           |                                           |
|                                                                                                                                 |                       | Abgasverlust % <input style="width: 50%;" type="text"/>   | ½ TA Luft <input type="checkbox"/>            |                                           |                                           |
|                                                                                                                                 |                       | LRV <input type="checkbox"/>                              | Regionale Richtlinie <input type="checkbox"/> |                                           |                                           |
|                                                                                                                                 |                       | Geforderte Werte                                          |                                               |                                           |                                           |
| NO <sub>x</sub>                                                                                                                 | mg/m³                 | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| CO                                                                                                                              | mg/m³                 | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| SO <sub>x</sub>                                                                                                                 | mg/m³                 | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| Staub                                                                                                                           | mg/m³                 | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| O <sub>2</sub> -Gehalt (Bezugswert)                                                                                             | Vol.-%                | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| Sonstiges                                                                                                                       |                       | <input style="width: 100%;" type="text"/>                 |                                               |                                           |                                           |
| <b>Wirtschaftlichkeit:</b>                                                                                                      |                       |                                                           |                                               |                                           |                                           |
|                                                                                                                                 |                       | Geforderte Werte                                          | Einzusetzende Kesselgröße – Wert              |                                           |                                           |
| Maximale Abgastemperatur                                                                                                        | °C                    | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Abgasverlust                                                                                                                    | %                     | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Wirkungsgrad                                                                                                                    | %                     | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Normnutzungsgrad                                                                                                                | %                     | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Sonstiges                                                                                                                       |                       | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Brennwert-Wärmetauscher (nur bei Gasfeuerung) bei einer Wassereintrittstemperatur von                                           |                       | °C                                                        | <input style="width: 50%;" type="text"/>      |                                           |                                           |
| Leistung                                                                                                                        | kW                    | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Maximale Abgastemperatur                                                                                                        | °C                    | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| Sonstiges                                                                                                                       |                       | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     |                                           |                                           |
| <b>Brennerdaten:</b>                                                                                                            |                       |                                                           |                                               |                                           |                                           |
|                                                                                                                                 |                       | Fabrikat A                                                | Fabrikat B                                    | Bei Fabrikat A                            | Bei Fabrikat B                            |
|                                                                                                                                 |                       | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     | <input style="width: 100%;" type="text"/> | <input style="width: 100%;" type="text"/> |
|                                                                                                                                 |                       | Geforderte Werte                                          | Einzusetzende Kesselgröße                     |                                           |                                           |
| Feuerraumlänge                                                                                                                  | mm                    | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     | <input style="width: 100%;" type="text"/> | <input style="width: 100%;" type="text"/> |
| Feuerraumdurchmesser                                                                                                            | mm                    | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     | <input style="width: 100%;" type="text"/> | <input style="width: 100%;" type="text"/> |
| Feuerraum-Volumenbelastung                                                                                                      | MW/m³                 | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     | <input style="width: 100%;" type="text"/> | <input style="width: 100%;" type="text"/> |
| Sonstiges                                                                                                                       |                       | <input style="width: 100%;" type="text"/>                 | <input style="width: 100%;" type="text"/>     | <input style="width: 100%;" type="text"/> | <input style="width: 100%;" type="text"/> |
| Die größte eingetragene Kesselgröße bestimmt den für die gestellten Anforderungen einzusetzenden Kesseltyp und die Kesselgröße. |                       |                                                           |                                               |                                           |                                           |

Fig. 82 Template for copying the boiler selection questionnaire

# Index

## B

|                                                 |       |
|-------------------------------------------------|-------|
| Boiler efficiency.....                          | 7, 38 |
| Boiler foundation.....                          | 105   |
| Boiler Logano S825L                             |       |
| Benefits and features.....                      | 6     |
| Boiler room dimensions.....                     | 95    |
| Combustion details .....                        | 45–46 |
| Connections.....                                | 30–31 |
| Dimensions.....                                 | 14–15 |
| Equipment overview .....                        | 11    |
| Flow safety line.....                           | 31    |
| Function principle .....                        | 12    |
| Handling dimensions .....                       | 92    |
| Installed dimensions.....                       | 95    |
| Operating conditions .....                      | 56    |
| Specification .....                             | 18    |
| Boiler Logano S825L LN                          |       |
| Benefits and features.....                      | 6     |
| Boiler room dimensions.....                     | 95    |
| Combustion details .....                        | 47–48 |
| Connections.....                                | 30–31 |
| Dimensions.....                                 | 16–17 |
| Equipment overview .....                        | 11    |
| Flow safety line.....                           | 31    |
| Function principle .....                        | 12    |
| Handling dimensions .....                       | 92    |
| Installed dimensions.....                       | 95    |
| Operating conditions .....                      | 56    |
| Specification .....                             | 19    |
| Boiler room dimensions                          |       |
| Boiler Logano S825L/L LN .....                  | 95    |
| Gas condensing boiler Logano plus SB825L LN.... | 96    |
| Boiler safety equipment assembly.....           | 98    |
| Burner                                          |       |
| Matched pressure-jet burners.....               | 44    |
| Selection.....                                  | 44    |
| Silencer hood .....                             | 104   |
| Burner selection.....                           | 44    |

## C

|                                      |       |
|--------------------------------------|-------|
| Chemical additives .....             | 58    |
| Combustion air supply.....           | 94    |
| Combustion chamber volume load.....  | 37–38 |
| Combustion details .....             | 45–52 |
| Condensate pump.....                 | 113   |
| Condensate volume .....              | 112   |
| Condensation heat .....              | 7     |
| Condensing technology                |       |
| Matching to the heating system ..... | 8     |
| Rated output (BWT) .....             | 41    |
| Sizing information .....             | 9     |
| Connections.....                     | 30–31 |
| Connector .....                      | 33    |

## Control systems

|                                                               |    |
|---------------------------------------------------------------|----|
| Burner control panel .....                                    | 68 |
| Control panel system Logamatic 4411 .....                     | 68 |
| Control unit Logamatic 4212 with auxiliary module ZM427 ..... | 63 |
| Control units Logamatic 4321 and 4322 .....                   | 64 |
| DA... display and control units .....                         | 68 |
| Logamatic Telecontrol system.....                             | 69 |
| Control unit .....                                            | 63 |
| Control unit retainer .....                                   | 66 |
| Corrosion protection.....                                     | 57 |

## D

|                                      |        |
|--------------------------------------|--------|
| DA... display and control units..... | 68     |
| Delivery method .....                | 92     |
| DHW heating .....                    | 72, 74 |
| DHW temperature control.....         | 72     |
| Dirt traps.....                      | 74     |
| Drain connection .....               | 106    |

## E

|                                        |    |
|----------------------------------------|----|
| Economic viability considerations..... | 10 |
| Emissions regulations.....             | 53 |

## F

|                                                    |     |
|----------------------------------------------------|-----|
| Flash trap.....                                    | 101 |
| Flow safety line.....                              | 31  |
| Flue gas loss.....                                 | 7   |
| Flue gas temperature.....                          | 42  |
| Flue system                                        |     |
| General information.....                           | 108 |
| Material requirements for gas condensing boilers   | 108 |
| Requirements .....                                 | 108 |
| Special information for gas condensing boilers ... | 108 |
| Fuel .....                                         | 57  |

## G

|                                          |        |
|------------------------------------------|--------|
| Gas condensing boiler Logano plus SB825L |        |
| Benefits and features.....               | 6      |
| Boiler room dimensions .....             | 96     |
| Combustion details .....                 | 49–50  |
| Connections .....                        | 30, 32 |
| Dimensions .....                         | 20–21  |
| Equipment overview .....                 | 11     |
| Flow safety line.....                    | 31     |
| Function principle .....                 | 12     |
| Handling dimensions .....                | 92     |
| Installed dimensions.....                | 96     |
| Operating conditions .....               | 56     |
| Specification .....                      | 24–25  |

## Gas condensing boiler Logano plus SB825L LN

|                             |        |
|-----------------------------|--------|
| Benefits and features.....  | 6      |
| Boiler room dimensions..... | 96     |
| Combustion details .....    | 51–52  |
| Connections.....            | 30, 32 |
| Dimensions.....             | 22–23  |
| Equipment overview .....    | 11     |
| Flow safety line.....       | 31     |
| Function principle .....    | 12     |
| Handling dimensions .....   | 92     |
| Installed dimensions.....   | 96     |
| Operating conditions .....  | 56     |
| Specification .....         | 26–27  |
| Gross calorific value ..... | 7      |
| Guidelines                  |        |
| Water quality.....          | 58     |

**H**

|                                |                  |
|--------------------------------|------------------|
| Handling dimensions .....      | 92               |
| Hydraulic balancing line ..... | 74, 82           |
| Hydraulic separation .....     | 84, 86–87, 89–90 |

**I**

|                                |         |
|--------------------------------|---------|
| Installation room.....         | 93      |
| Intermediate return piece..... | 99, 102 |
| Investment costs.....          | 10      |

**L**

|                             |     |
|-----------------------------|-----|
| Ladder .....                | 106 |
| Latent heat .....           | 7   |
| List of abbreviations ..... | 73  |

**M**

|                   |        |
|-------------------|--------|
| Maintenance ..... | 53, 74 |
|-------------------|--------|

**N**

|                              |     |
|------------------------------|-----|
| Net calorific value .....    | 7   |
| Neutralising system          |     |
| Equipment level.....         | 113 |
| Neutralising agent.....      | 113 |
| Neutralising obligation..... | 112 |
| Pump output graph .....      | 113 |
| Siting .....                 | 112 |

**O**

|                            |    |
|----------------------------|----|
| Operating conditions ..... | 56 |
|----------------------------|----|

**P**

|                                        |       |
|----------------------------------------|-------|
| Possible applications.....             | 6     |
| Pressure drop                          |       |
| Pressure drop on the hot gas side..... | 35–36 |
| Pressure drop on the water side.....   | 34    |

**R**

|                                           |                   |
|-------------------------------------------|-------------------|
| Regulations and operating conditions..... | 53–60             |
| Return temperature raising facility ..... | 9, 74, 83–84, 102 |
| Return temperature sensor.....            | 79, 85–90         |

**S**

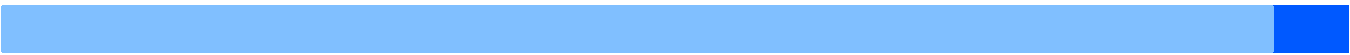
|                                                              |                                |
|--------------------------------------------------------------|--------------------------------|
| Safety equipment                                             |                                |
| Boiler safety equipment assembly.....                        | 98                             |
| Heat exchanger safety assembly .....                         | 79                             |
| Maximum pressure limiter .....                               | 97–98, 101                     |
| Minimum pressure limiter.....                                | 97–98                          |
| Requirements .....                                           | 78                             |
| Safety rail.....                                             | 106                            |
| Safety valve.....                                            | 11, 31, 79, 81, 88–91, 100–101 |
| Scaling.....                                                 | 58                             |
| Sensible heat.....                                           | 7                              |
| Sound insulation                                             |                                |
| Boiler foundation .....                                      | 105                            |
| Boiler mounts .....                                          | 104                            |
| Burner silencer hood .....                                   | 104                            |
| Flue gas silencer.....                                       | 103                            |
| Requirements .....                                           | 103–104                        |
| Standard delivery.....                                       | 92                             |
| Standard seasonal efficiency [to DIN].....                   | 9, 38                          |
| Standby loss.....                                            | 38, 40                         |
| System examples                                              |                                |
| 2-boiler system.....                                         | 81, 87, 90                     |
| Boiler Logano S825L and S825L LN .....                       | 83–87, 90                      |
| Control .....                                                | 74                             |
| DHW heating .....                                            | 74                             |
| Gas condensing boiler Logano plus SB825L and SB825L LN ..... | 88–91                          |
| Heating circuit pumps .....                                  | 74                             |
| List of abbreviations.....                                   | 73                             |
| Return temperature raising facility.....                     | 74                             |
| Single boiler system.....                                    | 79, 83–86, 88–89, 91           |
| System temperature                                           |                                |
| Boiler efficiency.....                                       | 38                             |
| Design.....                                                  | 8                              |
| Flue gas temperature.....                                    | 42                             |

**T**

|                          |    |
|--------------------------|----|
| Telecontrol system ..... | 69 |
| Transport options .....  | 92 |

**W**

|                           |        |
|---------------------------|--------|
| Walk-on boiler cover..... | 106    |
| Warranty.....             | 56, 74 |
| Water quality .....       | 58     |



## Notes

