Installation and Service Instructions

Low Emi
High Effi
Boiler

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 08/16/16

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Logano G125 BE US/CA

For trained and certified installers

Read carefully prior to installation, maintenance and service.

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Buderus

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1 Safety Considerations and Symbol Descriptions

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1.1 Regarding this Manual

This document contains important information regarding safe and proper installation, operation and maintenance of the boiler.

The high tech G125 BE boiler is designated as a hot water heating boiler.

The Installation and Maintenance Instructions are directed to the installing contractor who has professional knowledge regarding boiler installation and maintenance.

1.2 Guideline of Notices

Two levels of danger are identified by the following warning labels:

WARNING!

DANGER

Denotes a possible severely dangerous situation where, without proper caution, bodily injury or loss of life may result.

CAUTION!

DANGER OF INJURY/SYSTEM DAMAGE

Denotes a possible dangerous situation that can lead to mild to moderate bodily injury or physical damage.

NOTICE

Application comment for optimum use of equipment and adjustment as well as useful information.

➔ Cross reference

Designated by means of an arrow ➔ , refers to a notice in another document.

1.3 Observe the following

The local and state codes and regul
served during the installation of the

- The local building code requirements regarding placement, combustion air and venting and chimney system must be followed.
- Follow applicable electrical code requirements.
- Follow the local code and standards regarding safe boiler operation.

NOTICE

Use only original Buderus spare parts. Buderus can not be held liable for damage caused by non-Buderus parts.

NOTICE

The boiler installation must be performed by a qualified installer in accordance with regulations put forth in NFPA-31 Installation of Oil-Burning Equipment. The installation must comply with all local and national codes, regulations and authorities having jurisdiction regarding the installation of oil fired boilers.

For Canada refer to the guidelines of CSA/CGA-B149.1 and 2 Installation Codes.

1.3.1 Installation Guidelines

CAUTION!

DANGER TO LIFE

from electric shock

- Do not work on electrical components unless you have the required qualification and applicable certification.
- Do not work on electrical components unless you have the required qualification and applicable certification.
- Prior to opening the control: shut down the power supply and prevent from accidental reactivation.
- Observe all applicable installation guidelines.

1.3.2 Boiler Room Guidelines

CAUTION!

DANGER TO LIFE

from poisoning.
Insufficient combustion air can result in dangerous operation if combustion air is taken from indoors.

- Please observe that combustion air openings are not reduced in size or closed.
- Make sure that no mechanical air openings or devices remove combustion air from the boiler room such as central vacuum systems, dryers and air conditioning appliances.
- Make sure that the boiler is connected to a chimney or horizontal venting system that is capable of handling the slight positive breeching pressure.
- If any of these problems have not been corrected, one cannot operate the boiler.
- Make the end-user aware of these guidelines and their potential danger.

CAUTION!

FIRE DANGER

due to flammable or liquid materials.

- Make sure that flammable and liquid materials are not in the close vicinity of the boiler.

1.4 Tools, Materials an

For the installation and mainten
will need typical tools used in .

In addition, the following compo

- Boiler cart with rope or Bude
- Wood blocking.
- Cleaning brushes and/or chemical cleaning agents for wet cleaning.

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1.5 Disposal

- Please dispose of any trash in an environmentaly friendly fashion.
- Please discard properly of any heating system related components.

2 Product Description

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2.1 Product Applications

The boiler is designated for use as a hot water heating boiler for space heating applications and to heat domestic hot water by means of an indirect fired tank for single and multi-family homes and small commercial heating applications.

Please observe the technical data on the rating label and technical information (➔ Chapter 3, page 7), to ensure proper application of this product.

2.2 Product Description

The G125 BE is a oil fired low temperature boiler with boiler water temperature regulation.

The boiler consists of:

– Optional Logamatic control

– Boiler jacket

– Boiler block with insulation

– Burner

The optional Logamatic control manages most control functions in a heating system.

As an alternative, a Aquasmart control can be used for boiler control.

The boiler jacket serves to reduce energy loss and as a noise reducing agent.

The boiler block transfers the heat generated by the burner to the boiler water. The insulation reduces the stand-by losses.

Fig. 1 Boiler G125 BE US/CA

1 Control panel

2 Boiler jacket

3 Boiler block with insulation

4 Burner door cover

5 Burner

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3 Technical Information

3.1 Technical Data less Burner

Fig. 2 Dimensions and connections (measurements in inches)

Connections (For Measurements see following tables):

VK = Boiler supply
RK = Boiler return
EL = Boiler drain (Connection for drain valve)
VS = Connection (plugged)
RS = Connection (plugged)
VSL = Connection (plugged)

Boiler Model		G125/21-BE	G125/28-BE	G125/34-BE
Number of boiler blocks		3	4	5
Heating Capacity (Gross Output)	**MBtu/hr**	72	96	116
Net IBR	**MBtu/hr**	63	83	101
Boiler water content	**Gal**	8.7	10.8	12.9
Fireside volume	**cu.ft.**	1.20	1.75	2.21
Oil firing rate	**GPH**	.60	.80	1.0
Fireside pressure drop	**psi**	0.00058 – 0.00145		
Permissible max. supply temperature[1]	**°F**	230		
Allowable operating pressure	**psi**	58		
Maximum Reset High Limit for temperature sensor and overheat thermostat (STB)	**s**	40		

Table 1 Technical Data for G125 BE less burner

[1] *High limit (overheat thermostat STB)*
Permissible maximum supply temperature = High limit (STB) – 32 °F
e.g.: High limit (STB) = 212 °F, maximum permissible supply temperature = 212 – 32 = 180 °F
Select your high limit (STB setting) according to your local codes and requirements.

Boiler Model		G125/21-BE	G125/28-BE	
Total boiler length (L)		34 5/8”	39 3/8”	
Boiler block length (LK)		21 1/8”	25 3/4”	
Combustion chanber length		16”	20 1/2”	
Firebox diameter		10 5/8”		
Burner door thickness		3 1/2”		
Distance between boiler feet (FL)		11 3/8”	16 1/8”	
Dry weight[1]		386lbs	459lbs	513lbs

Table 2 Dimensions, Weight and other Data for G125 BE less burner

[1] *Weight incl. packaging material approx 6 – 8% more.*

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3.2 Operating Conditions

Maintain the operating requirements listed on the following page for long and trouble free operation of the boiler. Proper and timely maintenance procedures must be followed.

CAUTION!

SYSTEM DAMAGE

If these operating requirements are not followed, it can lead to premature failure can result and cause permanent damage to the boiler.

- Follow the instructions on the rating label and those in the manual.

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3.2.1 General Operating Requirements

Operating Conditions			
Minimum Boiler temperature	**Boiler Shutdown**	**Boiler Shutdown/ Mixed temperature[1]**	**Mini**
Systems controlled by R2107 controls for outdoor reset operation			
No requirements Operating conditions are met with R2107 control [2]	Automatic with Logamatic R2107	No requirement, yet beneficial with low temperature boiler with 130/113 °F system design Necessary with: – Radiant floor applications – Systems with large water content > 115 gal/100,000 Btu/hr	No re
Systems controlled by Aquasmart or R2109			
150 °F [3]	Possible, provided the boiler operates after total shut-down for at least 3 hours.	Necessary	Necessary for: – Systems with large water content > 115 gal/100,000 Btu/hr: 130 °F – Firing with modulating burners: 130 °F

Table 3 General Operating Requirements

[1] *A heating circuit equipped with a motorized mixing valve improves the controllability of that sub-system and is specifically recommended when requiring different water temperatures.*

[2] *In case the control system has no influence over the flow in a heating circuit (for instance using the Pumplogic feature of the R2107), then one should achieve a minimum supply temperature of 122 °F within 10 minutes after burner start-up by means of reducing (or interrupting) the water flow through the boiler.*

[3] *Minimum setting on the adjustable high limit or Aquasmart: During burner operation one should achieve the minimum boiler temperature within 10 minutes after burner start-up by means of flow reduction and one should maintain this temperature.*

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3.2.2 Requirements for Boiler Room and Surroundings

Operating Conditions		Comments – Detailed Information
Boiler room temperature	+40 to +104 °F	
Relative humidity	max. 90 %	No condensate or dampness in boiler room.
Dust	–	**No excess amounts of dust should be present in the bo** – No sheet rock or construction dust. The available combustion air can not contain dust or other p filter might be needed, e.g.: – Combustion air from nearby roads with high dust levels. – Combustion air from nearby production facilities such as chemical plants & shops. – Airborne particulates.
Halogenated Hydrocarbons contamination	–	**Combustion air must be free of halogenated hydrocarbons components.** – Eliminate any chemical compound such as paints, lacquers, thinners, cleaning agents. If not possible, provide fresh outside air for combustion. **Please observe the following:** – Product information of Buderus catalog. – Also observe guidelines in K3 chapter of Buderus catalog.
Fans, removing air from boiler room	–	Avoid forced air removal by mechanical means during boiler operation such as: – Bathroom exhaust fans – Dryer – Air-conditioning equipment
Animals	–	The boiler room and especially the air inlet openings for combustion air must be kept free from animals entering by means of grills.
Fire Protection	–	Maintain proper clearances to combustible materials as required per local code. Maintain a minimum distance of 16”. Do not store flammable materials near the boiler.
Flood Zone Conditions	–	Separate the fuel supply and electrical power supply from the boiler during flood conditions. Replace the boiler components such as insulation, electrical and control components afterwards.

Table 4 Boiler room and surroundings

3.2.3 Combustion Air Requirements

Operating Conditions	Boiler capacity (combine total boiler capacity for multiple units)	Cross area required
Two air inlet openings from outside: one top, one near bottom	< 170,000 Btu/hr	At least 43 square inch
	> 170,000 Btu/hr	At least 43 square inch plus 2.5 square inch per 10,000 Btu/hr, if the output is higher than 170,000 Btu/hr.

Table 5 Observe local codes and regulations for combustion air requirements

3.2.4 Fuel Conditions

Country	All Countries
Fuel	#2 Fuel Oil ASTM D396-05 Type 2
Comments	No other fuel may be used with this burner. Burner requires annual service and cleaning. Verify each time that the complete heating system is in working order. Defects must be remedied immediately.

Table 6 Permitted fuel types

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3.2.5 Requirements for Power Supply

Operating Conditions		Comments – Detailed Information
Main power supply	120 V	Provide proper grounding for equipment and persona
High amp protection	10 A	
Frequency	60 Hz	
Protection	–	Group all equipment per local code

Table 7 Power supply

3.2.6 Conditions Pertaining to Piping and Water Quality

Operating Conditions		Comments – Detailed Information
Operating pressure (over pressure)	12 – 58 psi	Maximum pressure is 30 psi based on supplied relief valve
Allowable test pressure	45 – 75 psi	
Adjustable temperature limit TR	122 – 194 °F	
Manual reset high limit	210 °F	In combination with Beckett AquaSmart the limit value (210 °F) may not be exceeded.
Water quality	–	Initial fill water and make-up water should be potable water type quality. A pH range of 8.2 to 9.5 is desired.

Table 8 Piping and water quality

4 Packaging and Components

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- Check the packaging for concealed damage.
- Check the packaging for completeness. Contact your wholesaler in case of missing parts.

Component	Qty	Packaging
Boiler block	1	Pallet
Boiler jacket, installed on boiler		
Burner door and burner door cover installed on boiler block		
Buderus oil burner mounted on customized burner door		
B-Kit-Components: Supply manifold (1¼" NPT) 30 psi relief valve (¾") boiler drain Pressure/temperature gauge (1¼" NPT × R1¼) conversion nipple (parallel to NPT) 90°-elbow (1¼" NPT) 90°-elbow (¾" NPT) Burner mounting studs and washers Screw in feet	1 4	Plastic packaging with boiler
Control panel, alternative Aquasmart control (ordered separately)		Cardboard box
Tigerloop oil filter	1	included with boiler package
Taco 007 circulator pump w/flanges		
Technical documents	1	Plastic packaging w/boiler

Table 9 Packaging and components

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5 Moving the Boiler

This chapter describes how to move the boiler.

CAUTION!

SYSTEM DAMAGE

due to bumps.

- Protect the boiler from bumps and rough treatment.

NOTICE

- Protect the boiler from connections from damage and dirt, when the boiler is not installed immediately.

NOTICE

Please dispose of the packaging in an environmentally friendly fashion.

5.1 Reducing Boiler Weight for Transportation

One can reduce boiler weight by removing the front cover and burner door itself.

- Remove the screws holding the front cover in place.
- Lift up the front cover slightly and remove.
- Disconnect burner cable from burner control before removing the burner door.

Fig. 3 Removing the front cover

- Open burner door by removing the two burner door bolts.
- Lift burner door from hinges.

NOTICE

- Protect the burner door and the burner tube from damage and dirt when the burner door is removed from the boiler.

Fig. 4 Removal of burner door

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5.2 Lifting and Carrying the Boiler

NOTICE

The boiler is secured to the pallet with two bolts.

- Remove the bolts from pallet before lifting the boiler.

The boiler can be picked up at the hand grips located along the lower jacket panels.

CAUTION!

BODILY DANGER

due to carrying of heavy loads.

- Lift and carry the boiler with at least two people at the designated hand grip positions.

Fig. 5 Lifting and carrying the boiler

5.3 Moving the Boiler with the Boiler Cart

CAUTION!

BODILY DANGER

if the product is not properly secured to the cart.

- Use proper moving equipment such as the Buderus cart or other dolly.
- Secure the boiler to the cart and move the boiler to the job location.

- Lift up the boiler from the rear side by using moving equipment (e.g. Buderus card or other dolly).
- Secure the boiler to the cart.
- Move the boiler to the job location.

NOTICE

By tipping the cart you can install the boiler feet (➔ Chapter 6.3, page 17).

You can order a Buderus cart from your local wholesaler.

Fig. 6 Moving the boiler with a Buderus cart

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6 Placing the Boiler

This chapter discusses how to place the boiler in the boiler room.

CAUTION!

SYSTEM DAMAGE

due to freezing temperatures

- Place the boiler in a frost free room.

6.1 Clearances

Position the boiler while observing the clearances in (➔ Fig. 7). Access to the boiler is reduced when reducing these clearances.

The boiler foundation must be level and sufficiently strong.

The burner door is factory installed right swinging. You-can reverse the door swing in the field.

	Distance	
A	Recommended	51 1/8"
	minimum	39 3/8"
B	Recommended	27 1/2"
	minimum	15 3/4"
C	Recommended	15 3/4"
	minimum	3 7/8"
L	see Chapter 3 „Technical Information“	

Table 10 Recommended and minimum clearances (Measurement in Inches)

Fig. 7 Clearance dimensions for G125 boilers

NOTICE

Smaller clearances must abide with state and local code. The boiler is approved for 6" side clearances. A minimum distance of 18" to combustible materials must be maintained per NFPA 31.

Floor material must comply with NFPA 31.

NOTICE

Observe required distances to other components such as water piping, venting and other components.

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6.2 Reversing the Burner Door Swing

The burner door hinges are factory installed on the right handside the burner door swings to the right. You can adjust the hinges so that the burner door swings to the left in the field.

Note: the front panel must first be removed. (➔ Chapter 5.1, page 13).

- Remove burner door (➔ Chapter 5.1, page 13).
- Remove hex head bolts of burner door hinges and remove hinges.
- Install the hinges on the left side of the boiler with the hex head bolts.

Fig. 8 Reversing burner door (boiler block)

1 Hex head bolts for hinges

2 Door hinges

- Remove the eyelets from the burner door by removing the hex head bolts.
- Locate and secure with hex head bolts these eyelets to the left side of the burner door.
- Hang the burner door on the hinges.
- Check to make sure that the flue baffle plates are horizontally in the boiler (➔ Chapter 8.3, page 40).
- Secure the burner door with the burner door bolts. Make sure to tighten the burner door bolts evenly with about 7.5 ft-lbs torque.

NOTICE

When reversing the swing of the burner door, make sure to remove the burner cable and oil line from the burner first.

Fig. 9 Reversing burner door (on burner door)

1 Hex head bolts for door eyelets

2 Door eyelet

3 Burner door

4 Door hinges

5 Flue baffles

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6.3 Installation of boiler Feet (Components of B-Kit)

You can level the boiler using the screw-in boiler feet, so that air can not collect in the boiler.

Requirement: remove front panel from boiler (➔ Chapter 5.1, page 13).

NOTICE

When installing a G125 BE boiler on top of a horizontal Buderus DHW indirect tank, do not use the boiler feet on the boiler, but rather use the feet to level the tank.

- Tip the boiler slightly using the boiler cart (➔ Chapter 5.3, page 14) or put a piece of wood under one side.
- Screw in the boiler feet 1/4" – 3/8".
- Level the boiler.

Fig. 10 Installation of boiler feet

1 Boiler rail

2 Boiler feet

6.4 Placement of the Boiler

- Bring the boiler to its final location.
- Put a level on the boiler and adjust boiler feet to level the boiler.

NOTICE

- Protect the boiler connections from dust and debris, if the boiler will not be connected right away.

Fig. 11 Leveling the boiler

7 Boiler Installation

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7.1 Installation of Venting Systems

This chapter describes the installation of the venting system and the combustion air supply system for the G125 BE boiler.
Following venting options are available:

Venting system	Comment	Draft	Combustion air	Chapter
Masonry chimney (no liner)	Barometric damper required	Negative	Outside air or room air	7.1.1.1, Page 19
Masonry chimney w/ 5" liner				7.1.1.2, Page 20
Vertical vent 5"				7.1.1.3, Page 21
Side wall	Sealed vent	Positive	Outside air only	7.1.2, Page 22

Table. 11Venting options

WARNING!

DANGER TO LIFE

from toxic flue gases.

- Never connect more than one appliance to a venting system - regardless of vertical or horizontal venting.
- Common venting of appliances can cause property damage and put life at risk.
- Chimney liners must be a single continuous piece inside an existing chimney and can not have any connections inside the chimney chase.
- The venting system shall not be routed into, through, or within any other vent, such as an existing masonry or factory-built chimney that is used to vent any other appliance.
- Always follow vent manufacturer's instructions.

WARNING!

FIRE DANGER

from insufficient clearance between vent system components and combustible surfaces.

- Maintain 18" clearance to combustible surfaces when using galvanized or stainless pipe in vertical or horizontal venting.
- Maintain 1" clearance to combustible surfaces when using flexible oil vent for horizontal venting.
- Both the Aerocowl (AT-4) exhaust termination and Fields (FT-4) concentric exhaust/intake terminations are approved with zero clearance to combustible surfaces.

NOTICE

The boiler installation must be performed by a qualified installer in accordance with regulations put forth in NFPA-31 Installation of Oil-Burning Equipment. The installation must comply with all local and national codes, regulations and authorities having jurisdiction regarding the installation of oil fired boilers.
For Canada refer to the guidelines of CSA/B139 Installation Codes.

NOTICE

- Avoid excessively long venting systems and keep the number of elbows to a minimum.

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NOTICE

Due to tight construction of modern homes, Buderus recommends drawing combustion air from outdoors. The boiler is factory prepared for connecting 4" rigid pipe ducted directly to the increaser at the rear of the boiler. For further directions ➔ Chapter 7.2, page 28.

Except for direct venting, and provided ample combustion air is available in the boiler room, combustion air can also be drawn from the room (➔ Chapter 7.2, page 28 for details).

NOTICE

For Canada the G125 BE is approved without a Blocked Vent Switch.
Should local authorities require a Blocked Vent Switch ➔ Chapter Fig. 63, page 68.

7.1.1 Vertical Venting Systems

The G125 BE boiler can be vented vertically using an existing masonry chimney or a factory built All-Fuel or L-vent chimney.

7.1.1.1 Masonry Chimney

Venting system: Masonry Chimney			
Comment	**Draft**	**Combus-tion air**	**Max. vent length**
Barometric damper required	Negative	Outside air or room air	60 ft.

Refer to NFPA 31 for requirements on chimney venting. Old, cold or over-sized chimneys require the use of an approved 5" chimney liner (➔ Page 20).
The maximum vent length of a masonry chimney is 60 ft.

A masonry chimney is operated under slight negative pressure, and requires a barometric damper.

- Follow damper manufacturer's instructions as to placement.
- Adjust draft for negative 0.02 – 0.04" W.C.

WARNING!

DANGER TO LIFE

from toxic flue gases.

- Verify that all vent pipe connections have been installed properly.
- Have the entire venting system cleaned and inspected annually by a qualified service company.

Fig. 12 Masonry chimney installation

1 Chimney

2 Barometric damper

3 Clean-out

4 Horizontal air connection for combustion air (optional, see 7.2)

7.1.1.2 Chimney with 5" Liner

Venting system: Chimney with 5" Liner			
Comment	**Draft**	**Combus-tion air**	**Max. Vent length**
Barometric damper required	Negative	Outside air or room air	60 ft.

Install liner according to manufacturer's instructions. Follow all applicable local and national codes and regulations.

The maximum vent length of 5" liner in a masonry chimney is 60 ft.
The 5" liner in a chimney is operated under slight negative pressure, which requires a barometric damper.

- Follow damper manufacturer's instructions as to placement.
- Adjust draft for negative 0.02 – 0.04" W.C.

WARNING!

DANGER TO LIFE

from toxic flue gases.

- Verify that all vent pipe connections have been installed properly.
- Have the entire venting system cleaned and inspected annually by a qualified service company.

Fig. 13 5" Chimney liner installation

1 5" Chimney liner

2 Barometric damper

3 Horizontal air connection for combustion air (optional, see 7.2)

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7.1.1.3 Vertical Vent

Venting system: 5" Vertical Vent			
Comment	**Draft**	**Combus-tion air**	**Max. Vent length**
Barometric damper required	Negative	Outside air or room air	60 ft.

Extend the vertical vent pipe sufficiently far above the roof per NFPA 31. Follow all applicable local and national codes and regulations.

The maximum length of the vertical 5" venting system is 60 ft.

The 5" vertical venting system operates under a slight negative pressure, which requires a barometric damper.

- Follow damper manufacturer's instructions as to placement.
- Adjust draft for negative 0.02 – 0.04" W.C.

WARNING!

DANGER TO LIFE

from toxic flue gases.

- Vertical vent pipe must have an approved fire stop at each ceiling penetration and the stack must be properly supported at its base.
- Each venting section must be supported at each elbow and at least every 48" of straight pipe.

WARNING!

DANGER TO LIFE

from toxic flue gases.

- Verify that all vent pipe connections have been installed properly.
- Have the entire venting system cleaned and inspected annually by a qualified service company.

Fig. 14 Vertical venting system installation (supports are not shown for clarity)

1 Roof Penetration

2 Fire stop

3 All-Fuel or L vent flue pipe

4 Barometric Damper

5 Clean-out

6 Horizontal air connection for combustion air (optional, see 7.2)

7.1.2 Horizontal Venting

Venting system: Side wall			
Comment	**Draft**	**Combus-tion air**	**Max. Vent length**
Sealed vent	Positive	Outside air only	20 ft.

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The maximum length of the direct vent system is 20 ft. of linear pipe including 3 x 90° elbows. With 4 elbows the maximum pipe length is 10 ft.

The following two direct vent terminations are approved with the G125 BE, and are available for purchase from your Buderus supplier.

Both exhaust terminations are approved for use with two different exhaust vent pipe options.

– **Option 1:**
Flexible, insulated 4" stainless steel oil vent. The insulated oil vent is rated for 1" clearance to combustibles. Wrap the adapters with 3" of ceramic wool covered with foil tape or sheet metal to maintain 1" clearance. For installation instructions ➔ Chapter „7.1.2.6 Installation of Insulated Flexible Oil Vent“, page 26.

– **Option 2:**
Standard, 26 gauge galvanized 4" vent pipe. Maintain 18" clearance to combustibles with galvanized vent pipe (➔ Chapter „7.1.2.7 Installation of Galvanized Vent Pipe“, page 27).

NOTICE

Horizontal vent systems operate under positive pressure, which requires all seams to be sealed. Use high temperature silicone (500°F rated, G.E. 106 or equivalent) to seal any joints, screw penetrations, or combustion test holes, and seal at each pipe connection and all joints on adjustable elbows. Refer to 7.1.2.2 for details.

NOTICE

Installations in Canada less than 7 ft. above ground are required to have a cage/screen over the termination to prevent injury from touching hot surfaces.

Fig. 15 Aerocowl (AT-4) and Concentric (FT-4) termination

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7.1.2.1 Location of Exhaust Wall Termination

Fig. 16 Minimum clearance for termination

The location of the wall termination is one of the most important aspects of a direct-vent installation. In addition to the minimum clearances of terminations shown in Fig. 16, observe the following rules:

1. **Both the intake and exhaust terminations must be located on the same outside wall in order to balance wind pressure effects.**
2. **Wall terminations shall not be facing the direction of prevailing winds.**
3. The exhaust terminal must be located such that flue gases will be freely dispersed without reentering the building.
4. Exhaust terminal shall be at least 2 ft. from adjacent buildings, and flue gases shall not be able to enter adjacent buildings.
5. The exhaust terminal shall be at least 7 ft. above grade when above public walkways. Ensure that freezing condensate does not lead to hazardous conditions on walkways.
6. The exhaust terminal shall never be located underneath porches or crawl spaces, alcoves, or other building features that prevent dispersing flue gases.
7. The exhaust terminal shall never be located less than 3 ft. from inside building corners, and never less than 2 ft. from outside corners.
8. The exhaust terminal shall be located at least 3 ft. above any forced air inlet within 10 ft. horizontally.
9. The exhaust terminal shall never be less than 4 ft. below, 1 ft. above, or 4 ft. horizontally from any door, window, or gravity air inlet into the building.
10. The exhaust terminal shall be at least 1 ft. above grade and snow line, and where it is not susceptible to blockage from debris, leaves or falling snow or ice.
11. A ½" wire-mesh screen at the exhaust terminal must be maintained in good working order.
12. The exhaust terminal shall terminate at least 3 ft. from any other building opening, oil tank vent or oil tank fill inlet, and 6 ft. from any gas service regulator vent outlet.
13. Select the point of wall penetration maintaining a minimum slope of ¼" per foot toward the termination on the last horizontal pipe section. The wall termination assembly must also slope ¼" per foot toward the outside to drain possible condensate from the venting system.

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7.1.2.2 Installation of Aerocowl exhaust termination (Part No. AT-4)

- Follow guidelines in section 7.1.2.1 regarding the relative position of the exhaust and terminal.
- Follow manufacturer's installation guidelines of the AT-4.

This system consists of a 4" air intake hood, a 5" x 4" reducer and a 26½" long, insulated Aerocowl exhaust termination. This termination has a zero clearance rating to combustibles. **Do not install** the vacuum relief damper ("not needed").

- Cut a 6" round opening in the outside wall at the selected location. Apply silicone caulking to the backside of the outer face plate and secure it to the outside wall.
- Insert the Aerocowl termination from the outside up to the outer wall stop. Ensure slope of ¼" per foot to outside.
- Slide inner plate on the termination up to the inside wall, tighten the gear clamp and secure the inner plate to the wall.
- For Aerocowl AT-4 installations in Canada less than 7 ft. above ground, install a cage/screen over the termination to prevent injury from touching hot surfaces.

Fig. 17 Aerocowl exhaust termination (Part No. AT-4) and separate air intake hood

7.1.2.3 Installation of the concentric Fields termination (FT-4)

- Follow manufacturer's installation guidelines of the FT-4.

This system consists of a 5" x 4" reducer and a zero clearance concentric combination intake/exhaust termination with a 4" provision for fresh air intake piping. **Do not install** the vacuum relief damper ("not needed").

- Cut a round 7" diameter opening in the outside wall at the selected location.
- Remove the 4" air intake collar from the termination assembly.
- Apply silicone caulking to the back side of the wall face plate. Insert the concentric termination from the outside.
- Ensure slope of ¼" per foot to outside. Secure the face plate to the outside wall.
- Reinstall the 4" collar.

Fig. 18 Combination air intake/exhaust termination (Part No. FT-4)

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7.1.2.4 Sealing of the Vent Pipe

WARNING!

DANGER TO LIFE

from toxic flue gases.

The discharge side of the direct vent combustion system operates under positive pressure.

- It is of vital importance to seal all joints and screw penetrations using high temperature silicone (rated for 500°F, G.E. 106 or equivalent) to prevent leakage of flue gases into the building.
- The venting system shall never be pierced under any circumstances after initial installation. Combustion measurements shall be taken at the exhaust termination and/or overfire. The breeching can be pierced for testing as long as the hole is sealed airtight with a bolt, washers and high temperature silicone.

CAUTION!

DANGER OF FIRE

from combustible m

- Establish a safe
  the vent termina
  ble material per
  The minimum c
  - galvanized vent pipe 18",
  - insulated oil vent pipe 1"

  The minimum clearances compared to the boiler➔ Chapter 6.1, page 15.

7.1.2.3 General Guidelines for Vent Pipe Installation

Maintain a minimum slope of ¼" per foot toward the termination on the last horizontal vent pipe section.

- The wall termination assembly must also slope ¼" per foot toward the outside to drain possible condensate from the venting system.
- Slope all other horizontal pipe runs ¼" per foot toward the boiler.
- Avoid any dips in the piping, particularly when using the flexible insulated stainless steel oil vent.

WARNING!

DANGER OF LIFE

from toxic flue gases.

- Never install a barometric damper into the horizontal direct vent exhaust piping.
- Verify that after system installation, all vent pipe connections have been installed properly.
- Check all seams and joints for gas leaks. Correct as necessary.
- Have the entire venting system cleaned and verified annually by a qualified service company.

7.1.2.6 Installation of Insulated Flexible Oil Vent

- Apply a ¼" wide bead of high temperature silicone all around the boiler vent connection 1" from the end.
- Install 5" to 4" reducer on boiler vent connection. Secure properly with a clamp.
- Carefully measure the required length of vent pipe. Cut to length with a hacksaw allowing for the two end adapters in your measurement.
- Apply a small bead of high temperature silicone to the outside of the oil vent ends.
- Twist end adapters to each end of the oil vent. Turn adapters counter clockwise. Engage the outer cover of the adapter evenly over the exterior of the vent pipe. Turn the adapter until the vent pipe interior seats evenly against the expanded teflon gasket of the end connector.
- Secure adapters to the vent pipe with the provided clamps.
- Apply a ¼" wide bead of high temperature silicone all around at the 5" x 4" boiler reducer and wall termination connection.
- Slide adapters on to reducer and wall termination pipe all the way. Tighten with clamps.
- Support the flexible vent pipe at regular intervals with brackets or hangers.
- Maintain a 1/2" rise per foot on horizontal runs sloped to outside.

NOTICE

With the installation:

– Avoid any sag in the pipe.

– Do not bend pipe excessively. Slope termination to outside.

– Wrap 3" ceramic insulation around adapter near termination and secure with sheet metal or foil tape and hose clamps to maintain 1" clearance.

Fig. 19 Boiler exhaust pipe

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7.1.2.7 Installation of Galvanized Vent Pipe

- Apply a ¼" wide bead of high temperature silicone (500°F rated silicone, G.E. 106 or equivalent) all around the boiler vent connection (breech) 1" from the end (➔ Fig. 19, page 26).
- Install 5" to 4" reducer on boiler vent connection. Secure properly with a clamp.
- The maximum length of the direct vent system is 20 ft. of linear pipe plus a maximum of 3 x 90º elbows. With 4 elbows the maximum pipe length is 10 ft. Use high temperature silicone to seal any joints, screw penetrations, or combustion test holes, as well as seal at each pipe connection and all joints on adjustable 90º elbows.

NOTICE

Once the entire venting system is installed, make sure all joints are secure (➔ as well as Chapter „7.1.2.4 Sealing of the Vent Pipe“, page 25).

NOTICE

Installations in Canada less than 7 ft. above ground are required to have a cage/screen over the termination to prevent injury from touching hot surfaces.

WARNING!

DANGER TO LIFE

from toxic flue gases.

- All seams and joints of the exhaust venting must be inspected for flue gas leaks.
- Have the entire venting system cleaned and inspected annually by a qualified service company.

CAUTION!

BOILER DAMAGE

from condensation.

When using galvanized vent pipe the flue gas temperature at the boiler breech must exceed 300°F in order to avoid condensation. If less than 300°F are measured, the flue gas temperature will have to be raised by removal of 2 or more baffles (➔ Chapter 8.8, page 42).

This notice is not applicable if stainless steel vent pipe is being used instead of galvanized pipe.

WARNING!

HEALTH DANGE

- When using ga
  proper protectio
  wall termination
  low also local c

7.2 Installation of Combustion Air Supply System

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CAUTION!

BOILER DAMAGE AND SYSTEM PROBLEMS

Due to missing or insufficient openings for combustion air.

Sufficient openings for combustion air and ambient air are required.

Insufficient air flow in the boiler room can lead to temperature rise, with a potential for consequential property damage.

Insufficient combustion air can result in poor burner performance and lead to service calls.

- Ensure that primary and secondary air openings are of sufficient size, and are not closed off or reduced in size.
- The boiler can not be placed in operation if such deficiencies have not been corrected.
- Make the equipment owner aware of the situation.

To ensure adequate combustion air supply for the boiler system, follow the guidelines of the NFPA 31, and observe all local and national codes and regulations.

For Canada refer to the guidelines of CSA/CGA-B149.1 and 2 Installation Codes.

CAUTION!

BOILER DAMAGE

from contaminated com

- Never place chlorin ing agents, and hyd chemicals near the cans, solvents, cleaning agents, paint, glue).
- Avoid generation and accumulation of large amounts of dust.

NOTICE

When contamination of combustion air is expected (such as installations near swimming pools, dry cleaning operations or hair salons), Buderus strongly recommends using fresh air ducted directly from the outside to the boiler.

WARNING!

DANGER OF FIRE

from flammable material and liquids.

- Do not store flammables or other liquids in the vicinity of the boiler.

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7.2.1 All air drawn from inside the building

The G125 BE boiler has been approved for operation drawing all combustion air from the room, provided the installation meets the requirements of NFPA 31, and the boiler is NOT vented horizontally.

7.2.2 All air drawn from outdoors

The boiler has been approved for operation drawing all combustion air from the outside, provided the combustion air intake system meets the following requirements.

The combustion air shall be directly delivered to the rear of the boiler via 4" ducting.

- Make an opening in the outside wall for wall termination.
- Use 4" rigid galvanized pipe or 4" flexible metal pipe.
- The maximum length of the fresh air piping must never exceed 100 ft. Reduce by 10 ft. for every 90° elbow, 5 ft. for every 45° elbow.
- Install a fresh air intake hood with 1/2" screen to avoid debris and objects from entering the pipe. Install from the outside and secure.
- Secure reducer to rear of boiler with 2 screws.
- Connect fresh air ducting to reducer.

NOTICE

Use only 4" diameter air intake piping or flexible metal hose. Outside components, and not be susceptible to blockage from debris, leaves or falling snow or ice.

Maximum fresh air intake piping must not exceed 100 ft.

Fig. 20 Combustion air supply system

1 Wall termination

2 Fresh air intake piping

3 Reducer with sensing port

7.2.3 Guidelines for the location of the air intake terminal

In addition to the minimum clearances of terminations (➔ Chapter „7.1.2.1 Location of Exhaust Wall Termination“, page 23), observe the following rules:

- Both the intake and exhaust terminations must be located on the same outside wall in order to balance wind pressure effects.
- Wall terminations shall not be facing the direction of prevailing winds.
- The exhaust terminal shall be at least 1 ft. above grade and snow line, and where it is not susceptible to blockage from debris, leaves or falling snow or ice.
- An outside air intake riser is permitted, provided it terminates in 2 x 90° elbows facing down (➔ Fig. 21).
- The intake and exhaust terminals must be at least 4 ft. apart when using the Aerocowl (AT-4) exhaust termination. This minimum distance can be reduced to 2 ft. when the intake terminal is at least 1 ft. below the exhaust terminal.
- A ½" wire-mesh screen at the exhaust terminal must be maintained in good working order.

Fig. 21 Outside air intake riser

1 Maximum snow level

2 Air intake riser terminating in 2 x 90° elbows

3 Vent pipe

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7.3 Installation of Water Connections

CAUTION!

SYSTEM DAMAGE

due to leaking connections.

- Install the piping connections to the boiler without having undue stress on the near boiler piping.

7.3.1 B-Kit Installation

The relief valve and pressure/temperature gauge are installed into the supply manifold as described below:

- Use the 1-1/4" BSP x NPT conversion nipple and install the unmarked end into the supply (VK) connection of the boiler. This side also has longer thread length and the thread is straight (BSP).
- The conversion nipple is marked on the 1-1/4" NPT side with pink color and a NPT stamping in the pipe.

Fig. 22 Measuring thread length on 1-1/4" conversion nipple

- Install 90° elbow 1-1/4" on conversion nipple.
- Install supply manifold into elbow and orient in desired direction (Fig. 23).
- Install 90° elbow, relief valve and pressure/temperature gauge.

NOTICE

The pressure relief valve can only be installed after the hydrostatic test (➔ Chapter 7.4, page 33)

Use the supplied ¾" 90° elbow to ensure that the relief valve discharge is installed horizontally.

NOTICE

We recommend, especially in older, large volume systems, to install a dirt filter in the return connection to the boiler to reduce waterside debris build-up.

Fig. 23 B-Kit Installation

1 90 degree 1 ¼" NPT elbow
2 (Conversion) nipple
3 Supply manifold
4 Pressure/temperature gauge
5 Relief valve
6 90 degree ¾" NPT street elbow

7.3.2 Installation of Boiler Drain (B-Kit Component)

- Install the ¾" boiler drain (B-kit component) into the EL tapping.

NOTICE

Install a fill connection in the supply piping to the boiler.

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Fig. 24 Boiler Drain installation

7.3.3 Installation of System Components

Use the adjacent diagram as an aid during the installation of near boiler components.

Additional installation samples are found in
➔ Chapter 12, page 57.

Fig. 25 Installation Diagram

1 Relief valve
2 Pressure/temperature gauge
3 Ball valve
4 Air eliminator
5 System pump
6 Backflow preventer
7 Expansion tank
8 Automatic feet valve
9 Flow check
10 Purge station

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7.4 Filling and Checking for Water Leaks

The boiler must be tested hydrostatically for leaks. Check the entire system for leaks prior to placing the system in operation to prevent leaks during operation.

CAUTION!

SYSTEM DAMAGE

Be careful not to expose the system to excessive test pressures during the hydrostatic test as it can damage pressure, control and safety components.

- Make sure that all pressure, control and safety components are NOT installed during the hydrostatic test.

CAUTION!

SYSTEM DAMAGE

due to excessive temperatures.

When a hot system is filled with cold water, large temperatures stresses can occur. The boiler can develop a leak under these circumstances.

- Fill the system only when the boiler is cold (The fill water temperature can not exceed 100 °F).
- Water quality must comply with quality guidelines and fill water conditions must be recorded.

Perform the hydrostatic test at 1.5 times the expected operating pressure and in accordance with local code requirements:

Maximum operating pressure		Maximum test pressure
30 psi	(based on supplied relief valve)	45 psi
58 psi	(based on 50 psi relief valve)	75 psi

- Plug relief valve connection (➔ Fig. 23, page 31) and all boiler openings with plugs. (Not supplied).
- Close the ball valve to the expansion tank.
- Open automatic feed valve.
- Fill the boiler slowly with the feed valve.

Fig. 26 Pressure and temperature gauge

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CAUTION!

HEALTH DANGER

due to contamination of drinking water.

- Please observe local and state requirements regarding avoidance of contamination of drinking water (e.g. due to water from closed loop heating systems).

- Open the automatic air vent to allow air to escape.
- Slowly fill the heating system. Monitor the pressure gauge.
- Check all water connections for leaks.
- Vent the heating system by opening and bleeding radiators. Open purge valve slowly and allow air to escape.
- When water pressure drops during the fill, open up the fill valve more.
- When no leaks are found, remove plug, drain water and install relief valve (➔ Fig. 23, page 31).

7.5 Installation of Oil Line

- Install the oil line per local code.

The furnished Tigerloop oil filter must be installed on the outside of the boiler using the supplied mounting bracket.

- Inspect the existing oil line and replace if necessary. Check swing direction on burner door and reverse door swing if desired.
- Drill 4 holes into the side panel of the jacket panel conforming to the Tigerloop mounting bracket.
- Secure mounting bracket to boiler side panel.
- For a 3/8" oil line, install a 3/8" flare x 3/8" NPT adapter in the inlet and a 1/4" x 3/8" NPT adapter in the outlet of the Firomatic valve.
- Install the Firomatic in Tigerloop.
- Connect the return oil line from the burner using the G3/8" x ¼" NPT adapter back to the oil filter.
- Install the vacuum gauge in its adapter and screw into the oil line feeding the burner.
- Secure oil filter assembly to the mounting bracket.
- Attach oil lines.
- Check entire oil line assembly for leaks.

Fig. 27 Field installation of Tigerloop oil filter

1 NPT adapter (3/8" flare x 3/8" NPT)

2 Firomatic valve

3 Tigerloop oilfilter

4 NPT adapter (3/8" x ¼")

5 Vacuum gauge

6 Mounting plate

7 adapter 3/8" x 1/4" NPT

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7.6 Electrical Connections

This section only applies to G125 BE boilers equipped with a Buderus Logamatic or Aquasmart control.

WARNING!

HEALTH DANGER

from electric shock.

- All electrical work must be performed by a qualified electrician.
- Before opening the control: Shut off electrical supply and prevent from accidental reactivation.
- Observe all installation instructions.

7.6.1 Installation of Aquasmart

An Aquasmart controls the boiler water supply temperature when not using a Buderus Logamatic control.

- If a Beckett AquaSmart is being installed the factory-fitted immersion well must be replaced by the immersion well supplied with the control.

Fig. 28 Top rear cover removal

- Install the Aquasmart according to manufacturers' instructions.
- Install Aquasmart as per wiring diagram (Fig. 62, page 67).

7.6.2 Control System Installation

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- To remove rear top cover first unscrew two rear sheet metal screws.
- Carefully route the burner cable on the outside of the insulation from the front of the boiler to the controls location at the top of the boiler.

Fig. 29 Removal of rear top cover and top cover plate

- Slide plastic front tabs of control panel into the oval shaped openings.
- Slide the control panel forward.
- Push forward on plastic snap tabs in rear of control to engage them into the top panes square knock-outs.

Fig. 30 Installation of control

1 Plastic snap tabs

2 Plastic font tabs

3 Oval knock-outs

4 Square knock-outs

- Remove top cover of control panel. Remove cover screws.
- Secure control to top cover using small sheet metal screws.

Fig. 31 Removal of top cover

1 Top cover screws

2 Sheet metal screws

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7.6.3 Installation of Temperature Sensor and Burner Cables

NOTICE

When installing a Logamatic control, you must replace the installed brass well with the chrome well supplied with the Logamatic control.

- Remove factory installed sensor well.
- Apply sealant to Logamatic well and screw into tapping.
- Remove plug.

Fig. 32 Changing out the well

1 Logamatic well

2 Supplied well

CAUTION!

SYSTEM DAMAGE

Be careful not to kink or have the capillary tubes come in contact with sharp surfaces.

- Route the capillary tubing carefully and avoid kinking. Route capillaries and sensor wiring to the immersion well.

- Strap excess tubing and wiring together and place on top of insulation.
- Plug the burner cable into the designated location of the Logamatic control (Fig. 63, page 68).
- Burner wiring can be routed down towards the front of the boiler. If burner is supplied with a wiring harness, route harness between jacket panels and boiler insulation.
- Connect end of burner cable into green plug to Logamatic control panel.

Fig. 33 Routing and connecting of capillary, sensor and electrical wiring

1 Capillary and sensor wiring

2 Well location

3 Burner cable/wiring

- Bring the sensor bundle to the installed chrome well and slide bundle into the well. The plastic holding clip will slide back.
- Insert all sensing elements fully into the well and secure tubing with furnished metal holding clip.

NOTICE

Ensure all sensing elements are all fully inserted into the well and make good contact with well inner surface. Use the tension clip in the middle of sensing elements.

Fig. 34 Routing and connecting of capillary, sensor and electrical wiring

1 Cable raceway opening in top front cover

2 Capillary tubing and sensor wiring

3 Well location

4 Burner cable/wiring

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7.6.4 Electrical Connections

Install a power supply point near the boiler in accordance with local and state code.

WARNUNG!

DANGER OF FIRE

Electrical wiring can be damaged by hot boiler parts.

- Make sure that all tubing and wiring components are all placed on top of the boiler insulation.
- Ensure that the unit is properly grounded.

- Route all electrical wiring through the top cover race way and install wiring per electrical schematics in Logamatic manuals (➔ Chapter 14, page 67).

7.6.5 Strain Relief Installation

Secure all electrical wiring near the Logamatic using the furnished plastic cable ties.

- Install cable clips with the tab facing up into the rear of the Logamatic (step 1).
- Slide cable clips down and lock them in (step 2).
- Push cable clips in (step 3).
- Push hinging tab down to secure cable (step 4).

Fig. 35 Secure wiring with cable clips

7.6.6 Top Rear Panel Installation

- Put control top cover back and secure.
- Install rear top panel on boiler.

Fig. 36 Installation of rear top cover

1 Control top cover

2 Rear top panel

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8 Placing the Boiler in Operation

This chapter describes the initial start-up procedure for the G125 BE boiler irrespective of the employed control system.

- Please fill out the start-up protocol during this process (➔ Chapter 8.11, page 46).

Further information regarding boiler room lay-out and clearances, combustion air requirements and venting system as well as boiler operational requirements, refer-back to ➔ Chapter 3.2, page 8.

CAUTION!

BOILER DAMAGE

from excessive dust and air contamination.

- Do not operate the boiler under high dust conditions, such as sheet rock dust and construction dust. Make sure to provide clean combustion air if the boiler needs to operate under such conditions.
- Install an air filter, or other means to ensure clean combustion air. Dust can originate from within during construction, but also from outside when the installation is in close vicinity of chemical plants, shop or dusty outside conditions.

8.1 Setting the Initial System Pressure

Set the system for regular operation during the initial start-up procedure.

CAUTION!

SYSTEM DAMAGE

from material stresses as a result of temperature differences.

- Use cold water for the initial fill (Limit the fill water temperature to 100 °F maximum).

- Add additional make-up water until the desired pressure is achieved; at least 12 - 15 psi, but no more than 30 psi. (Actual settings are dependent on the pressure rating of the relief valve).

Fig.38 Pressure and temperature gauge

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CAUTION!

HEALTH DANGER

due to contamination of drinking water.

- Please observe local and state requirements regarding avoidance of contamination of drinking water (e.g. due water from closed loop heating systems).

- Vent the system during the initial fill.

8.2 Checking the Relief Valve

- Make sure nobody is near the discharge of the relief valve.
- Lift up on the relief valve.

The relief valve has to open and relief water and pressure. Replace the relief valve immediately if it does not discharge. A defective relief valve can cause damage to the system.

8.3 Check Position of Flue Baffles (Room Air Operation)

Check to make sure that the flue baffle plates are in horizontal position before the initial start-up process:

- Remove burner cable from burner at disconnect point.
- Open the burner door by removing the two burner door bolts.
- Pull the baffle plates slightly out of the boiler.
- Bring the baffles in a fully horizontal position and push back into the boiler.
- Close the burner door and torque door bolts evenly with 90 lbs-inch torque using hex-head bolts.
- Reconnect burner cable back at burner.

Fig.39 Opening the burner door

1 Flue baffles in secondary passages

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8.4 Check Position of Flue baffle Plates (Outside Air Operation)

NOTICE

In case of outside air operation, you must check the position of 8 flue baffles.

The check is identical as described in ➔ Chapter 8.3.

- In addition, make sure to fully close the burner door and tighten the burner door bolts.

Fig.40 Blue baffle plates for fresh air operation

1 Flue baffle plates Nr. 1

2 Flue baffle plates Nr. 2

3 Flue baffle plates Nr. 3

4 Flue baffle plates Nr. 4

8.5 Prepare System for Operation

- Open fuel shut-off valve.
- Install burner cover on boiler.
- Turn on main system disconnect switch or turn on breaker in main breaker box.

8.6 Start-up of Control and Burner

Follow the burner start-up procedure per burner manufacturer's recommendations. Follow the ➔ instructions furnished with the burner.

Turn on the main switch of the Logamatic control to activate the heating system. The burner comes on when the control is switched to a heat demand occurs or manual mode. Follow the instructions in the ➔ Service Manual of the control.

- Select "manual" operation.
- Set the desired adjustable limit temperature on the control.
- Turn control on (Position "I").

Fig.41 Switching control panel (Logamatic 2000 series controls)

1 Adjustable high limit dial

2 Main control switch

8.7 Guidelines for Burner Start-up

Allow the burner to operate for 15 to 20 minutes prior to performing combustion test. Earlier combustion tests can lead to erroneous readings due to burning off of the sealing rope. We recommend to check the burner after a few weeks of operation.

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NOTICE

Improper burner adjustments can lead to improper combustion and sooting of the boiler. Burner lock-outs can also occur as a result.

- Always check the combustion with the following instruments.
- Never check and/or adjust burner operation by eye sight.

Necessary instruments

– CO_2 measuring equipment

– Draft measuring equipment

– Oil pressure gauge

– Stack thermometer

– Smoke tester

- Measure the over fire pressure at the measuring port on the burner door.
- Measure the breeching draft in the vent connector two vent pipe diameters away from the vent connections (Only on chimney vent models: refer to Direct Vent Manual for proper test location).

Fig.42 Pressure test port on burner door

1 Pressure test port

8.8 Adjusting Stack Temperatures

CAUTION!

BURNER DAMAGE

due to excessively high air inlet temperatures.

- You are only allowed to raise the stack temperature of the boiler in case of a dual pipe venting system. In case of complete concentric venting systems, one is not allowed to raise the stack temperature as it may lead to high inlet air temperatures.

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When you determine that the stack temperature is too low, and condensate formation might take place in the chimney, the stack temperature can be increased by the following steps:

– Adjust the flue baffles

– Remove the flue baffles

– Remove flue blocking plates

- Shut-off the boiler (➔ Chapter 9, page 47).

WARNING!

DANGER TO LIFE

from electric shock.

- Prior to opening the burner: Shut off power supply and prevent from accidental reactivation.

- Remove burner cover from boiler (➔ Chapter 5.1, page 13).

CAUTION!

BURNING DANGER

due to touching of hot surfaces.

- Wear thermal protective gloves or use a set of pliers.

8.8.1 Adjusting/Removing Flue Baffles

Adjust or remove the flue baffles always in pairs.

- Remove burner cable from burner connector.
- For sealed combustion operation, remove hose from burner intake connection.
- Open burner door by removing the two hex head bolts.
- Close burner door and secure with burner door bolts (ca. 90 Lbs/inch). Tighten bolts evenly.

Fig.43 Adjusting the flue baffles

- Pull flue baffles slightly out of the flue passages.

Fig.44 Removal of the flue baffles

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When you need/want to remove flue baffles for fresh air operation, you can use the Table 13 below to estimate the effect on stack temperature.

Flue baffles	Increase in stack temperature
Removal of Nr. 4	about 40 °F
Additional Removal of Nr. 3	additional 40 °F
Additional Removal of Nr. 2	additional 40 °F

Table 12 Increase in Stack Temperatures

- Close burner door and secure with burner door bolts (ca 90 Lbs/inch). Tighten bolts evenly.
- Install burner cable back to burner disconnect.
- Recheck tightness of burner door after operation the burner for 10 minutes.
- Check stack temperature again.

Fig.45 Blue baffle plates for fresh air operation

1 Flue baffle plates Nr. 1

2 Flue baffle plates Nr. 2

3 Flue baffle plates Nr. 3

4 Flue baffle plates Nr. 4

8.8.2 Removing Flue Blocking Plate

When the stack temperature after removal of flue baffles is still too low, you can also remove the front section blocking plate to increase the stack temperature.

The opening of the burner door is described in
➔ Chapter 8.8.1.

- Remove blocking plate by removing set screw from the front section.
- Measure the stack temperature again
  ➔ Chapter 8.8.1.

Fig.46 Removal of flue blocking plate

8.9 Testing of the Manual Reset High Limit (STB) of Logamatic controls

The manual reset high limit will permanently interrupt burner operation once its limit (230 °F) is exceeded. To restore operation, it is required to reset this control and lower the water temperature well below its fixed setting.

- Refer to ➔ Logamatic Service Manual to check operation of manual reset high limit.

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8.10 Installation of Front Burner Cover

- Hang burner cover into the hooks of the boiler jacket.
- Secure burner cover with s screws into the side panels.

WARNING!

DANGER TO LIFE

from electric shock.

- Operate the boiler only with an installed burner cover.

Fig.47 Installation of burner cover

8.11 Detailed Start-up Procedure

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- Check off performed start-up steps, sign and date.

	Start-up Procedure	Page	Value Measured	
1.	Filling of system and check for leaks	33	☐ _____ psi	
2.	Set operating pressure Vent heating system Check operation of relief valve Pre-set expansion tank pressure (➔ see expansion tank manufacturer instructions)	39	☐ _____ psi	
3.	Check combustion air and venting system		☐	
4.	Check position of flue baffles	40	☐	
5.	Turn on control (➔ Refer to control Service Manual)	41	☐	
6.	Turn on burner (➔ Refer to burner Service Manual)	41	☐	
7.	Measure stack temperature (Adjust if needed)	42	☐ _____ °F	
8.	Check manual reset high limit (STB)	44	☐	
9.	Adjust control settings based on requirements (➔ Refer to control Service Manual)		☐	
10.	Inform end user and hand over instructions		☐	
	Confirm start-up procedure Company stamp/signature/date			

NOTICE

- Always inform your customer regarding proper fuel source and record in ➔ Operating Manual.

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9 Taking the Boiler Out of Operation

9.1 Normal Boiler Shut-down

- With Buderus Logamatic controls: Turn the main switch to "0" position. This shuts off power to components wired directly to the control panel.

Fig. 48 Shutting down heating system (Logamatic 2000)

1 ON/OFF switch

- With Honeywell aquastat control: Shut off main heating system switch. (Position "OFF") This shuts off power to all components wired through this switch.
- Further shut-down procedure ➔ refer to aquastat documentation.
- Close off fuel supply with oil shut off.

Fig. 49 Heating system shut down (with aquastat)

CAUTION!

SYSTEM DAMAGE

from freezing.

When the system is shut off, the system could potentially freeze up.

- Keep the system operational as long as possible.
- Protect the systems against freeze-up by draining the entire system at its lowest point.

9.2 Emergency Shut-down

Explain to customer and homeowner what to do in case of emergency, such as fire:

- Safety first! Never put your life or your health at risk!
- Shut off fuel supply by closing main valve.
- Shut down the heating system electrically either using the main emergency switch or the suitable electrical breaker.

10 Boiler Maintenance

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10.1 Why do maintenance?

Regular maintenance is required for the following reasons:

– To maintain high efficiency operation and minimize fuel usage.

– To sustain reliable operation.

– To maintain clean combustion and reduce pollutant emissions.

Please offer your customer an annual service and maintenance plan. You can review the service and maintenance protocol regarding precise description of suitable services (➔ Chapter 10.6, page 52).

NOTICE

Spare parts can be ordered by contacting your Buderus wholesaler.

10.2 Prepare Boiler for Cleaning

- Shut down the heating system (➔ Chapter 9.1, page 47).

WARNING!

DANGER

due to electricity.

- Prior to opening control panel: Shut down electricity supply and padlock shut to protect against accidental operation.

- Remove burner cover from boiler (➔ Chapter 5.1, page 13).
- Remove burner cable from burner disconnect.
- In case of connection of direct fresh air connection to burner, disconnect from burner.

CAUTION!

BURNING DANGER

due to touching of hot surfaces.

- Wear thermal protective gloves or use a set of pliers.

- In order to open the burner door, remove the 2 hex head burner door bolts.

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10.3 Boiler Cleaning

The boiler can be cleaned using boiler brushes and/or by a wet cleaning. Boiler brushes are available from your Buderus wholesaler.

10.3.1 Cleaning the Boiler with Brushes

- Record the position of the flue baffles so they can be placed back in their original position.
- Remove blue baffles from passages.
- Clean flue fire baffles using a hard bristled brush.

Fig. 50 Opening of burner door

1 Flue baffles in secondary flue passages

- Brush out flue passages by rotating the round brush.

Fig. 51 Brushing out of flue passages

- Clean the combustion chamber with a flat brush. Remove the loosened debris from combustion chamber, flue passages and breaching connection areas.
- Insert the flue baffles into the boiler in their original position.
- Check burner door sealing rope. Replace damaged or hardened sealing rope.

NOTICE

Burner door sealing rope is available through your local Buderus wholesaler.

Fig. 52 Brushing out the combustion chamber

- Close burner door by tightening the burner door bolts (Torque to 90 Lbs-in). Torque burner door evenly for proper door closure.
- Reinstall burner cable to burner disconnect.
- For fresh air operation, make double sure to tighten burner door sufficiently.
- Place system back in operation.

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10.3.2 Wet Cleaning

Use for the wet cleaning a suitable cleaning agent designed to dissolve the internal build-up or clean the soot.

Following the wet cleaning, proceed with the brushing steps outlined in ➔ Chapter 10.3.1, page 49.

NOTICE

Observe and follow recommendations of the cleaning agent's manufacturer. Under certain conditions you may need to deviate from the guidelines below.

- Cover control with plastic to prevent water damage.
- Spray heating surfaces evenly with cleaning agent.
- The closing of the burner door is described in ➔ Chapter 10.3.1, page 49.
- Close burner door and turn on heating system.
- Heat the boiler to a minimum temperature of 160 °F.
- Turn the system off.
- Brush out heating surfaces.

10.3.3 Inspecting the combustion air hose (sealed combustion only)

- Loosen hose clamp from the burner attenuator and remove hose. Inspect for debris and contamination.
- For cleaning the hose must be removed from the boiler. Remove right side panel to gain access.

Fig. 53 Check for flexible combustion air hose

1 Hose clamp

2 Flexible combustion air hose

3 Burner attenuator

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10.4 Testing System Pressure

The system pressure should be 12 to 30 psi for a closed system.

- Check system pressure.
- When the pressure gauge shows less than 15 psi, the pressure is too low. Add fill water as described in ➔ Chapter 8.1, page 39 and check system pressure once again.

Fig. 54 Pressure/temperature gauge to display system pressure and supply temperature

CAUTION!

SYSTEM DAMAGE

due to frequent make up water.

When you frequently add make up water to the system, this can lead to corrosion and lime build-up in the system.

- Make sure that the heating system is equipped with automatic air elimination.
- Verify that the system has no leaks and check the expansion tank for proper operation.

10.5 Testing Relief Valve

Check the functioning of the relief valve every 1 to 3 years as required per local code.

- Make sure nobody is near the discharge of the relief valve.
- Lift up on the relief valve.

The relief valve must open and discharge water. If the valve does not discharge, replace the valve and re-check. If the defective valve is not replaced, it can lead to damage to certain system components due to excessive high pressures.

10.6 Inspection and Maintenance Procedure

- Sign off and date performed service work.

This service and maintenance protc
copied for further use.

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	Service Work	Page	Date: _____	Date: _____	
1.	Check general status of system		☐	☐	
2.	Do visual performance test on system		☐	☐	☐
3.	Check fuel and water components for: Leaks during operation Hydrostatic water test Visual corrosion Exterior system changes		☐	☐	☐
4.	Check flue passages for soot, shut off system	48	☐	☐	☐
5.	Check burner operation (➔ See burner manual)		☐	☐	☐
6.	Check combustion air inlets and vent system		☐	☐	☐
7.	Check system pressure, relief valve and expansion tank	51	☐	☐	☐
8.	Check DHW tank anode status (➔ See DHW tank manual)		☐	☐	☐
9.	Check control settings (➔ See manual)		☐	☐	☐
10.	Final check, record combustion test results		☐	☐	☐
	Confirm service work		Sign/Date	Sign/Date	Sign/Date

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	Date: _____	Date: _____	Date: _____	Date: _____	Date: _____	Date: __	
1.	☐	☐	☐	☐	☐	☐	
2.	☐	☐	☐	☐	☐	☐	☐
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10.	☐	☐	☐	☐	☐	☐	☐
	Sign/Date	Sign/Date	Sign/Date	Sign/Date	Sign/Date	Sign/Date	Sign/Date

NOTICE

When you find conditions during the annual service/maintenance work that require attention, please perform the necessary remedial steps.

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	Maintenance Procedure	Page	Date: _____	Date: ____	
1.	Take the boiler out of operation	47	☐	☐	
2.	Remove flue baffles from passages and clean flue fire baffles	49	☐	☐	
3.	Clean flue passages and the combustion chamber, Insert the flue baffles into the boiler in their original position	49	☐	☐	
4.	Check burner door sealing rope. Replace damaged or hardened sealing rope. Close burner door by tightening the burner door bolts.	49	☐	☐	☐
5.	Take the boiler in operatio	39	☐	☐	☐
6.	Final check at the system after maintenance and service inspection		☐	☐	☐
7.	Check boiler in operation		☐	☐	☐
	Confirm service and maintenance work		Sign/Date	Sign/Date	Sign/Date

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	Date: _____	Date: _____	Date: _____	Date: _____	Date: _____	Date: __	
1.	☐	☐	☐	☐	☐	☐	
2.	☐	☐	☐	☐	☐	☐	
3.	☐	☐	☐	☐	☐	☐	
4.	☐	☐	☐	☐	☐	☐	☐
5.	☐	☐	☐	☐	☐	☐	☐
6.	☐	☐	☐	☐	☐	☐	☐
7.	☐	☐	☐	☐	☐	☐	☐
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11 Restoring System Lock-outs

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One can identify two different types of lock-outs:

– Burner lock-outs.

– Control and system lock-outs.

A lock-out light will typically be lit on the burner (➔ see burner manual) during its lock-out. Press the burner reset button once to restart the burner. Call your service company immediately if the burner locks out again. Do NOT continue to reset the burner.

Error conditions on the control or in the system are typically displayed on the control display, if so equipped. Further information can be found in the ➔ Control Service Manual.

Correct burner lock-outs

- Remove burner cover, when the burner is so equipped. Press the burner reset button once.

CAUTION!

SYSTEM DAMAGE

Due to frequent pressing of burner reset button, one can damage the ignition transformer.

- Do not press the burner reset more than three times. If the burner does not restore itself after three resets, review the Burner Operating Manual. Contact your service company for assistance.

CAUTION!

SYSTEM DAMAGE

due to frost.

When the entire system is shut off, it can cause a freeze-up condition.

- Have any lock-out condition corrected immediately and restart the heating system.
- If this is not possible, protect the system for freeze-up by draining the heating system and domestic hot water system at their respective lowest points.

Fig. 55 Reseting burner lock-outs (boiler with built-in burner)

1 Burner reset button

12 Piping Diagrams

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Explanation of the abbreviations

KR	Flow Check	SH	2-way motorized valve
MAG	Expansion tank	WH	Boiler bypass
PH	Heating pump	SV	Relief valve/ Air elimination
PW	DHW charging pump	THV	Zone valve

Fig. 56 Zoning with zone valve

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Fig. 57 Zoning with pumps

Fig. 58 Zoning with zone valves and built in bypass for larger water volume systems

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Fig. 59 Multiple zones with DHW, high temperature and low temperature circuits with a motorized 3-way valve

13 Spare Parts

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The following parts are available through Buderus Hydronic Systems. Model specific part numbers are listed under the various models. In other cases the table shows the number of components for each model.

Legend for Table 13 and 14:
x = no spare part
(x) = not available as individual part,
0 = no image

Boiler block and burner door (Fig. 60)

Item	Description	Part Number		
		G125/21-BE 3 Section	G125/28-BE 4 Section	G125/34-BE 5 Section
10	Boiler block G125	63036027	-	-
10	Boiler block G125	-	63036028	-
10	Boiler block G125	-	-	63036029
Spare parts for boiler replacement				
Front section components:				
21	Plug G1 1 ¼" right	86055310		
22	Gasket for plug D41, 7x55x1, 5mm AFM 34, white	86159710		
23	Blocking plate with screw M8x16	63015342		
24	Screw DIN7991 M8x16 Ms	(x)	(x)	(x)
Rear section components:				
50	Seal D33x44x2	63005462		
51	Plug DIN2950 291 1"	05317712		
52	Threaded stud M10x65 5.6	05555070		
53	Distance sleeve R3/8"x39	(x)	(x)	(x)
54	Hex. head nut ISO4032-M10-8-A3K	(x)	(x)	(x)
55	Washer DIN125-A10,5-A3K	(x)	(x)	(x)
57	Reducing Nipple	63027607		
60	Immersion well Pmw-3See (4 1/2")"US"	00472887		
70	Tie bar - Set M8x310mm	05127574	-	-
70	Tie bar - Set M8x440mm	-	05127578	-
70	Tie bar - Set M8x555mm	-	-	05127580
80	Flue collector G115/125	05354074		
81	Sealing rope 8x1050 GP	63020961		
	Glue for securing rope (a 310ml)	63014361		
90	Return diffuser 1 1/4-NPT1 compl. G125"US" for 3-4 section	63028062	63028062	-
90	Return diffuser 1 1/4-NPT1 compl. G125"US" for 5 section	-	-	63028061
91	Gasket 55x41,7x1,5mm	05752540		
Spare parts for diffuser				
Spare parts which are not furnished with the spare boiler block:				
120	Flue baffle 3-section	05347085	-	-
120	Flue baffle 4-section	-	05347087	-
120	Flue baffle 5-section	-	-	05347089
121	Flue baffle 3-section	63028999		
121	Flue baffle 4-section		63029001	
121	Flue baffle 5-section			63029003
130	Boiler rail 420mm long	05198102	-	-
130	Boiler rail 540mm long	-	05198104	-
130	Boiler rail 660mm long	-	-	67900117
131	Washer DIN126-9	(x)	(x)	(x)
132	Hex. head screw ISO4017-M8x25-8.8	(x)	(x)	(x)
133	Hex. head nut DIN6923-M8-8.8-A3K	(x)	(x)	(x)

Table 13 Boiler block and Burner door

Item	Description	Part Numb		
		G125/21-BE 3 Section	G125/28-BE 4 Section	
140	Door hinge G105/G115		05327033	
141	Gasket DIN125-A10.5-A3K	(x)	(x)	
142	Hex. head bolt ISO4017-M10x25-8.8	(x)	(x)	
150	Hex. head bolt ISO4014-M10x65-8.8	(x)	(x)	
160	Washer DIN125-A10.5-A3K	(x)	(x)	
180	Boiler feet M10x51mm complete		05236440	
190	Gasket for flue collar DN130 complete		05354010	
200 or 210	Flue silencer DN130 complete, without condensate drain; higher sound absorption		05074020	
	Flue silencer D130 with adapter 100mm long, with condensate drain, lower sound absorption		05074022	
Flue silencer components:				
190	Flue collar DN130 complete		05354010	
220	Flue collar DN130 complete (step cuff)		05354030	
230	Sealing rope10x2000 GP		63020963	
250	Burner door complete		63015200	
Burner door components:				
260	Door hinge		05327020	
270	Washer DIN125 A10.5 A3K	(x)	(x)	(x)
280	Hex. head screw ISO4017 M10x25 8.8	(x)	(x)	(x)
290	Observation port cover complete G115/G125/G135		63023634	
Observation port cover components:				
300	Gasket 30x30x3		63014382	
310	Sight glass Tempax 30x30x3.3mm		05447620	
320	Sight glass cover plate	(x)	(x)	(x)
330	Hex. head screw ISO4017 M6x12 8.8 A3K	(x)	(x)	(x)
340	Pressure measuring port M6 SW10 V2	(x)	(x)	(x)
350	Burner door insulation G125 W607		63002401	
Burner door insulation components:				
360	Insulating plate for burner door 24mm		63004169	
370	Insulating ring for burner door 10mm		63004170	
380	Washer DIN9021 A6,4 A3K	(x)	(x)	(x)
390	Sheet metal screw DIN7981 C ST6.3x25 A3T	(x)	(x)	(x)
400	Sealing rope14x1650 GP		63020965	
	Glue for securing sealing rope to burner door (a 310ml)		63014361	
	Mounting material for boiler block G125 "US"		63031288	
	Components:			
	1 Hex. head screw M8x16 Ms			
	2 Distance sleeve R3/8"x39			
	2 Hex. head nut ISO4032 M10 8 A3K			
	8 Washer DIN125 A10,5 A3K			
	4 Washer DIN126 9			
	4 Hex. head screw ISO4017 M8x25 8.8			
	4 Hex. head nut DIN6923 M8 8.8 A3K			
	4 Hex. head screw ISO4017 M10x25 8.8			
	2 Hex. head screw DIN6921 M10x65 8.8			
	1 Hex. head screw ISO4017 M6x12 8.8A3K			
	2 Washer DIN9021 A6.4 A3K			
	2 Sheet metal screw DIN7981 C ST6.3x25 A3T			

Table 13 Boiler block and Burner door

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Item	Description	Part Number	
		G125/21-BE 3 Section	G125/28-BE 4 Section
	B-KIT G125"US"	63029762	
	Components:		
	1 Supply manifold G115"US"		
	1 90 degree 1 1/4 NPT elbow		
	1 90 degree 3/4 NPT elbow		
	1 Conversion nipple R11/4-11/4NPTx75		
	1 Boiler drain valve 3/4		
	1 Relief valve 3/4Mx3/4F 30PSI		
	1 Pressure / Temperature gauge 1/4NPT		
	1 Screw-Set B-Kit G115"US"		
	4 Boiler feet set M10x51		

Table 13 Boiler block and Burner door

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Fig. 60 Boiler block and burner door

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Boiler Jacket Component (Fig. 61)

Item	Description	Part Number		
		G125/21-BE 3 Section	G125/28-BE 4 Section	
	The complete boiler jacket for a G125 boiler contains the following components: Front panel, name plate, front insulation, top gross bracket, 2 side panels, boiler block insulation, holding clips, top front cover, top rear cover, rear panel and mounting material set.			
Boiler jacket components:				
10	Burner cover G125	63029954		
16	Name plate Logano G125	67902123		
20	Front insulation G125	63025265		
40	Hex. head screw ISO4017-M8x12-8.8	(x)	(x)	(x)
50	Top croos bracket G115/G125	63029209		
60	Hex. head nut DIN555 M8 5	(x)	(x)	(x)
70	Washer DIN126 9	(x)	(x)	(x)
80	Side panel 445mm long	63029945		
80	Side panel 565mm long		63029946	
80	Side panel 685mm long			63029947
85	Sheet metal screw C ST3,9x13 A3T	(x)	(x)	(x)
90	Screw 3,9x9,5 A3T	(x)	(x)	(x)
100	Boiler block insulation G125	05670040	-	-
100	Boiler block insulation G125	-	05670045	-
100	Boiler block insulation G125	-	-	05670046
110	Holding clips for boiler block insulation	00476378		
120	Top front cover G115U/S105/S105U	63029222		
125	Cover plate 300x160	63021497		
130	Top rear cover complete G125 "US"	05198112	-	-
130	Top rear cover complete G125 "US"	-	05198114	-
130	Top rear cover complete G125 "US"	-	-	05198176
140	Rear panel complete G125 RLU	63029952		
145	Rear panel insulation for G125	63025264		
150	Cable rail way	07060754		
160	Washer DIN432 10,5 St A3E	(x)	(x)	(x)
170	Hex. head nut DIN555 M10 5	(x)	(x)	(x)
180	Burner cable with strain relief	7747007984		
Spare parts for burner cable				
181	7 Pole green connecting plug	07079220		
182	7 Pole silver colored plug	67903164		
190	Side insulation	63020896		
200	Strain relief for flat cable	Refer to assembly material: 63031847		
201	Strain relieve for round cable	Refer to assembly material: 63031847		
210	Burner BE 1.2/1.3 – 2.2/2.3 For spare parts, refer to Installation and Maintenance manual 7747009804			
220	Fresh air duct SLDN63 L1450	63024885		

Table 14 Boiler jacket

Item	Description	Part Nu	
		G125/21-BE 3 Section	G125/28-B 4 Section
230	Clamp 60/80 mm	630249	
240	Adapter RLU 60 mm/ 4“	774701	
Mounting material for boiler jacket G115, GC115, G125, G134		63031847	
	Components:		
	17 Screw St3,9x9,5-A3T05180842		
	3 Sheet metal screw C-St3,9x13-A3T		
	1 Screw DIN7985-M6x16-4.8-A3T		
	2 Clip		
	4 Hex. head screw ISO4017-M8x12-8.8		
	1 Hex. head nut DIN555 M8 5		
	4 Washer DIN126 9		
	4 Washer DIN432 10,5 St A3E		
	4 Hex. head nut DIN555 M10 5		

Table 14 Boiler jacket

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Fig. 61 Boiler jacket

14 Burner Wiring Examples

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Buderus G125BE and GB125BE Oil Fired Burner Wiring

Buderus G125BE and GB125BE Oil Fired Burner

Using a Beckett Aquasmart Aquastat -

1) Connect room thermostat or end switch to the TW and TR terminals of the AQUASMART.
2) Connect incoming 120VAC power source to L1 on the AQUASMART
3) Connect incoming neutral to L2 on the AQUASMART
4) Remove connector from cable.
5) Connect White wire to B2 on the AQUASMART to the wire on Terminal 4 on the connector.
6) Connect Black wire to B1 on the AQUASMART to the wire on terminal 11 on the connector.
7) Connect Green wire to the Ground screw on the AQUASMART to the Ground wire on the connector.
8) Protect all other wires from accidental shorting.

Fig. 62 Wiring diagram 1

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Fig. 63 Wiring diagram 2

15 Glossary

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