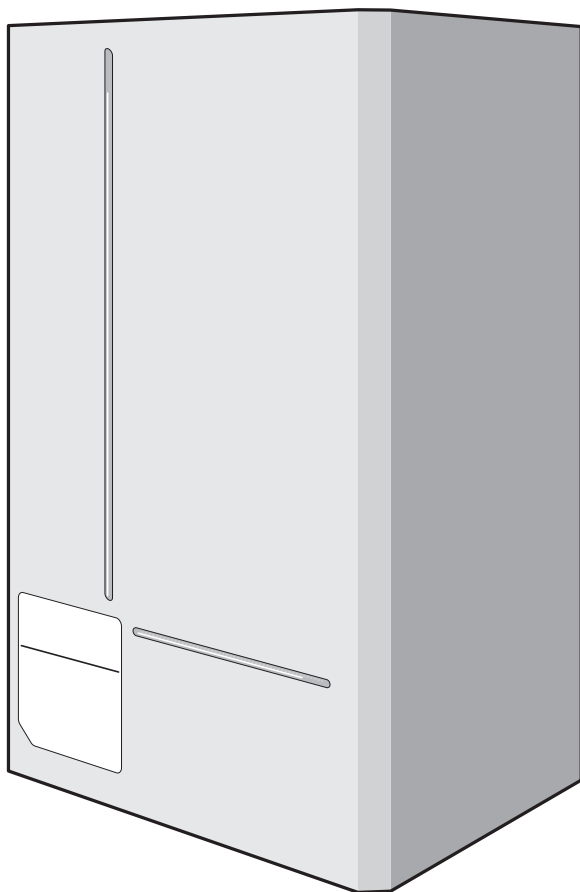


# Installation and servicing instructions

**Gas wall hung Boiler condensing  
Buderus 600 - 11R / 19R / 24R**



**Buderus**



The boiler meets the basic requirements of the appropriate standards and directives.

Conformity has been substantiated by the proper documents which - together with the declaration of conformity - are filed with the manufacturer.

### **Subject to technical modifications!**

Constant development efforts may result in changes to illustrations, functional steps and technical data.

### **Updating the documentation**

If you have suggestions for improvement or have found discrepancies, please do not hesitate to contact us.

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### G. C. Appliance No. :

Buderus 600 - 11R	41-110-21
Buderus 600 - 19R	41-110-22
Buderus 600 - 24R	41-110-23

Other manuals available for this boiler are:

- user manual.

## Preface

These installation and servicing instructions apply to:  
Buderus wall-mounted condensing gas boilers  
600 - 11R / 19R / 24R.

Model: C<sub>13</sub>, C<sub>33</sub>, C<sub>53</sub>

Type: GB II<sub>2H3P</sub> 20 mbar, 37 mbar

In this document: NG = 2H-G20-20 mbar  
LPG = 3P-G31-37 mbar

Fuse rating: 1.25 Ampere slow blow (on boiler)

Power rating: 230 VAC, 50 Hz, IPX4D

A fuse main supply of 3 amp required (**BS. 1362**).

The boiler consists of the following components:

- 600 : Gas condensing boiler
- 11, 19, 24 : Maximum output in kW for the different models
- R : Regular boiler.

### Important general instructions for use

Only use the boiler in accordance with its designated use and the installation and servicing instructions. Installation, maintenance and repair must be carried out by competent service engineers (e.g. CORGI registered). Only use the boiler in conjunction with the accessories and spare parts indicated in the installation and servicing instructions. Other accessories and consumables may only be used if they are expressly provided for the designated use and if system performance and safety are not affected in any way.

The boiler is suitable for connection to fully pumped, open vented or sealed water systems.

Adequate arrangements for completely draining the system by provision of draining cocks must be provided in the installation pipework.

### Subject to technical modifications.

As a result of our policy of constant development, there may be differences between illustrations, functional steps and technical data.



### BENCHMARK' Log Book

All Buderus gas fired boilers include an installation, commissioning and service record log book. The details of the log book will be required in the event of any warranty work being requested.

Please complete the appropriate sections on completion of the installation and commissioning.

**REMEMBER:** Please hand the log book back to the user.

## Regulations and directives

It is a requirement that all gas appliances are installed and serviced by a CORGI registered installer in accordance with the regulations. Failure to install appliances correctly could lead to prosecution. It is in your own interest, and that of safety, to ensure the law is complied with.

The installation must also be in accordance with the latest I.E.E (**BS.7671**) Wiring Regulations, water regulations, the building regulations and the Building Standards (Scotland) and any relevant requirements of the local authority.

It is a requirement and in your own interest, and that of safety that this boiler must be installed by a CORGI registered installer, in accordance with the relevant requirements of the current Gas Safety (Installation and Use) Regulations, The Building Regulations, current I.E.E. Wiring Regulations and the relevant British Standard Codes of Practice.

Detailed recommendations are contained in the following British Standard Codes of Practice:

- BS. 5440:1** Flues (for gas appliances of rated input not exceeding 70 kW).
- BS. 5440:2** Ventilation (for gas appliances of rated input not exceeding 70 kW).
- BS. 5449** Forced circulation hot water systems.
- BS. 5546** Installation of gas hot water supplies for domestic purposes (2nd. family Gases).
- BS. 6798** Installation of gas fired hot water boilers of rated input not exceeding 60 kW.
- BS. 6891** Low pressure installation pipes.

**IGE/UP/1b** Tightness testing and purging domestic sized gas installations.

**Health and Safety Document No. 635.**

**The Electricity at Work Regulations, 1989.**

The manufacturer's notes must not be taken, in any way, as overriding statutory obligations.

The design and construction of the Buderus wall-mounted condensing gas boiler 600 - 11R/19R/24R conforms to the basic specifications listed in the European directive governing gas-fired appliances 90/396/EEC, and with respect to EN 625, EN 483 and EN 677.



### NOTE

Observe the corresponding technical rules and the building supervisory and statutory regulations when installing and operating the system.



### WARNING!

### WARNING!

Keep the burner-control unit housing **CLOSED** when working on water-bearing components.



### NOTE

It is mandatory to inspect and service the system once a year. This includes an inspection of the entire system to see if it is in full working order. Defects and faults must be eliminated immediately.



### NOTE

When instructions aren't followed, warranty expires.

### Timber Framed Buildings

If the boiler is to be fitted in a timber framed building it should be fitted in accordance with the Institute of Gas Engineering document **IGE/UP/7:1998**.

### Bathroom Installations

This appliance is rated IPX4D.

The boiler may be installed in any room or internal space, although particular attention is drawn to the requirements of the current IEE (**BS.7671**) Wiring Regulations and, in Scotland, the electrical provisions of the building regulations applicable in Scotland, with respect to the installation of the boiler in a room or internal space containing a bath or shower.

If the appliance is to be installed in a room containing a bath or shower then, providing water jets are not going to be used for cleaning purposes (as in communal baths/showers), the appliance can be installed in Zone 3, as detailed in **BS.7671**.

### Compartment Installations

A compartment used to enclose the boiler should be designed and constructed especially for this purpose.

An existing cupboard or compartment may be used, provided that it is modified for the purpose.

In both cases, details of essential features of cupboard/compartment design, including airing cupboard installation, are to conform to the following:

**BS 6798** (No cupboard ventilation is required - see 'Air Supply' for details).

It is not necessary to have a purpose-provided air vent in the room or internal space in which the boiler is installed. Neither is it necessary to ventilate a cupboard or compartment in which the boiler is installed, due to the low surface temperatures of the boiler casing during operation; therefore the requirements of **BS 6798**, **Clause 12**, and **BS 5440:2** may be disregarded.

The permanent clearances required are:

in front:	8 mm
below:	21 mm
right side:	5 mm
left side:	5 mm
above:	21 mm

The position selected for installation **MUST** allow adequate space for servicing in front of the boiler.

See table below:

in front:	350 mm
below:	50 mm
right side:	5 mm
left side:	5 mm
above:	200 mm

For the minimum clearances required for safety and subsequent service, see the wall mounting template. In addition, sufficient space may be required to allow lifting access to the wall mounting plate.

Wall-mounted condensing gas boilers must only be operated with the combustion air/flue gas systems especially devised and authorised for this type of boiler.

Observe the relevant standards, regulations and legislation of the country of final use.



**CAUTION!**

Use this device for its intended purpose only.

**CAUTION!**



**DANGER!**

**notes relating to the heating system water.**

**WARNING!**

Thoroughly flush the system before it is filled with water. Use only untreated water or water treatment product such as Sentinal X100 to fill and top up the system.

When using water treatment, only products suitable for use with Buderus heat exchangers are permitted (e.g. Sentinel X100). Your warranty is at risk if an incorrect water treatment product is used in conjunction with this appliance. For more information, contact Buderus Product Support Department.

It is most important that the correct concentration of the water treatment product is maintained in accordance with the manufacturer's instructions.

If the boiler is used in an existing system any unsuitable additives **MUST** be removed by thorough cleaning.

**BS.7593:1992** details the steps necessary to clean a domestic central heating system.

In hard water areas, treatment to prevent lime scale may be necessary - however, the use of artificially softened water is **NOT** permitted.

Under no circumstances should the boiler be fired before the system has been thoroughly flushed.

Do not use water softened in a salt bedding exchanger.

Do not use anti-freeze or other additives.

The expansion vessel must be of sufficient size.

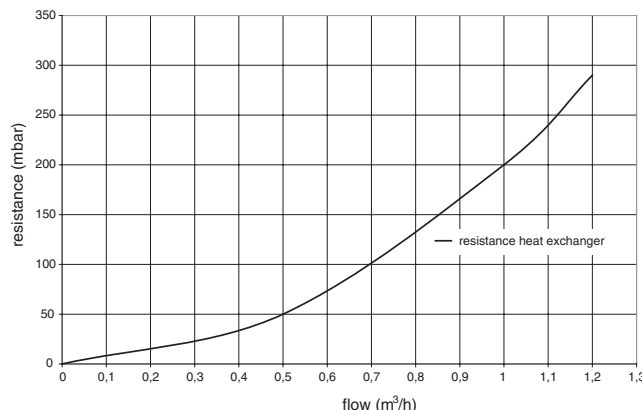
When oxygen-permeable pipes are used (e. g. for floor heating systems) the system must be separated by means of heat exchangers. Unsuitable heating water promotes sludge formation and corrosion. This may cause malfunctions and damage in the heat exchanger.

This appliance is not suitable for gravity central heating nor are they suitable for the provision of gravity domestic hot water.

The boiler must be vented.

Drain cocks must be located in accessible positions, which permits the draining of the entire system. They should be at least 1/2" BSP nominal size and be in accordance with **BS 2879**.

The hydraulic resistance of the boilers is shown in the graph below.





**NOTE:**  
**notes relating to domestic hot water.**

The boiler must not be used for direct hot water supply.

The hot water storage cylinder must be of the indirect type.

Prismatic cylinders are not recommended and must not be used on sealed systems.

The hot water cylinder and ancillary pipework, not forming part of the useful heating surface, should be lagged to prevent heat loss and any possible freezing - particularly where pipes run through roof spaces and ventilated under-floor spaces.

The domestic hot water service must be in accordance with **BS 5546** and **BS 6700**.

### Safe handling of substances

Care should be taken when handling the boiler's insulation, which can cause irritation to the skin.

No asbestos, mercury or CFCs are included in any part of the boiler and its manufacture.

### Open vent system requirements

The system should be vented directly off the boiler flow pipe, as close to the boiler as possible. The cold feed entry should be inverted and **MUST** be positioned between the pump and the vent, and not more than 150 mm away from the vent connection.

There should be a minimum height, 450 mm, of open vent above the tank water level. The vertical distance between the highest point of the system and the feed/expansion cistern water level **MUST** not be less than 1000 mm. The pump must be fitted on the flow side of the boiler.

A suitable pump is a domestic circulator capable of providing a maximum 11 °C temperature differential across the boiler with the whole of the heating circuit open. With the minimum flow circuit allowed by the controls the differential must not exceed 25 °C (see also the graph on page 5).

The vertical distance between the pump and feed/expansion cistern **MUST** comply with the pump manufacturer's minimum requirements, to avoid cavitation. Should these conditions not apply either lower the pump position or raise the tank above the minimum requirements specified by Buderus. The isolation valves should be fitted as close to the pump as possible.

The system will work more efficiently when the flow temperature is as low as possible.

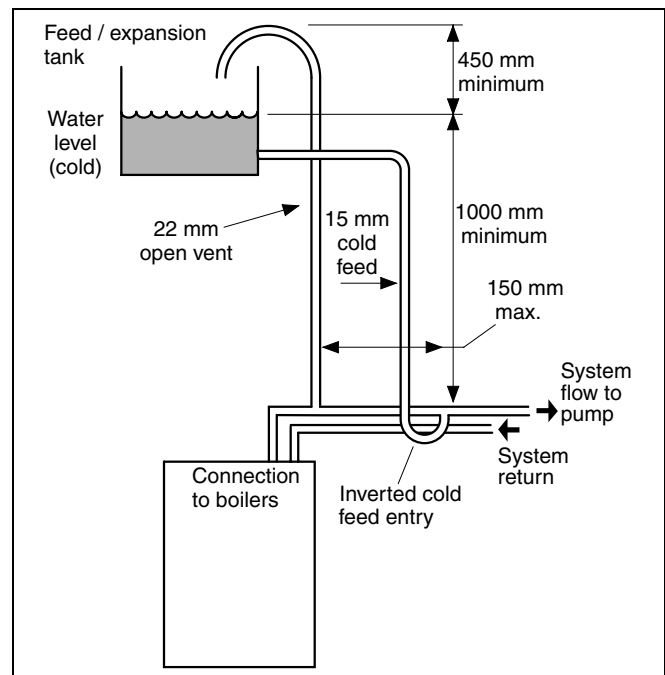


fig. 1 Open vent system

## Schematic pipework

The boiler does not normally need a bypass but is required when using 2 port zone valves. Lock shield valves are required on the radiators in the area where the thermostat is situated.

### Thermostatic radiator valves

An automatic bypass is always required.

To comply with the building regulations that heating systems utilising the thermostatic radiator valve control of temperature in individual rooms shall also be fitted with a room thermostat, controlling the temperature in a space served by radiators not fitted with such a valve.

Such an arrangement will provide for potentially more efficient control of the environment and will also avoid the continuous running of the circulation pump during programmed heating ON periods - thus saving electrical energy.

It is, therefore, strongly recommended that, when thermostatic radiator valves are used, space heating temperature control over a living/dining area or a hallway having a heating requirement of at least 10% of the minimum boiler heat output, is achieved using a room thermostat whilst other rooms are individually controlled by thermostatic radiator valves.

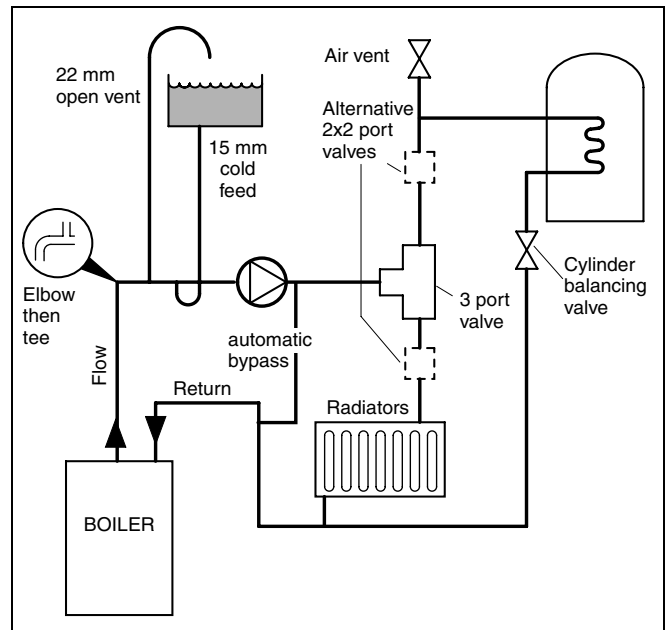


fig. 2 Schematic pipework

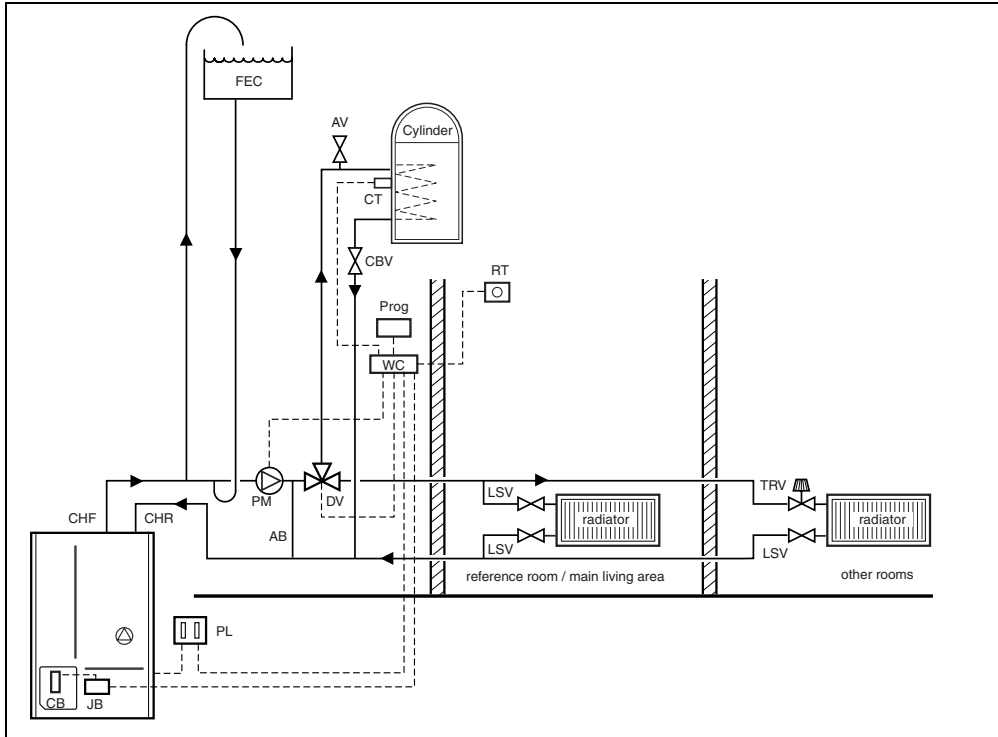
## System examples



### NOTE

System examples are to be regarded as schematic representations only.

**Buderus 600 Regular with external 230V connection (Y-plan)**



Key to abbreviations:

- AB = Automatic Bypass
- AV = Air Vent
- CB = Connection Block
- CBV= Cylinder Balancing Valve
- CHF = Central Heating Flow
- CHR = Central Heating Return
- CT = Cylinder Thermostat
- DV = Diverter Valve
- FEC= Feed / Expansion Cistern
- JB = Junction Box / RTH Converter
- LSV = Lockshield Valve
- PL = Permanent Live
- PM = Pump
- Prog= Programmer
- RT = Room Thermostat
- TRV = Thermostatic Radiator Valve
- WC = Wiring Centre

fig. 3

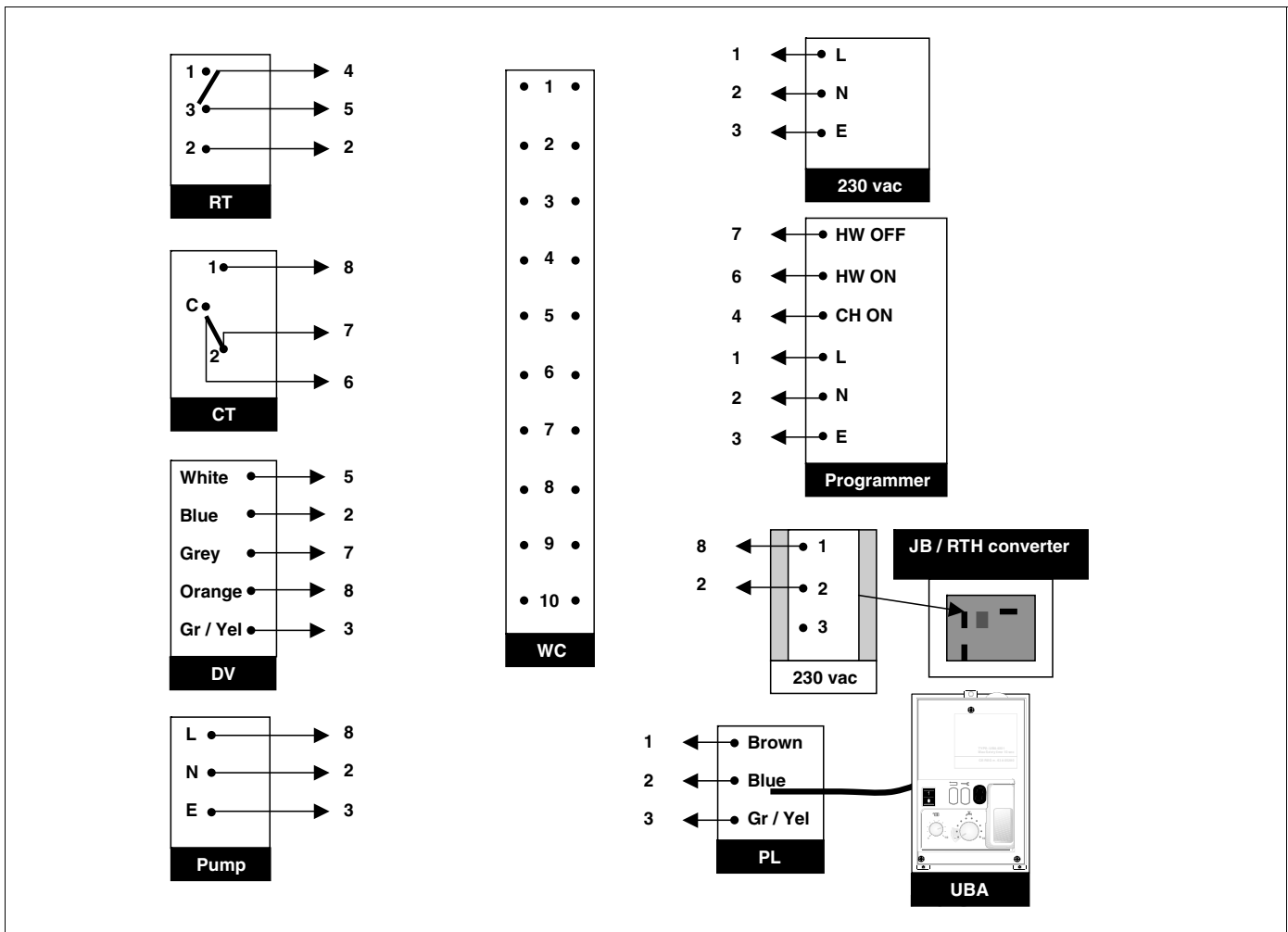
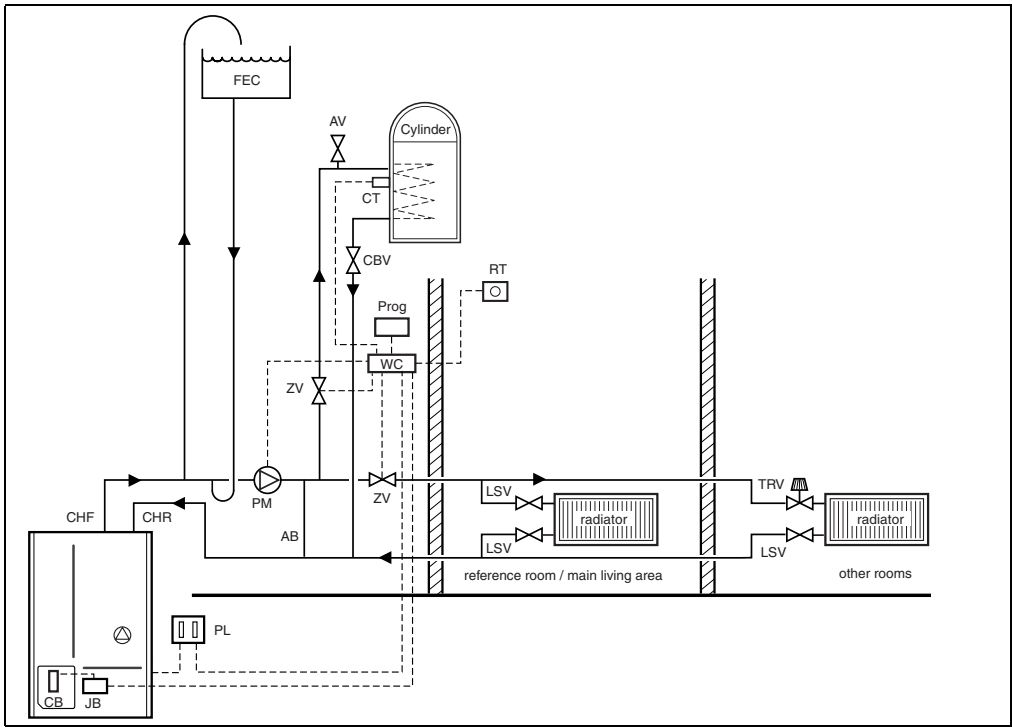


fig. 4 Y-plan 230V



**Buderus 600 Regular with external 230V connection and two port zone valves (S-plan)**



- Key to abbreviations:
- AB = Automatic Bypass
  - AV = Air Vent
  - CB = Connection Block
  - CBV= Cylinder Balancing Valve
  - CHF = Central Heating Flow
  - CHR =Central Heating Return
  - CT = Cylinder thermostat
  - FEC= Feed / Expansion Cistern
  - JB = Junction Box / RTH Converter
  - LSV = Lockshield Valve
  - PL = Permanent Live
  - PM = Pump
  - Prog= Programmer
  - RT = Room thermostat
  - TRV = Thermostatic Radiator Valve
  - WC = Wiring Centre
  - ZV = Two port Zone Valve

fig. 5

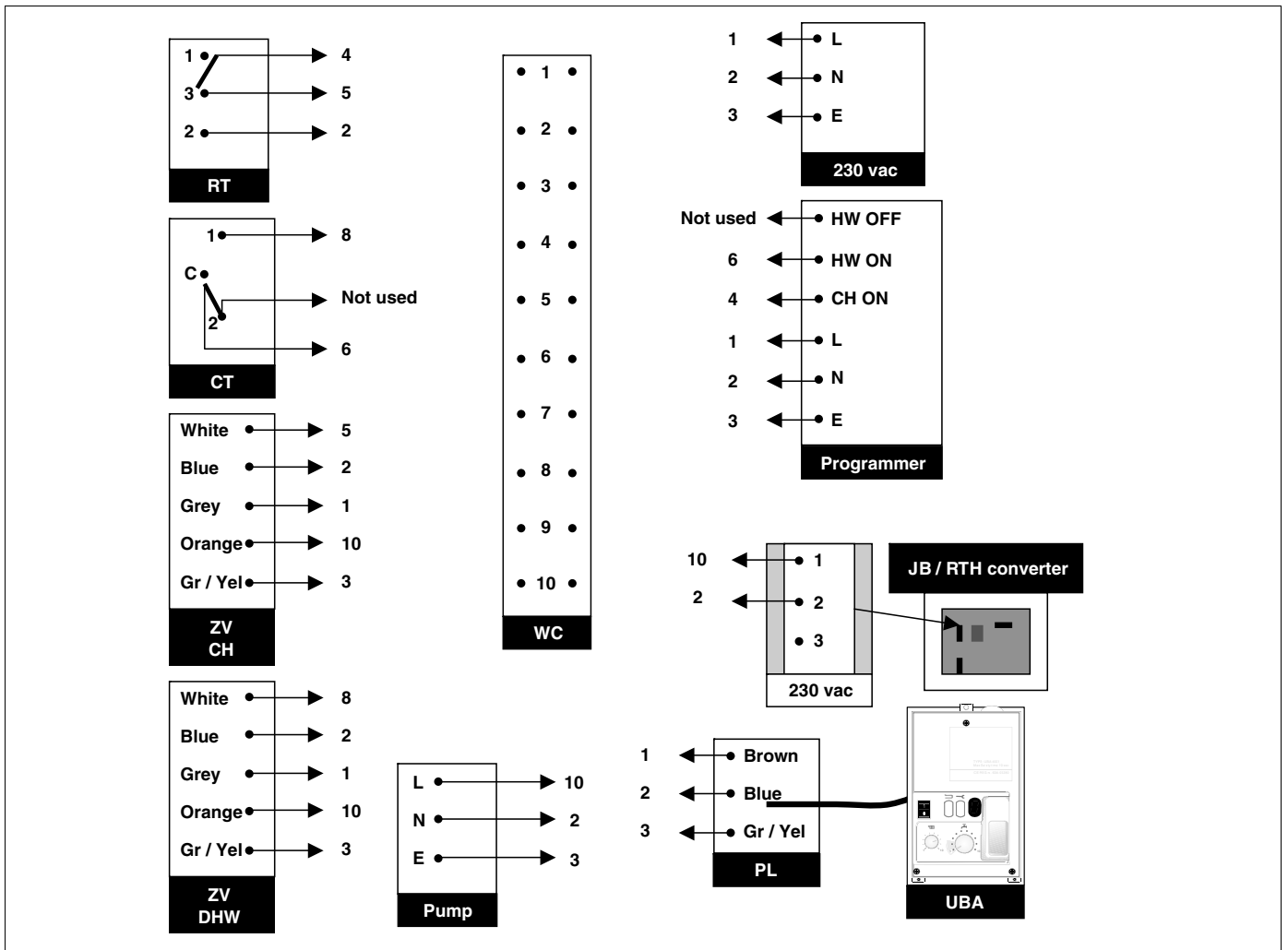


fig. 6 S-plan 230V

## Sealed system requirements

### 1. General

The installation must comply with the requirements of **BS. 6798** and **BS. 5449**.

All components of the system, including the heat exchanger of the indirect cylinder, must be suitable for a working pressure of 3 bar and temperature of 110 °C. Care should be taken in making all connections so that the risk of leakage is minimised.)

### 2. Safety valve

A spring loaded safety valve complying with the relevant requirements of **BS. 6759** must be fitted in the flow pipe as close to the boiler as possible and with no intervening valve or restriction. The valve should have the following features:

- A non-adjustable preset lift pressure not exceeding 3 bar;
- A manual testing device;
- Provision for connection of a discharge pipe. The valve or discharge pipe should be positioned so that the discharge of water or steam cannot create a hazard to the occupants of the premises or cause damage to electrical components and wiring.

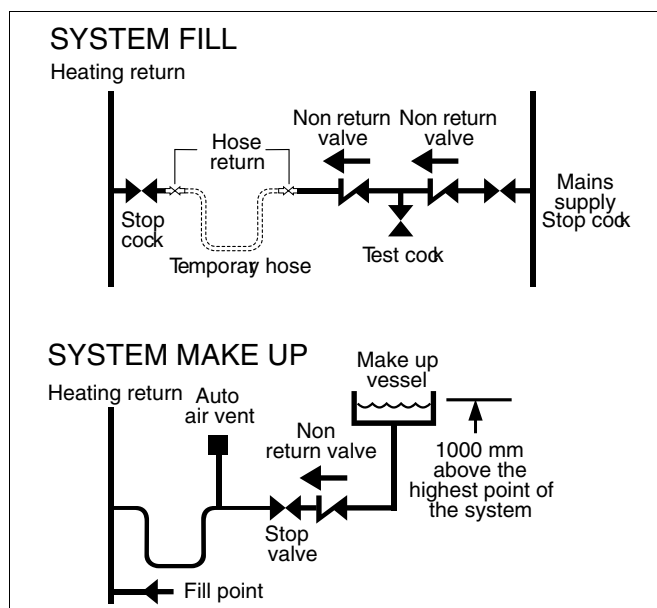


fig. 7 System fill and make up

### 3. Pressure gauge

A pressure gauge covering at least the range of 0-4 bar must be fitted to the system. The gauge should be easily seen from the filling point and should preferably be connected at the same point as the expansion vessel.

### 4. Expansion vessel

A diaphragm type expansion vessel must be connected to a point close to the inlet side of the pump, the connecting pipe being not less than 15 mm size and not incorporating valves of any sort.

The vessel capacity must be adequate to accept the expansion of the system water when heated to 110 °C.

The charge pressure must not be less than the static water head above the vessel. The pressure attained in the system when heated to 110 °C should be at least 0.35 bar less than the lift pressure of the safety valve. For guidance on vessel sizing refer to table 1.

For further details refer to **BS. 5449** and **BS. 7074:1** and the British Gas Corporation publication: "Material and Installation Specifications for Domestic Central Heating and Hot Water".

### 5. Cylinder

The cylinder must be either of the indirect coil type or a direct cylinder fitted with an immersion calorifier which is suitable for operating on a gauge of 0.35 bar in excess of the safety valve setting. Primatic cylinders are not suitable for sealed systems.

### 6. Make-up water

provision must be made for replacing water loss from the system, either:

- from a manually filled make-up vessel with a readily visible water level. The vessel should be mounted at least 150 mm above the highest point of the system, and be connected through a non-return valve to the system, filled at least 300 mm below the make-up vessel on the return side of the domestic hot water cylinder or radiators.

or

- where access to a make-up vessel would be difficult by pre-pressurisation of the system. Refer to "Filling", below.

### 7. Mains Connection

There must be no direct connection to the mains water supply or to the water storage tank supplying domestic water, even through a non-return valve, without the approval of the local water authority.

## 8. Filling

The system may be filled through a temporary hose connection from a draw-off tap supplied from a servicing pipe under mains pressure. Where the mains pressure is excessive a pressure reducing valve shall be used to facilitate filling.

The following fittings shall form a permanent part of the system and shall be fitted in the order stated:

- A stop valve complying with the requirements of **BS. 1010, Part 2** (the hose from the draw-off tap shall be connected to this fitting);
- A test cock;
- A double check valve of an approved type.

### Sizing procedure for expansion vessel

The volume of the expansion vessel (litres) fitted to a sealed system shall not be less than that given by table 1, multiplied by a factor of 0.8 (for flow temperatures of less than 80 °C).

Safety valve setting	3.0 bar		
Vessel charge and initial system pressure	0.5	1.0	1.5
	bar	bar	bar
Total water content of system (litres)	Expansion vessel volume litres		
25	2.1	2.7	3.9
50	4.2	5.4	7.8
75	6.3	8.2	11.7
100	8.3	10.9	15.6
125	10.4	13.6	19.5
150	12.5	16.3	23.4
175	14.6	19.1	27.3
200	16.7	21.8	31.2
225	18.7	24.5	35.1
250	20.8	27.2	39.0
275	22.9	30.0	42.9
300	25.0	32.7	46.8
<b>Multiplying factors for other system volumes</b>	0.0833	0.109	0.156

Table 1 Expansion vessel volumes

# Hazard definitions and abbreviations

## Hazard definitions



**WARNING!**

### **DANGER:**

Indicates the presence of hazards that will cause severe personal injury, death or substantial property damage.



**WARNING!**

### **WARNING:**

Indicates the presence of hazards that can cause severe personal injury, death or substantial property damage.



**CAUTION!**

### **CAUTION:**

Indicates presence of hazards that will or cause minor personal injury or property damage.



### **NOTICE:**

Indicates special instructions on installation, operation or maintenance that are important but not related to personal injury or property damage.

## Abbreviations

AB	=	Automatic Bypass
AV	=	Air Vent
CB	=	Connection Block
CBV	=	Cylinder Balancing Valve
CH	=	Central Heating
CHF	=	Central Heating Flow
CHR	=	Central Heating Return
CT	=	Cylinder Thermostat
CWDO	=	Condensate water drainage outlet
DV	=	Diverter Valve
E	=	Earth
FEC	=	Feed / Expansion Cistern
L	=	Live
LSV	=	Lock Shield Valve
MCW	=	Mains Cold Water
N	=	Neutal
JB	=	Junction Box / RTH Converter
PL	=	Permanent Live
PM	=	Pump
Prog	=	Programmer
PRV	=	Pressure relief valve (safety valve)
RT	=	Room Thermostat
T	=	Timer
TRV	=	Thermostatic Radiator Valve
WC	=	Wiring Centre
ZV	=	Two Port Zone Valve

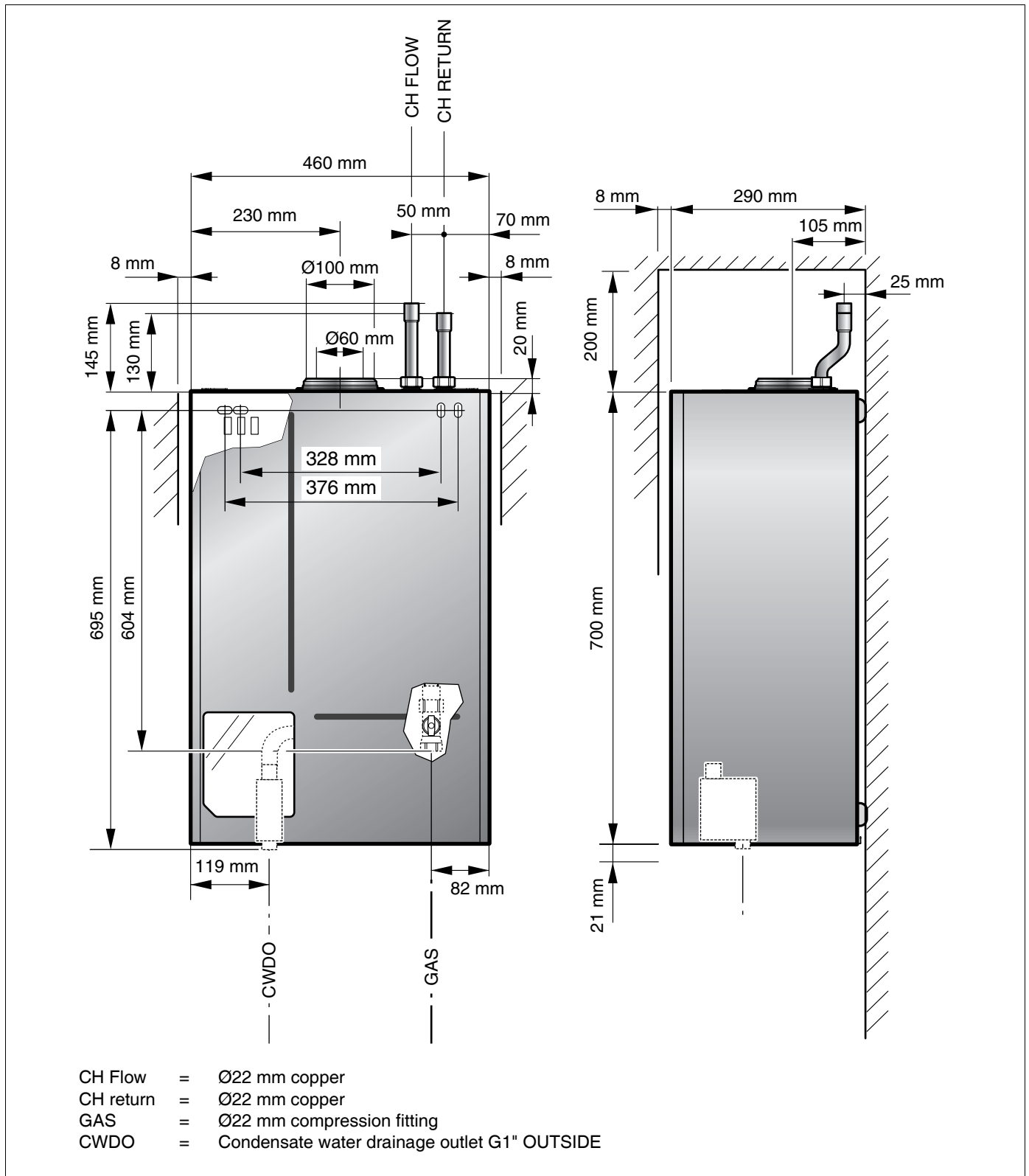
# 1 Installation

## 1.1 Technical specifications

Dimensions	Unit	600 Series Buderus wall-mounted condensing gas boiler		
		11R	19R	24R
Type of gas supply as established in EN 437 (GB)		GB II <sub>2H3P</sub> 20 mbar, 37 mbar (natural gas <b>H</b> , propane <b>P</b> )		
Rated heating capacity for system temperature (modulating from 30° to 100°)				
Heating curve 75/60 °C	kW	4.3 - 10.0	8.6 - 17.4	8.6 - 22.0
Heating curve 40/30 °C	kW	4.9 - 11.0	9.7 - 19.0	9.7 - 24.0
Seasonal efficiency (SEDBUK)	%	90.3	90.3	90.2
<b>Central heating installation</b>				
Heating water temperature	°C	40 - 80		
ΔT at residual head of 200 mbar	°C	<20		
Max. operating overpressure of boiler	bar	3.0		
Volume heat exchanger heating circuit	l	1.0		
<b>Pipe connections</b>				
Gas (compression fitting)	mm	Ø 22		
CH flow/return	mm	Ø 22		
Condensate water outlet	inch	G1"		
<b>Flue gas values</b>				
Condensate water quantity, natural gas, 40/30 °C	l/h	0.7	1.3	1.6
pH value of condensate water		approx. 4.1		
Flue gas mass-flow rate				
Full load	g/s	4.9	8.4	10.6
Part-load	g/s	2.2	4.3	4.3
Flue gas temperature, full load				
Heating curve 75/60 °C	°C	75	85	95
Heating curve 40/30 °C	°C	50	55	55
Flue gas temperature, part-load				
Heating curve 75/60 °C	°C	65	70	70
Heating curve 40/30 °C	°C	40	45	45
CO <sub>2</sub> full load, natural gas standard test gas G20	%	9.2		
CO <sub>2</sub> full load, natural gas standard test gas LPG	%	10.3		
Standard emission factor CO	mg/kWh	<22		
Standard emission factor NO <sub>x</sub>	mg/kWh	<30		
Max. pressure drop permitted	Pa	35	60	100

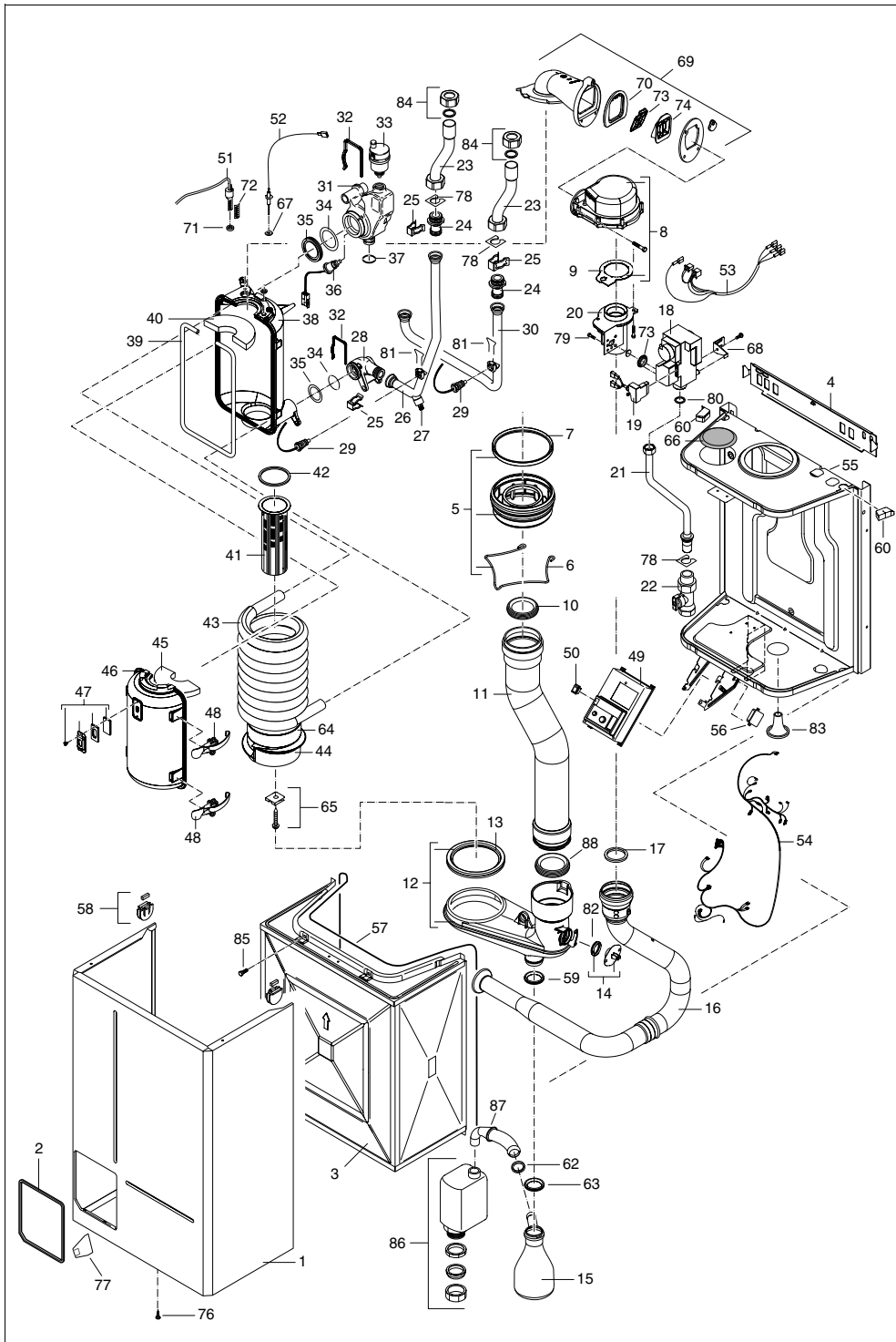
Dimensions	Unit	600 Series Buderus wall-mounted condensing gas boiler		
		11R	19R	24R
<b>Flue-gas system</b>				
Type of flue gas connection		C <sub>13</sub> , C <sub>33</sub> , C <sub>53</sub>		
Standard diameter of flue gas system	mm	60/100		
<b>Electrical data</b>				
Mains connection voltage	V	230		
Electrical power consumption Full/Part load	W	40/25	40/25	40/25
Electrical protection rating		IPX4D		
<b>Boiler dimensions and weight</b>				
Height x Width x Depth	mm	700 x 460 x 290		
Weight (without casing)	kg	23.5	23.5	23.5
Casing	kg	5.5	5.5	5.5

## 1.2 Dimensions and connections



1.3 Boiler assembly - exploded view

Regular unit (11R / 19R / 24R)



Legend

- 1. Casing
- 2. Door complete
- 3. Ventilation cover
- 4. Bracket
- 5. Concentric adaptor
- 6. Clip adaptor
- 7. 100 mm Lipring
- 8. Fan
- 9. Seal Fan / Venturi
- 10. 60 mm Lipring
- 11. Flue gas pipe
- 12. Condensate collector
- 13. Seal flue gas pipe
- 14. Flue gas thermostat (STL)
- 15. Condensate trap
- 16. Air silencer tube
- 17. 50 mm Lipring
- 18. Gas valve
- 19. Rectifier
- 20. Venturi
- 21. Gas pipe
- 22. Gas service valve
- 23. Pipe return/flow top
- 24. Pipe connection
- 25. Clip
- 26. Return pipe
- 27. Drain cock
- 28. Connection return
- 29. Sensor
- 30. Flow pipe
- 31. Connection supply
- 32. Spring heat exchanger
- 33. Automatic air vent
- 34. O-ring heat exchanger
- 35. Seal heat exchanger
- 36. Safety sensor
- 37. O-ring
- 38. Rearpart heat exchanger
- 39. Gasket heat exchanger
- 40. Insulation rearpart heat exchanger
- 41. Burner 11 kW  
Burner 19-24kW
- 42. Burner seal
- 43. Heat exchanger
- 44. Restrictor baffle
- 45. Front heat exchanger insulation
- 46. Frontpart heat exchanger
- 47. Sight glass
- 48. Securing latch
- 49. UBA
- 50. Power switch
- 51. Glow ignitor
- 52. Ionisation electrode
- 53. Cable fan
- 54. Cable harness
- 55. Frame
- 56. RTH converter 230V
- 57. Seal ventilation cover
- 58. Assembly casing block
- 59. Seal

- 60. Air seal bush
- 61. Bracket ionisation electrode & glow ignitor
- 62. Syphon seal condensate trap
- 63. Seal syphon
- 64. Insulation divider
- 65. Clip & screw insulation divider
- 66. Cap
- 67. Seal ionisation electrode
- 68. Clip air silencer

- 69. Gas air supply
- 70. Valve fan / gas air supply
- 71. Seal glow ignitor
- 72. Shield glow ignitor
- 73. Seal venturi / gasket
- 74. Seal fan / gas air supply
- 75. Gas air supply valve
- 76. Plate screw
- 77. Casing clip
- 78. Clip

- 79. Screw M5
- 80. Gasket
- 81. Clip
- 82. Seal flue gas thermostat
- 83. Seal condensate pipe
- 84. Swivel dreg with pinching
- 85. Screw
- 86. Syphon
- 87. Drain pipe condensate trap / syphon
- 88. 60 mm Lipring



## 1.4 Items supplied with unit

- Check the contents against the packing list to ensure that no parts are missing.

Key to fig. 1:

**item 1:** Wall-mounted condensing gas boiler

**item 2:** Wall bracket

**item 3:** Technical documents

**item 4:** CH Flow connection pipe

**item 5:** CH Return connection pipe

**item 6:** Gas service valve

**item 7:** Plastic bag containing the following accessories:

2 x wall fixing-screws

2 x wall plugs

2 x washers

Seals (2 x 3/4")

Square wrench

Initial start-up sticker

Second identification plate

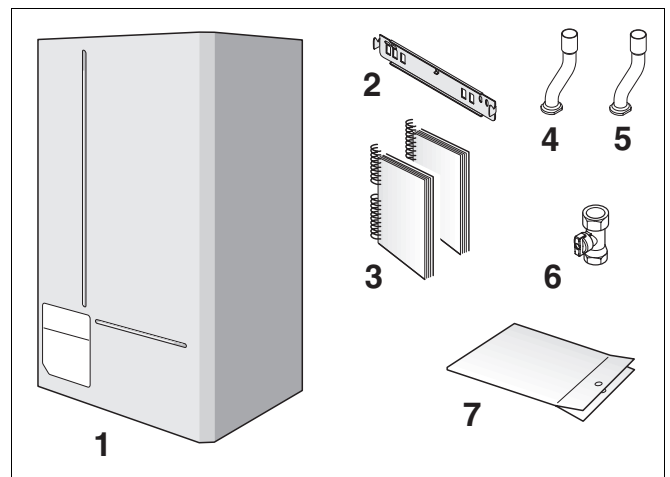


Fig. 1 Items supplied with unit

## 1.5 Hanging the boiler

The boiler is transported in a horizontal position.

- Open the box and remove the four foam supports (fig. 2, item 1). The casing is not attached to the boiler.
- Take out the casing (fig. 2, item 2) and put aside during installation.



**CAUTION!**

### CAUTION!

Do not carry the boiler by the casing at any time.

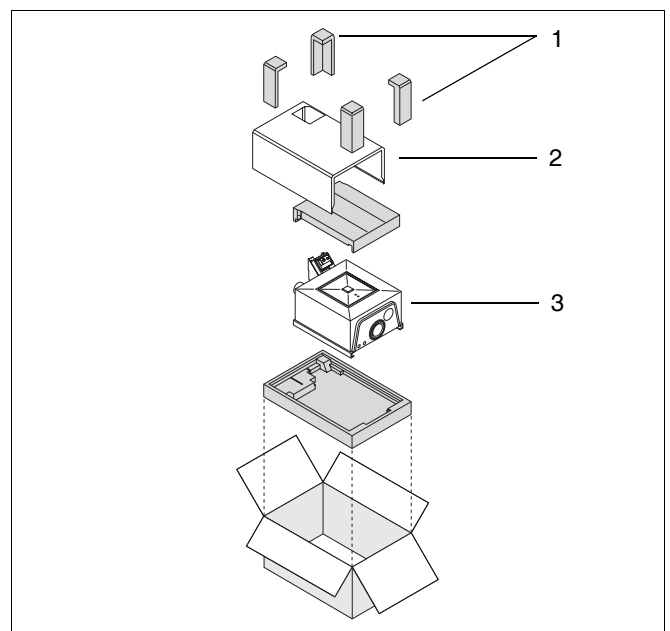


Fig. 2 Unpacking the box

- Hang the wall mounting template.
- Drill the necessary holes.
- Take out the wall bracket (fig. 1, item 2) and attach to the wall using the wall mounting template.
- Take out the condensing gas boiler (fig. 2, item 3) and hang onto the wall bracket (fig. 3).
- Dispose of packaging.

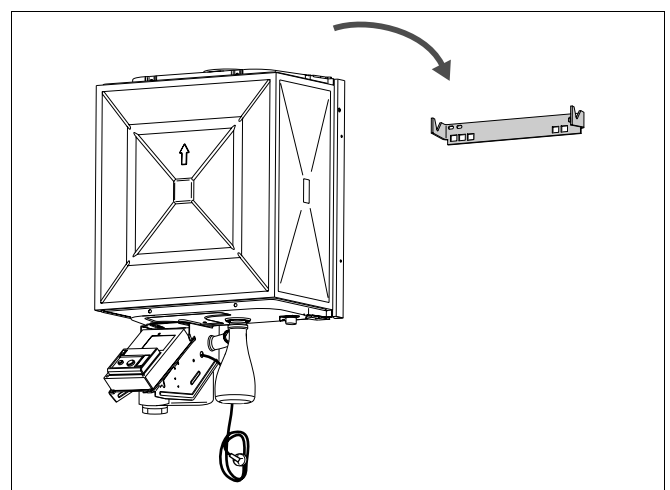


Fig. 3 Installation

## 1.6 Pipe connections



### CAUTION!

Ensure that all pipework is routed so as to minimise any strain on the boiler fittings.

CAUTION!

Buderus advises to use copper piping for the first 600 mm, then it is allowed to switch to another approved pipe material.

- Take the CH flow connection pipe and the CH return connection pipe out of the box and connect to the condensing gas boiler (fig. 4, item 1 and 2).
- Connect the central heating system to these pipe connections according to the relevant standards.

### 1.6.1 Gas Supply

The gas installation must be installed in accordance with **BS.6891**.



### CAUTION!

Pipework from the meter to the boiler **MUST** be of adequate size.

CAUTION!

The complete installation **MUST** be tested for gas tightness and purged as described in **IGE/UP/1b**.

### 1.6.2 Gas connection

- A gas service valve is supplied with the unit. Take it out of the box and connect it to the boiler see fig. 4, item 3 with approved P.T.F.E.-tape. Connect to gas supply according to the relevant standards.

### 1.6.3 Water circulation system

The central heating system should be installed in accordance with **BS.6798** and, in addition, for smallbore and microbore systems, **BS.5449** or EN 12823.

### 1.6.4 Condensate removal

#### Positioning and termination of the condensate drain pipe

The condensate pipe should be run and terminate internally to the house soil and vent stack or waste pipe. Alternatively, the condensate can be discharged into the rainwater system if connected to a foul water draining system, or into a purpose-made soak away (condensate absorption point).

All connecting drainage pipework should generally have a fall of at least 2.5° to the horizontal, or approximately 50 mm per metre of pipe run. If this is can not be achieved, consider the use of a condens pump.

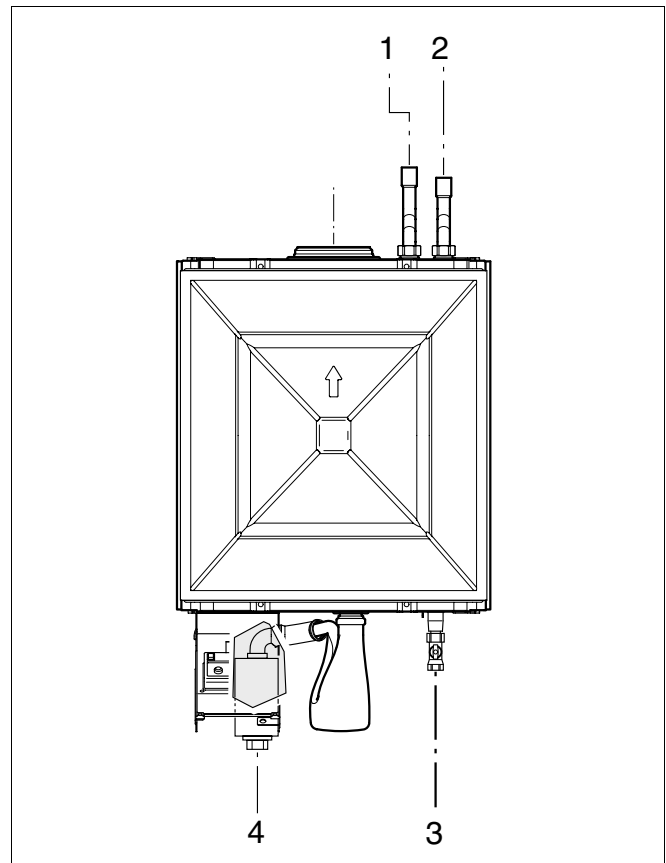


Fig. 4 Pipe connections

Key to fig. 4:

**item 1:** CH flow

**item 2:** CH return

**item 3:** Gas

**item 4:** Condensate water drainage outlet (CWDO)

If an external pipe run is unavoidable then the run should be insulated with water proof insulation limited to 3 m in length. Should this be exceeded then the pipework diameter should be increased to 32mm and the pipework insulated using weather proof materials.



#### WARNING!

Any external run must be insulated with water proof insulation.

WARNING!

It should be noted that the connection of a condensate pipe to a drain may be subject to local building controls.

#### Material for condensate



#### NOTE

Ensure that the condensate trap is filled with water.

The condensate drainage pipe should be run in a standard drain pipe material, e.g. PVC (polyvinyl chloride), PVC-U (unplasticized polyvinyl chloride), BS (acrylonitrile-butadienestyrene), PP (polypropylene polypropylene) or PVC-C (cross-linked polyvinyl chloride).

The condensate drain can be attached to the syphon (fig. 5).

Any internal pipework should be of a diameter to match the requirements of the condensate exit pipe on the appliance.

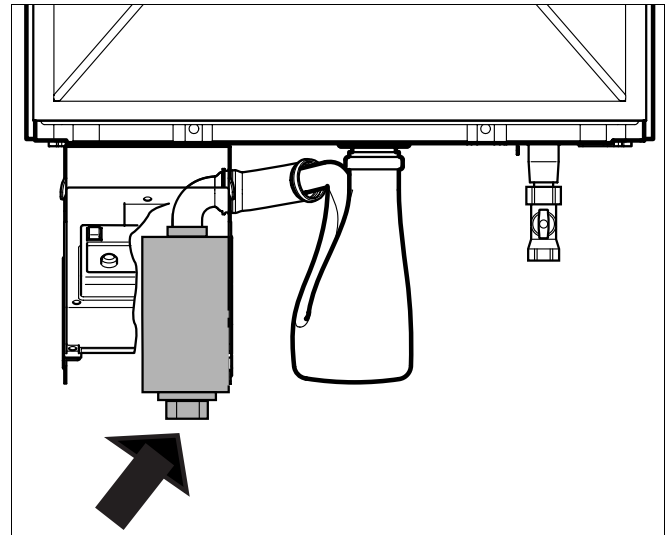


Fig. 5 Condensate outlet

#### Internal termination to internal stack

The condensate drainage pipe should have a minimum outside diameter of 1" with no length restriction. It should incorporate a trap with a 75 mm condensate seal and be connected to the stack at a point at least 450 mm above the invert of the stack. **The trap built into the boiler will provide this 75 mm (fig. 6) condensate seal.**

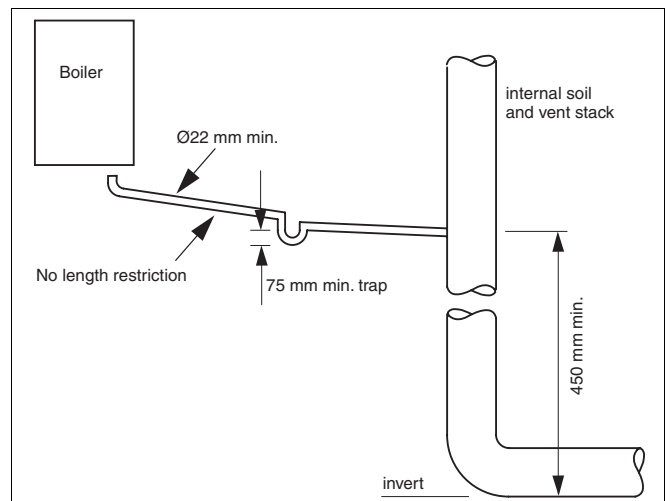
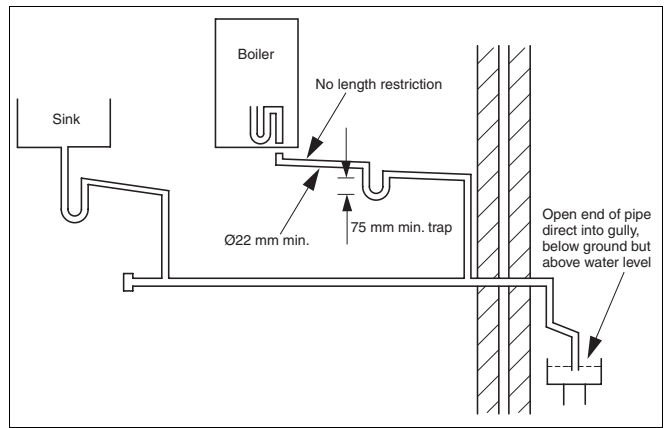


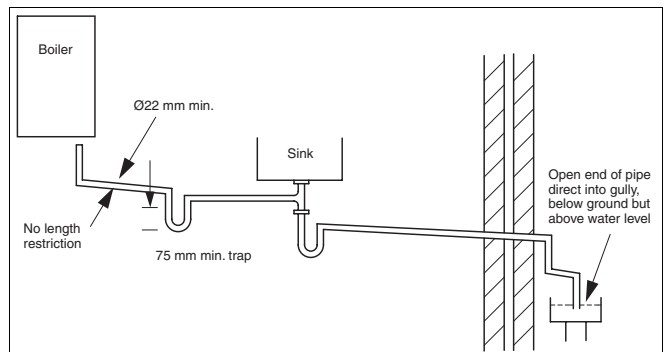
Fig. 6 Internal termination of condensate drainage pipe to internal stack

**External termination via internal branch (e.g. sink waste)**

The condensate drainage pipe should have a minimum outside diameter of 1" with no length restriction. The connection should preferably be made downstream of the sink waste trap. If the connection is only possible upstream, then the air break is needed between the two traps. This is normally provided by the sink waste pipe (see fig. 7 and 8).



**Fig. 7** External termination of condensate drainage pipe via internal discharge branch (e.g. sink waste) and condensate syphon



**Fig. 8** External termination of condensate drainage pipe via internal discharge branch (e.g. sink waste – proprietary fitting) and condensate syphon

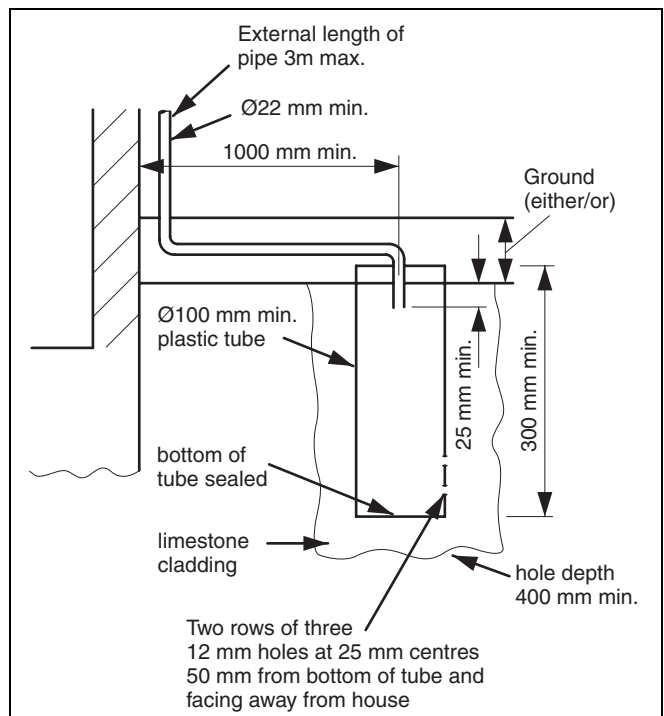
**Condensate absorption point**

The condensate drainage pipe should have a minimum outside diameter of 1" and the external pipe length should not be more than 3 m. The condensate absorption point should be sited in a convenient position as close as possible to the boiler but not in the vicinity of other services. See fig. 9 for information.



**NOTE**

When discharging condensate to an outside drain caution must be taken to ensure blockage cannot occur during freezing conditions. If this is likely to occur, the use of a syphon trap is recommended.



**Fig. 9** External termination of condensate drainage pipe to absorption point

## 1.7 Flue Installation

### 1.7.1 Siting the flue terminal

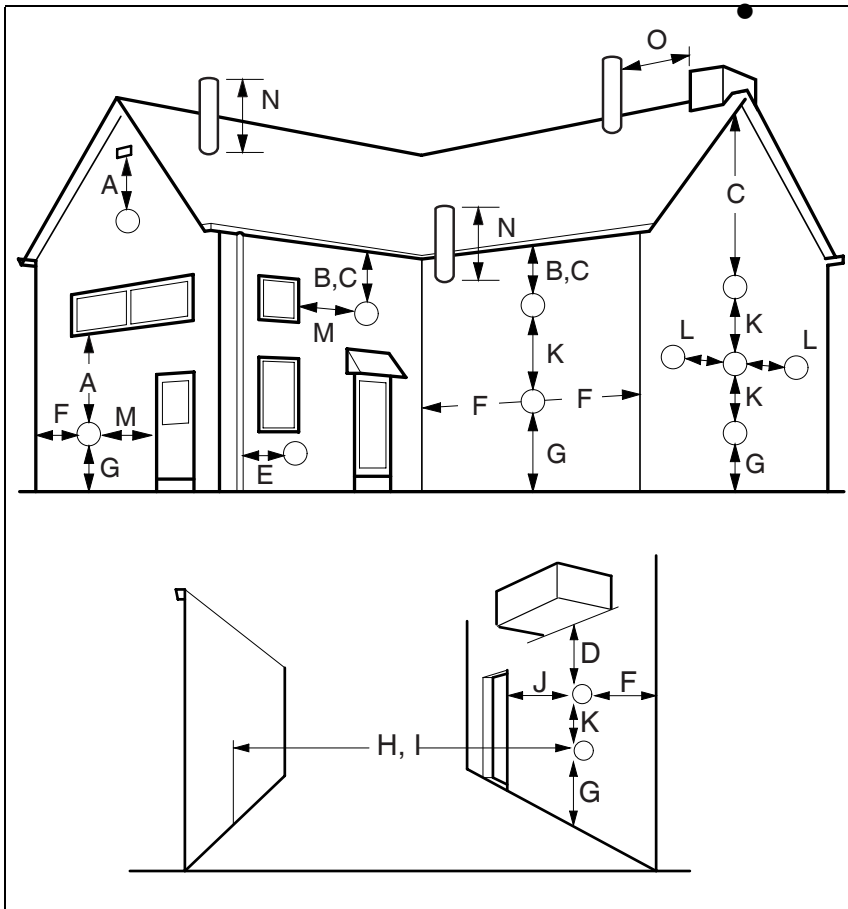


Fig. 10 Flue terminal position

Terminal Position	Minimum Spacing
A. Directly below, above or alongside an opening window, air vent or other ventilation opening	300 mm
B. Below guttering, drain pipes or soil pipes	200 mm
C. Below eaves	200 mm
D. Below balconies or a car port roof <b>Not recommended!</b>	200 mm
E. From vertical drain pipes or soil pipes	150 mm
F. From internal or external corners	300 mm
G. Above adjacent ground, roof or balcony level	300 mm
H. From a surface facing the terminal	600 mm
I. From a terminal facing a terminal	1200 mm
J. From an opening in a car port (e.g. door or window) into dwelling. <b>Not recommended!</b>	1200 mm
K. Vertically from a terminal on the same wall	1500 mm
L. Horizontally from a terminal on the wall	300 mm
M. Adjacent to opening	300 mm
N. Above intersection with roof	300 mm
O. From a vertical structure on the roof	500 mm

table 1 Balanced flue terminal position

The flue must be installed in accordance with the recommendations of **BS. 5440-1:2000**.

Plumbing will occur at the terminal so terminal positions where this could cause a nuisance should be avoided.

The air supply and the flue gas exhaust must meet the applicable general regulations. Please consult the instructions provided with the flue terminal kits prior to installation.

The boiler **MUST** be installed so that the terminal is exposed to external air.

It is important that the position of the terminal allows the free passage of air at all times.

Minimum acceptable spacing from the terminal to obstructions and ventilation openings are specified in table 1.

If the lowest part of the terminal is less than 2 metres above the level of the ground, balcony, flat roof or place to which any person has access, the terminal must be protected by a guard.

Ensure that the guard is fitted centrally.

The flue assembly shall be so placed or shielded as to prevent ignition or damage to any part of the building.

The air inlet/products outlet duct and the terminal of the boiler MUST NOT be closer than 25 mm to combustible material. Detailed recommendations on the protection of combustible material are given in **BS. 5440- 1:2000**.



**NOTE**

It is absolutely essential to ensure, in practice, that products of combustion discharging from the terminal cannot re-enter the building or any other adjacent building through ventilators, windows, doors, other sources of natural air infiltration, or forced ventilation/air-conditioning.

If this could occur the appliance MUST be turned off (with the owners permission), and labelled as unsafe until corrective action can be taken.



**DANGER!**

Only use Buderus flue gas systems. As other flue gas systems are not tested with this appliance.

**1.7.2 Air supply and flue gas exhaust in a closed installation**

A ventilation cover is integrated into the 600 Series condensing gas system boilers. This cover houses a number of components, such as the burner and the heat exchanger. Since this ventilation cover is part of the air supply system, it is vital that it is always installed correctly.

To ensure optimal operation, the 600 Series appliances must be connected to a Buderus horizontal or vertical flue terminal. These terminals have been developed specifically for Buderus condensing gas boilers and have been comprehensively tested for trouble free operation when correctly installed.

Standard horizontal flue pack (fig. 11):

- **item 1:** Flue turret 60/100;
- **item 2:** Horizontal flue terminal 60/100;
- **item 3:** Flue finishing kit.

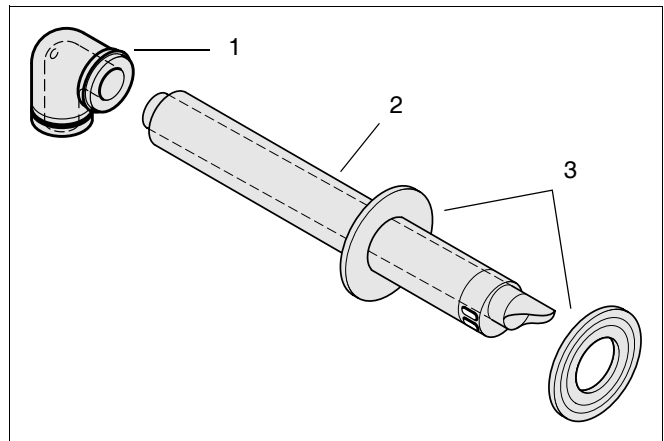


Fig. 11 Standard horizontal flue pack

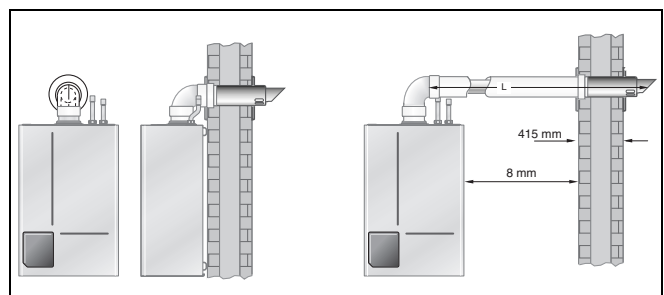


Fig. 12 Side flue and rear flue installation

Standard vertical flue pack (fig. 13):

- **item 1:** Vertical flue terminal 60/100.
- **item 2:** Weather collar
- **item 3:** Flue support bracket
- **item 4:** Vertical flue adaptor

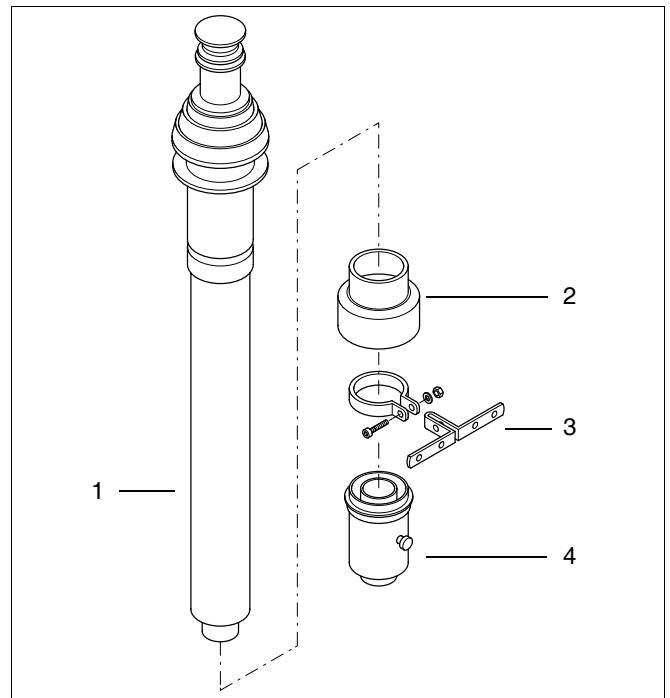


Fig. 13 Standard vertical flue pack

### 1.7.3 Maximum Flue length (L)

The maximum pipe length (L) of the air supply and flue gas exhaust pipes for the 600 Series condensing gas system boilers is determined by the total pressure loss of all components in the flue gas exhaust / air supply system.

Maximum length of horizontal or vertical extensions for 60/100 flue system is  $L = 7.5$  m. Maximum length of horizontal or vertical extensions for 80/125 flue system (special adapter required)  $L = 20$  m (see fig. 14 and fig. 15).

Take the flue pipe clearances into account when planning the layout of the place of installation (see subsection 1.7.1: "Siting the flue terminal" on page 21).

Maximum wall thickness without extensions is 415 mm. Maintain a minimum side clearance of 8 mm (see fig. 12).

Flow pressure available for use [Pa]	
Buderus 600 - 11R/19R/24R	75

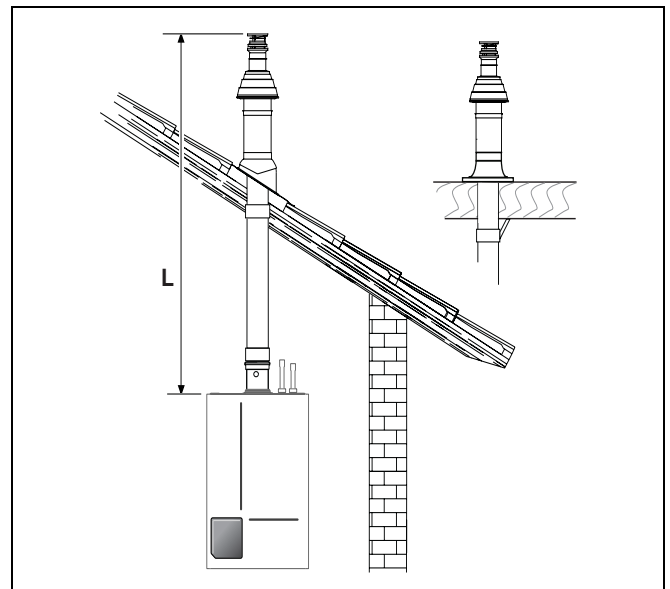






Fig. 14 Vertical flue length

**1.7.4 Additional flue parts**

The additional flue parts listed can be ordered from your supplier.

**Flue size 60/100:**

60/100 flue system	For every bend or extension the max. flue length (L) has to be reduced by:
 500 mm extension	0.5 m
 1000 mm extension	1.0 m
 90° bend	1.4 m
 45° bend	0.7 m

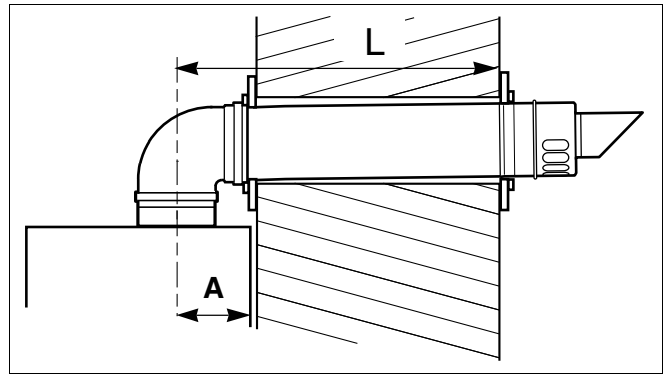






Fig. 15 Horizontal flue length



**NOTE**

The total reduction length must never exceed the maximum flue length.

**Flue size 80/125 (optional):**

80/125 flue system	For every bend or extension the max. flue length (L) has to be reduced by:
 500 mm extension	0.5
 1000 mm extension	1.0
 90° bend	1.6
 45° bend	0.9



**NOTE**

Vertical adaptor (60/100 --> 80/125) is required for 80/125 flue gas systems, because the flue outlet of the boiler is 60/100.

**Weathering slates for 60/100 and 80/125**

Flat roof, pitched roof.



### 1.7.5 Standard 100 mm flue systems

The standard concentric flue system provides for a max. horizontal straight length of upto 7.5 m for 60/100 flue connection (see paragraph 1.7.3). Full instructions for fitting this flue are in subsection 1.7.2: "Air supply and flue gas exhaust in a closed installation" on page 22.



#### IMPORTANT

Any horizontal flue system fitted to a condensing boiler must be inclined towards the appliance at an angle of 30 mm per metre length to prevent condensate dripping from the flue terminal.

This means that the clearance above the appliance must be increased to match the duct length. See figure on page 15.

### 1.7.6 Connecting the vertical flue adaptor

- Fit the vertical flue adaptor (fig. 16) onto the appliance flue connector.

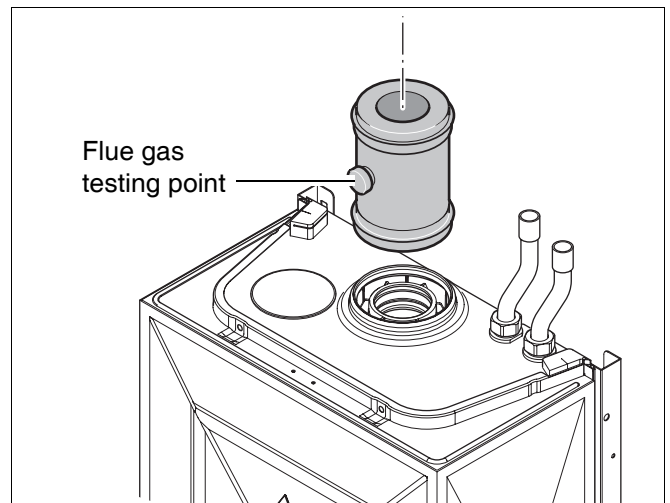


Fig. 16 Vertical flue adaptor

### 1.7.7 Connecting the horizontal flue turret

- Fit the horizontal flue turret (fig. 17) onto the appliance flue connector.

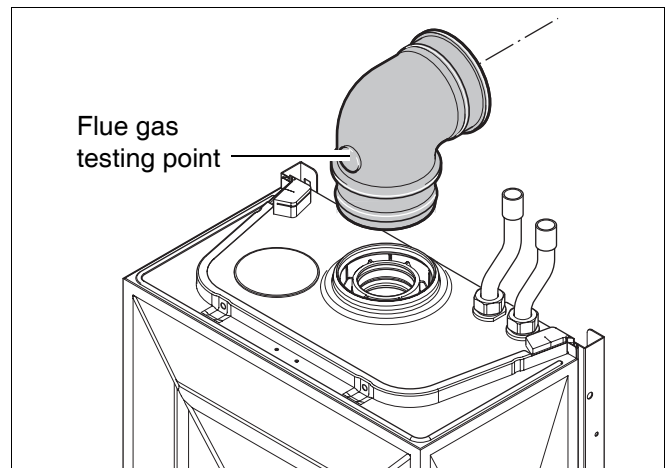


Fig. 17 Horizontal flue turret with flue gas testing point

**1.7.8 Installation of the horizontal flue**

The standard flue is suitable for lengths upto 660 mm (see fig. 18). For longer flue runs upto 7.5 m, extension air/flue ducts are available.



**NOTE**

Use the wall-mounting template to help you mark the position of the side flue opening

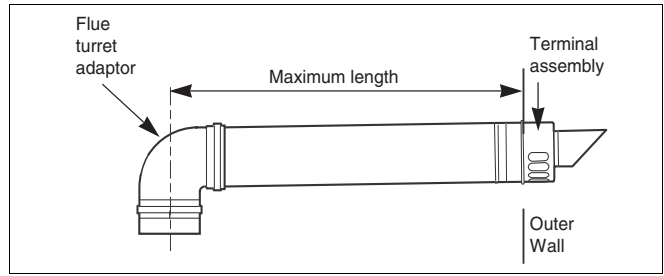


Fig. 18 Installation with horizontal flue gas turret

**1.7.9 Flue duct preparation and assembly**

- Measure the flue length L. Refer to figures 19 and 20.



**NOTE**

The flue must be inclined from the boiler.

- Mark off the lengths shown onto the ducts and cut the length. The cuts must be square and free from burrs. Terminal assembly outer (air) duct - L-70 mm, inner (flue) duct - L-50 mm. The measurement is made from the ridge at the terminal indicating the outer face of the wall. Refer to figure 21. Extension air duct - L-70 mm, flue duct - L-50 mm. The measurement is from the formed end.
- Assemble flue system completely. Push the ducts fully together. The slope of the terminal outlet must be face downwards (see fig. 21, item 1). The assembly will be made easier if a solvent free grease is lightly applied to the male end of the ducts.

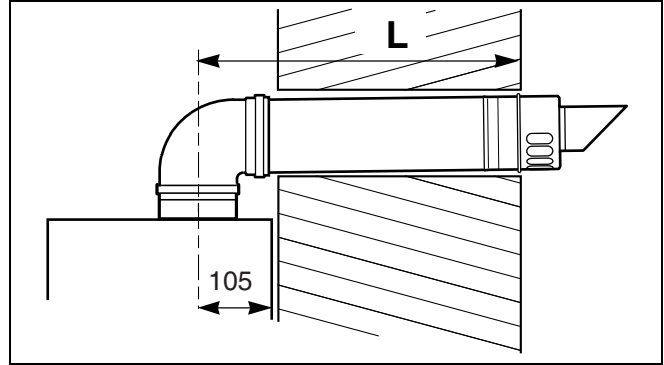


Fig. 19 Flue length - rear



**NOTE**

An inner flue finishing kit is provided which should be fitted to the ducts before assembly.

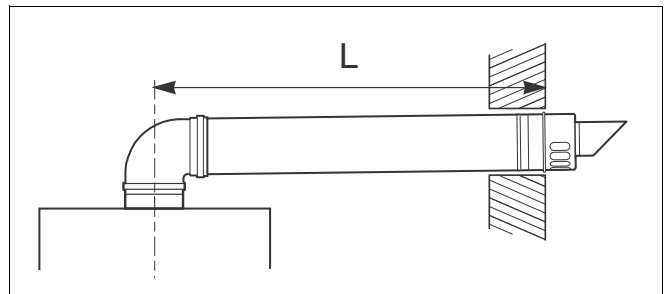


Fig. 20 Flue length - side

- Push the assembly through the wall and slide the turret onto the flue connector. Refer to figure 17. Ensure that the turret is fully entered into the socket on the boiler.
- From the outside fix the flue finishing kit to the terminal and, after ensuring the duct is properly inclined towards the boiler, fix the finishing kit to the wall. If the terminal is within 2 m of the ground where there is access then an approved terminal guard must be fitted. The guard must give a clearance of at least 50 mm around the terminal and be fixed with corrosion resistant screws.

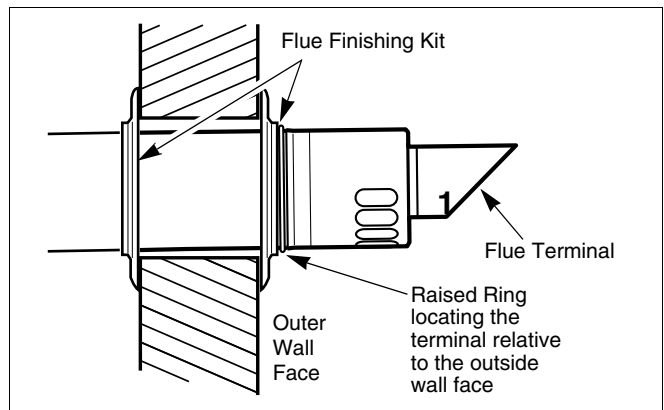


Fig. 21 Flue terminal position

## 1.8 Electrical connections

### 1.8.1 Mains connection



#### NOTE

All Buderus boilers require a permanent live.

A mains supply of 230 V - 50Hz is required.

External controls are suitable for volt free or 230 V installation.

Wiring to the boiler **MUST** be in accordance with the current I.E.E. (**BS.7671**) Wiring Regulations and any local regulations.

Wiring should be a 3 core PVC insulated cable, not less than 0.75 mm<sup>2</sup> (24 x 0.2 mm), and to table 16 of **BS.6500**.

Connection must be made in a way that allows complete isolation of the electrical supply such as a double pole switch having 3 mm contact separation in both poles, or by a three pin connector, serving only the boiler and system controls. This boiler is equipped with a double pole switch see fig. 22, item 1.

The means of isolation must be accessible to the user after installation.

The electrical connection to the mains supply should be readily accessible and adjacent to the boiler.

If the supply cord is damaged, it must be replaced by a registered Corgi installer to avoid a hazard and must be an original spare part.

The electrical supply for both the boiler and the system must be taken from the same fused spur outlet.

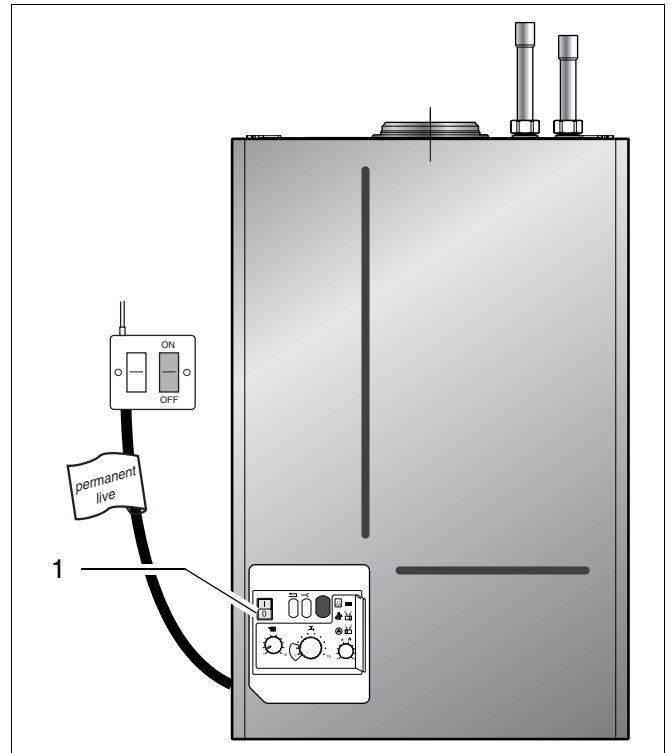
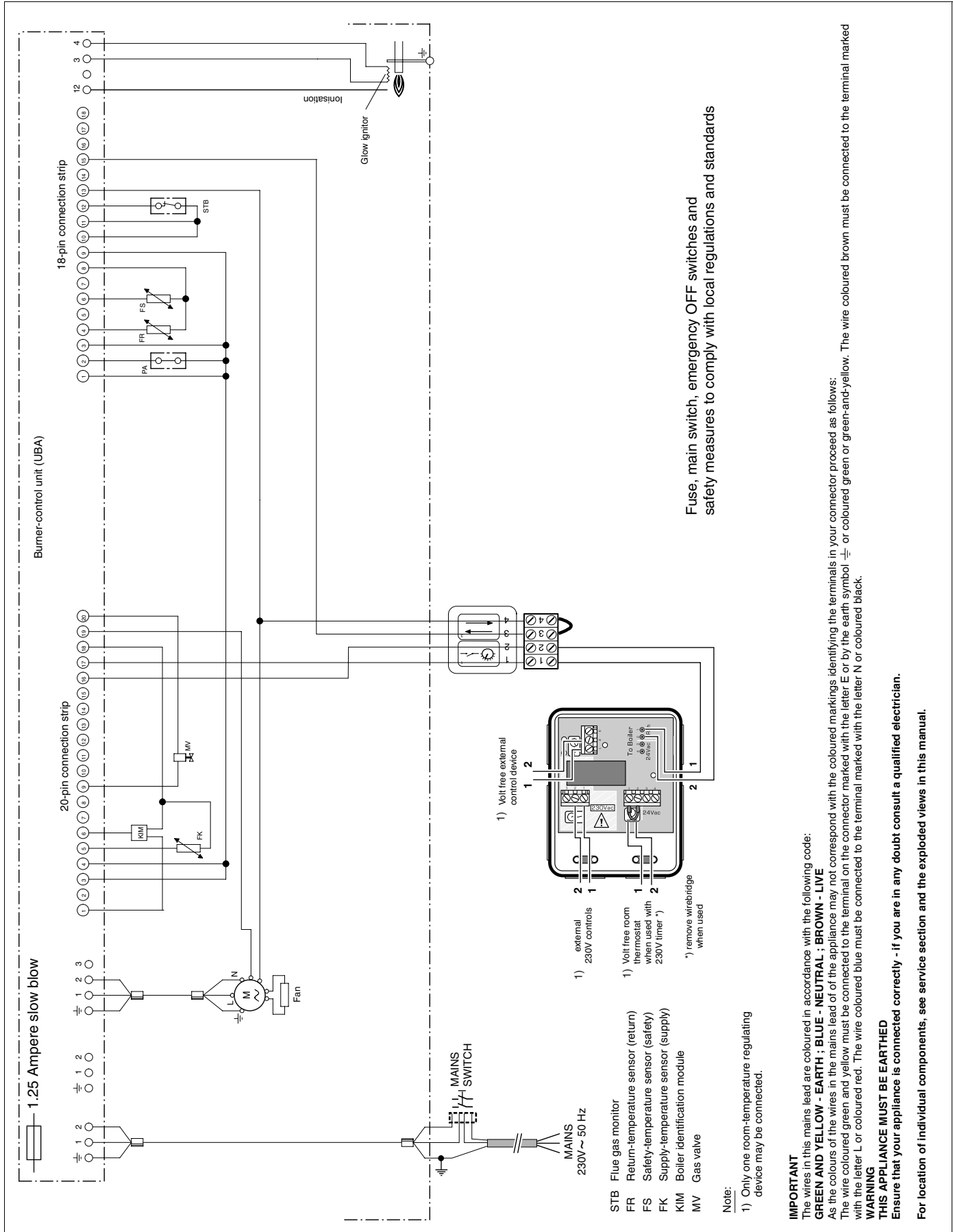


Fig. 22 UBA

1.8.2 Wiring Diagram



Fuse, main switch, emergency OFF switches and safety measures to comply with local regulations and standards

## 1.9 External control connections

The wall-mounted condensing gas boiler can be fitted with the following control devices:

- A room-temperature control device at 230V connected to the RTH converter (see fig. 23, item 2)
- ON/OFF temperature controller, volt free (see fig. 23, item 3).

### 1.9.1 External 230V controls (see also Y-plan and S-plan on page 8 and 9)"



#### WARNING!

**This appliance must be earthed.**

#### WARNING!

- Connect the black pre-wired lead to a permanent live supply (from the same fused isolator as all other controls on the heating system), L N E (fig. 22).
- Remove the cover of the RTH converter (fig. 23, item 1).
- Feed the 230V switch live and neutral (from external controls) through the cable gland.
- Identify the 230V terminal block by the shaded area and 230V label.
- Connect the switch live to terminal "1" and a neutral to terminal "2" (fig. 23, item 2).
- Replace covers.



#### NOTE

Terminal 3 (fig. 23, item 2) is not used.

### 1.9.2 Volt free external control device connection



#### NOTE

If using the boiler for central heating only. Volt free controls may also be used.

- Connect the black pre-wired lead to a permanent live supply (from the same fused isolator as all other controls on the heating system), L N E (fig. 22).
- Remove the cover of the RTH converter (fig. 23, item 1).
- Lead the control device wire through the cable lead.
- Fix the wire to terminal "1" and "2" of the volt free connection (fig. 23, item 3).

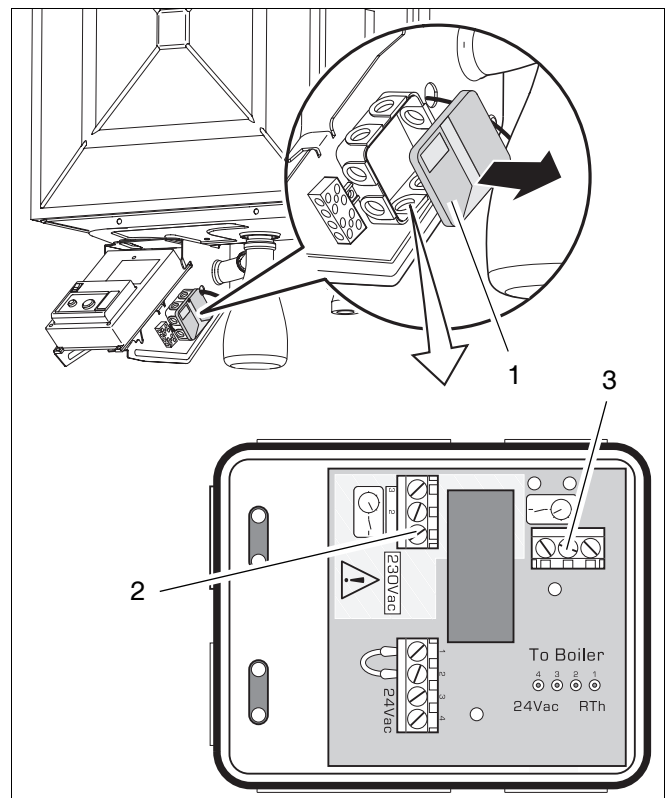


Fig. 23 Connecting the control device

## 2 Commissioning

When a boiler starts up there are a couple of things that happen. Below is a short process description:

### When there is a heat demand:

The fan starts up and the glow ignitor turns on.

When there is a DHW request then the three-way-valve switches from CH operation to DHW operation.

Once all the requirements are met (glow ignitor is hot enough, fan is operating at the correct speed and the pump is on) then the gas valve will open.

A flame will establish and the glow ignitor extinguishes. The boiler will start at partial load and will go to the requested load after a few seconds.

If the boiler detects a no-flow situation, the boiler will shut down for a short while and then try to start up again.

If no flame develops then the gas valve closes and the fan continues to run to post purge. The boiler will try to start up three times. If there still is no flame developing after three times, then the boiler will lock-out.

### When the heat demand stops:

The gas valve closes.

The fan will keep going for a short while to post purge the appliance.

If there has been a DHW request then the three-way-valve will switch back to the central heating setting.

Follow the steps described in this chapter to properly commission the boiler and fill out the commissioning log book.



#### NOTE

If a fault occurs, then refer to the servicing section in this manual or contact Buderus.

### 2.1 Requirements

- Thoroughly flush out the whole of the system with cold water, without the pump in position.

#### For sealed system only:

- Fill and vent the system until the pressure gauge registers 1.5 bar. Test for leaks.
- Check the operation of the safety valve by manually raising the water pressure until the valve lifts. This should occur within  $\pm 0.3$  bar of the preset lift pressure.
- Release water from the system until the initial system design pressure is reached.

- Light the boiler and heat the system to the maximum working temperature. Test for leaks.
- Turn off the boiler and drain the system while still hot.
- Refill and vent the system.
- Adjust the initial pressure to the required value.

## 2.2 Preparing the boiler for operation



**CAUTION!**

### CAUTION

DO NOT operate the condensing gas boiler if large amounts of dust are present, e.g. due to building work in and around the place of installation.

### 2.2.1 Checking for leaks

- Disconnect the system from the power supply.
- Check all sections of gas pipework and connections for leaks before starting up system for the first time. If a leak is detected during tightness testing, use an approved leak detector to check all connections for possible escapes. The product must be certified as a gas leak-testing agent. DO NOT allow the product to come into contact with electrical wiring.

### 2.2.2 Purging air from the gas supply system

- Loosen the 4 crosshead screws on the ventilation cover (fig. 24).
- Remove the ventilation cover.
- Close the gas service valve.
- Unscrew the gas inlet test point by two turns (fig. 25).
- Open gas service valve.
- Purge system and appliance as per relevant procedures, **IGE/UP/1b**. Ensuring all safety requirements are met.
- Close the gas service valve.
- Shut the gas inlet test point once more.
- Open cover for 2nd operating level (fig. 26, item 1).
- Make sure that system pump is running.
- Start boiler up and move chimney sweep switch (fig. 26, item 3) to position "1".

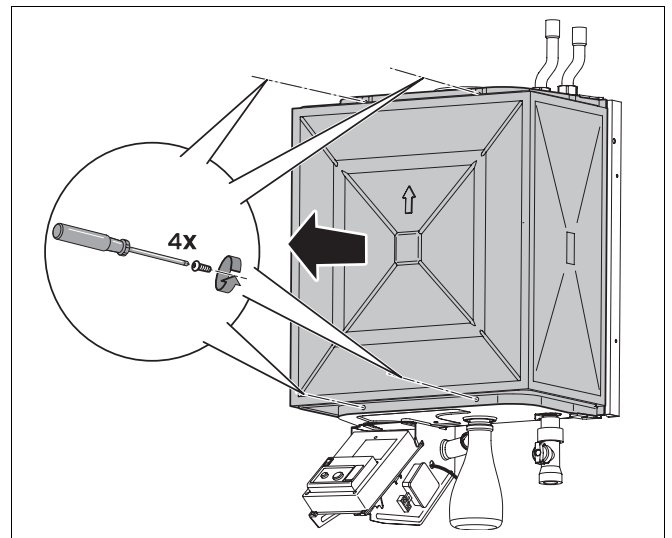


Fig. 24 Unscrew ventilation cover

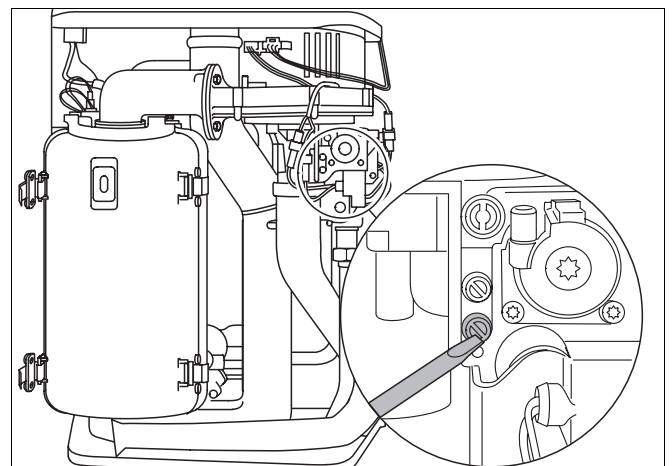


Fig. 25 Purging air from the gas supply system

The display shows (fig. 26, item 2) “ - .” to indicate that the gas supply system is purged of air. Return chimney sweep switch to position “0”.

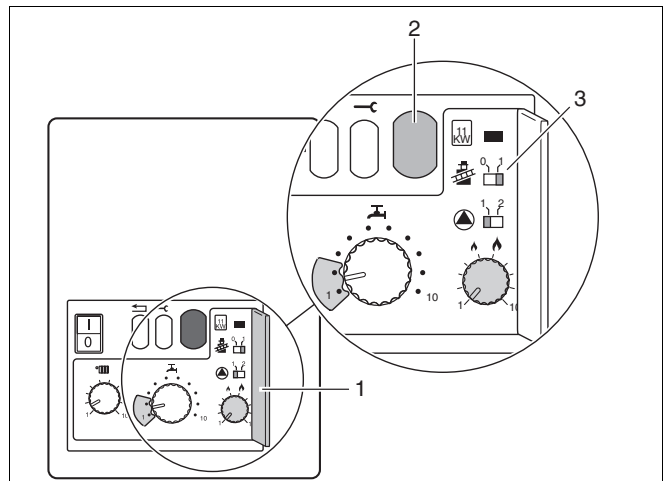


Fig. 26 Display and chimney-sweep switch

**2.2.3 UBA adjustments**

The boiler is equipped with a UBA. This is the internal control of the boiler. The UBA is located behind the door. The UBA allows you to operate the boiler and to make adjustments in its settings.

**UBA overview:**

**1. Power switch (see fig. 27, item 1)**

Use this switch to turn the boiler on or off.

**2. Reset button (see fig. 27, item 2)**

When a blinking code is in the display, it is possible to try and restart the boiler by pressing this button.



**NOTE**

It is not possible to reset the boiler when there is no fault code blinking in the display.

**3. Service Button (see fig. 27, item 3)**

When the service button is pressed, the second digit of a code can be seen.

**4. Display (see fig. 27, item 4)**

The display visualizes settings, adjustments and fault codes.

**5. Heat-capacity Jumper (see fig. 27, item 5)**

Do not use.

**6. Chimney sweep switch (see fig. 27, item 6)**

The chimney sweep switch when set to '1' places the boiler in Service mode. This means that the boiler operates at full load without there being an actual heat request. This setting is used for servicing purposes only.

**7. Pump over-run time switch (see fig. 27, item 7)**

The Pump over-run time switch is not applicable to this boiler.

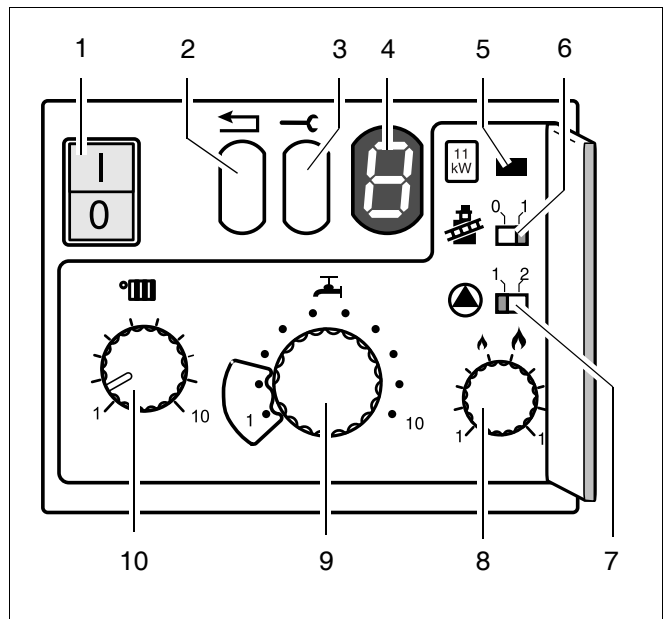


Fig. 27 UBA

**item 1:** Power switch

**item 2:** Reset button

**item 3:** Service button

**item 4:** Display

**item 5:** Heat-capacity jumper (do not remove)

**item 6:** Chimney sweep switch

**item 7:** Pump over-run time switch (not applicable for this boiler)

**item 8:** Heating capacity controller

**item 9:** DHW temperature controller / Service capacity controller (used in service mode only)

**item 10:** Flow temperature controller



### 8. Heating capacity controller (see fig. 27, item 8)

This controller is to set the maximum load. The highest setting corresponds to a maximum load of 100 % and the lowest setting corresponds to a maximum load of 30 %.

### 9. DHW temperature controller / Service capacity controller (see fig. 27, item 9)

The function of DHW temperature controller is not applicable to this boiler. The function that remains is that of Service capacity controller. This allows you to adjust the boiler's capacity while in Service mode.

Set boiler to Service mode by setting the Chimney sweep switch to '1', then press the Service button until a 'Y' can be seen in the display. Now you can adjust the service heating capacity of the boiler. The setting is only valid during Service Mode.

### 10. Flow temperature controller (see fig. 27, item 10)

This controller with the radiator symbol allows the installer to set the maximum flow temperature (see table 4 on page 36).

#### 2.2.4 Checking the gas type

It is very important that the gas type to which the boiler will be connected corresponds to the gas type the boiler is equipped with. If this is not the case, then the boiler must not be put into operation.

- Check the gas type with your gas supplier and compare this to the boiler's gas type as registered on the identification tag (see table 3).

It is possible to change the boiler to another gas type (see table 2). This accessory can be ordered from your supplier.



**CAUTION!**

#### CAUTION

The burner must only be put into operation with the correct nozzles (table 3).

Type of gas	Factory settings of gas burners
Natural gas H	When delivered ready for operation and set to Wobbe index 14.1 kWh/m <sup>3</sup> (referred to 15 °C, 1,013 mbar), applicable for Wobbe index range 11.3 to 15.2 kWh/m <sup>3</sup> . Inscription on gas-type indicating label: Category setting: 2H G 20_20 mbar
LPG	After adaptation by a CORGI registered installer, the unit can be run on propane. Inscription on gas-type indicating label: Category setting: 3P G 31_37 mbar

table 2 Gas-supply types

### 2.2.5 Measuring the gas-supply pressure (working pressure)

There are two ways to measure the gas-supply pressure:

- measuring the standing gas-supply pressure (boiler not in operation);
- measuring the working gas-supply pressure (boiler operating at full power).



**NOTE**

The difference between the standing and working pressure may never be greater than 5 mbar. If the difference between the two is greater than 5 mbar then the pressure loss in the gas pipe is too great.

#### Measuring the standing gas-supply pressure

- Take the boiler out of service by pressing the power switch (fig. 28, item 1) to "0".
- Close the gas shut off valve (fig. 29, item 1).
- Set the pressure gauge to "0".
- Attach a tube from the pressure gauge to the gas test nipple (the lower one, fig. 30).
- Slowly open the gas shut off valve (fig. 29, item 2).
- Measure the standing gas-supply pressure.

#### Measuring the working pressure

- Take the boiler out of service by pressing the power switch (fig. 28, item 1) to "0".
- Close the gas shut off valve (fig. 29, item 1).
- Set the pressure gauge to "0".
- Attach a tube from the pressure gauge to the gas test nipple (the lower one, fig. 30).
- Slowly open the gas shut off valve (fig. 29, item 2).
- Open at least two radiators.
- Set the power switch (fig. 28, item 1) to "1".
- Create a heat demand setting the chimney sweep switch to "1" (fig. 28, item 6). The burner should ignite after about 30 seconds.
- Measure the working gas-supply pressure.
- The working gas-supply pressure should be between:
  - a minimum of 17 mbar and a maximum of 25 mbar (nominal connection pressure of 20 mbar) for Natural gas.
  - a minimum of 30 mbar and a maximum 50 mbar (nominal connection pressure 37 mbar for LPG).
- Pull off the tube from the gas testing nipple.
- Tighten the screw of the gas testing nipple.

Type of gas supply	Gas nozzles Ø [mm]		Venturi tubes
	11R	19R/24R	
Natural gas H (G20)	5.55	6.5	Standard
LPG	3.40	4.15	Standard

table 3 Gas nozzle diameter

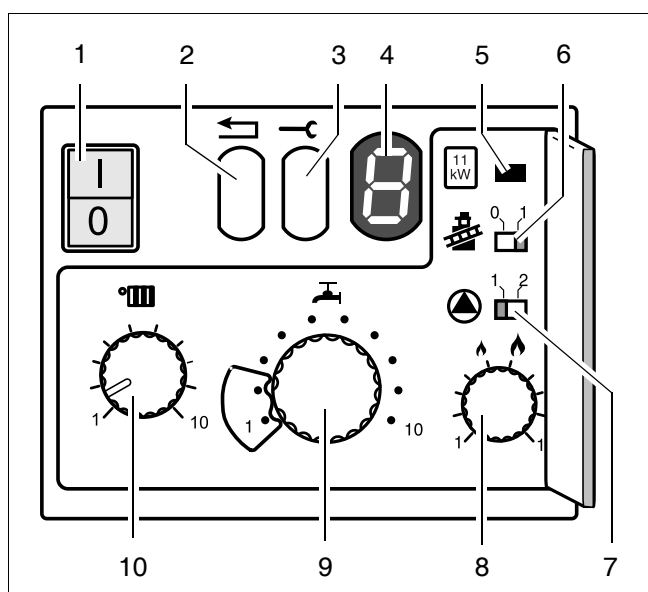


Fig. 28 UBA

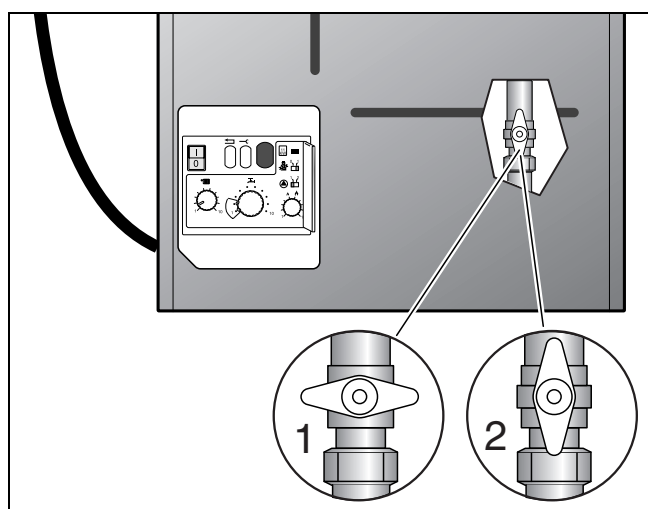


Fig. 29 Gas valve

item 1: Gas valve closed

item 2: Gas valve open

**ATTENTION**

If the required connection pressure is incorrect contact your gas supplier.

**WARNING!**

- Ensure that all disturbed joints and connections are checked for gas tightness on completion of tasks.

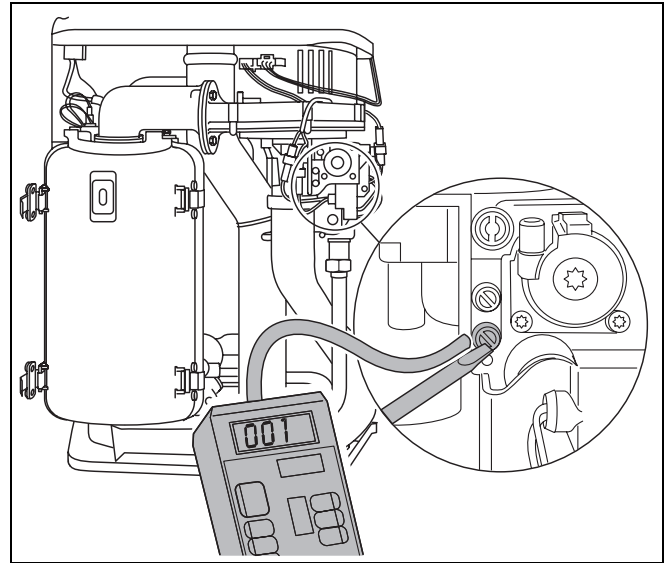


Fig. 30 Measuring the gas-supply pressure

### 2.2.6 Adjusting the flow temperature

**NOTE**

Observe stickers attached to Venturi tubes.

- Adjust the knob (fig. 31, item 2) to the desired flow temperature (table 4) for your particular installation.

**NOTE**

Factory setting of the controller is "10" (around 83 °C).

If the flow temperature is set too low, there is the risk that an external hot water cylinder cannot achieve a comfortable enough temperature.

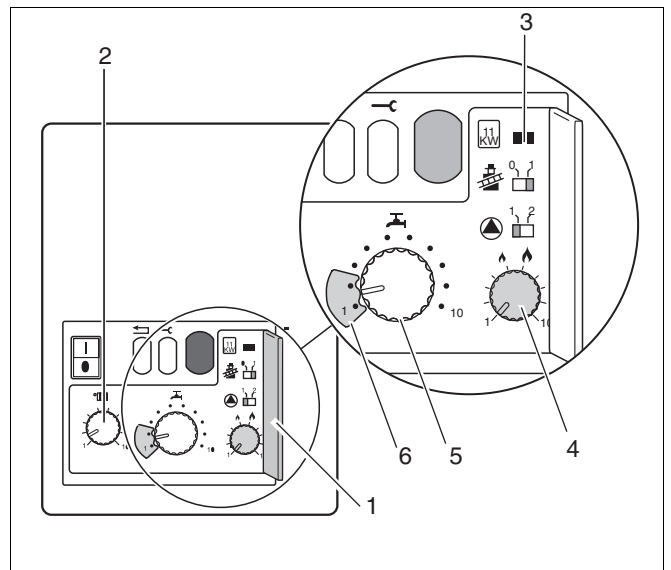


Fig. 31 Control box

Key to fig. 31:

- item 1:** Cover for second operating level
- item 2:** Flow temperature controller
- item 3:** Heat-capacity jumper (do not remove)
- item 4:** Heating capacity controller
- item 5:** only used when boiler is in service mode
- item 6:** only used when boiler is in service mode

Controller setting	Flow temperature [°C]
1	40
2	44
3	48
4	53
5	58
6	62
7	67
8	71
9	76
10	80

table 4 Flow temperature

### 2.2.7 Setting the heating capacity

- Open the cover to the 2nd operating level (fig. 31, item 1).
- Set the heating capacity (table 5), according to the amount of heat output required for the system (fig. 31, item 4).



#### NOTE

The controller is factory-adjusted to setting "6".

Controller setting	Heating capacity [kW] (±5 %)		
	11 R	19 R	24 R
1	4.9	9.7	9.7
2	5.6	10.7	11.3
3	6.3	11.8	12.9
4	6.9	12.8	14.5
5	7.6	13.8	16.0
6	8.3	14.9	17.6
7	9.0	15.9	19.2
8	9.6	16.9	20.8
9	10.3	18.0	22.4
10	11.0	19.0	24.0

table 5 Heating capacity

### 2.2.8 Check the gas/air ratio and adjust as required

- Turn power switch (fig. 32, item 2) and chimney sweep switch (fig. 32, item 4) to "0".
- Unscrew the sealing closure of the burner-pressure testing nipple by one turn (fig. 33).
- Connect the positive port of the pressure gauge with a hose to the burner pressure measuring nipple (fig. 33).
- Zero the pressure gauge.
- Make sure that the system pump is running.
- Turn power switch to "I" and chimney sweep switch to "1".
- If the burner has fired after approx. 30 seconds, keep the service button (fig. 32, item 3) pressed until "Y" appears on the display.
- Turn the hot-water temperature controller (fig. 32, item 1) to "1".
- Read the differential pressure. The differential pressure ( $p_{\text{GAS}} - p_{\text{AIR}}$ ) should total -5 Pa to 5 Pa (-0.05 mbar – 0.05 mbar) (display on measuring gauge: -10 Pa to 0 Pa).
- If the gas/air ratio does not conform to specifications, re-adjust at the setscrew (fig. 33, item 1).
- Turn power switch and chimney sweep switch to "0".
- Remove the measuring equipment and retighten the screw in the burner-pressure measuring nipple.
- Re-adjust the hot water temperature controller to its original setting.
- Turn the power switch to "I".

### 2.2.9 Record readings

- Unscrew the corresponding sealing closure (fig. 34) on the connection adapter for the combustion-air/flue-gas system and replace it once the measuring operation in question has been carried out.

#### Carbon monoxide content



**CAUTION!**

#### CAUTION

The carbon monoxide values under vacuum must be smaller than 400 ppm or 0.04 Vol%. Values around or exceeding 400 ppm indicate a faulty burner adjustment, a dirty gas burner or heat exchanger, or a defective burner. Ensure that the cause of the fault is remedied immediately.

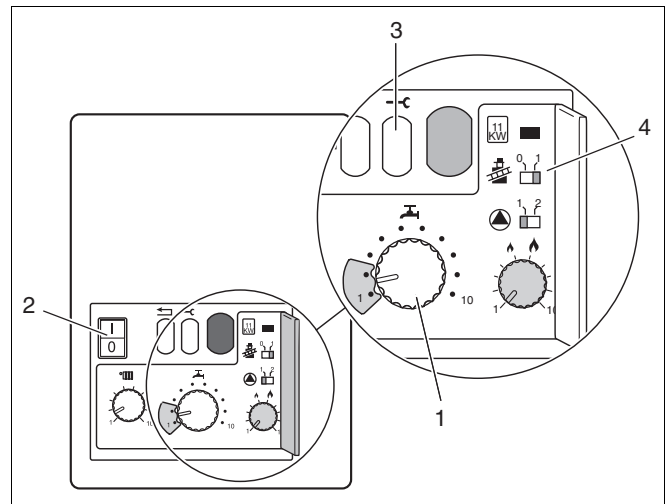


Fig. 32 Power switch, service button and chimney sweep switch

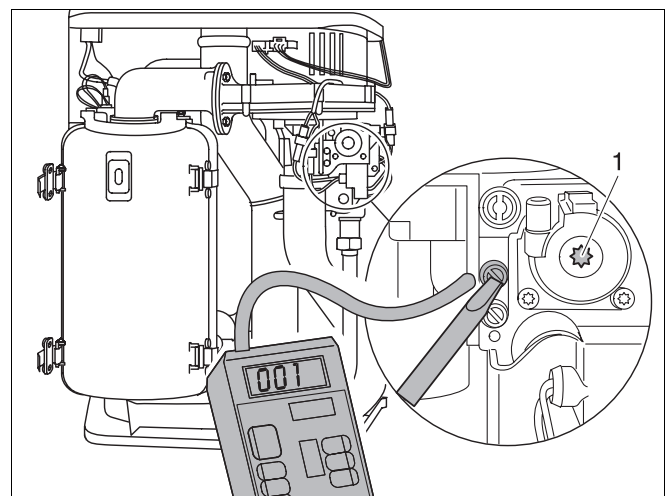


Fig. 33 Check the gas/air ratio

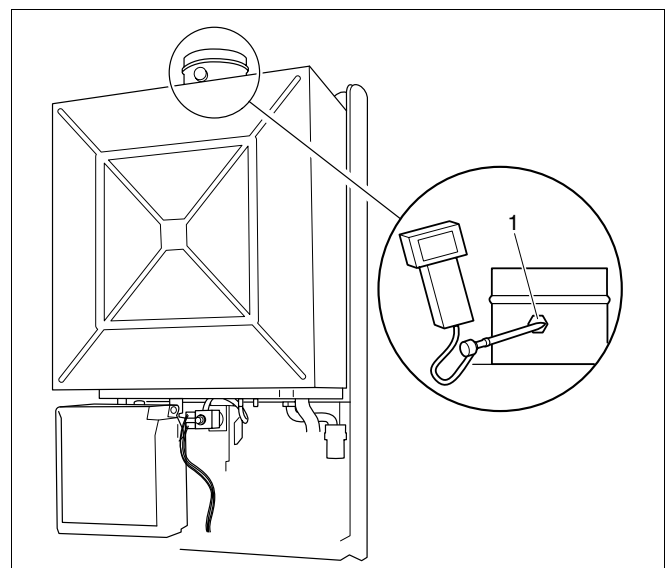


Fig. 34 Measuring points on exhaust conduit

Key to fig. 34:

**item 1:** Exhaust-fume temperature, CO<sub>2</sub>, CO, NO<sub>x</sub>

### 2.2.10 Function testing



#### NOTE

During initial start-up and annual servicing, make sure that all control, regulating and safety devices are in full working order and, if applicable, check for correct adjustment.

#### Measuring the ionisation current (fig. 35)

- Disconnect the system from the power supply.
- Loosen the plug-and-socket connector of the ionisation electrode and connect the multimeter in series. On the measuring device, select the  $\mu$ -direct current range. The measuring device must have a resolution of at least 1  $\mu$ A.
- Make sure that the system pump is running.
- Reconnect the system to the power supply and turn the chimney-sweep switch to "1".
- Measuring the ionisation current. The ionisation current being checked must measure >2  $\mu$ A direct current.
- Enter the reading on the report form.
- Disconnect the system from the power supply.
- Remove multimeter and restore the plug-and-socket connection to its original state.
- Turn the chimney sweep switch to position "0".
- Reconnect the system to the power supply. When the display shows "7" and the service button is pressed, the display turns to "c". Press the Reset button. The display shows "r".
- Fit the casing (see fig. 36, item 1).
- Tighten the fixing screw (see fig. 36, item 2).

#### 2.2.11 Balancing

1. Set the programmer to ON for both CH and HW. Turn the cylinder thermostat down. Close the manual or thermostatic valves on all radiators leaving the twin lockshield valves (on the radiators referred to above) in the open position. Turn up the room thermostat and adjust these lockshield valves to give boiler flow and return temperatures not more than 20 °C apart. These valves should now be left as set.
2. Open all manual or thermostatic radiator valves and adjust the lockshield valves on remaining radiators to give around 11 °C temperature drop at each radiator.
3. Turn up the cylinder thermostat and adjust the cylinder balancing valve so that the cylinder achieves a maximum flow consistent with adequate flow to the radiators. Check that with only the domestic hot water loop in circuit a differential temperature of 20 °C across the boiler is not exceeded.

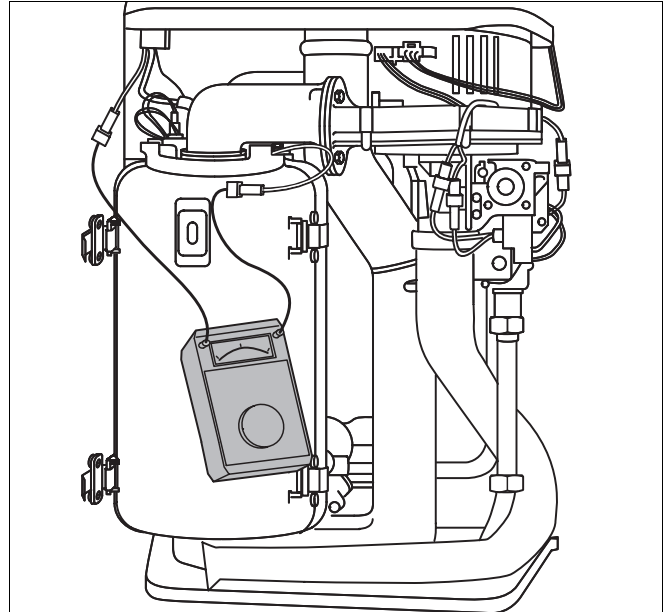


Fig. 35 Measuring the ionisation current

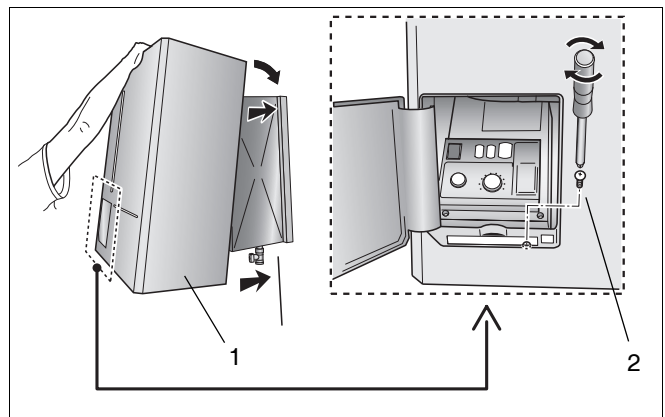


Fig. 36 Fitting the case

4. Adjust room and cylinder thermostats and programmer to NORMAL settings.

### 2.2.12 Handing over

After completing the installation and commissioning of the system the installer should hand over to the householder by the following actions:

- Hand the User Manual to the householder and explain his/her responsibilities under the relevant regulations.
- Explain and demonstrate the lighting and shut down procedures.
- The operation of the boiler and the use and adjustment of all system controls should be fully explained to the householder, to ensure the greatest possible fuel economy consistent with the household requirements of heating. Advise the user of the precautions necessary to prevent damage to the system and to the building in the event of the system remaining inoperative during frosty conditions.
- Explain the function and the use of the boiler heating controls.
- Explain the function of the boiler fault mode. Emphasise that if a fault is indicated, the boiler should be turned off and a registered local heating installer consulted.
- Explain and demonstrate the function of time and temperature controls, radiator valves etc., for the economic use of the system.

### Loss of system water pressure

- Explain that when there is a significant loss of pressure the user should contact a Corgi registered installer.



#### **WARNING!**

Do not fire the boiler if the pressure has reduced to zero from the original setting.

#### **WARNING!**

- After installation, commissioning and customer handover instructions please complete the **BENCHMARK** appliance log book and leave this with the customer.

## 3 Inspection

### 3.1 General directions

Do a visual and functional test of the installation.

### 3.2 Preparing the boiler for inspection

- Disconnect the boiler from the mains power supply.



**DANGER!**

#### **DANGER OF FATAL INJURY**

due to electric shock when appliance casing is removed.

- Before removing the appliance case: disconnect the heating unit at the emergency OFF switch or the corresponding circuit breaker of the house power supply.
  - Ensure that the heating system cannot be reconnected by accident.
- Remove the casing.



#### **NOTE**

If the gas supply pipes are to be disconnected from the burner, the housing **MUST ONLY** be removed by a competent service technician and checked for tightness on reassembly.

#### 3.2.1 Internal leak test

- Disconnect the boiler from the mains power supply.



#### **NOTE**

Do not allow the product to come into contact with the electrical wiring.

#### 3.2.2 Check the combustion chamber and heat exchanger for pollution

#### 3.2.3 Check the burner

#### 3.2.4 Check the functioning and safety of the flue gas exhaust

#### 3.2.5 Check the pre-pressure of the expansion vessel

#### 3.2.6 Check the hot water cylinder for leakage

#### 3.2.7 Check the programming of the room thermostat



## 4 Maintenance



### NOTE

The described cleaning of the burner and heat exchanger is only necessary when the boiler is heavily soiled. Otherwise it is sufficient to clean the burner and heat exchanger with a soft brush or compressed air without disassembling them.

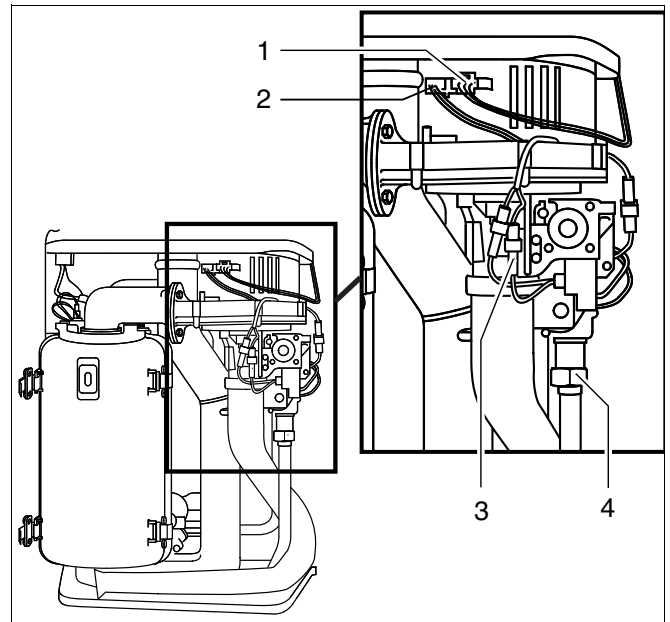


Fig. 37 Loosen the union nut and remove the cable

### 4.1 Clean the heat exchanger, burner and condensate trap

#### 4.1.1 Cleaning the heat exchanger without dismantling

- Disconnect the system from the power supply.
- Close the gas service valve.
- Loosen the fixing screws, remove casing and ventilation cover.
- Release plug-in connection of fan power lead (fig. 37, item 1), burner-control unit fan control lead (fig. 37, item 2) and gas-burner assembly (fig. 37, item 3).
- Loosen union nut on gas valve assembly (fig. 37, item 4).
- Push safety plate out of way.
- Turn air silencer tube and pull off from below.
- Swivel the gas-air unit forward (fig. 38, item 1).
- Pull the gas-air unit up and out of bayonet connector (fig. 38, item 2) and remove via front of unit.

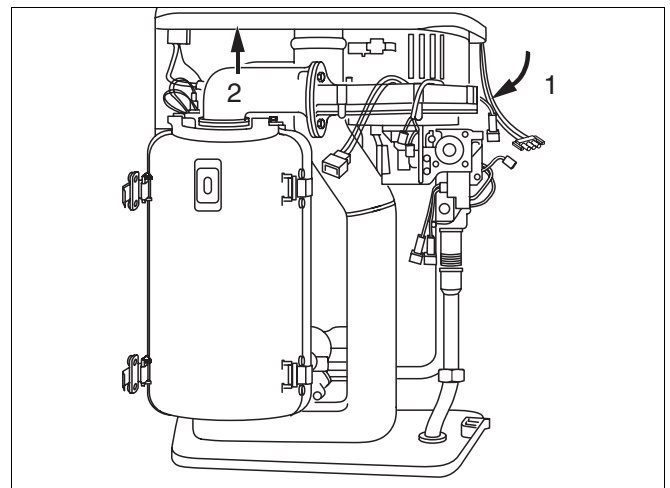


Fig. 38 Remove the gas-air unit

- Remove burner gasket (fig. 39, item 1).
- Remove rubber seal in heat exchanger by pushing upwards from inside (fig. 39, item 2).

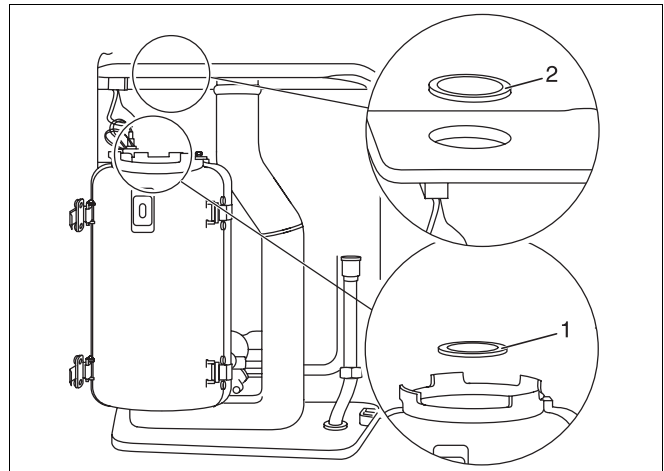


Fig. 39 Remove burner gasket and rubber seal

- Remove heat exchanger by pulling upwards through the opening (fig. 40).



#### NOTE

Maintain the specified clearance of approx. 25 cm between the ceiling and the ventilation cover.

- Remove the front of the heat exchanger. This is done by releasing the four snap catches at the sides.

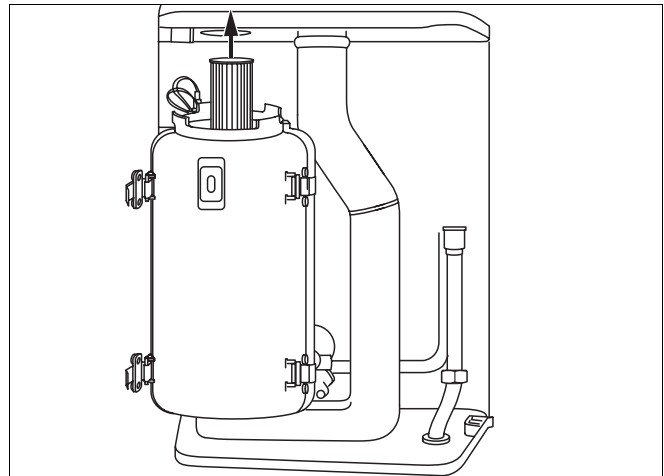


Fig. 40 Remove burner

- Remove the glow ignitor (fig. 41, item 1) and ionisation electrode (fig. 41, item 2).

**In the case of the glow ignitor:** loosen the fixing screw of the glow ignitor, detach both earth (ground) leads and remove the retaining plate of the glow ignitor by pulling it upwards, withdraw the glow ignitor by pulling it upwards.

**In the case of the ionisation electrode:** Swivel the retaining plate to one side and carefully remove the ionisation electrode by pulling it upwards.

- Clean the burner and both parts of the heat exchanger with compressed-air or brush.
- Refit the heat exchanger by following the above procedure in reverse order.

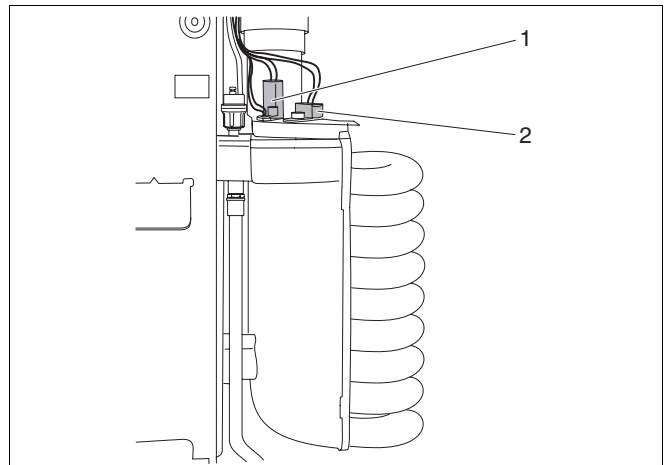


Fig. 41 Remove the glow ignitor and ionisation electrode



#### CAUTION!

#### CAUTION

The gasket between the two halves of the casing shell should normally be replaced. Fit the new gasket by pressing in from the top on both sides, and without stretching. DO NOT attempt to cut the gasket to size.

**CAUTION!****CAUTION!**

The burner gasket must match the shape of the groove in the housing.

**CAUTION!****CAUTION!**

Check the heat exchanger for leaks **BEFORE** reassembling the casing shells.

#### 4.1.2 Cleaning the heat exchanger after dismantling

- Disconnect the system from the power supply.
- Close the gas service valve.
- Loosen the retaining screw and remove the casing.
- Close the heating shutoff valves and drain the system.

**CAUTION!****CAUTION**

Shut off the system water supply side by closing the heating shutoff valve.

To drain the boiler take the following steps:

**NOTE**

If the boiler is going to be out of service for prolonged period, drain the boiler.

- First drain the system.
- In case of frost, drain the boiler.
- Loosen the draining nipple with a screwdriver see fig. 42.
- Attach temporary hose to the nipple. Connect the other side of the temporary hose to a draining pipe.
- When the boiler is drained, tighten the draining nipple screw.
- Release plug-in connection of fan power lead (fig. 37, item 1, page 41), burner-control unit fan control lead (fig. 37, item 2, page 41) and gas-burner assembly (fig. 37, item 3, page 41).
- Loosen union nut on gas valve assembly (fig. 37, item 4, page 41).
- Push safety plate out of way.
- Turn air silencer tube and pull off from below.
- Swivel the gas-air unit forward (fig. 38, item 1, page 41).
- Pull the gas-air unit up and out of bayonet connector (fig. 38, item 2, page 41) and remove via front of unit.
- Remove rubber seal in combustion chamber from top (fig. 39, item 2, page 41).

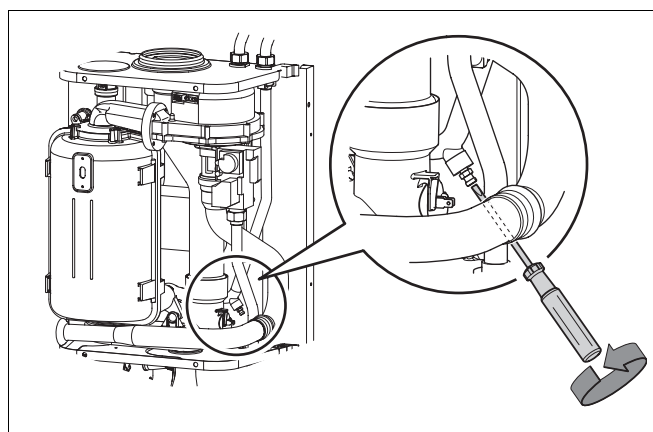


Fig. 42 Draining the boiler

- Remove burner and burner gasket (fig. 39, item 1, page 41) by pulling upwards through the opening (fig. 43, item 1).
- Remove the front of the heat exchanger by releasing the four retaining clips (fig. 43, item 2).

- Remove the glow ignitor (fig. 41, item 1) and ionisation electrode (fig. 41, item 2).

**In the case of the glow ignitor:**

Loosen the fixing screw of the glow ignitor, detach both earth (ground) leads and remove the retaining plate of the glow ignitor by pulling it upwards, withdraw the glow ignitor by pulling it upwards.

**In the case of the ionisation electrode:**

Swivel the retaining plate to one side and carefully remove the ionisation electrode by pulling it upwards.

- Remove securing pin on flow and return connection conduit (fig. 44) of heat exchanger.
- Remove spiral heat exchanger by pulling towards front (fig. 44). Drain any water remaining in the heat exchanger into the condensate trap.

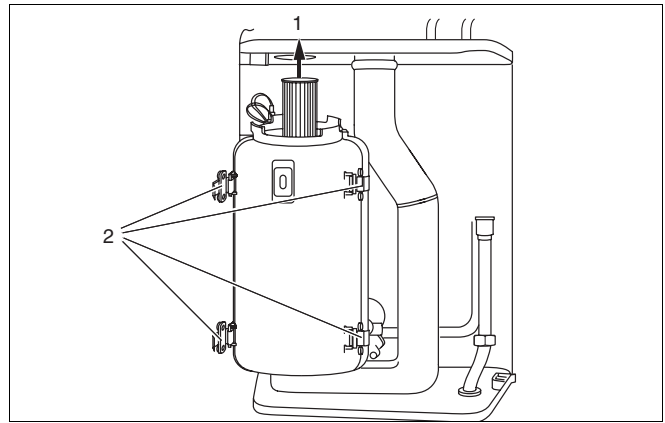


Fig. 43 Remove burner and release retaining clips

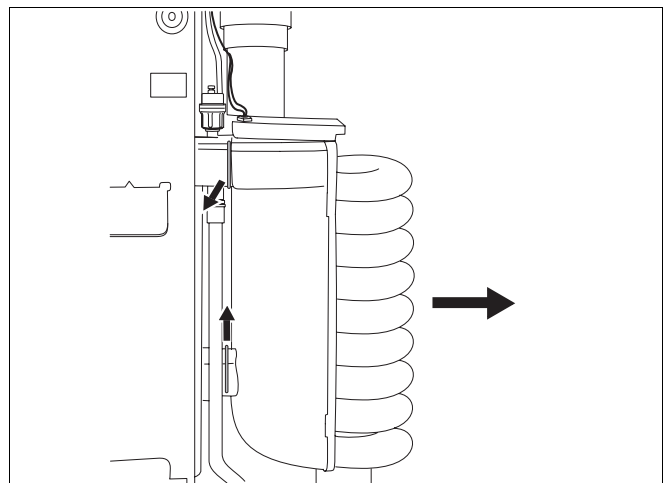


Fig. 44 Securing pin on spiral heat exchanger

- Remove the restrictor baffle (fig. 45, item 2) on the underside of the heat exchanger by withdrawing the securing pin (fig. 45, item 1) and unscrewing the restrictor baffle.
  - Clean the front and back cover of the heat exchanger and the heat exchanger with water or compressed air.
  - Clean the burner with compressed air or a soft brush.
- Take care not to damage the fins of the heat exchanger.

**Refitting** (fig. 46) :



**NOTE**

Excessive flue gas temperatures may be an indication of an incorrectly-fitted restrictor baffle.

- Screw the restrictor baffle in as far as it will go on the underside of the heat exchanger (the final turn of the heat exchanger increases the clearance between the pipes) and insert securing pin.

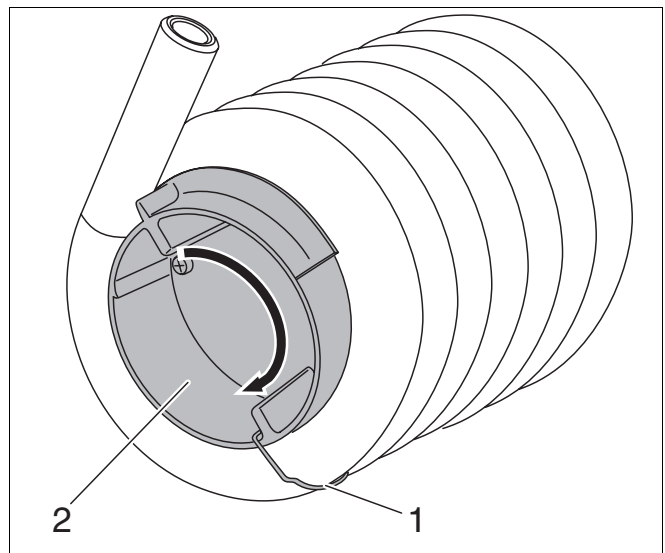


Fig. 45 Removing the restrictor baffle

**CAUTION**

Take care not to damage the insulation on the restrictor baffle.

**WARNING!**

- Check to ensure that the heat exchanger has been fitted the right way round. The upper securing-pin groove must be horizontal (fig. 46, item 1).
- Refit the heat exchanger by following the above procedure in reverse. Note the following:
- The gasket between the front and back cover of the heat exchanger should normally be replaced. Fit the new gasket by pressing in from the top on both sides, and without stretching. **DO NOT** attempt to cut the gasket to size.
- Check the heat exchanger for leaks **BEFORE** reassembling the front and back cover of the heat exchanger.
- Check O-ring seals (spiral), and replace as required.
- Smear the O-ring seal **with** a thin layer of silicone grease.

**4.1.3 Cleaning the condensate trap and syphon**

- Remove the trap and withdraw it from the outlet see fig. 47, item 1 and 2.
- Clean the condensate trap.
- Loosen the swivel and disconnect the syphon from the hose (fig. 47, item 3).
- Pull the syphon out of the bracket (fig. 47, item 3).
- Clean the syphon.
- Reassemble the syphon in reverse order.
- Fill the condensate trap with water and then reassemble in reverse order.
- Measuring the gas input pressure (flow pressure).
- Check the gas/air ratio.
- Leak test in operational condition.
- Measuring the carbon monoxide content.
- Carry out function testing.

**4.1.4 Re-commission**

See chapter 2 on page 30.

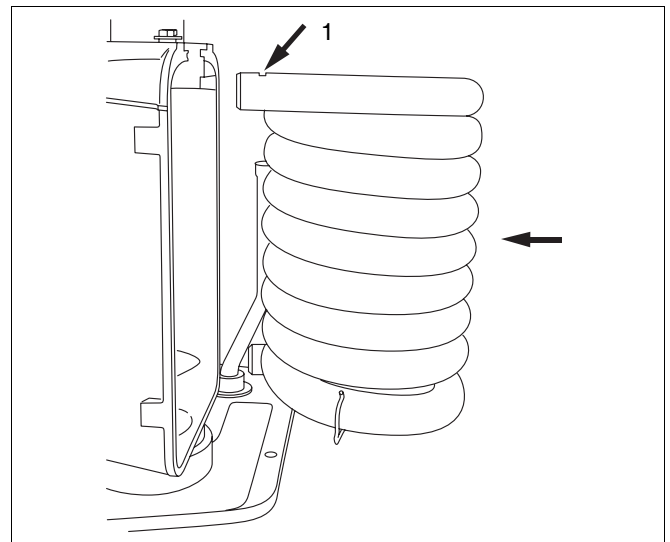


Fig. 46 Refitting the heat exchanger

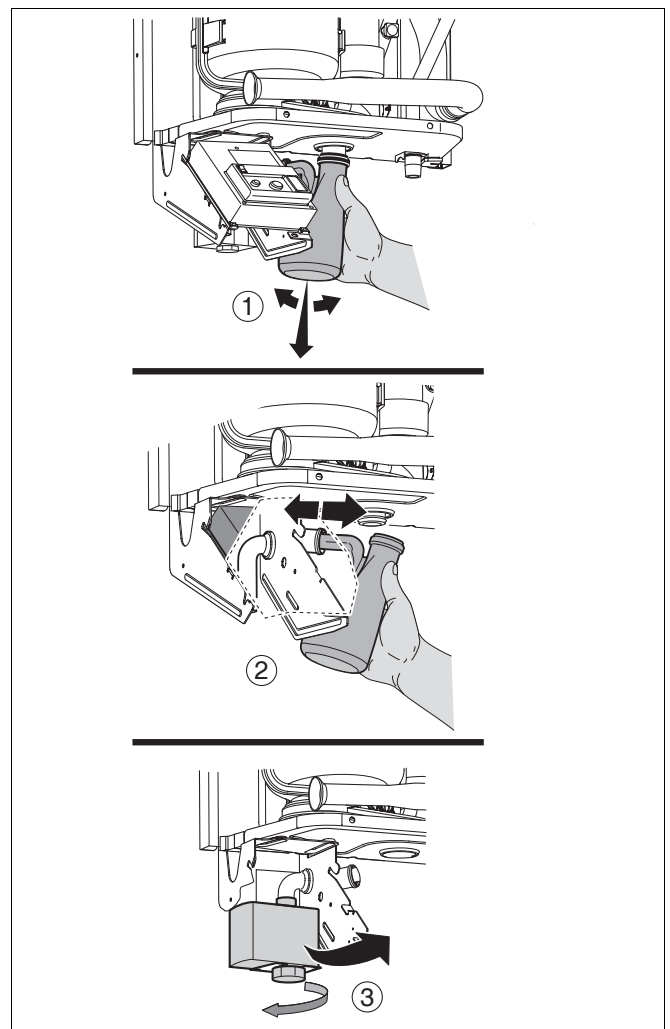


Fig. 47 Removing the condensate trap and syphon

## 5 Servicing

### 5.1 Operating codes



#### NOTE

If the code displayed on the burner-control unit is not listed under the operating codes or fault warnings, the burner-control unit itself is malfunctioning.

Display	Display after pressing the service button	Meaning
0		<b>Buderus 600 - 11R / 19R / 24R is ready for operation</b>
	A	Burner interval circuit, 10 min. from burner start-up
	H	Standby activated, Buderus 600 - 11R / 19R / 24R ready to provide heat
	L	Initial safety period: self-testing of burner-control unit during burner start-up
	U	Post- or pre-purging period of fan unit
	Y	Flow temperature over set point
- .		<b>Buderus 600 - 11R / 19R / 24R running in heating mode</b>
	A	"Chimney-sweep" mode, flow-temperature controller by passed, Buderus 600 - 11R / 19R / 24R heating to previously entered flow temperature.
	H	Normal heating mode
	Y	Service mode
r		<b>Reset</b>

## 5.2 Fault codes

Code	Meaning	
2C	<i>Safety sensor exceeds 95 °C</i>	
Possible cause		Action
1	Resistance in the installation is too high	Check if not all (thermostatic) radiator valves are clogged with dirt.
2	Heating capacity is too large for the installation	Adjust the heating capacity (see subsection 2.2.7)
3	Safety sensor is faulty	Measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.8, subsection 5.3.9, subsection 5.3.10)
4	Problem with the pump or pump cable (flex) (no circulation)	Check if the pump cable (flex) is faulty or if the pump is stuck
5	Water pressure is too low in the installation	Top up the system

Code	Meaning	
2F	<i>Temperature difference between the safety sensor and flow sensor is greater than or equal to 15 °K</i>	
Possible cause		Action
1	Resistance in the installation is too high	Check if (thermostatic) radiator valves are closed or clogged with dirt
2	Safety sensor is dirty or faulty	Check the safety sensor for dirt. Measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.8, subsection 5.3.9, subsection 5.3.10)
3	Flow sensor is dirty or faulty	Check the sensor, replace if necessary (see subsection 5.3.11, subsection 5.3.12, subsection 5.3.13)
4	Problem with the pump or pump cable (flex) (no circulation)	Check if the pump cable (flex) is faulty or if the pump is stuck. Replace pump if necessary.
5	Water pressure is too low in the installation	Top up the system

Code	Meaning	
2P	<i>Safety sensor rises faster than 5 °C/sec.</i>	
Possible cause		Action
1	Heating capacity is too large for the installation	Adjust the heating capacity (see subsection 2.2.7)
2	Resistance in the installation is too high	Check if (thermostatic) radiator valves are closed or clogged with dirt
3	Safety sensor is dirty or faulty	Check the safety sensor for dirt. Measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.8, subsection 5.3.9, subsection 5.3.10)

Code	Meaning	
2U	<i>Temperature difference between flow and return more than 55 °C</i>	
Possible cause		Action
1	Flow sensor is dirty or faulty	Check the sensor, replace if necessary (see subsection 5.3.11, subsection 5.3.12, subsection 5.3.13)
2	Problem with the pump or pump cable (flex) (no circulation)	Check if the pump cable (flex) is faulty or if the pump is stuck. Replace pump if necessary.
3	Water pressure is too low in the installation	Top up the system
4	Resistance in the installation is too high	Check if (thermostatic) radiator valves are closed or clogged with dirt
5	Safety sensor is dirty or faulty	Check the safety sensor for dirt. Measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.8, subsection 5.3.9, subsection 5.3.10)

Code	Meaning	
3C	<i>Bad plug-in connection at cable harness, or damaged wiring</i>	
Possible cause		Action
1	Cable harness is faulty	Check cable harness for faults and bad connections
2	Connectors at the back of the UBA are loose or faulty	Check the connectors at the back of the UBA
3	UBA might be faulty	Check the UBA by temporarily connecting an other UBA (see subsection 5.3.3)

Code	Meaning	
4A	<i>Flow sensor exceeds 100 °C</i>	
Possible cause		Action
1	Flow sensor is dirty or faulty	Check the sensor, replace if necessary (see subsection 5.3.11, subsection 5.3.12, subsection 5.3.13)
2	There is a problem with the pump or pump cable (flex) (no circulation)	Check if the pump cable (flex) is faulty or if the pump is stuck. Replace pump if necessary.
3	Water pressure is too low in the installation	Top up the system

Code	Meaning	
4C	<i>F2 fuse malfunction, or flue gas thermostat active</i>	
Possible cause		Action
1	Water pressure is too low in the installation	Top up the system
2	Heat exchanger is dirty	Check for a dirty heat exchanger and clean if necessary. (see subsection 4.1)
3	Flue gas retarder faulty or missing	Check if the flue gas retarder is installed in the heat exchanger
4	Heat exchanger has a problem	Purge heat exchanger



Code	Meaning	
4F	<i>Safety sensor exceeds 95 °C</i>	
Possible cause		Action
1	Resistance in the installation is too high	Check if not all (thermostatic) radiator valves are clogged with dirt
2	Heating capacity is too large for the installation	Adjust the heating capacity
3	Safety sensor is faulty	Check the sensor and measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.8, subsection 5.3.9, subsection 5.3.10)
4	Problem with the pump or pump cable (flex) (no circulation)	Check if the pump cable (flex) is faulty or if the pump is stuck
5	Water pressure is too low in the installation	Top up the system

Code	Meaning	
4L	<i>Short circuit in safety sensor</i>	
Possible cause		Action
1	Safety sensor is faulty	Check the sensor and measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.8, subsection 5.3.9, subsection 5.3.10)
2	A short or bad connection in the cable harness	Check the cable harness and/or connector of the sensor
3	UBA might be faulty	Check the UBA by temporarily connecting a different UBA (see subsection 5.3.3)

Code	Meaning	
4P	<i>Safety sensor has a loose connection or is defective</i>	
Possible cause		Action
1	Safety sensor faulty or disconnected	Check the sensor and measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.8, subsection 5.3.9, subsection 5.3.10)
2	A short or bad connection in the cable harness	Check the cable harness and/or connector of the sensor
3	UBA might be faulty	Check the UBA by temporarily connecting a different UBA (see subsection 5.3.3)

Code	Meaning	
4U	<i>Short circuit in flow sensor</i>	
Possible cause		Action
1	Flow sensor is dirty or faulty	Check the sensor, replace if necessary (see subsection 5.3.11, subsection 5.3.12, subsection 5.3.13)
2	A short or bad connection in the cable harness	Check the cable harness and/or connector of the sensor
3	UBA might be faulty	Check the UBA by temporarily connecting a different UBA (see subsection 5.3.3)

Code	Meaning	
4Y	<i>Flow sensor interrupted</i>	
Possible cause		Action
1	Flow sensor faulty or disconnected	Check the sensor and measure if resistance over the sensor is correct. If not replace safety sensor (see subsection 5.3.11, subsection 5.3.12, subsection 5.3.13)
2	A short or bad connection in the cable harness	Check the cable harness and/or connector of the sensor
3	UBA might be faulty	Check the UBA by temporarily connecting a different UBA (see subsection 5.3.3)

Code	Meaning	
6A	<i>F1 fuse defective, or no ionisation message after ignition</i>	
Possible cause		Action
1	There is no flame, ionisation electrode doesn't glow, fan is running	<ul style="list-style-type: none"> <li>– Check wiring of the glow ignitor, measure the resistance of the glow ignitor (should be between 50 and 300 Ohm). Replace glow ignitor if necessary (see subsection 5.3.14 and subsection 5.3.15)</li> <li>– Check the UBA's F1 fuse, replace if necessary</li> </ul>
2	There is no flame, ionisation electrode does glow, fan isn't running	<ul style="list-style-type: none"> <li>– Check the fan and KIM connectors and the UBA fuses</li> </ul>
3	There is no flame, ionisation electrode and fan are working	<ul style="list-style-type: none"> <li>– Check and adjust the gas/air ratio (see subsection 2.2.8)</li> <li>– Check for 24 V~ on the gas valve during start up</li> <li>– Check the gas-supply pressure (see subsection 2.2.5), this should be higher than 20 mbar for natural gas.</li> <li>– Check the earthing cable connections (yellow/green wire).</li> <li>– Check the cabling on the ionisation electrode</li> </ul>
4	There is a flame, but the flame disappears when the fan starts up	<ul style="list-style-type: none"> <li>– Check the gas-supply pressure (see subsection 2.2.5), this should be higher than 20 mbar for natural gas.</li> <li>– Check and adjust the gas/air ratio (see subsection 2.2.8)</li> <li>– Check the earthing cable connections (yellow/green wire)</li> <li>– Check the cabling on the ionisation electrode</li> <li>– Press reset. If fault code remains than try to temporarily connect a different UBA (see subsection 5.3.3)</li> </ul>

Code	Meaning	
6C	<i>Ionisation message, but no flame</i>	
Possible cause		Action
1	There is no flame, ionisation electrode doesn't glow, fan is running	<ul style="list-style-type: none"> <li>– Check wiring of the glow ignitor, measure the resistance of the glow ignitor (should be between 50 and 300 Ohm). Replace glow ignitor if necessary (see subsection 5.3.14 and subsection 5.3.15)</li> <li>– Check the UBA's F1 fuse, replace if necessary</li> </ul>
2	There is no flame, ionisation electrode does glow, fan isn't running	<ul style="list-style-type: none"> <li>– Check the fan and KIM connectors and the UBA fuses</li> </ul>
3	There is no flame, ionisation electrode and fan are working	<ul style="list-style-type: none"> <li>– Check and adjust the gas/air ratio (see subsection 2.2.8)</li> <li>– Check for 24V – on the gas valve during start up</li> <li>– Check the gas-supply pressure (see subsection 2.2.5), this should be higher than 20 mbar for natural gas.</li> <li>– Check the earthing cable connections (yellow/green wire).</li> <li>– Check the cable on the ionisation electrode</li> </ul>
4	There is a flame, but the flame disappears when the fan starts up	<ul style="list-style-type: none"> <li>– The gas valve doesn't close properly. If there is still more than 20 V~ on the gas valve when there is no heat demand then check the UBA by temporarily connecting a different UBA.</li> <li>– Check ionisation electrode/circuit (see subsection 2.2.10 and subsection 5.3.17)</li> <li>– When both the UBA and the ionisation electrode/circuit are OK, then replace the gas valve</li> <li>– Press reset. If fault code remains than try to temporarily connect a different UBA (see subsection 5.3.3)</li> </ul>

Code	Meaning	
6H	<i>Flame dies out after gas valve is opened</i>	
Possible cause		Action
1	Gas/air ratio not in order	Check and adjust the gas/air ratio (see subsection 2.2.8)
2	Gas supply pressure may need adjusting	Check the gas-supply pressure (see subsection 2.2.5), this should be higher than 20 mbar for natural gas
3	Earthing cable may be faulty	Check the earthing cable connections (yellow/green wire)
4	Ionisation electrode may be faulty	Check the cable on the ionisation electrode

Code	Meaning	
6L	<i>Flame goes out during warm-up phase</i>	
Possible cause		Action
1	Gas/air ratio not in order	Check and adjust the gas/air ratio (see subsection 2.2.8)
2	Gas supply pressure may need adjusting	Check the gas-supply pressure (see subsection 2.2.5), this should be higher than 20 mbar for natural gas
3	Earthing cable may be faulty	Check the earthing cable connections (yellow/green wire)
4	Ionisation electrode may be faulty	Check the cable on the ionisation electrode

Code	Meaning	
7A	<i>Voltage in burner-control unit too low (lower than 187 V~) or too high (higher than 246 V~)</i>	
Possible cause	Action	
1	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>

Code	Meaning	
7C	<i>Mains supply interrupted</i>	
Possible cause	Action	
1	A problem with the mains supply	Check the mains supply during operation (230V~)
2	Reset button pressed too briefly	Press the Reset button until "r" appears in the display

Code	Meaning	
7F	<i>F3 fuse defect, or burner control unit error</i>	
Possible cause	Action	
1	Short circuit in the 24V circuit (three-way-valve or connector)	Check for a short circuit and replace the F3 fuse
2	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>

Code	Meaning	
7H	<i>Voltage peaks in the UBA</i>	
Possible cause	Action	
1	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>

Code	Meaning	
7L	<i>Internal UBA error</i>	
Possible cause	Action	
1	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>

Code	Meaning	
8Y	<i>Gas fault</i>	
Possible cause	Action	
1	External switching contact (e.g. temperature-monitoring device for underfloor heating has been tripped or gas pressure too low	Check gas pressure detector is defective or the wires have not been properly connected to the back of the UBA (see subsection 5.3.6)

Code	Meaning	
9A	<i>System error</i>	
Possible cause	Action	
1	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>
2	UBA may be defective	Press reset. If fault code remains then try to temporarily connect a different UBA

Code	Meaning	
9C	<i>KIM error</i>	
Possible cause	Action	
1	Kim connected incorrectly or KIM defective	Check the KIM connector and fan connector. If the connectors are fine then contact the technical support of Buderus

Code	Meaning	
9F/H	<i>System error</i>	
Possible cause	Action	
1	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>
2	UBA may be defective	Press reset. If fault code remains then try to temporarily connect a different UBA (see subsection 5.3.3)

Code	Meaning	
9L	<i>Gas valve assembly error</i>	
Possible cause	Action	
1	Wiring to the gas valve incorrect, or loose wiring connections in UBA	<ul style="list-style-type: none"> <li>– Check the electrical connections of the gas valve.</li> <li>– Measure the resistance of the gas valve (18-55 Ohm)</li> <li>– Check if for example induction fields interfere with the regulating device</li> </ul>
2	UBA may be defective	– Press reset. If fault code remains then try to temporarily connect a different UBA (see subsection 5.3.3)
3	Peaks in the electrical network	– Check if there are any peaks in the electrical network

Code	Meaning	
9U	<i>KIM defective</i>	
Possible cause	Action	
1	Kim connected incorrectly or KIM defective	Check the KIM connector and fan connector. If the connectors are fine then contact the technical support of Buderus

Code	Meaning	
E with any character but P	<i>UBA defective</i>	
Possible cause	Action	
1	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>
2	UBA may be defective	– Press reset. If fault code remains then try to temporarily connect a different UBA (see subsection 5.3.3)

Code	Meaning	
EP	<i>Non compatible UBA fitted</i>	
Possible cause	Action	
1	Regulating device may have to cope with interference	<ul style="list-style-type: none"> <li>– Check if for example induction fields interfere with the regulating device</li> <li>– Check if there are any peaks in the electrical network</li> </ul>
2	Kim connected incorrectly or KIM defective	– Check the KIM connector and fan connector. If the connectors are fine then contact the technical support of Buderus

<b>Problem:</b> <i>No heating, despite that there is a demand for heat and the boiler is operational</i>
– Check regulating device configuration and/ or the wiring
– Check the wiring between the regulating device and the UBA (see subsection 5.3.6)
– Check all the wiring
– Check the UBA and replace if necessary (see subsection 5.3.3)

## 5.3 Checking and replacing parts

### 5.3.1 Checking the flue gas thermostat

- Detach plug-and-socket connection on cable to flue gas thermostat. Ensure that no cable is earthed (grounded) at any point.
- Allow the flue gas thermostat to cool down. Activation temperature: Buderus 600 - 11R / 19R / 24R: 105 °C
- Check flue gas thermostat for continuity. If continuity is not present, the flue gas thermostat is defective.
- Replace any flue gas thermostat found to be defective. Ensure you use only genuine Buderus spare parts.
- If the flue gas thermostat is working correctly, plug it in once more.

### 5.3.2 Replacing the flue gas thermostat

- Unscrew the flow-backup mounting.
- Detach the cable plug at the flue gas thermostat.
- Loosen both retaining screws on the flue gas thermostat.
- Remove the flue gas thermostat and replace with a new unit (fig. 48).
- Retighten the retaining screws.
- Reconnect the cable plug.
- Screw the mounting into place.

### 5.3.3 Replacing the UBA

- Disconnect the system from the power supply.
- Loosen the two screws on the UBA (fig. 49, item 1).
- Carefully turn the UBA around with the backside facing up (fig. 50).
- Note the position of the cable plugs, disconnect all cable plugs.
- Fit a new UBA.
- Reconnect all plug-in cables to their correct sockets.
- Turn the UBA around and place back onto the bracket.
- Tighten the two screws.
- Connect system to mains power supply.

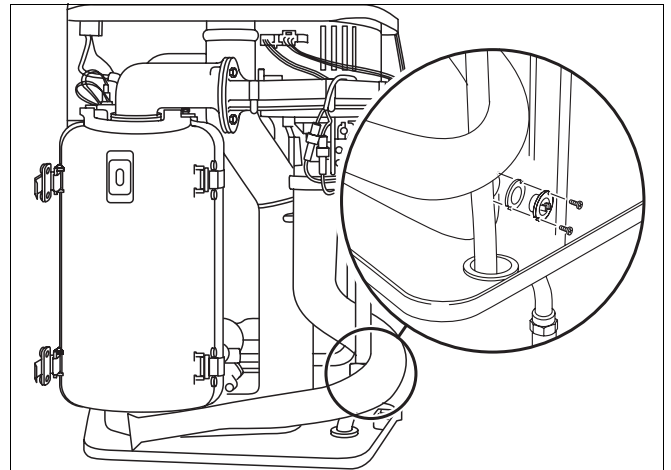


Fig. 48 Buderus 600 - 11R / 19R / 24R :  
replacing the flue gas thermostat

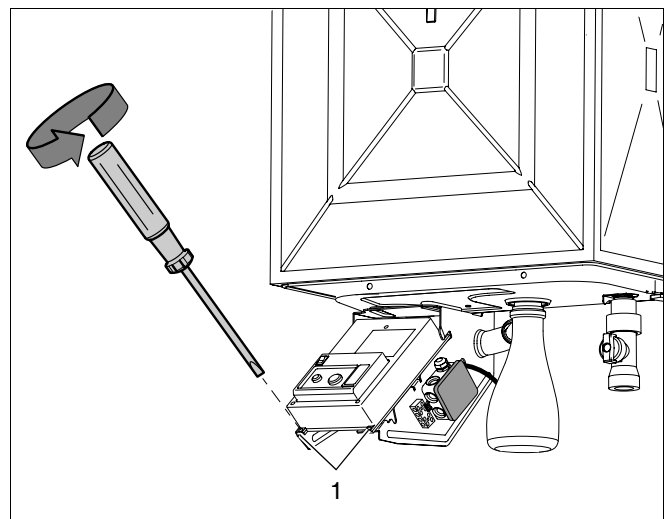


Fig. 49 Replacing the UBA

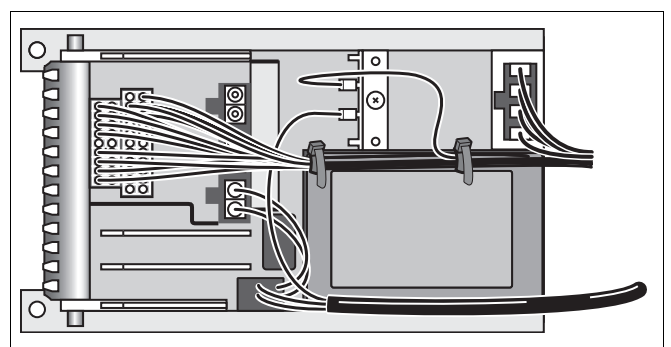


Fig. 50 Backside of the UBA

### 5.3.4 Checking the fan

- Set the power switch to “0”.
- Disconnect the fan's plug and socket connection.
- Connect a multimeter (230 V AC).
- Turn the power switch to “I”.
- Take voltage reading at measuring device.  
If the voltage reading is 230 V, the power supply is in order.
- Set the power switch to “0”.
- If the power supply is in order, plug the unit in once more.
- Turn the power switch to “I”.
- If the fan now fails to run, it must be replaced.
- If the fan runs at only partial load (i.e. effective operation of the boiler is not possible), troubleshooting should start at the connection cable to the UBA or UBA.

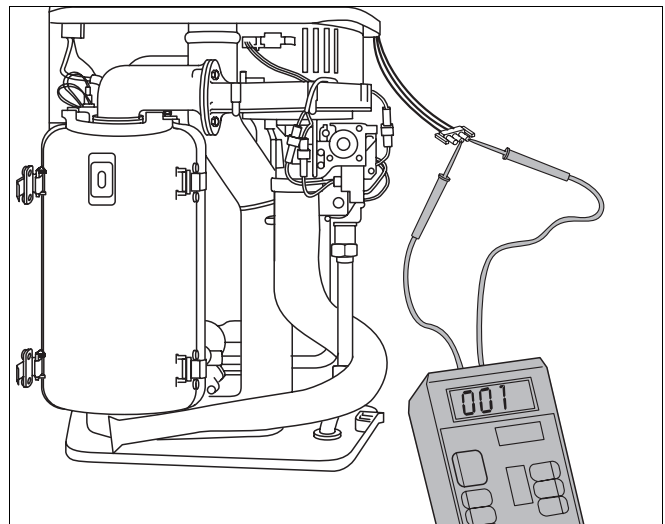


Fig. 51 Checking the fan

### 5.3.5 Replacing the fan

- Shut the gas valve.
- Disconnect the system from the power supply.
- Disconnect the fan, using the plug and socket from the power supply (fig. 52, item 1), loosen the UBA control cable at the fan (fig. 52, item 2) and the gas burner connection fitting (fig. 52, item 3).
- Loosen the union nut (fig. 52, item 4) on the gas burner fitting.

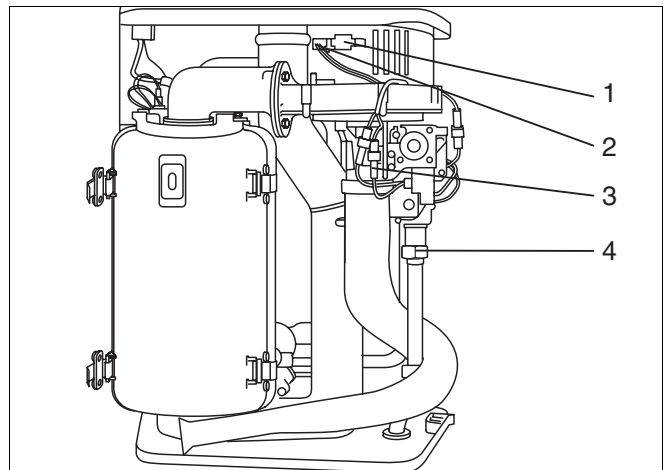


Fig. 52 Replacing the fan on the 600 Series:  
loosen plug and union nut

- Push the safety plate out of the way (fig. 53, item 1).
- Turn air silencer tube and pull off from below.

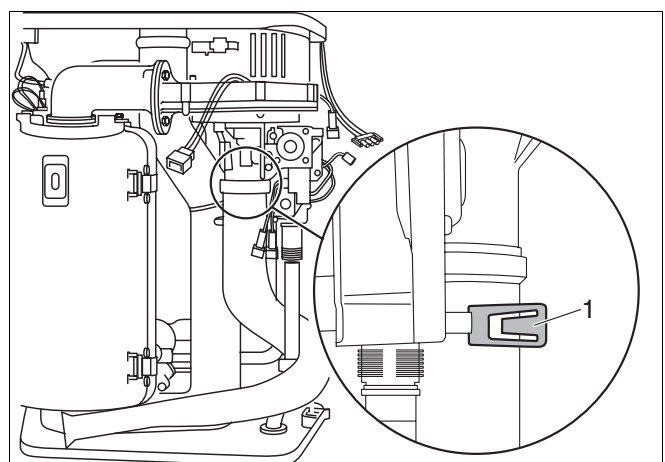


Fig. 53 Replacing the fan on the 600 Series:  
remove the air silencer tube



- Swivel the gas-air unit forward (fig. 54, item 1)
- Remove the gas-air unit from its bayonet connector and pull upwards to detach (fig. 54, item 2).

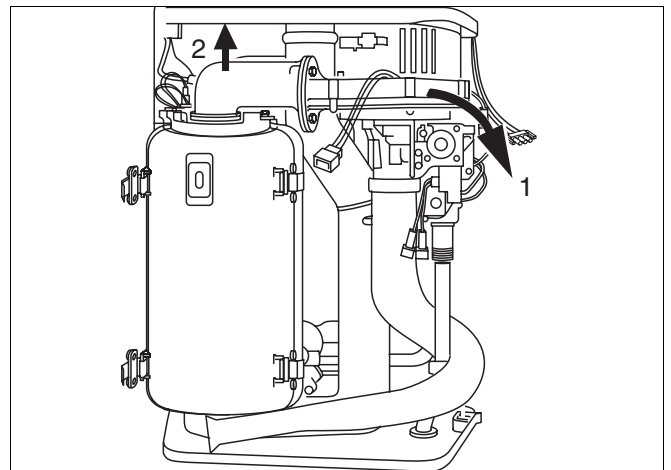


Fig. 54 Replacing the fan on the 600 Series: remove the gas-air unit

- Detach the fan by loosening the 2 x 2 screws on the connection unit.
- Replace the fan.
- Refit by following the above procedure in reverse.



#### NOTE

Once installation has been completed successfully, carry out leak testing as per subsection 2.2.1.

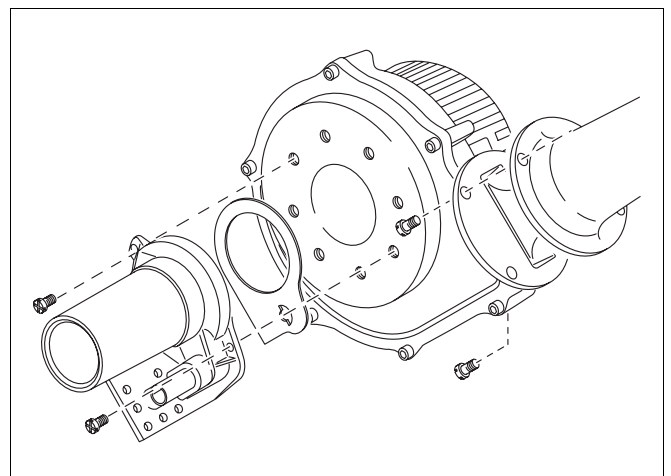


Fig. 55 Replacing the fan on the 600 Series: replace the fan

### 5.3.6 Checking the wiring connections of the UBA

- Disconnect the system from the power supply.
- Loosen the two fixing screws and carefully turn the UBA around (fig. 49, item 1, page 55).
- Check all cable terminals for tightness and resecure/retighten as required.
- Turn the UBA around and place back onto the bracket.
- Tighten the two screws.
- Connect system to mains power supply.

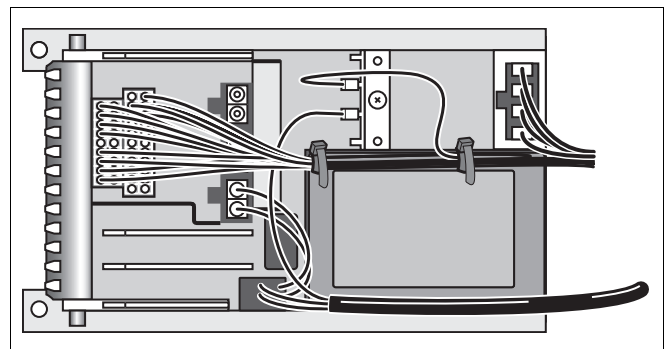


Fig. 56 Checking the wiring connections of the UBA

### 5.3.7 Checking the miniature fuses

- Disconnect the system from the power supply.
- Loosen the two fixing screws and carefully turn the UBA around.
- Check miniature fuses (fig. 57) for correct functioning, or carry out visual inspection. If defective, fit new fuse (1.25 AT).

Fuse	Function
1	Glow ingitor
2	UBA, sensors, thermostat valve
3	UBA

- Turn the UBA around and place back onto the bracket.
- Tighten the two screws.
- Connect system to mains power supply.

### 5.3.8 Checking the safety sensor

- Unplug cable connection from sensor.
- Measure resistance of sensor (fig. 58, item 1).
- Use a second-reading thermometer to measure the temperature around the sensor.
- Compare readings with values shown in table 6 on page 60. If there is any mismatch (i.e. > 5%), the sensor is defective.
- If the sensor is working correctly, plug it in once more.

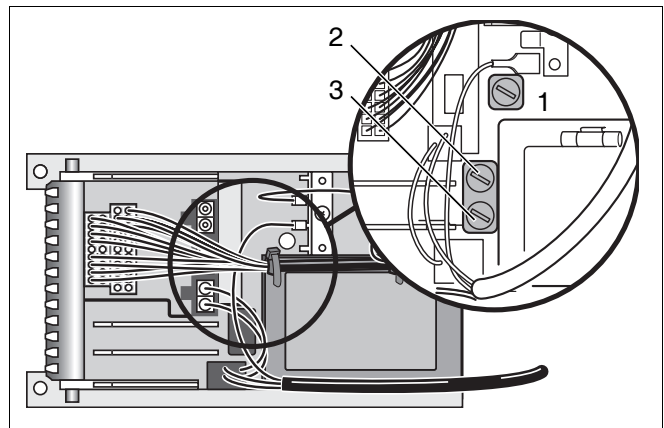


Fig. 57 Checking the miniature fuse

### 5.3.9 Replacing the safety sensor

- Shut the servicing valve.
- Drain the Buderus 600 - 11R / 19R / 24R as per the "Installation and Servicing Instructions".
- Loosen the plug-in connection (fig. 59, item 1).
- Unscrew the sensor (fig. 59, item 2) and replace with a new unit.
- Plug in cable connection.
- Open servicing valves.

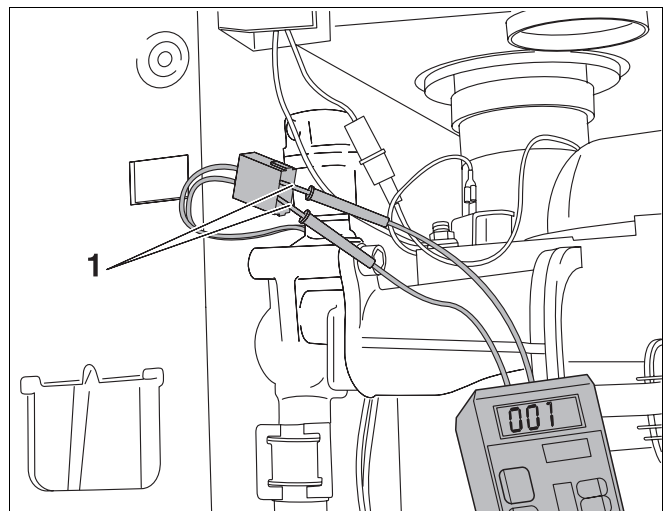


Fig. 58 Buderus 600 - 11R / 19R / 24R: checking the safety sensor

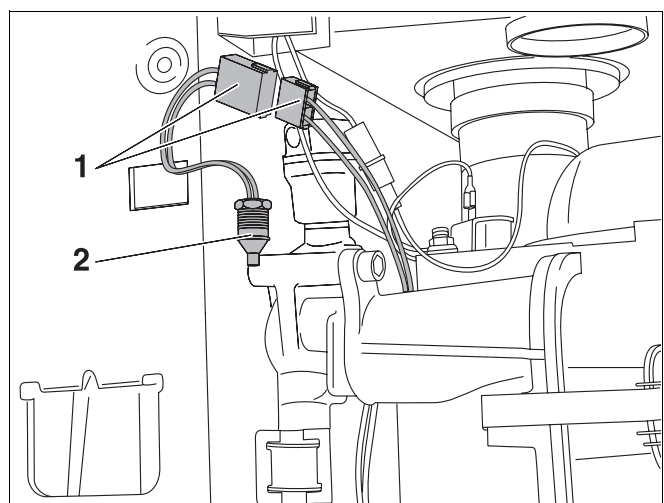


Fig. 59 Buderus 600 - 11R / 19R / 24R: replacing the safety sensor



#### NOTE

Fill the Buderus 600 - 11R / 19R / 24R and purge the system of air.

### 5.3.10 Checking the safety sensor connection lead

Check to ensure that all plug-in connections on the sensor and UBA are in order. Note that an incorrectly-inserted plug can lead to the generation of error messages. Start up the boiler by pressing the “reset” button.

- Set the power switch to “0”.
- Disconnect the system from the power supply.
- Unplug cable connection from flow sensor (fig. 60, item 1).
- Disconnect 18-pin plug from UBA (fig. 60, item 2).
- Use a continuity tester to check the cable between the plug-in connection and the 18-pin plug in the UBA. The test should be carried out on connections 06-18 and 08-18 (fig. 60).
- If the cables are in order, plug them in.
- Connect system to mains power supply.
- Turn the power switch to “1”.

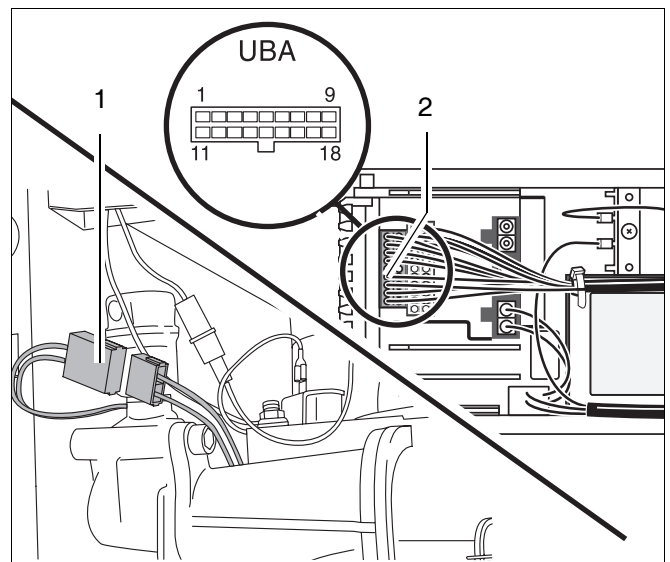


Fig. 60 Buderus 600 - 11R / 19R / 24R:  
checking the safety sensor connection lead

### 5.3.11 Checking the flow sensor

- Unplug cable connection from sensor.
- Measure resistance of sensor (fig. 61, item 1).
- Use a second-reading thermometer to measure the temperature around the sensor.
- Compare readings with values shown in table 6. If there is any mismatch (i.e. > 5%), the sensor is defective.
- If the sensor is working correctly, plug it in once more.

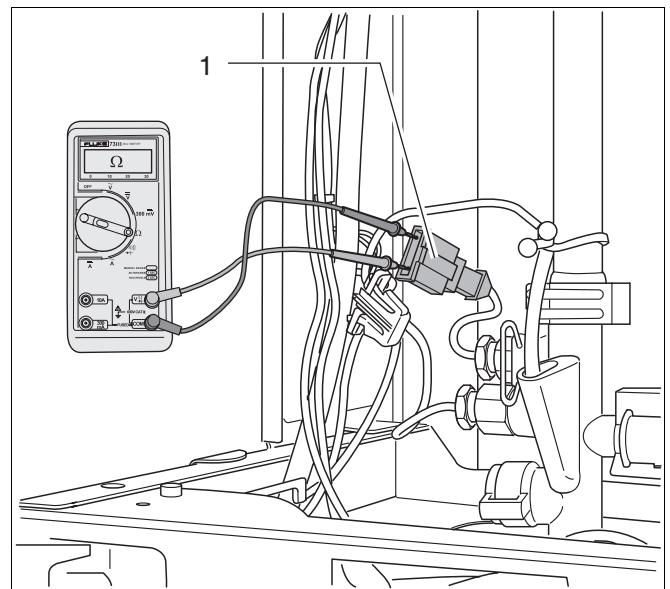


Fig. 61 Buderus 600 - 11R / 19R / 24R:  
checking the flow sensor

Temp. [°C]	Resistance [Ω]	Temp. [°C]	Resistance [Ω]
0	29,490		
5	23,462	55	3,271
10	18,787	60	2,760
15	15,136	65	2,339
20	12,268	70	1,990
25	10,000	75	1,700
30	8,197	80	1,458
35	6,754	85	1,255
40	5,594	90	1,084
45	4,656	95	939.6
50	3,893	100	817.2

table 6 Resistance values for hot water / boiler sensor (approximate values)

### 5.3.12 Replacing the flow sensor

- Shut the servicing valve.
- Drain the Buderus 600 - 11R / 19R / 24R as per the "Installation and Servicing Instructions".
- Loosen the plug-in connection (fig. 62, item 1).
- Unscrew the sensor (fig. 62, item 2) and replace with a new unit.
- Plug in cable connection.
- Open servicing valves.



#### NOTE

Fill the Buderus 600 - 11R / 19R / 24R and purge the system of air.

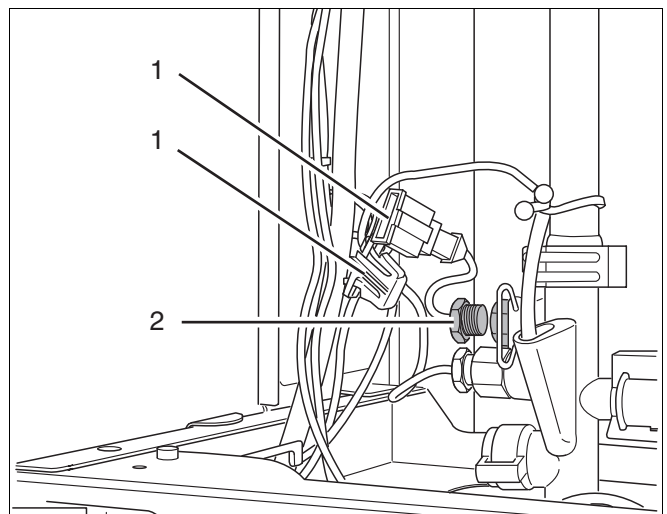


Fig. 62 Buderus 600 - 11R / 19R / 24R: replacing the flow sensor

### 5.3.13 Checking the flow sensor connection lead

Check to ensure that all plug-in connections on the sensor and UBA are in order. Note that an incorrectly-inserted plug can lead to the generation of error messages. Start up the boiler by pressing the "reset" button.

- Set the power switch to "0".
- Disconnect the system from the power supply.
- Unplug cable connection from flow sensor.
- Disconnect 20-pin plug from UBA.
- Use a continuity tester to check the cable between the plug-in connection and the 20-pin plug in the UBA.  
The test should be carried out on connections 05-20 and 18-20 (fig. 63).
- If the cables are in order, plug them in.
- Connect system to mains power supply.
- Turn the power switch to "I".

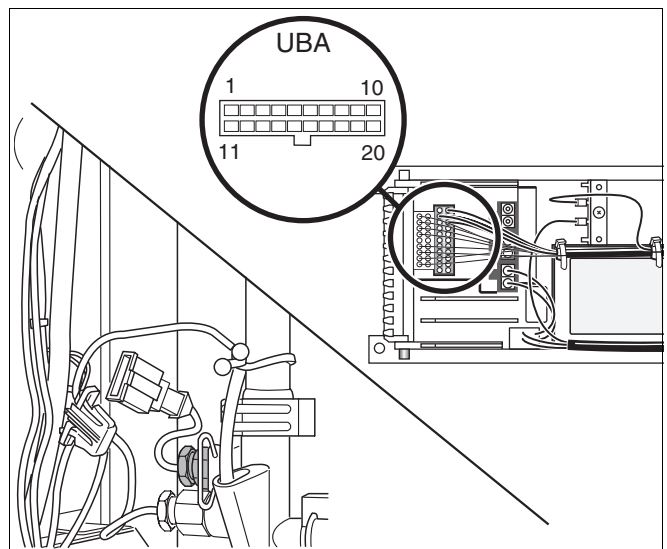


Fig. 63 Buderus 600 - 11R / 19R / 24R: checking the flow sensor connection lead

### 5.3.14 Checking the glow ingitor

- Disconnect the system from the power supply.
- Loosen the two fixing screws and carefully turn the UBA around.
- Unplug and remove glow ingitor from UBA housing (fig. 64).
- Check glow ingitor for free through-put. If through-put is free, the glow ingitor is in order.
- If the glow ingitor is in order, plug the cable into the UBA housing.
- Turn the UBA around and place back onto the bracket.
- Tighten the two screws.
- Connect system to mains power supply.

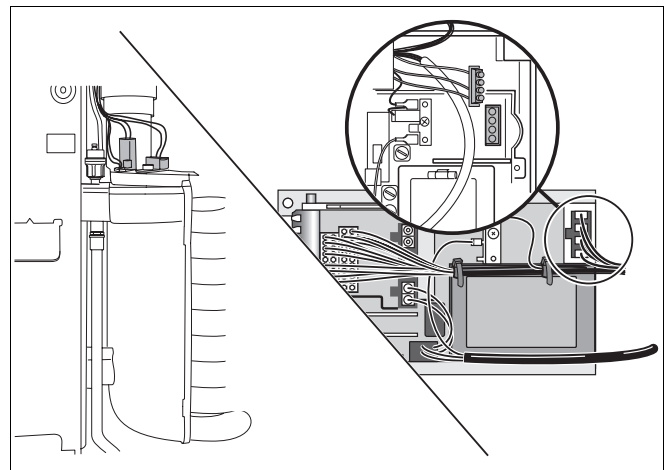


Fig. 64 Checking the glow ingitor

### 5.3.15 Replacing the glow ingitor

- Disconnect the system from the power supply.
- Remove burner cover.
- Remove the earth (ground) lead from the glow ingitor (fig. 65, item 1).

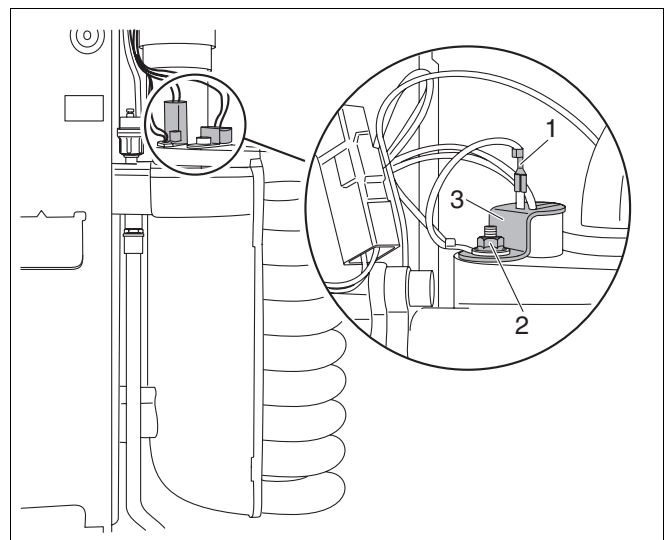


Fig. 65 Replacing the glow ingitor

- Loosen the two screws on the UBA and carefully turn the UBA around with the backside facing up.
- Unplug glow ingitor connection cable from UBA (fig. 66).
- Loosen nut on clamp used to secure earth (ground) lead (fig. 65, item 2).
- Detach retaining plate of glow ingitor (fig. 65, item 3) and remove glow ingitor.

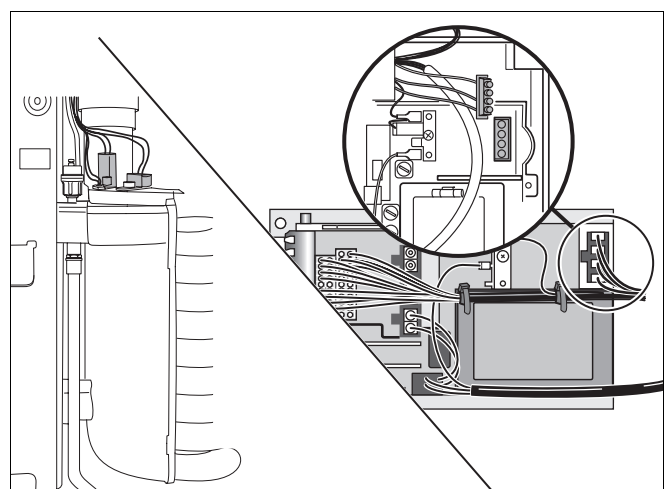


Fig. 66 Disconnect the plug-in cable from the UBA housing

### 5.3.16 Measuring the ionisation current

See subsection : "Measuring the ionisation current (fig. 35)" on page 38.

### 5.3.17 Replacing the ionisation electrode

- Remove the gas-air unit.
- Loosen the plug-and-socket connection of the ionization electrode.
- Loosen screw (fig. 67, item 1) by a half-turn and slide bar to remove.
- Pull electrode to remove, and fit new unit.
- Reassemble by following the above procedure in reverse.

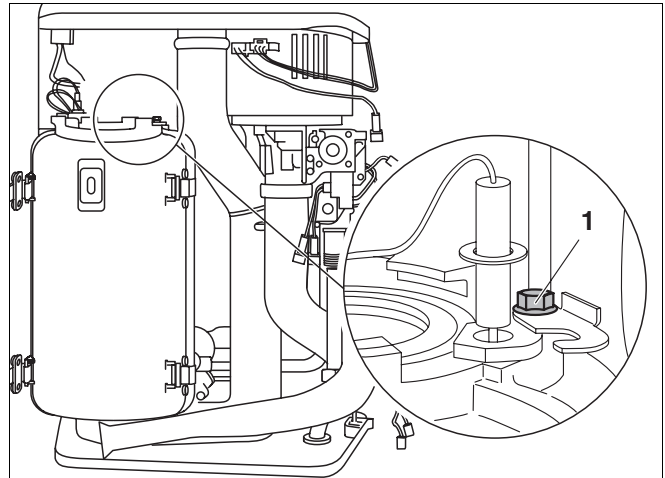


Fig. 67 Replacing the ionisation electrode

### 5.3.18 Checking KIM connections

- Locate KIM on the side of the UBA bracket.
- Check if 4 pin connector (fig. 68, item 1) is fitted and secure.



#### NOTE

This is not a servicable part and any fault identified with this component, contact Buderus.

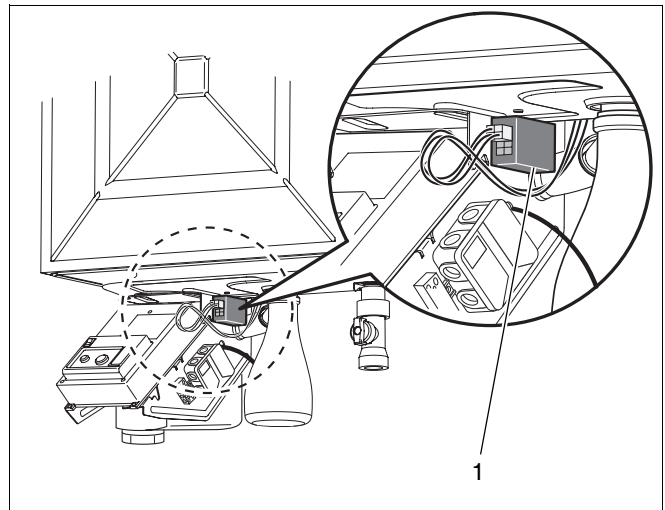


Fig. 68 KIM connections



## 6 Conversion to another type of gas



**WARNING!**

### **WARNING!**

Work on components in contact with gas must only be carried out by a registered CORGI engineer.

### Switch off the heating boiler

- Disconnect the system from the power supply.
- Close the gas service valve.
- Loosen the 4 crosshead screws on the ventilation cover (fig. 69).
- Remove the ventilation cover.

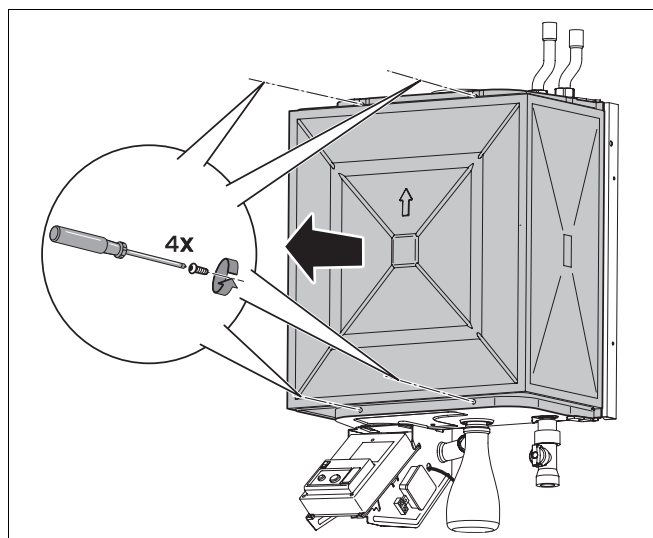


Fig. 69 Unscrew ventilation cover

- Loosen union nut on gas valve assembly (fig. 70, item 4).
- Release plug-in connection of fan power lead (fig. 70, item 1), burner-control unit fan control lead (fig. 70, item 2) and gas-burner assembly (fig. 70, item 3).

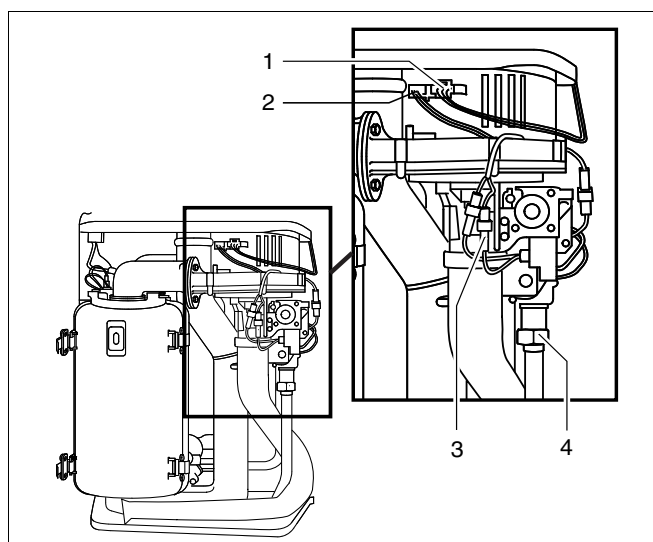


Fig. 70 Loosen the union nut and remove the cable

- Push safety plate out of way (fig. 71, item 1).
- Turn air silencer tube and pull off from below.

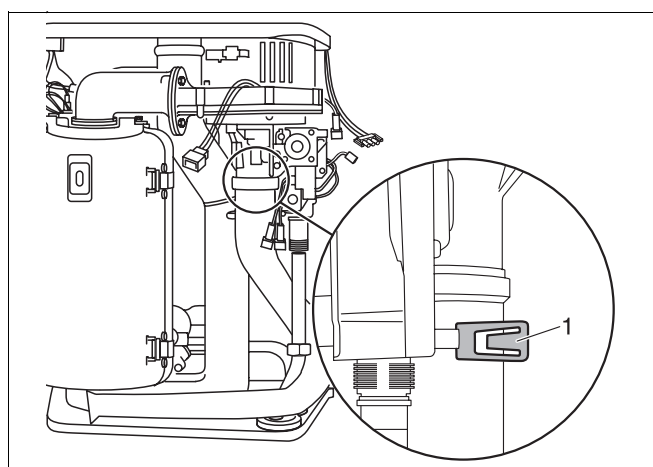


Fig. 71 Remove safety plate

- Swivel the gas-air unit forwards (fig. 72, item 1).
- Pull the gas-air unit up and out of the bayonet connector (fig. 72, item 2) and remove via the front of the unit.

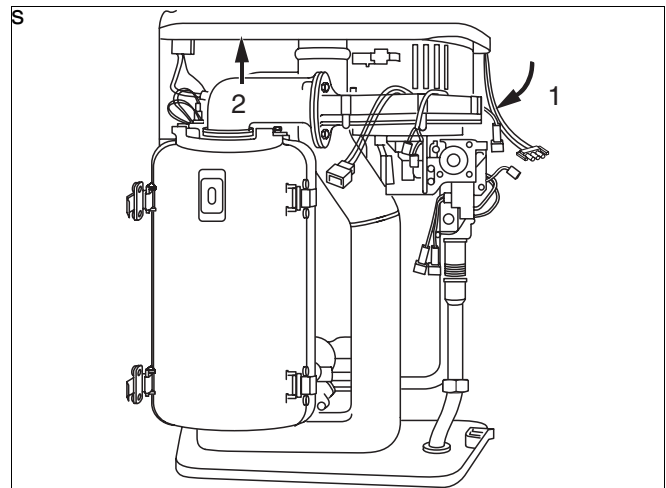


Fig. 72 Remove the gas-air unit

Replacing a gas nozzle



**WARNING!**

Conversion to another gas type is implemented by installing/removing a gas nozzle (fig. 73, item 3) of the appropriate gas nozzle diameter (table 7).

Type of gas supply	Gas nozzles Ø [mm]		Venturi tubes
	11R	19R/24R	
Natural gas H (G20)	5.55	6.5	Standard
LPG	3.40	4.15	Standard

table 7 Gas nozzle diameter

- Undo the three screws (fig. 73, item 2) on the long side of the gas fitting.
- Remove the gas nozzle and insert the correct gas nozzle for the new gas type.
- Insert new seal (fig. 73, item 4).
- Remount all components in the reverse sequence.
- Cover stickers (fig. 74, item 1) with the new stickers (2 pieces, included in conversion kit).

Starting up

- Start up the appliance following the procedure described in the mounting and maintenance instructions.
- Include all seal areas concerned during mounting in the gas-tightness check when in operation.
- Refit all covers.

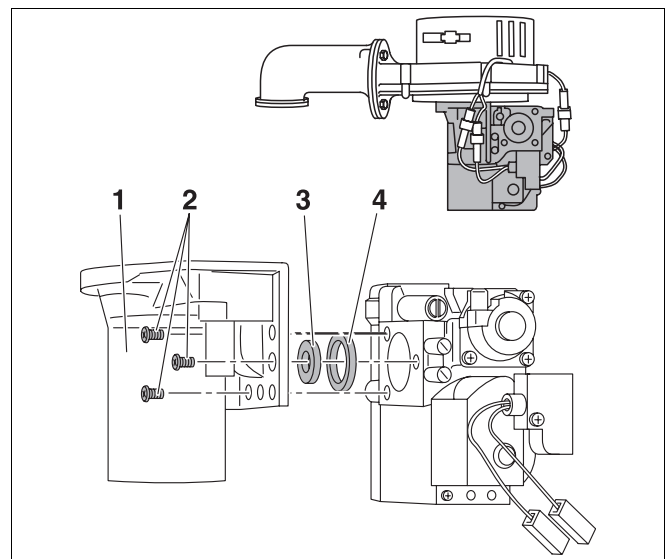


Fig. 73 Replacing a gas nozzle

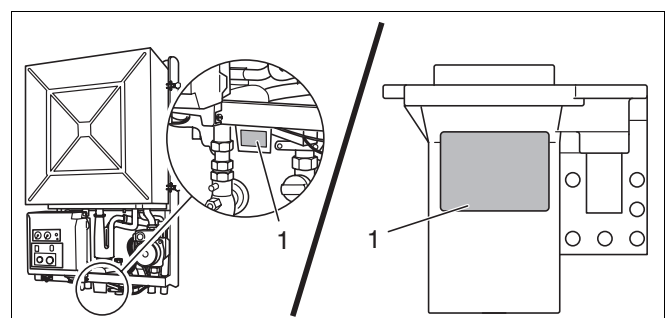


Fig. 74 Place new stickers



## 7 Appendix

### 7.1 Short list of spare parts

The following are parts commonly required due to damage or expendability. Their failure or absence is likely to affect safety or performance of this appliance. For a pictorial representation of the part see the respective position number on the exploded view picture on page 16.

Pos.	Art. no.	Description
1	75131	Casing complete
2	75130	Door
3	38470	Ventilation cover
4	38092	Bracket
5	77465	Concentric adaptor
6	38496	Clip adaptor
7	77464	100 mm Lipring
8	73366	Fan
9	73565s	Seal fan / venturi (set of 5 pc)
10	73563	60 mm Lipring
11	73743	Flue gas pipe
12	73630	Condensate collector
13	73579	Seal flue gas pipe
14	73376	Flue gas thermostat
15	75969	Condensate trap
16	73573	Air silencer tube
17	73574	50 mm Lipring
18	73278	Gas valve
19	38355	Rectifier
20	73567	Venturi 11 kW
20	73568	Venturi 19-24 kW
21	76680	Gas pipe
22	76681	Gas service valve
23	75968s	Pipe return-flow top (set of 2 pc)
24	75970	Pipe connection
25	38602s	Clip (set of 5 pc)
26	75966	Return pipe
27	75967	Drain cock
28	73583	Connection return
29	38352	Sensor
30	75965	Flow pipe
31	73581	Connection supply
32	73582s	Spring heat exchanger (set of 2 pc)
33	38618	Automatic air vent
34	73580s	O-ring heat exchanger (set of 10 pc)
35	73584s	Lipring heat exchanger (set of 2 pc)
36	38323	Safety sensor
37	38478s	O-ring (set of 10 pc)
38	73611	Rearpart of heat exchanger
39	73578	Gasket heat exchanger
40	73514	Insulation rearpart heat exchanger
41	73593	Burner 11 kW
41	73594	Burner 19-24 kW
42	73571s	Burner seal (set of 5 pc)
43	73612	Heat exchanger
44	73587	Restrictor baffle
45	73513	Front heat exchanger insulation
46	73610	Frontpart heat exchanger

Pos.	Art. no.	Description
47	73576	Sight glass
48	75132s	Securing latch (set of 2 pc)
49	38324	UBA
50	38340	Power switch
51	78105	Glow ignitor
52	38320	Ionisation electrode
53	73367	Cable fan
54	78109	Cable harness
55	**	Frame
56	78079	RTH converter 230V
57	38456	Seal ventilation cover
58	38458s	Assembly casing block (set of 2 pc)
59	73561	Seal
60	38463s	Air seal bush (set of 4 pc)
61	73054	Bracket ionisation electrode and glow ignitor
62	73841s	Syphon seal condensate trap (set of 5 pc)
63	73463	Seal syphon
64	73515	Insulation divider
65	73851s	Clip + screw insulation divider
66	73560	Cap
67	73586s	Seal ionisation electrode
68	73053	Clip air silencer
69	73570	Gas air supply
70	73770	Valve fan / gas air supply
71	73368s	Seal glow ignitor
72	38453	Shield glow ignitor
73	73569s	Seal venturi / gasket (set of 5 pc)
74	73566s	Seal fan / gas air supply (set of 2 pc)
75	73756s	Gas air supply valve (set 2x2 pc)
76	36406s	Plate screw (set of 10 pc)
77	38460s	Casing clip (set of 5 pc)
78	38474s	Clip (2 small & 2 big)
79	73572s	Screw M5 (set of 10 pc)
80	73488s	Gasket (set of 5 pc)
81	38475s	Clip (set of 5 pc)
82	77486s	Seal flue gas thermostat (set of 5 pc)
83	73561	Seal condensate pipe
84	75882	Swivel dreg with pinching
85	38415s	Screw (set of 10 pc)
86	75986	Syphon
87	75987	Drain pipe condensate trap / syphon
88	73736	60 mm Lipring
*	75301	230V cable
*	78110	Kim 163 (11 kw)
*	78111	Kim 164 (19 kw)
*	78112	Kim 165 (24 kw)

## 8 Reports

### 8.1 Start-up report

- Please check off the start-up tasks carried out and enter the corresponding readings.

Initial start-up tasks	Remarks or measurement readings
1. Type of gas:	<input type="checkbox"/> Natural gas <input type="checkbox"/> LPG
2. Inspect to check for leaks (see subsection 2.2.1 on page 31)	<input type="checkbox"/>
3. Check combustion air/flue gas connection (see subsection 2.2.4 on page 33)	<input type="checkbox"/>
4. Checking the boiler equipment (change to another type of gas if necessary) (see subsection 2.2.4 on page 33)	<input type="checkbox"/>
5. Carry out adjustment settings (see subsection 2.2.6 on page 35)	<input type="checkbox"/>
6. Measure the gas connection pressure (working pressure) (see subsection 2.2.5 on page 34)	_____ mbar
7. Checking and adjusting the gas/air-ratio  CO <sub>2</sub> -content:     at full load at part load (see subsection 2.2.8 on page 37)	_____ Pa _____ % _____ %
8. Leak test in operational condition	<input type="checkbox"/>
9. Measure carbon monoxide content (CO), vacuum (see subsection 2.2.9 on page 37)	_____ ppm
10. Function testing  Measuring the ionisation current (see subsection 2.2.10 on page 38)	<input type="checkbox"/> _____ $\mu$ A
11. Fit the boiler casing	<input type="checkbox"/>
12. Instruct the user. Fill in Benchmark log book. Hand over documentation. (see subsection 2.2.12 on page 39)	<input type="checkbox"/>
13. Confirm initial start-up  Confirmation of initial start-up by qualified service technician  (Company stamp, signature)	



## 8.2 Inspection and maintenance reports

The inspection and maintenance reports provide an overview of all the tasks and operations carried out.

See also Section 3: "Inspection" on page 40 or Section 4: "Maintenance" on page 41.

Please check off the inspection and/or requirement-related maintenance tasks carried out and enter the corresponding readings.

- Sign details of inspection and maintenance tasks, indicating date carried out.

Use only original replacement parts.

Inspection tasks	Date: _____	Date: _____
1. Check general state of system	<input type="checkbox"/>	<input type="checkbox"/>
2. Visual inspection and function check of system	<input type="checkbox"/>	<input type="checkbox"/>
3. Check gas- and water-bearing components for: - leaks; - signs of corrosion; - signs of ageing.	<input type="checkbox"/>	<input type="checkbox"/>
4. Take system out of service and check the burner, heat exchanger and syphon for signs of dirt and soiling. (see subsection 4.1.1 on page 41)	<input type="checkbox"/>	<input type="checkbox"/>
5. Check the burner, glow ignitor and ionisation electrode, after disconnecting the system. (see subsection 4.1.1 on page 41)	<input type="checkbox"/>	<input type="checkbox"/>
6. Measuring the ionisation current (see subsection 2.2.10 on page 38)	_____ $\mu\text{A}$	_____ $\mu\text{A}$
7. Measure the gas connection pressure (working pressure) (see subsection 2.2.5 on page 34)	_____ mbar	_____ mbar
8. Check the gas-air ratio (see subsection 2.2.8 on page 37)	_____ Pa	_____ Pa
9. Gas leak test in operational condition (see subsection 2.2.1 on page 31)	<input type="checkbox"/>	<input type="checkbox"/>
10. Measure the carbon monoxide content (CO), vacuum (see subsection 2.2.9 on page 37)	_____ ppm	_____ ppm
11. Pressure-testing of heating system: - admission pressure of expansion tank (see installation instructions supplied with expansion tank) - Filling pressure	_____ mbar _____ mbar	_____ mbar _____ mbar
12. Check ventilation and flue gas conduits for correct functioning and safety	<input type="checkbox"/>	<input type="checkbox"/>
13. Check requirement-related adjustment settings of control device (see documentation supplied with control device)	<input type="checkbox"/>	<input type="checkbox"/>
14. Final check of inspection tasks, with record kept of measurement readings and test results	<input type="checkbox"/>	<input type="checkbox"/>
15. Confirm inspection carried out by qualified service engineer and fill out the <b>Benchmark</b>  Company stamp / Date / Signature)		

Date: _____	Date: _____	Date: _____	Date: _____	Date: _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____ $\mu$ A	_____ $\mu$ A	_____ $\mu$ A	_____ $\mu$ A	_____ $\mu$ A
_____ mbar	_____ mbar	_____ mbar	_____ mbar	_____ mbar
_____ Pa	_____ Pa	_____ Pa	_____ Pa	_____ Pa
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____ ppm	_____ ppm	_____ ppm	_____ ppm	_____ ppm
_____ mbar	_____ mbar	_____ mbar	_____ mbar	_____ mbar
_____ mbar	_____ mbar	_____ mbar	_____ mbar	_____ mbar
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Date: _____	Date: _____	Date: _____	Date: _____	Date: _____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____ Pa _____ % _____ %	_____ Pa _____ % _____ %	_____ Pa _____ % _____ %	_____ Pa _____ % _____ %	_____ Pa _____ % _____ %

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