

**delta** performance

Combination boiler

25 / 35 / 45 / 55

F25 / F35 / F45 / F55

G25 / G35 / G45 / G55

**delta**  
performance

*Installation, Operating and  
Servicing Instructions*



*excellence in hot water*

<b>1 INTRODUCTION</b>	<b>2</b>
1.1 People who should read these instructions	2
1.2 Symbols	2
1.3 Applicable standards	2
1.4 Warnings	2
<b>2 INSTALLATION</b>	<b>3</b>
2.1 Boiler room	3
2.2 Connections	3
2.3 Oil supply	5
2.4 Electrical connections	6
<b>3 STARTING UP</b>	<b>7</b>
3.1 Filling the heating and domestic hot water circuits	7
3.2 Troubleshooting the burner	7
<b>4 SERVICING</b>	<b>7</b>
4.1 Recommendation	7
4.2 Servicing the gas boiler	7
4.3 Servicing the oil boiler	7
4.4 Servicing the safety devices	7
4.4 Servicing the burner	8
4.6 Emptying the boiler	8
4.7 Spare parts	8
<b>5 DESCRIPTION</b>	<b>9</b>
5.1 Overview	9
5.2 Description of operation	9
5.3 Build features	10
<b>6 TECHNICAL SPECIFICATIONS</b>	<b>11</b>
6.1 Effective dimensions	11
6.2 Maximum operating conditions	11
6.3 Domestic hot water performance	11
6.4 Boiler without burner	11
6.5 Boiler with ACV oil burner	12
6.6 Boiler with ACV BG 2000-S gas burner	13
<b>7 USER GUIDE</b>	<b>14</b>
7.1 Using the boiler	14
7.2 Boiler room	15

## 1.1 PEOPLE WHO SHOULD READ THESE INSTRUCTIONS

These instructions should be read by:

- the specifying engineer
- the installation engineer
- the user
- servicing technicians

## 1.2 SYMBOLS

The following symbols are used in these instructions:



**Essential to ensure that the system works properly.**



**Essential for personal safety and environmental protection.**



**Danger of electrocution.**



**Danger of burns.**

## 1.3 APPLICABLE STANDARDS

The products have been granted the “EC” certificate in accordance with the standards in force in different countries (European Directives, 92/42/EEC “efficiency” and 90/396/ECC “gas devices”). These products have also been granted the Belgian “HR+”(gas boilers) and “OPTIMAZ” (oil boilers) marks.



## 1.4 WARNINGS

These instructions are an integral part of the equipment to which they refer and the user must be provided with a copy.

The product must be installed and serviced by qualified engineers, in compliance with current standards.

ACV cannot accept liability for any damage resulting from incorrect installation or from the use of components or fittings not specified by ACV.



**Any failure to follow instructions relating to tests and test procedures may result in personal injury or risks of pollution.**



**Because of their high level of performance our boilers produce flue gas discharge at low temperatures. This can cause condensation in some chimney flues. Your installing engineer will advise you whether you need to install a flue pipe in your chimney.**

*N.B.*

*ACV reserves the right to change the technical specifications and components of its products without prior notice.*

## 2 INSTALLATION

### 2.1 BOILER ROOM

#### 2.1.1 ACCESSIBILITY

The boiler room must be large enough to allow proper access to the boiler. The following minimum distances (mm) around the boiler are required:

- at the front	500	- at the sides	100
- at the rear	150	- above	700

#### 2.1.2 VENTILATION

The boiler room must be fitted with top and bottom vents as shown in the table below.

#### 2.1.3 BASE

The boiler must be laid on a base made of non-combustible materials.

### 2.2 CONNECTIONS

#### 2.2.1 CHIMNEY CONNECTION

The boiler can be connected to a suitable flue or to chimney by a metal pipe rising at an angle from the boiler to the chimney. It must be easily removable in order to give access to the flue pipes when servicing the boiler. A draught regulator must be installed on the chimney in order to stabilise negative pressure.



**Because of their high level of performance our boilers produce flue gas discharge at low temperatures. This can cause condensation in some chimney flues. Your installing engineer will advise you whether you need to install a flue pipe in your chimney.**

- A. Top vent
- B. Bottom vent
- C. Draught regulator
- D. Inspection cover
- E. Chimney height
- F. Chimney diameter

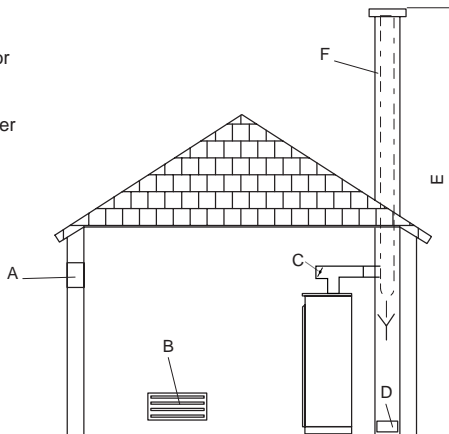


Fig. 1: Boiler room ventilation and chimney connection

Ventilation		25-F25	35-F35	45-F45	55-F55	G25	G35	G45	G55	
Min. fresh air requirement	m <sup>3</sup> /h	50/66	66/90	84/122	100/138	45	63	81	99	
Top vent (A)	dm <sup>2</sup>	2	2	2	2	1,5	1,5	1,5	1,5	
Bottom vent (B)	dm <sup>2</sup>	1,5	1,5	1,5	1,5/2,1	1,5	1,5	1,5	1,7	
<b>Chimney</b>										
E = 5m	Ø min.F	mm	158/182	182/213	208/248	226/266	160	189	215	236
E = 10m	Ø min.F	mm	133/153	153/179	175/209	190/223	135	159	181	199
E = 15m	Ø min.F	mm	130/138	138/162	158/188	172/202	130	143	163	179



**Important**  
Boilers must be installed by an approved engineer, in accordance with current local standards and regulations.

### 2.2.2 CENTRAL HEATING CONNECTION

#### 2.2.2.1 Examples of basic circuit configurations

The drain cock and safety valve must be connected to the waste water disposal system.

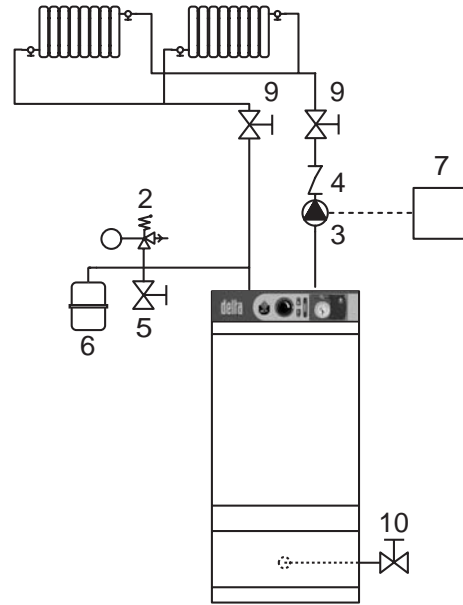


Fig. 2: Hydraulic diagram showing circulator controlled by a room thermostat.

1. Motorised 3-way manual mixer valve
2. Safety valve preset to 3 bar with pressure gauge
3. Circulator
4. Non-return valve
5. System filling valve
6. Expansion tank
7. Room thermostat (fig. 2)
8. ACV 13 controller (see controller kit on page 5) (fig. 3)
9. Central heating isolation valve
10. Discharge outlet

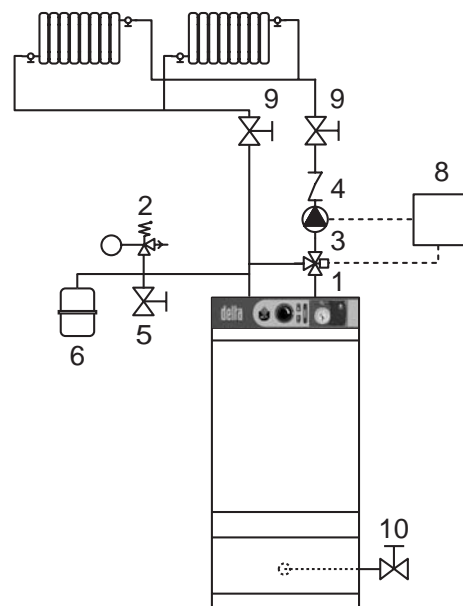


Fig. 3: Hydraulic diagram with motorised mixer valve

## 2 INSTALLATION

### 2.2.2.2 ACV hydraulic kit

ACV offers an optional pre-assembled hydraulic kit comprising:

- A circulator.
- A motorised 3-way manual valve.
- Connecting pipes including an optional second circuit.
- Two isolation valves.
- Connectors for mounting the safety valve with pressure gauge and the filling valve to the right or left of the expansion tank.

### 2.2.2.3 Discharge

The drain cock and safety valve must be connected to the waste water system in accordance with current regulations.



Fig. 4: Assembly with the ACV hydraulic kit

## 2.2.3 DOMESTIC HOT WATER CONNECTION

### 2.2.3.1 Pressure reducer

If the water mains pressure is greater than 6 bar, a pressure reducer calibrated to 4.5 bar must be fitted.

### 2.2.3.2 Safety unit

The tank safety unit must be ACV approved and calibrated to 7 bar. The valve discharge must be connected to the waste water system in accordance with current regulations.

### 2.2.3.3 Domestic hot water expansion tank

Installing a hot water expansion tank avoids any risk of pressure surges due to waterhammer.

### 2.2.3.4 Hot water circulation

If the tank is located a long way from the point of use, then installing a closed recirculation circuit ensures that a faster supply of hot water is always available.

### 2.2.3.5 Description

1. Safety unit
2. Pressure reducer
3. Thermostatic mixing valve
4. Hot water circulator
5. Non-return valve
6. Domestic hot water type expansion tank
7. Inlet valve
8. Draw-off valve
9. Bleed valve

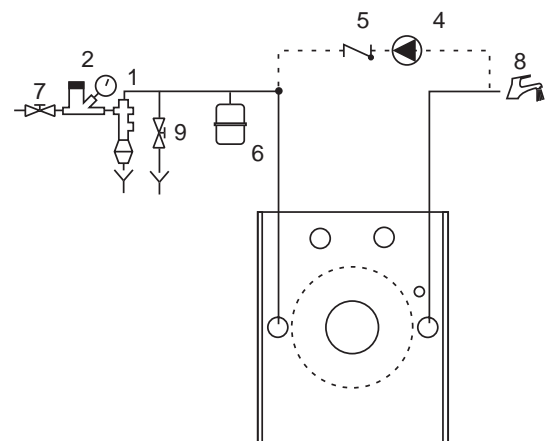


Fig. 5a: Connection without thermostatic mixing valve

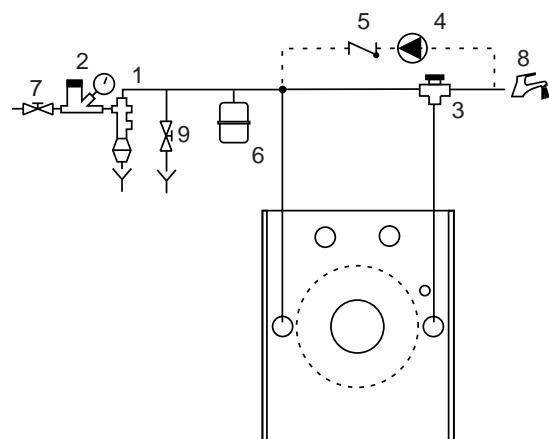


Fig. 5b: Connection with thermostatic mixing valve



### IMPORTANT

As a safety measure against burns, we strongly advise installing a thermostatic mixing valve (recommended temperature: 60° C).

*This is available as an optional accessory*

Safety unit	Ø 3/4"
Pressure reducer	Ø 3/4"
Thermostatic mixing valve	Ø 3/4"
Expansion tank	5 litres

## 2 INSTALLATION

### 2.2.4 CONTROLLER KITS

#### KIT 1: ACV 13.00 / Basic

Basic kit for regulating initial flow temperature according to weather conditions.

It comprises: a temperature regulator with analogue clock, wall-mounted water temperature sensor (-30/130° C), external sensor (-30/50° C), 3-pin servomotor SQY 31 230 V and an intermediate base.



Fig. 5b: kit 1

#### KIT 1: ACV 13.00 / Standard

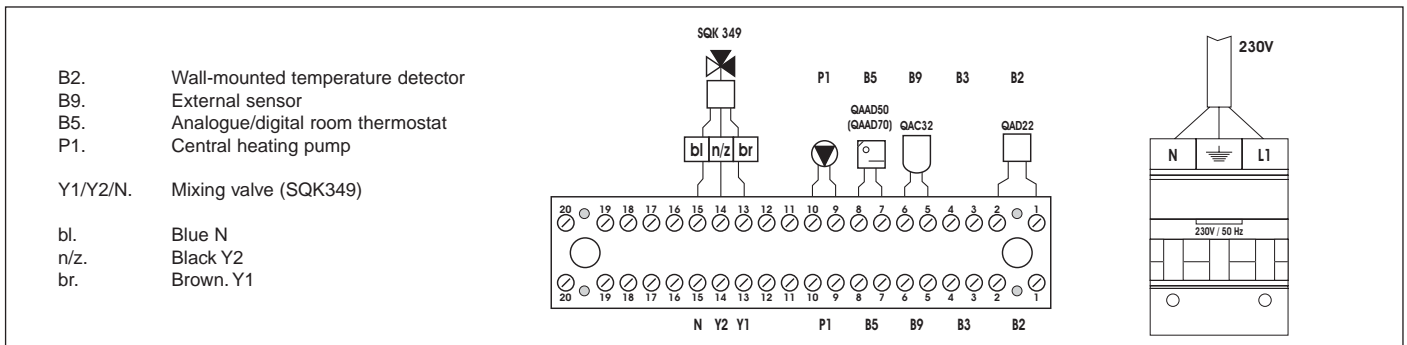
Basic kit for regulating initial flow temperature according to weather conditions.

It comprises: a temperature regulator with analogue clock, wall-mounted water temperature sensor (-30/130° C), external sensor (-30/50° C), 3-pin servomotor SQY 349, 230 V and an intermediate base.



Fig. 5b: kit 2

#### Wiring diagram for ACV controller kits (fig. 7)



### 2.3 OIL SUPPLY

#### 2.3.1 INSTALLATION WITHOUT RETURN

H (m)	L (m)	
	Ø int. 8 mm	Ø int. 10 mm
0,5	10	20
1	20	40
1,5	40	80
2	60	100

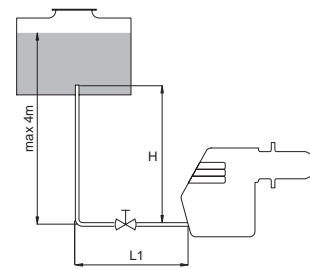


Fig. 8a: Oil supply without return

#### 2.3.2 INSTALLATION WITH RETURN

H (m)	L (m)	
	Ø int. 8 mm	Ø int. 10 mm
0	35	100
0,5	30	100
1	25	100
1,5	20	90
2	15	70
2	8	30
3,5	6	20

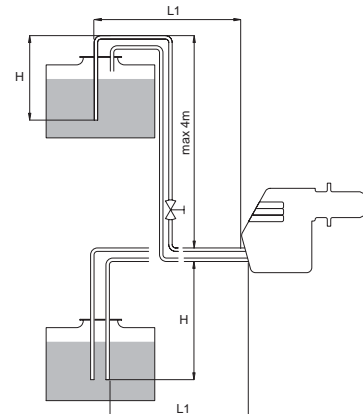


Fig. 8b: Oil supply with return from either top or bottom mounted tank

## 2 INSTALLATION

### 2.4 ELECTRICAL CONNECTION

#### 2.4.1 DESCRIPTION OF POWER SUPPLY

The boiler operates on single phase 230 V – 50 Hz. An on-off switch box with 6 A fuses must be fitted outside the boiler to allow power to be shut off during servicing and before any repairs are carried out on the boiler.

#### 2.4.2 COMPLIANCE

Boiler installation must comply with current local standards and legislation.

#### 2.4.3 SAFETY

The stainless steel tank must be earthed separately.

#### 2.4.4 BURNER ELECTRICAL CONNECTION

The burner is powered through a 3-core cable, which is plugged into the connector in the lower right hand corner of the burner chamber plate. Details of how to connect it up are given in the technical instructions for the burner.



It is important to switch the boiler off before carrying out any work.

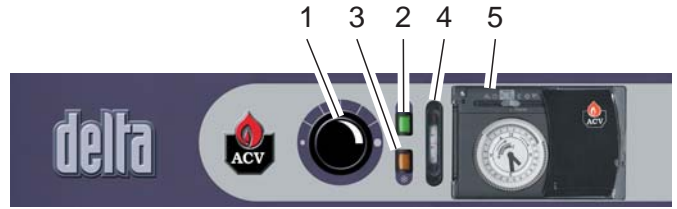


Fig. 9 Control panel

- |  |                 |
|--|-----------------|
| 1. Boiler thermostat (60/90° C)          | M. Brown        |
| 2. On/off switch                         | O. Orange       |
| 3. Summer/Winter selector switch         | N. Black        |
| 4. Thermometer                           | B. Blue         |
| 5. Controller (optional)                 | T. Green-yellow |
| 6. Safety thermostat (95° C max.)        | G. Grey         |
| 7. Safety thermostat (103° C max.)       | J. Yellow       |
| 8. Plug for power and control            |                 |
| 9. Central heating circulator connection |                 |
| 10. Burner connection                    |                 |
| 11. Room thermostat                      |                 |

- PH: Phase  
 N: Neutral  
 M: Motor  
 VM 1: Magnetic valve 1  
 VM 2: Magnetic valve 2  
 PF: Oil preheating  
 T: Ignition transformer  
 AL: Alarm  
 CF: Photoelectric cell

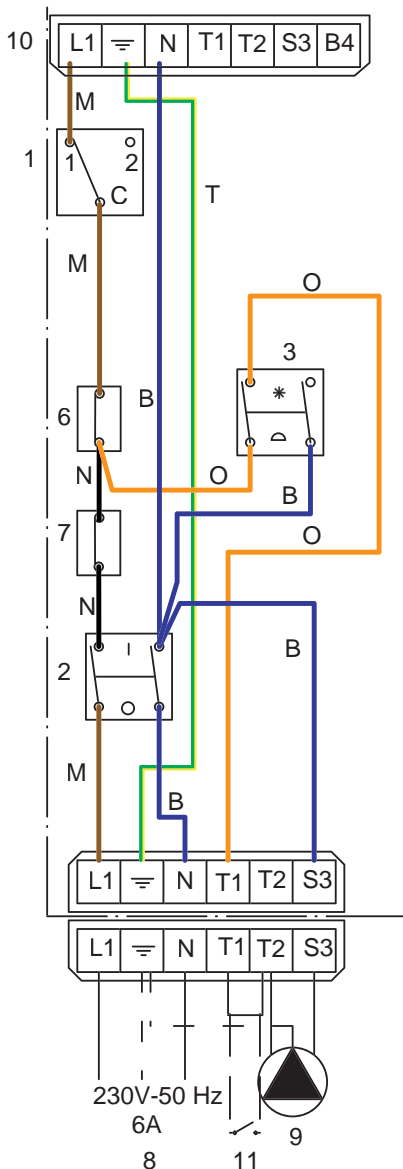


Fig. 10 a: Boiler wiring

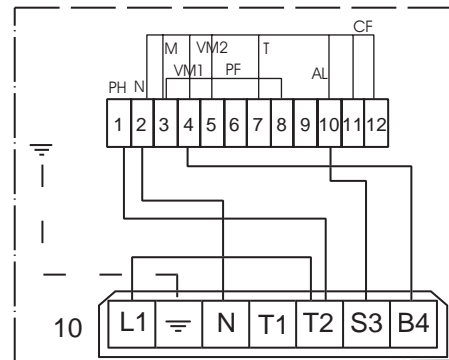


Fig. 10 b: Oil burner

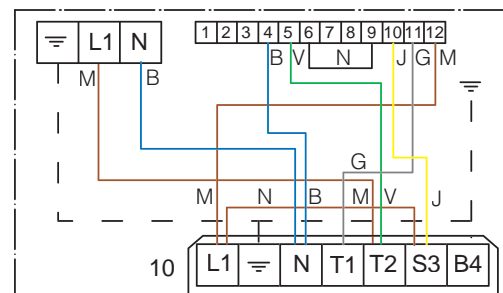


Fig. 10 c: Gas burner

### 3.1 FILLING THE HEATING AND DOMESTIC HOT WATER CIRCUITS

1. Fill the domestic hot water circuit and bring it up to pressure.



#### IMPORTANT

The hot water tank must be pressurised before the heating circuit is filled.

2. Fill the heating circuit taking care not to exceed the 2 bar pressure limit.
3. Bleed the air from the top of the boiler.
4. After bleeding the air out of the system, bring the pressure up to the static pressure (height) plus 0.5 bar: 1.5 bar = 10 m – 2 bar = 15 m.
5. Check the power connection, the boiler room ventilation and ensure that there are no leaks in the flue gas discharge pipes.
6. Set the thermostat (1) to between 60 and 90° C.

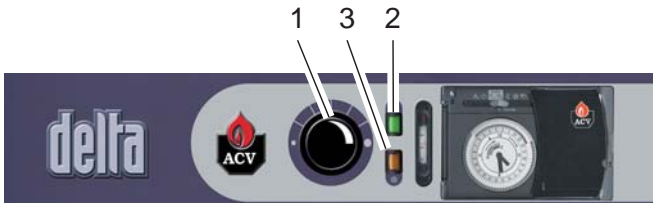


Fig. 11: Control panel

7. Set the Summer/Winter selector switch (3) to the desired position.
8. Switch the on/off switch (2) to the ON position.
9. Check the pressure of the gas supply when starting up.
10. For the oil burner check the oil supply (and return). Carry out any bleeding, measuring and adjustment work which may be necessary.

### 3.2 TROUBLESHOOTING THE BURNER

#### 3.2.1 ACV BG 2000-S GAS BURNER

Please refer to the servicing and troubleshooting instructions for the burner.

#### 3.2.2 ACV OIL BURNER

Please refer to the servicing and troubleshooting instructions for the burner.



Before carrying out any servicing or repair work, switch the power off at the mains switch fitted in the boiler room by the electrician.

### 4.1 RECOMMENDATION

ACV recommend that boilers should be serviced at least once a year. The burner must be serviced and tested by a competent engineer.

### 4.2 SERVICING THE BOILER

- 1 - Switch the power off at the mains switch outside the boiler and close the gas tap.
- 2 - Set the on/off switch on the control panel to the OFF position.
- 3 - Release and remove the chimney flue (1) to free the top of the boiler.
- 4 - Remove the jacket top (2) and lift off the flue reducer (3).
- 5 - Remove the baffles (4) from the flue pipes (5) for cleaning. Replace them if they are in poor condition.
- 6 - Remove the chamber plate (6).
- 7 - Brush the flue pipes (5).
- 8 - Clean the burner chamber (7) and the burner (8).
- 9 - Check the insulation on the chamber plate (6)

1. Chimney flue
2. Jacket cover
3. Chimney flue reducer
4. Baffles
5. Flue pipes
6. Chamber plate
7. Combustion chamber
8. Burner

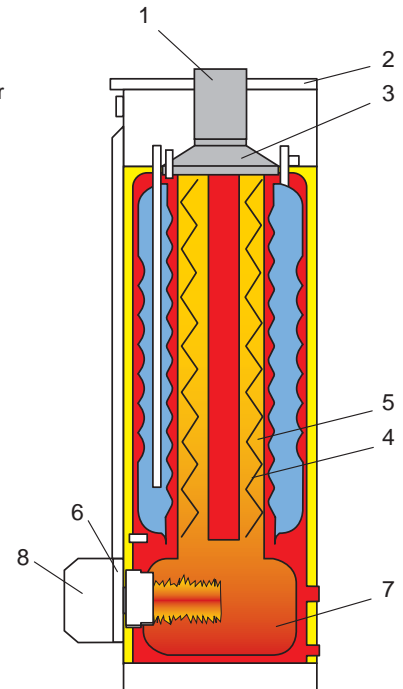


Fig. 12: Description of the main components which require servicing.

### 4.3 SERVICING THE OIL BOILER

- Switch the power off at the mains switch outside the boiler and close the oil inlet.
- Proceed following instructions 2 to 9 in paragraph (4.2 Servicing the gas boiler).

### 4.4 SERVICING THE SAFETY DEVICES

- Check that all thermostats and safety devices are working properly: boiler thermostat, cut-off thermostat and manually reset safety thermostat.
- Check the safety valves on both the central heating and the hot water circuits.

## 4 SERVICING

### 4.5 SERVICING THE BURNER

#### 4.5.1 OIL BURNER

- Check the main filter on the oil line and clean it if necessary.
- Check the nozzle line: check, clean or change the nozzle and filter, check that it is clean and that the electrodes and flame holder are properly set.
- Replace the whole unit and check that the safety devices are working properly
- Adjust the combustion parameters.

#### 4.5.2 GAS BURNER

- Check and clean the burner and the electrodes.
- Check that the safety devices are working properly.

### 4.6 EMPTYING THE BOILER

#### 4.6.1 EMPTYING THE PRIMARY CIRCUIT (CENTRAL HEATING):

1. Switch the power to the boiler off at the mains switch installed by the electrician.
2. Close the boiler system's isolating valves (1).
3. Connect a hose to the drain cock (2).
- Make sure that it is properly attached.
4. Open the drain cock and let the hot water drain out.




5. When the boiler is empty, return the valves to their initial positions

#### 4.6.2 EMPTYING THE DOMESTIC HOT WATER TANK:

1. Switch the mains power to the boiler off at the external switch installed by the electrician.
2. Remove the pressure from the primary circuit.
3. Close valves (A) and (B).
4. Open valves (C) and (D) (first C then D).
5. Let the water drain away.



6. After emptying, return the valves to their initial positions.

 To allow the tank to be emptied, valve (C) must be situated at ground level.

### 4.7 SPARE PARTS

Please refer to the specific document available from ACV or your distributor.

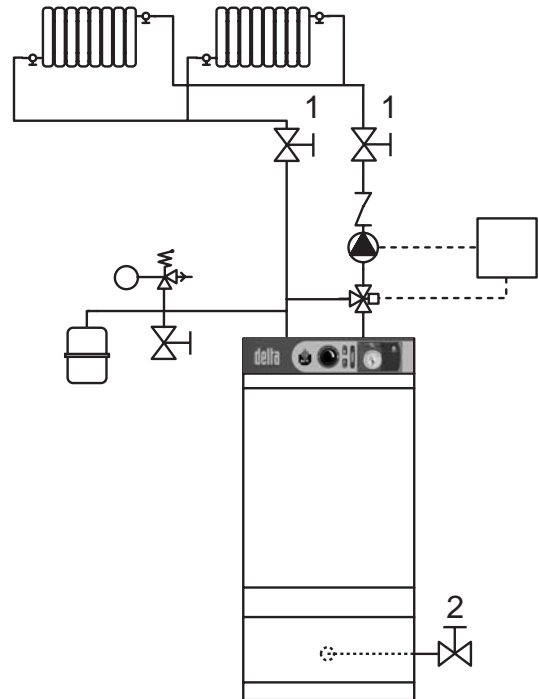


Fig. 13a: Emptying the primary circuit

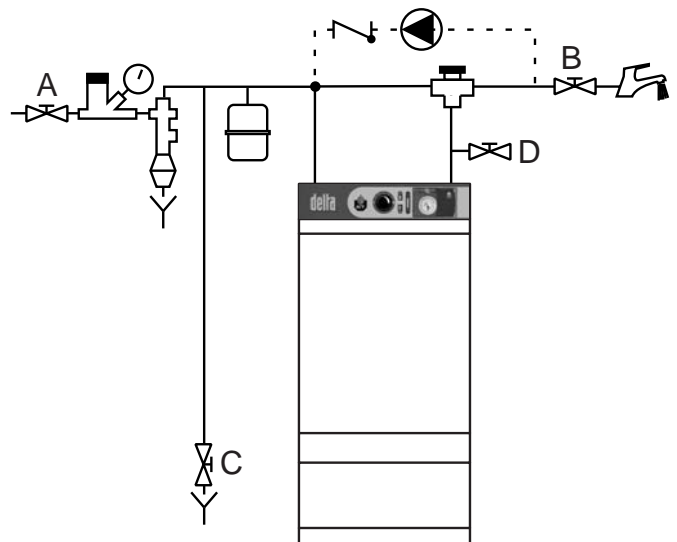


Fig. 13b: Emptying the hot water circuit



## 5 DESCRIPTION

### 5.1 OVERVIEW

- Combination boiler (central heating and domestic hot water).
- Designed for connection to a chimney.
- TANK-IN-TANK indirect storage type domestic hot water production.
- Fittings required to connect the hydraulic kit for feeding the heating circuit (available as an optional extra).
- Control panel with on/off switch, adjustable thermostat, thermometer, Summer/Winter selector and knockout for fitting ACV integrated control system (optional).
- DELTA Performance 25, 35, 45 and 55 models - with effective outputs adjustable between 22 and 62 kW - are shipped without burners. They can be fitted with most gas or oil burners available on the market.
- DELTA Performance F25, F35 and F45 models - with effective outputs adjustable between 22 and 54 kW - are shipped with an ACV BM R oil burner.
- DELTA Performance F55 models - with effective outputs adjustable between 45 and 62 kW - are shipped with an ACV BM oil burner.
- DELTA Performance G25, G35, G45 and G55 models - with effective outputs adjustable between 22.5 and 49 kW - are shipped with a BG 2000-S gas burner.

### 5.2 DESCRIPTION OF OPERATION

#### 5.2.1 THE TANK-IN-TANK CONCEPT

The DELTA Performance series differs from traditional hot water producers in that it has a ring-shaped tank immersed in the primary fluid contained in the outer body. When hot water from the central heating system or the domestic hot water system is needed, the thermostat starts up the burner. The combustion gases quickly heat up the primary fluid, thus creating a natural circulation around the tank.

#### 5.2.2 INDIRECTLY HEATING DOMESTIC HOT WATER

This circulation allows easier heat exchange between the primary fluid and the domestic water, all over the tank surface. The corrugations on the inner and outer shells of the ring-shaped tank increase the area of heat exchange still further and thus speed up the process of heating the domestic water.

#### 5.2.3 EASY TO SET AND SAFETY ASSURED

With a single command, the water temperature of both the primary circuit and the domestic hot water circuit can be set by the adjustable thermostat situated underneath the tank in the primary circuit.

A cut-off thermostat, placed on the top of the boiler automatically switches off the burner when the temperature of the water in the primary circuit reaches 95° C. A manually reset safety thermostat switches off the burner if the temperature reaches 103° C.



Fig. 14: Stainless steel domestic hot water tank

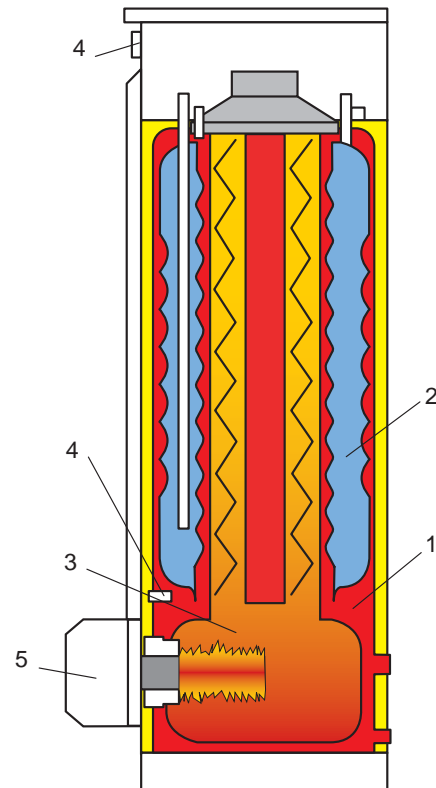


Fig. 15: Brief description of the boiler

1. Primary fluid
2. Domestic hot water
3. Combustion chamber
4. Control thermostat
5. Burner

## 5 DESCRIPTION

### 5.3 BUILD FEATURES

#### 5.3.1 OUTER BODY

The outer body containing the primary fluid is made of STW 22 steel.

#### 5.3.2 TANK-IN-TANK TYPE EXCHANGER ACCUMULATOR

The ring-shaped inner tank with its large heating surface, used for producing domestic hot water, is built using Chrome/Nickel 18/10 stainless steel. It is corrugated all the way up to the top using an exclusive production process and entirely argon arc welded using the TIG (Tungsten Inert Gas) method.

#### 5.3.3 COMBUSTION GAS CIRCUIT

The combustion gas circuit is protected by a coat of paint. The combustion gas circuit comprises:

##### 5.3.3.1 Flue pipes

Depending on output, the various DELTA Performance models contain either 4 or 8 steel flue pipes with an inner diameter of 64 mm. Each pipe is fitted with a special steel baffle designed to improve heat exchange and reduce the flue gas temperature.

##### 5.3.3.2 Combustion chamber

All DELTA Performance models feature a fully water-cooled combustion chamber.

#### 5.3.4 INSULATION

The boiler body is fully insulated by rigid polyurethane foam with a high thermal insulation coefficient. This is sprayed onto the tank without using any CFCs.

#### 5.3.5 JACKET

The boiler is covered by a steel jacket which has been scoured and phosphated before being stove finished at 220° C.

#### 5.3.6 BURNER

DELTA Performance F25 and F35 boilers are shipped with the ACV BM R 31 gas burner, F45 boilers are fitted with the ACV BM R 51 burner and the F55 boiler can be fitted with the ACV BM 101 burner. These new generation burners incorporate the latest technological developments and meet all safety, efficiency and clean combustion requirements. They come fitted with a preheating device, with the exception of the BM 101. DELTA G25, G35, G45 and G55 performance boilers all ship with the ACV BG 2000-S gas burner.



#### IMPORTANT

For assembly, the various settings, start-up and servicing please see the technical instructions which come with the burner.

#### 5.3.7 CONTROL PANEL (FIG. 17)

- 1 - Thermostat adjustable between 60° and 90° C
- 2 - On/off switch
- 3 - Summer/Winter selector switch
- 4 - Thermometer
- 5 - Knockout for control system (optional).

1. Inner ring-shaped tank containing the domestic hot water
2. External body containing central heating circuit
3. Insulation
4. Jacket
5. Flue pipes
6. Baffles
7. Thermostat adjustable between 60° and 90° C
8. Lower central heating return
9. Combustion chamber
10. Chamber plate
11. Emptying the boiler
12. Upper central heating flow pipe and return
13. Chimney connection
14. Control panel
15. Domestic hot water outlet
16. Domestic cold water inlet
17. Cut-off thermostat 95° C / Thermometer
18. Manually reset 103° C safety thermostat
19. Gas or oil burner

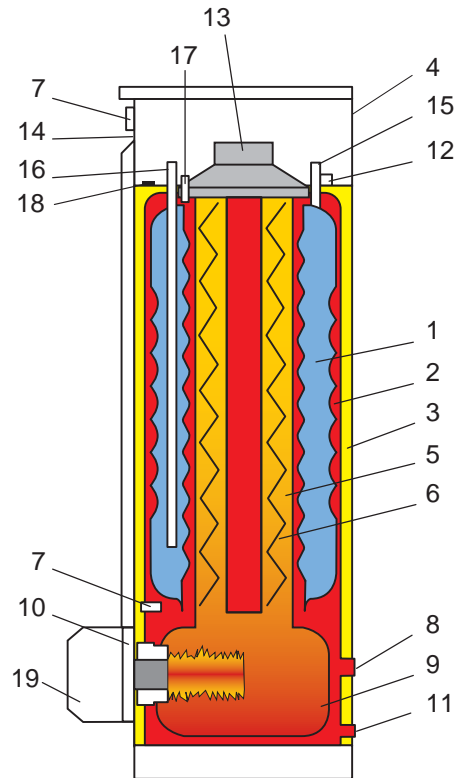


Fig. 16: The boiler



Fig. 17: Control panel

## 6 TECHNICAL SPECIFICATIONS

### 6.1 EFFECTIVE DIMENSIONS

Units are shipped fully assembled, tested and packed on a timber base with shockproof edges and protected by a heat-shrunk plastic film. On reception and after unpacking, check the equipment for any damage. For transportation purposes, please see the weights and dimensions given below:

### 6.2 MAXIMUM OPERATING CONDITIONS

**Maximum operating pressure** (tank full of water)

- Primary circuit: 3 bar
- Secondary circuit: 10 bar

**Test pressure** (tank full of water)

- Primary circuit: 4.5 bar
- Secondary circuit: 13 bar

**Operating temperature**

- Maximum temperature: 90° C

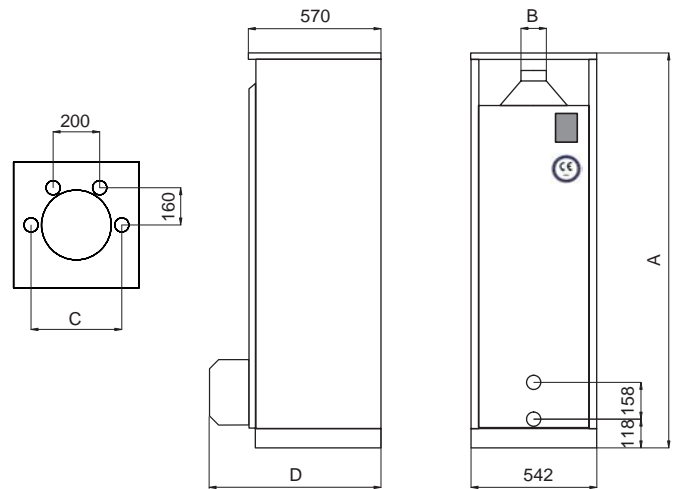


Fig. 18: Effective dimensions

Dimensions	25	35	45	55	F25	F35	F45	F55	G25	G35	G45	G55
<b>A</b>	1497	1697	1497	1697	1497	1697	1497	1697	1497	1697	1497	1697
<b>B</b>	130	130	150	150	130	130	150	150	130	130	150	150
<b>C</b>	360	360	390	390	360	360	390	390	360	360	390	390
<b>D</b>	565	565	565	565	818	818	818	848	755	755	755	755
<b>Kg</b>	145	156	168	200	157	168	180	212	159	170	182	214

### 6.3 DOMESTIC HOT WATER PERFORMANCE

Domestic hot water performance			25 - F25 - G25	35 - F35 - G35	45 - F45 - G45	55 - F55 - G55
<b>OPERATING AT 80° C</b>						
Peak flow at 40° C	( $\Delta T = 30^\circ C$ )	<b>l/10'</b>	268	285	316	362
Peak flow at 40° C	( $\Delta T = 30^\circ C$ )	<b>l/60'</b>	806	1035	1284	1533
Continuous flow 40° C	( $\Delta T = 30^\circ C$ )	<b>l/h</b>	645	900	1161	1405
<b>OPERATING AT 80° C</b>						
Start-up		<b>minutes</b>	32	29	16	16
After drawing off 140 l at 45° C		<b>minutes</b>	15	11	9	7

### 6.4 BOILERS WITHOUT BURNER

		25	35	45	55
Heat release rate (input)	<b>kW</b>	25/33	33/45	42/61	50/69
Effective rated output (output)	<b>kW</b>	22/29	29/40	38/54	45/62
Maintenance loss at 60°C as % of rated value	<b>%</b>	1,36/1	1/0,79	0,8/0,56	0,75/0,6
Total capacity	<b>l</b>	157	178	132	162
Primary circuit capacity	<b>l</b>	83	104	70	82
Central heating connection	<b>Ø</b>	1"	1"	1"	1"
Domestic hot water connection	<b>Ø</b>	3/4"	3/4"	3/4"	3/4"
Hot water tank heat exchange surface	<b>m²</b>	1,59	1,59	1,99	2,46
Weight when empty	<b>Kg</b>	145	156	168	200

## 6 TECHNICAL SPECIFICATIONS

### Chamber plate (oil)

The chamber plate has 4 screws (M 10 x 20) for the fixing of the burner. It is protected from the radiation of the flame by an insulation blanket.

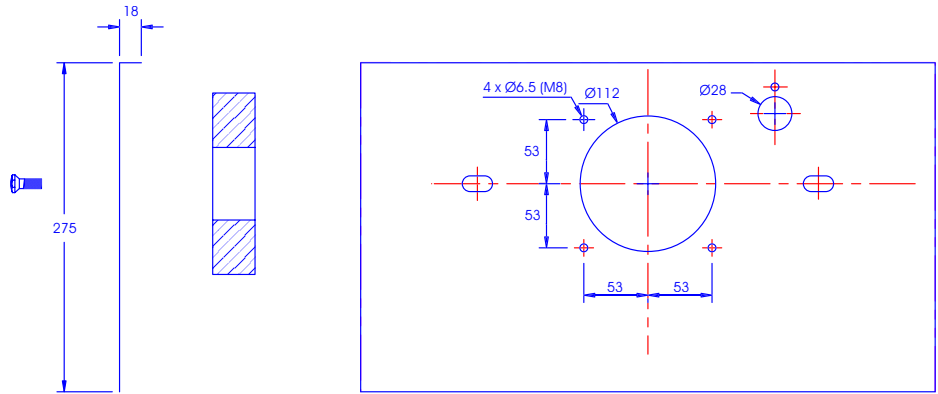


Fig. 19: Combustion chamber door detail

### 6.5 BOILERS WITH ACV OIL BURNER

#### 6.5.1 GENERAL SPECIFICATIONS

		F25	F35	F45	F55
Heat release rate (input)	<b>kW</b>	25/33	33/45	42/61	50/69
Effective rated output (output)	<b>kW</b>	22/29	29/40	38/54	45/62
Combustion efficiency	<b>%</b>	91,7	90,5	91	92,5
Maintenance loss at 60°C as % of rated value	<b>%</b>	1,36/1	1/0,79	0,8/0,56	0,6/0,45
Mass flow rate of combustion products	<b>g/sec.</b>	11	14,3	18,1	28,9
Average CO <sub>2</sub>	<b>%</b>	13	13	13,3	13
Total capacity	<b>litres</b>	157	178	132	151
Primary circuit capacity	<b>litres</b>	83	104	70	82
Central heating connection	<b>Ø</b>	1"	1"	1"	1"
Domestic hot water connection	<b>Ø</b>	3/4"	3/4"	3/4"	3/4"
Hot water tank heat exchange surface	<b>m<sup>2</sup></b>	1,59	1,59	1,99	2,46
Weight when empty	<b>Kg</b>	157	168	180	214

#### 6.5.2 OIL BURNER SPECIFICATIONS

		F25	F35	F45	F55
<b>BRULEUR</b>		<b>BM R 31</b>	<b>BM R 31</b>	<b>BM R 51</b>	<b>BM 101</b>
Output	<b>kW</b>	12/48	12/48	42/60	55/130
Electrical power	<b>W</b>	150	150	150	185
Nozzle	<b>gal/h</b>	0,6	0,75	0,85	1,50
Nozzle angle		60°	60°	60° B	60° B
Oil flow rate	<b>Kg/h</b>	2,18	2,84	3,60	5,76
Pump pressure	<b>bar</b>	11,2	12	15	10
Flue gas index		0,6	0,3	0,4	0,5
Air flap setting		4,5	4,8	4,5	5
Combustion head setting		1	2,83	4 at 5	
Flue pressure drop	<b>mbar</b>	0,02/0,09	0,08/0,09	0,01/0,08	0,02/0,05
Weight	<b>Kg</b>	12	12	12	14

		<b>BM R 31</b>	<b>BM R 51</b>	<b>BM 101</b>
	A mm	240	240	260
	B mm	270	270	300
	C mm	215	215	250
	D mm	280	280	310
	E mm	60 - 130	60 - 130	60 - 150
	F	M 8	M 8	M 8
	G Ø	80	80	90
	L Ø	85	85	95
LK Ø	140 - 165	140 - 165	125 - 180	

Fig. 20: ACV oil burner specifications

## 6 TECHNICAL SPECIFICATIONS

### 6.6 BOILERS WITH ACV BG 2000-S GAS BURNER

#### 6.6.1 BURNER SPECIFICATIONS / REFERENCE GAS

		G25	G35	G45	G55
Burners		BG 2000-S/25	BG 2000-S/35	BG 2000-S/45	BG 2000-S/55
Heat release rate (input)	<b>kW</b>	25	34,9	45	55
Effective rated output (output)	<b>kW</b>	22,45	31,35	40,5	49
Combustion efficiency	<b>%</b>	91,7	91,5	92,4	92
CO <sub>2</sub> natural gas	<b>%</b>	9,1	9	8,9	9
<b>Gas G20 - 20 mbar - I 2E(S)B - I 2Er - I 2H - I 2ELL - I 2E</b>					
Flow	<b>m<sup>3</sup>/h</b>	2,65	3,70	4,76	5,8
Upstream gas pressure	<b>mbar</b>	20	20	20	20
<b>Gas G25 - 20 mbar - I 2ELL / 25 mbar - I 2L</b>					
Flow	<b>m<sup>3</sup>/h</b>	3,07	4,3	5,52	7,98
Upstream gas pressure	<b>mbar</b>	25	25	25	25
<b>Gas G31 - 30/37/50 mbar - I 3P</b>					
Flow	<b>m<sup>3</sup>/h</b>	1,02	1,43	1,84	2,25
Upstream gas pressure	<b>mbar</b>	37/50	37/50	37/50	37/50
Net T° of burnt gases	<b>°C</b>	170	173	153	165
Flow	<b>%</b>	1,36	1	0,8	0,7
Upstream gas pressure	<b>Kg</b>	159	170	182	214
Type of chimney connection		B23	B23	B23	B23

BE	I 2E(S)B
FR	I 2Er
AT - DK ES - GB IT - PT IE - SE	I 2H
BE - FR ES - GB IE - PT	I 3P
NL	I 2L
DE	I 2ELL
LU	I 2E

#### 6.6.2 ACV BG 2000-S AIR/GAS PREMIX GAS BURNERS

The air/gas premix BG 2000-S burner is fitted with a Honeywell gas valve, a venturi tube and an electrical control relay. The gas valve has been specially developed for low NO<sub>x</sub> air/gas premix burners with automatic lighting and flame detection by ionisation.

The pressure at the gas valve outlet is equal to the air pressure at the neck of the venturi tube, reduced as the offset is adjusted. The fan sucks in the combustion air through the venturi tube which the gas inlet leads into. As it goes through, the air creates a vacuum to the right of the neck of the venturi tube and sucks in the gas at the venturi tube outlet. A perfect air/gas mix then goes through the fan and then goes on towards the ramp.

The electrical control relay built into the gas valve ensures that the flame on the burner is properly it and controlled.

This principle guarantees silent and totally safe operation:

- if there is not enough air, the vacuum in the venturi tube falls, the gas flow is reduced, the flame goes out and the gas valve is closed. The burner is locked out.
- if there is any restriction in the discharging of the burnt gases, the air flow drops and this leads to the same reactions as those described above leading to the burner being shut down, locked out.

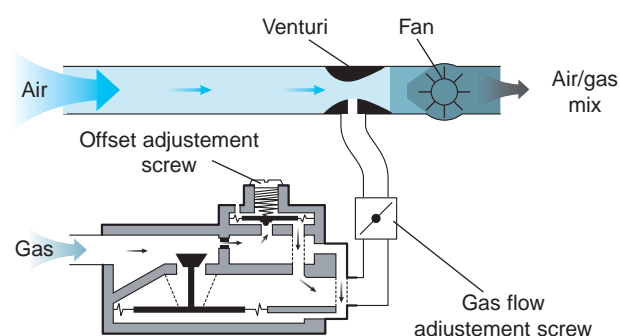


Fig. 21: Wiring diagram

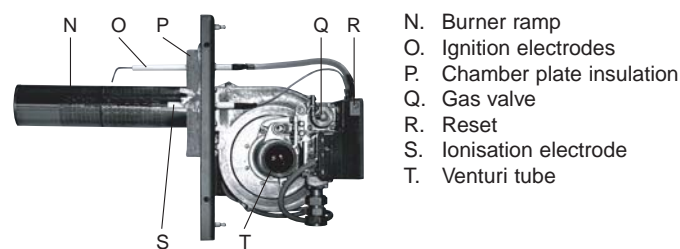


Fig. 22a: Side view of the 2000-S

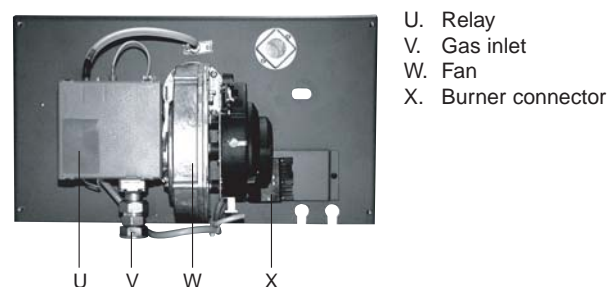


Fig. 22b: Frontal view of the BG 2000-S



**The BG 2000-S burner is factory preset to natural gas.**

#### Conversion to propane:



**Prohibited in Belgium.**

Conversion kit enclosed with the burner comprising:

- Gate disk(s)
- Rating plate(s)
- Settings sticker.
- Assembly instructions.

## 7.1 USING THE BOILER

### 7.1.1 LEARNING YOUR WAY AROUND THE CONTROL PANEL (Fig. 23)



**Before carrying out any work on the boiler, switch the power off at the mains switch installed in the boiler room by the electrician. Turn the ON/OFF switch on the control panel off.**  
(item marked 2, Fig. 23)

#### 1 - Thermostat adjustable between 60 and 90° C (item marked 1, Fig. 23)

Central heating systems are generally designed to operate at a maximum of 80° C. When used at lower temperatures, a 3-way mixer valve installed on the heating flow pipe (see Fig. 3 on page 3) allows the temperature to be set manually or, if you decide to install a regulator (§ 2.2.4), automatically.

We recommend that you set the thermostat to the maximum values to get the best out of the domestic hot water system.



**There is a risk of burns from hot water!**

The water stored in the domestic hot water tank in the boiler can be at a very high temperature.

In all cases, install the thermostatic mixer (Fig. 5b on page 4) on the domestic hot water flow pipe which must not exceed 60° C. A mixer or mixing valve at each point of use is recommended.

#### 2 - ON/OFF switch (item marked 2, Fig. 23)

This must be used to switch the boiler off before carrying out any work on it.

#### 3 - Summer/Winter selector switch (item marked 3, Fig. 23)

“Winter” position: provides both domestic hot water and central heating functions. “Summer” position: The room thermostat or regulator (§ 2.2.4) is switched off. The central heating circulator is also switched off. Only the domestic hot water function is provided. You can use the thermostat (1) to reduce the temperature and save energy. If there is not enough hot water available, we recommend setting the thermostat (1) to its maximum value.

When the weather turns cold again, simply select “Winter” to reactivate the heating system.

#### 4 - Thermometer (item marked 4, Fig. 23)

Reads the boiler primary circuit (central heating) temperature directly.

#### 5 - Controller (item marked 5, Fig. 23)

Please refer to the enclosed instructions if you have chosen this option.

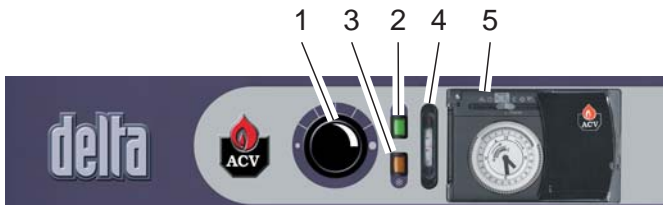


Fig. 23: Control panel

## 7.1.2 CENTRAL HEATING SYSTEM GAUGE PRESSURE

Your system is fitted with a central heating safety valve, set to 3 bar, which is fitted with a pressure gauge.

First make sure that the water in the system is still pressurised. When cold and after the air in the system has been bled, the pressure gauge should show a pressure of between 1 and 2, depending on the height of the building: (1 bar = 5 m / 1.5 bar = 10 m and 2 bar = 15 m).

To add water, open the filling valve (Fig. 2 and 3 on page 3). Make sure the valve is properly closed after filling. Bleed the air in the system to get an accurate water pressure reading.

### 7.1.3 SAFETY VALVE (central heating)

(item marked 2, Fig. 3 on page 3)



**The water, which may flow out of the safety valve is very hot and may cause serious burns. The pipe discharging to waste water disposal system should be open to the atmosphere and installed in accordance with current regulations. Make sure there is nobody near the flow of hot water.**



**If you notice anything unusual after this short trial, please inform the installing engineer.**

### 7.1.4 SAFETY UNIT (domestic hot water)

(item marked 1, Fig. 5a and 5b on page 4)

A monthly inspection is recommended:

Lift the lever on the emptying device for a few seconds to ensure that the safety valve is working properly.



**The water flowing out of the safety unit may be extremely hot. The pipe discharging to waste water disposal system should be open to the atmosphere and installed in accordance with current regulations. Make sure there is nobody near the flow of hot water.**



**If you notice anything unusual after this short trial, please inform the installing engineer.**

## 7 USER GUIDE

### 7.1.5 OIL BURNER - RESETTING

If the red light on the burner lights up, this indicates an operating fault. Wait five minutes before resetting the burner by pressing the button located on the cover.

If the burner fails to start up again, call the installing engineer after ensuring that the fault is not due to a power cut or low oil in the tank.



Fig. 24: Oil burner reset button

### 7.1.6 GAS BURNER - RESETTING

If the burner is not working:

1. Remove the protective cover.
2. Press the "red" button to start the burner.

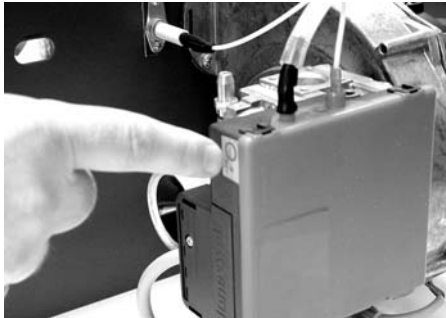


Fig. 25: Gas burner reset button

3. If the burner is working, replace the cover.



**If the burner is not working, isolate the electricity supply before attempting to reset the safety thermostat.**

4. Remove the front panel and reset the safety thermostat located on the top of the boiler.



**Wait until the boiler temperature drops below 60°C. Then replace the front panel.**



Fig. 26: Safety thermostat reset button.

5. If the burner is working, replace the burner cover.
6. If the fault persists, please notify the installing engineer.

#### **Starting the burners.**

In normal operation, the gas burner starts up automatically provided that the boiler temperature falls below the set point.



**To ensure your system operates properly, have it professionally serviced once a year before the cold weather starts.**

### 7.1 BOILER ROOM

- Keep vents free at all times.
- Do not store any inflammable products in the boiler room.
- Take care not to store any corrosive products, such as paints, solvents, chlorine, salt, soap and other cleaning products, near the boiler.
- If you smell gas, do not switch on the light or light a flame. Turn off the mains gas tap at the meter and inform the appropriate services immediately.



excellence in hot water

www.acv-world.com

#### INTERNATIONAL

**ACV international n.v**  
KERKPLEIN, 39  
B-1601 RUIJBROEK - BELGIUM  
TEL.: +32 2 334 82 20  
FAX: +32 2 378 16 49  
E-MAIL: international.info@acv-world.com

#### BELGIUM

**ACV BELGIUM nv/sa**  
KERKPLEIN, 39  
B-1601 RUIJBROEK-BELGIUM  
TEL.: +32 2 334 82 40  
FAX: +32 2 334 82 59  
E-MAIL: belgium.info@acv-world.com

#### CHILE

**ALBIN TROTTER Y ACV LTDA**  
SAN PABLO 3800  
QUINTA NORMAL - SANTIAGO - CHILE  
TEL.: +56 2 772 01 69  
FAX: +56 2 772 92 62/63  
E-MAIL: chile.info@acv-world.com

#### CZECH REPUBLIC

**ACV CR SPOL. s.r.o**  
NA KRECKU 365  
CR-109 04 PRAHA 10 - CZECH REPUBLIC  
TEL.: +420 2 720 83 341  
FAX: +420 2 720 83 343  
E-MAIL: ceskarepublika.info@acv-world.com

#### DEUTSCHLAND

**ACV WÄRMETECHNIK GMBH & CO KG**  
GEWERBEGBIET GARTENSTRASSE  
D-08132 MÜLSEN OT ST. JACOB - DEUTSCHLAND  
TEL.: +49 37601 311 30  
FAX: +49 37601 311 31  
E-MAIL: deutschland.info@acv-world.com

#### ESPAÑA

**ACV ESPAÑA**  
C/DE LA TEIXIDORA, 76  
POL. IND. LES HORTES  
E-08302 MATARÓ - ESPAÑA  
TEL.: +34 93 759 54 51  
FAX: +34 93 759 34 98  
E-MAIL: spain.info@acv-world.com

#### ARGENTINA

**TECNO PRACTICA**  
ALFEREZ BOUCHARD 4857  
1605 CARAPACHAY - BUENOS AIRES  
TEL.: +54 11 47 65 33 35  
FAX: +54 11 47 65 43 07  
E-MAIL: jchas@tecnopractica.com

#### AUSTRALIA

**HUNT HEATING PTY LTD**  
10 GARDEN BOULEVARD  
3172 VICTORIA - AUSTRALIA  
TEL.: +61 3 9558 7077  
FAX: +61 3 9558 7027  
E-MAIL: enquiries@huntheat.com.au

#### BRAZIL

**SIMETAL INDUSTRIA E COMERCIO DE FERRAMENTAS LTDA**  
RUA GERSON ANDREIS 535  
95112 - 130 CAXIAS DO SUL - BRAZIL  
TEL.: +55 54 227 12 44  
FAX: +55 54 227 12 26  
E-MAIL: export@simetall.com.br

#### BULGARIA

**PROXIMUS ENGINEERING LTD**  
7 BIAL KREM STR.  
9010 VARNNA - BULGARIA  
TEL.: +359 52 500 070  
FAX: +359 52 301 131  
E-MAIL: info@proximus-bg.com

#### CHINA

**BEIJING HUADIAN HT POWER TECHNOLOGY DEVELOPMENT CO. LTD**  
ROOM B-912, TOWER B, COFCO PLAZA  
N°. 8, JIANGUOMENNEI AVENUE  
BEIJING 100005 - PEOPLE'S REPUBLIC OF CHINA  
TEL.: +86 10 652 30 363/393 EXT 101  
FAX: +86 10 652 27 071  
E-MAIL: li.zheng@acv-world.com

#### SHANGHAI COOLTECH LTD

14/F E. CHINA MERCHANTS PLAZA  
N°. 333 CHENGDU ROAD (N)  
200041 SHANGHAI - CHINA  
TEL.: +86 21 52 98 11 22 - 820  
FAX: +86 21 52 98 13 58  
E-MAIL: cooltech@cooltech.sh.cn

#### FRANCE

**ACV FRANCE sa**  
31, RUE AMPERE - Z.I MI - PLAINE  
F-69680 CHASSIEU - FRANCE  
TEL.: +33 4 72 47 07 76  
FAX: +33 4 72 47 08 72  
E-MAIL: france.info@acv-world.com

#### ITALIA

**ACV ITALIA**  
VIA PANA 92  
I-48018 FAENZA (RA) - ITALIA  
TEL.: +39 0546 64 61 44  
FAX: +39 0546 64 61 50  
E-MAIL: italia.info@acv-world.com

#### NEDERLAND

**ACV NEDERLAND bv**  
POSTBUS 350  
NL-2980 AJ RIDDERKERK - NEDERLAND  
TEL.: +31 180 42 10 55  
FAX: +31 180 41 58 02  
E-MAIL: nederland.info@acv-world.com

#### POLAND

**ACV POLSKA sp. z o.o.**  
UL. WITOSA 3  
87 - 800 WŁOCŁAWEK - POLAND  
TEL.: +48 54 412 56 00  
FAX: +48 54 412 56 01  
E-MAIL: polska.info@acv-world.com

#### PORTUGAL

**BOILERNOX LDA**  
RUA OUTEIRO DO POMAR  
CASAL DO CEGO, FRACÇÃO C,  
PAVILHÃO 3 - MARRAZES  
2400-402 LEIRIA - PORTUGAL  
TEL.: +351 244 837 239/40  
FAX: +351 244 823 758  
E-MAIL: boilernox@mail.telepac.pt

#### RUSSIA

**ACV RUSSIA**  
1/9, MAL'YI KISEL'NYI  
103031 MOSCOW - RUSSIA  
TEL.: +7 095 928 48 02 / +7 095 921 89 79  
FAX: +7 095 928 08 77  
E-MAIL: russia.info@acv-world.com

#### DENMARK

**VARMEHUSET**  
FRICHSVEJ 40 A  
8600 SILKEBORG - DENMARK  
TEL.: +45 86 82 63 55  
FAX: +45 86 82 65 03  
E-MAIL: vh@varmehuset.dk

#### ESTONIA

**TERMOMX AS**  
TAHE 112A  
51013 TARTU - ESTONIA  
TEL.: +372 736 73 39  
FAX: +372 736 73 44  
E-MAIL: termox@termox.ee

#### GREECE

**ESTIAS**  
MARASLI STREET 7  
54248 THESSALONIKI - GREECE  
TEL.: +30 23 10 31 98 77 / +30 23 10 32 03 58  
FAX: +30 23 10 31 97 22  
E-MAIL: info@genikithermanseon.gr

#### ÎLE MAURICE

**SOTRATECH**  
29, RUE MELDRUM  
BEAU BASSIN - ÎLE MAURICE  
TEL.: +230 46 76 970  
FAX: +230 46 76 971  
E-MAIL: stech@intnet.mu

#### LITHUANIA

**UAB "GILIUS IR KO"**  
SAVARNORIŲ PR. 192  
3000 KAUNAS - LITHUANIA  
TEL.: +370 37 308 930  
FAX: +370 37 308 932

#### MAROC

**CASATHERM**  
PLACÉ EL YASSIR  
20300 CASABLANCA - MAROC  
TEL.: +212 22 40 15 23  
FAX: +212 22 24 04 86

#### SLOVAK REPUBLIC

**ACV SLOVAKIA s.r.o.**  
PLUHOVÁ 49  
831 04 BRATISLAVA - SLOVAK REPUBLIC  
TEL.: +421 2 444 62 276  
FAX: +421 2 444 62 275  
E-MAIL: slovakia.info@acv-world.com

#### SLOVENIA

**ACV D.O.O. SLOVENIA**  
OPEKARNA 22b  
1420 TRBOVLJE - SLOVENIA  
TEL.: +386 356 32 830  
FAX: +386 356 32 831  
E-MAIL: slovenia.info@acv-world.com

#### UK

**ACV UK Ltd**  
ST. DAVID'S BUSINESS PARK  
DALGETY BAY - FIFE - KY11 9PF  
TEL.: +44 1383 82 01 00  
FAX: +44 1383 82 01 80  
E-MAIL: uk.info@acv-world.com

#### USA

**TRIANGLE TUBE PHASE III**  
FREEWAY CENTER - 1 TRIANGLE LANE  
BLACKWOOD NJ 08012 - USA  
TEL.: +1 856 228 8881  
FAX: +1 856 228 3584  
E-MAIL: sales@triangletube.com

#### NEW ZEALAND

**ENERGY PRODUCTS INTERNATIONAL**  
8/10 BELFAST PLACE  
PO BOX 15058 HAMILTON - NEW ZEALAND  
TEL.: +64 7 847 27 05  
FAX: +64 7 847 42 22  
E-MAIL: pmckenzie@tycoint.com

#### ÖSTERREICH

**PROTHERM HEIZUNGSTECHNIK GmbH**  
TRAUNUFERSTRASSE 113  
4052 ANSFELDEN - ÖSTERREICH  
TEL.: +43 7229 804 82  
FAX: +43 7229 804 92  
E-MAIL: protherm@nextra.at

#### ROMANIA

**SC TRUST EURO THERM SA**  
D.N PIATRA NEAMT - ROMAN  
km 2 C.P 5 O.P 3 jud. Neamt  
5600 PIATRA NEAMT - ROMANIA  
TEL.: +40 233 20 62 06  
FAX: +40 233 20 62 00  
E-MAIL: office@eurotherm.ro

#### TUNISIE

**SO.CO.ME CHAUMAX**  
BOÎTE POSTALE N°44  
1002 TUNIS - TUNISIE  
TEL.: +216 71 78 15 91  
FAX: +216 71 78 87 31

#### UKRAINE

**UKRTEPLOSERVICE LTD**  
PR. LAGUTENKO 14  
83086 DONETSK - UKRAINE  
TEL.: +38 062 382 60 47/48  
FAX: +38 062 335 16 89