

delta

performance

delta performance
ventouse FV

EN *INSTALLATION OPERATING AND
SERVICING INSTRUCTIONS*

FR *NOTICE D'INSTALLATION,
D'UTILISATION ET D'ENTRETIEN*

NL *GEBRUIKSHANDLEIDING EN
INSTALLATIEVOORSCHRIFT*



excellence in hot water

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EN ISO 9002 : 1994 Certification



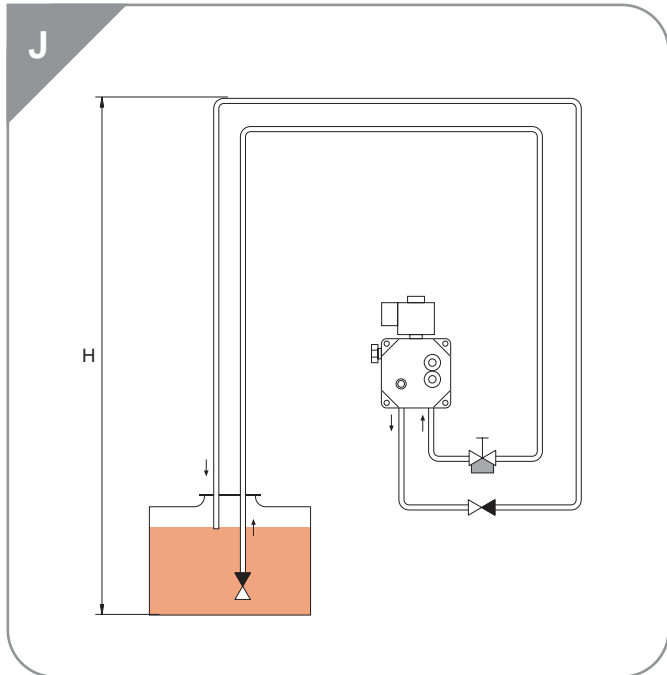
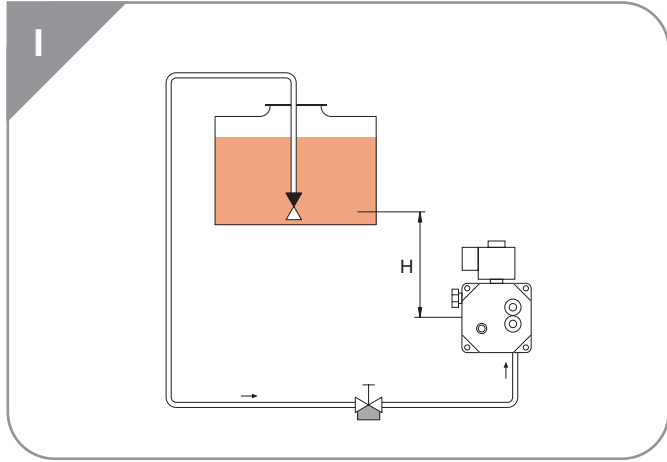
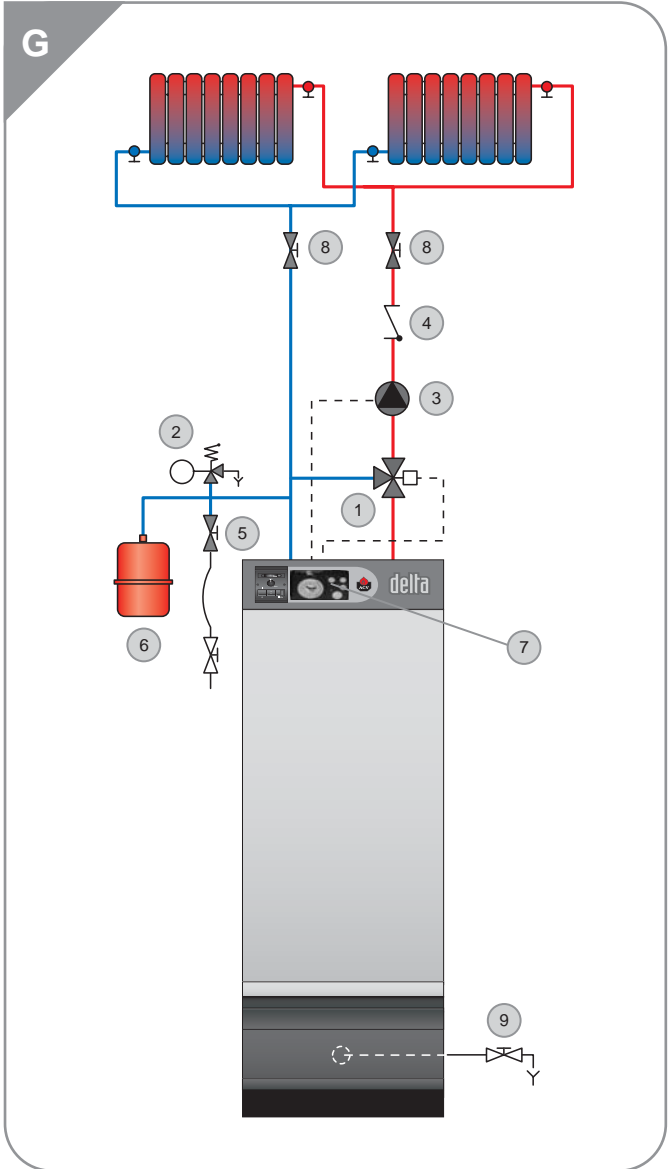
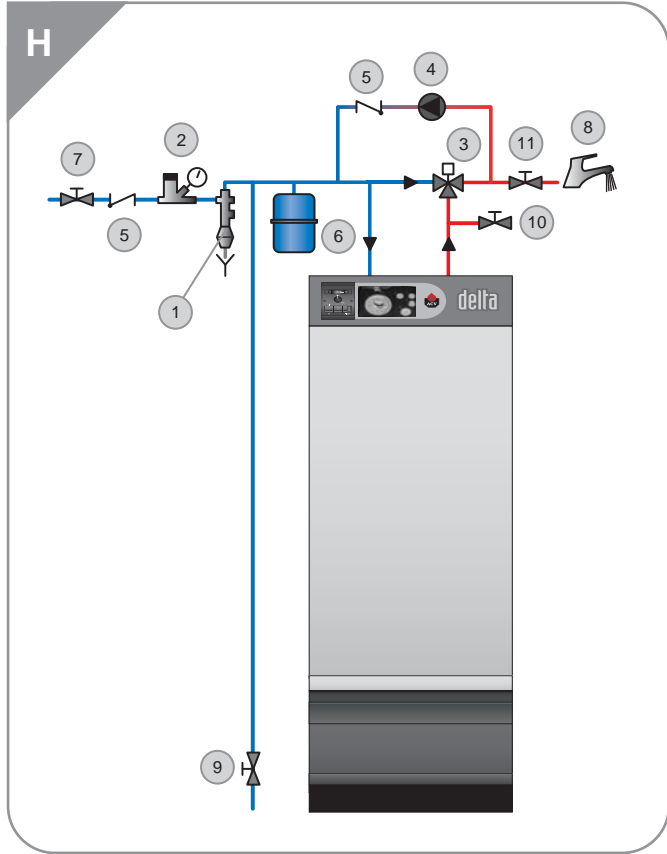
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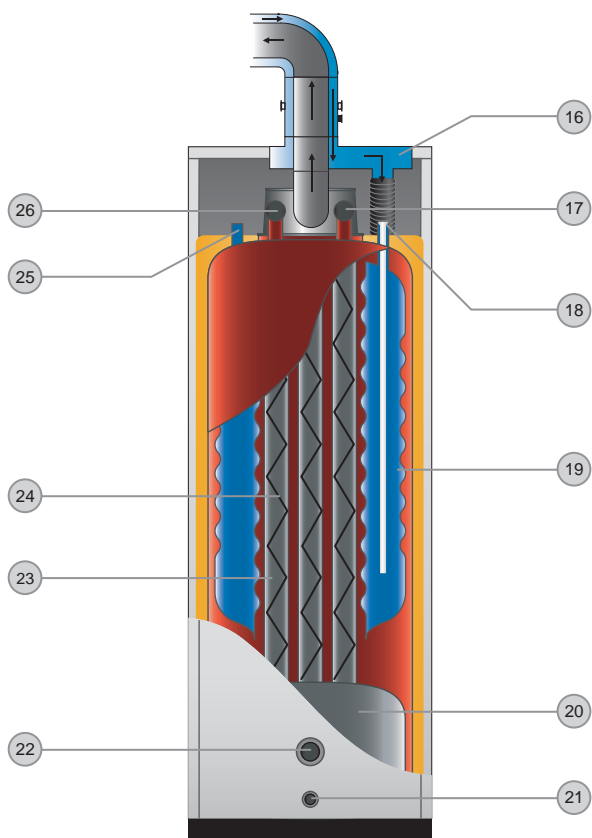
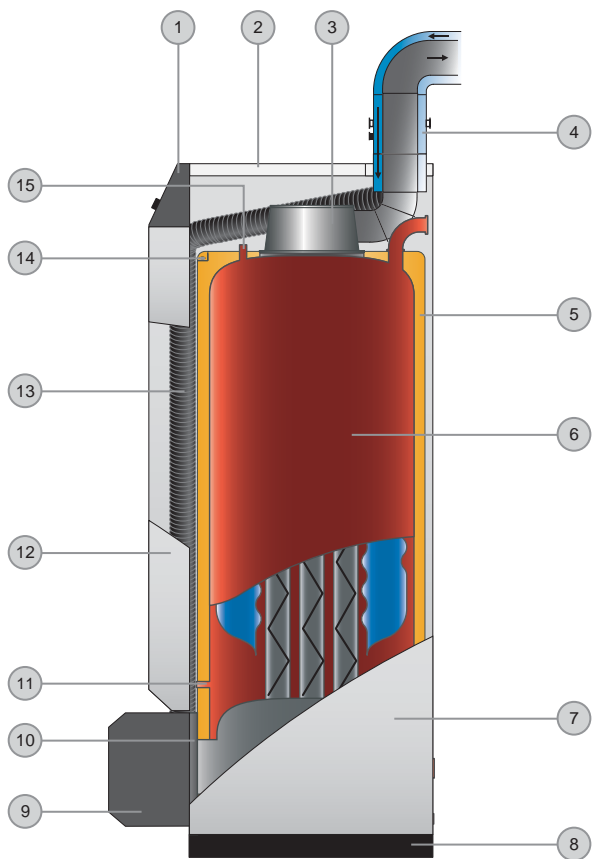
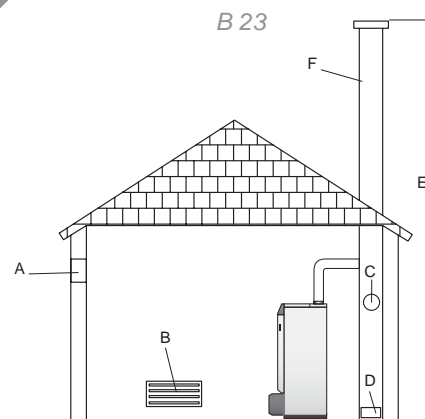
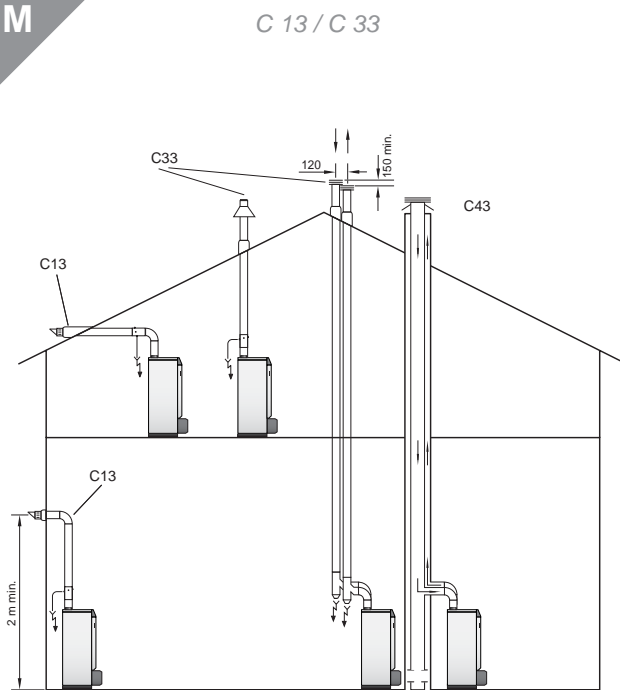
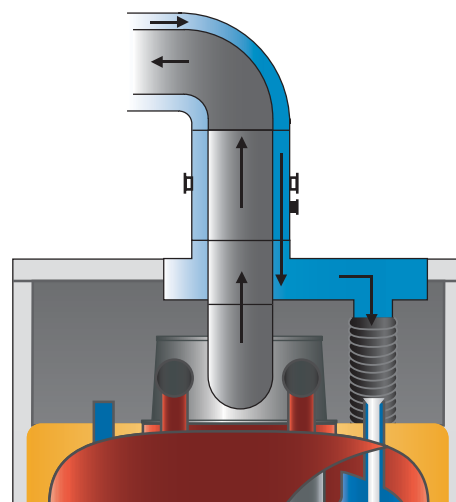
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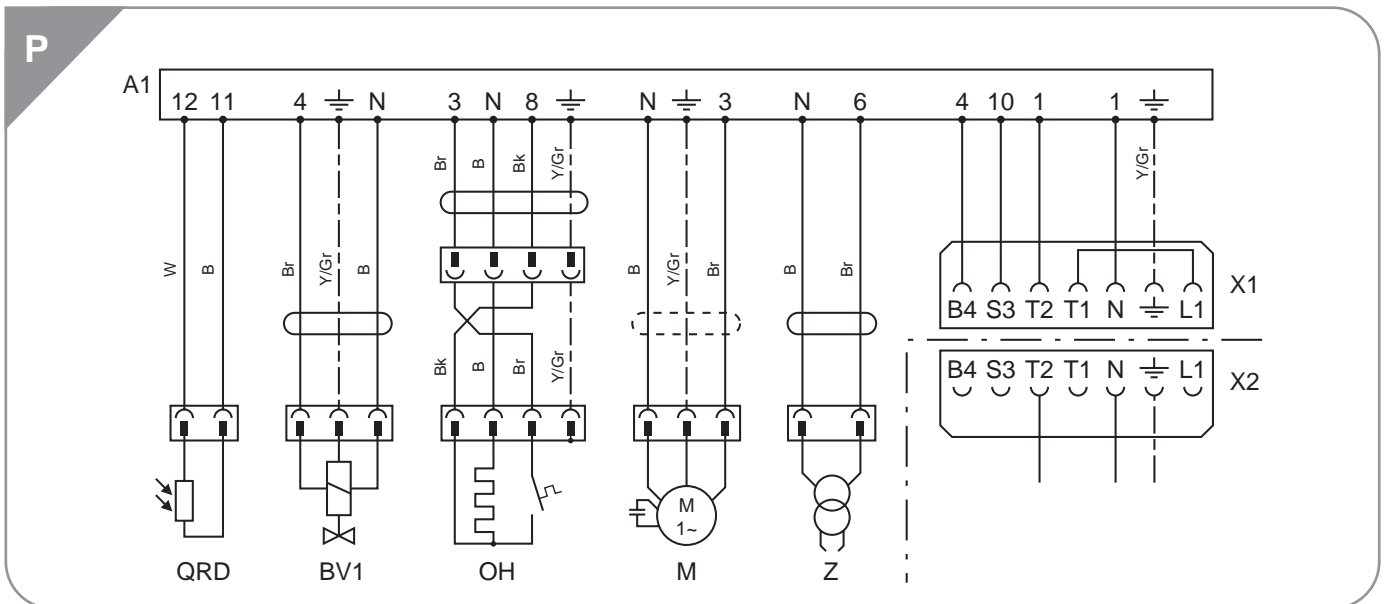
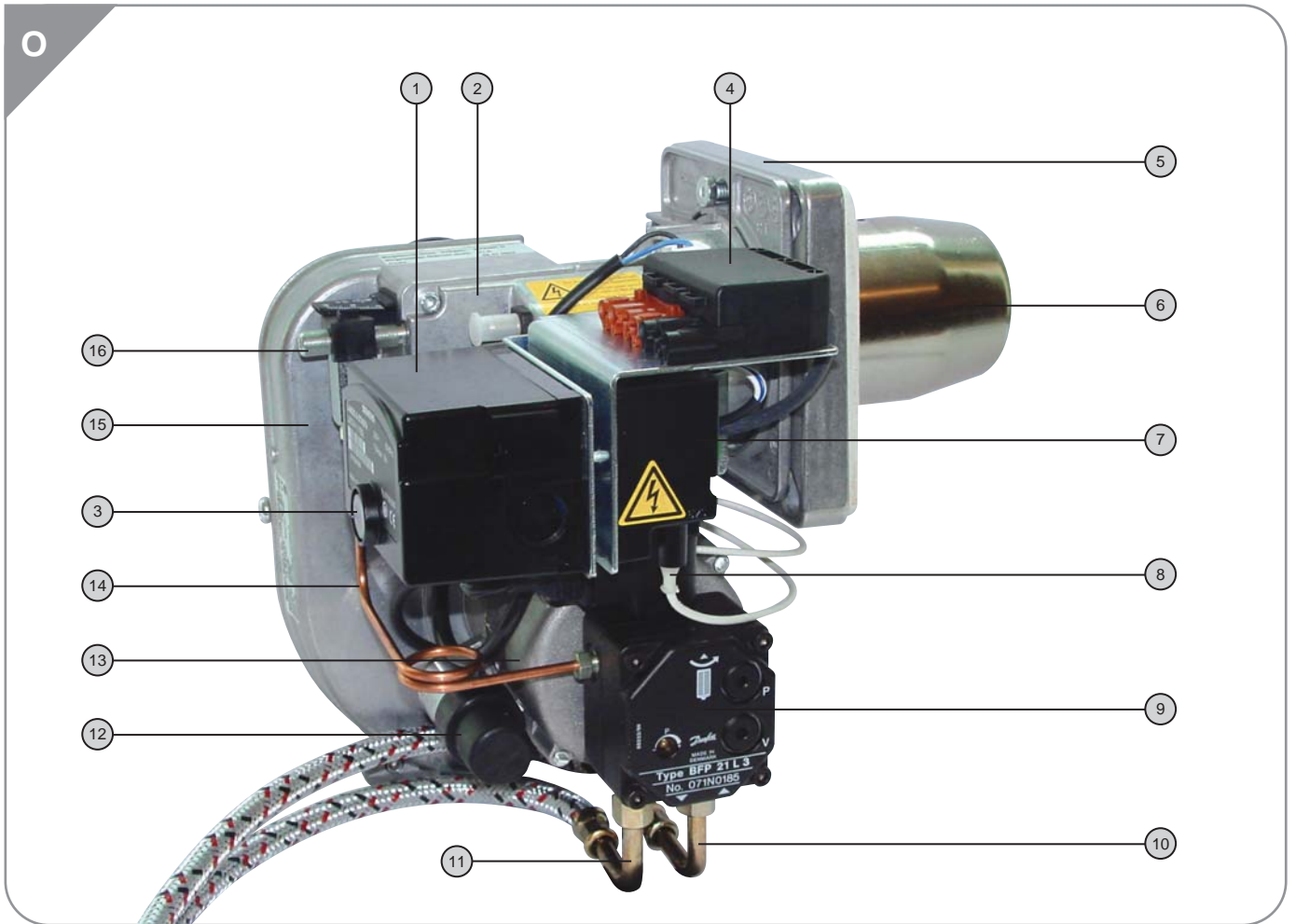


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K**L****M****N**



INSTALLATION, OPERATING AND SERVICING INSTRUCTIONS

delta performance
balanced flue

**FV 35
with ACV
BMV(K)1
oil burner**

**FV 50
with ACV
BMV(K)2
oil burner**



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INTENDED USERS OF THESE INSTRUCTIONS

These instructions are intended for:


- specifying engineers
- installing engineers
- users
- servicing technicians


SYMBOLS

The following symbols are used in these instructions:

 **Essential instruction for operating the system correctly.**

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

 **Danger of electrocution.**

 **Risk of burns.**

APPLICABLE STANDARDS

The products have received the "EC" certificate of compliance with standards of individual countries (European Directive 92/42/EEC, "efficiency"). These products also have the Belgian OPTIMAZ mark.




WARNINGS

These instructions are an integral part of the equipment to which they refer and must be supplied to the user.

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

ACV accepts no liability for any damage resulting from incorrect installation or from the use of components or fittings not specified by ACV.

 **Failure to observe instructions regarding tests and test procedures can result in personal injury or pollution risks.**

Note:
ACV reserves the right to modify the technical specifications and components of its products without prior notice.

OVERVIEW

- Combination boiler (*central heating and domestic hot water*).
- TANK-IN-TANK indirect storage type domestic hot water production.
- Equipment required: a hydraulic connection kit for the heating circuit (available as an option).
- The control panel comprises an on/off switch, adjustable thermostat, thermometer, Summer/Winter selector and knockout for fitting the ACV integrated control system (*optional*).
- The Delta Performance FV can be connected as a balanced flue system with a type C concentric adapter..., or with a type B23 adapter directly to the chimney.
- The Delta Performance FV 35 with a fixed output of 35 is fitted with the ACV BMV1 oil burner.
- The Delta Performance FV 50 with a fixed output of 50 is fitted with the ACV BMV2 oil burner.

DESCRIPTION OF OPERATION

The "Tank-in-Tank" concept

The Delta Performance balanced flue series differs from traditional hot water generators because of its ring-shaped tank immersed in the primary fluid contained in the outer body. When there is a demand for heat from the central heating system or the domestic hot water system, the potentiometer starts the burner. The combustion gases quickly heat up the primary fluid, creating a natural circulation around the tank.

Domestic hot water heated indirectly

This circulation facilitates heat exchange between the primary fluid and the domestic water, which takes place all over the tank surface. The corrugations on the inner and outer shells of the ring-shaped tank further boost the area of heat exchange and speed up the heating process of the domestic water.

Easy setting with safety assured

With a single command, the water temperature of both the primary circuit and the hot water circuit is set by the adjustable thermostat situated under the tank in the primary circuit.

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

CONSTRUCTION FEATURES

Corps externe

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

"Tank-in-Tank" type exchanger accumulator

The ring-shaped inner tank with its large heating surface for producing domestic hot water is built of Chrome/Nickel 18/10 stainless steel. It is corrugated over its full height by an exclusive production process and entirely argon arc welded by the TIG (Tungsten Inert Gas) method.

Combustion gas circuit

The combustion gas circuit is protected by a high temperature resistant paint. It is composed of:

- Flue pipes. Delta Performance balanced flue models have 8 steel flue pipes with an internal diameter of 64 mm. Each pipe is fitted with a special steel baffle designed to improve heat exchange and reduce flue gas temperature.
- Combustion chamber. The sealed combustion chamber is water cooled.

Insulation

The boiler body is fully insulated by rigid polyurethane foam with a high thermal insulation coefficient, sprayed on without the use of CFCs.

Jacket

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

BOILER CAPTIONS (*see illustration K*)

1. Control panel
2. Removable jacket top
3. Flue reduction collar
4. Measuring unit
5. CFC-free polyurethane foam insulation
6. Inner ring-shaped domestic hot water tank
7. Side panel
8. Base
9. Burner and burner chamber plate cover
10. Burner chamber plate
11. Control thermostat bulb
12. Removable front panel
13. Tube supplying air to venturi
14. Manual reset safety thermostat - 103 °C
15. Cut-off thermostat bulb - 95 °C
16. Balanced flue connection unit
17. Heating return
18. Domestic cold water inlet
19. Inner ring-shaped domestic hot water tank
20. Combustion chamber
21. Boiler drain
22. Lower heating return
23. Flue pipes
24. Turbulators
25. Domestic hot water outlet
26. Central heating flow pipe

TECHNICAL SPECIFICATION

GENERALE

The units are delivered fully assembled, tested and packed on a timber base with shockproof edges and protected by heat-shrunk plastic film. On reception and after unpacking, check the equipment for damage. For transport purposes, refer to the weights and dimensions given below.

MAXIMUM OPERATING CONDITIONS

Maximum service 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

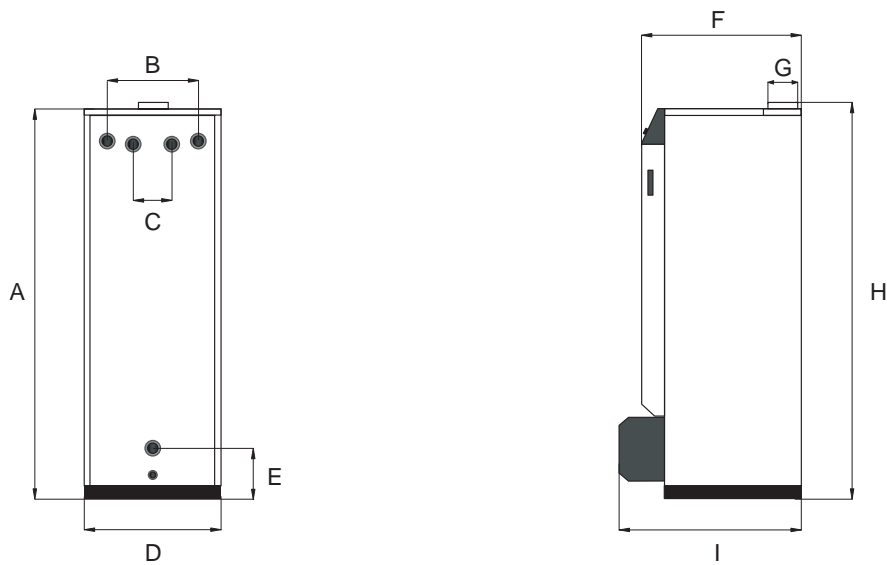
Operating temperature

- Maximum temperature: 90 °C

Water quality

- Chlorides: < 150 mg/l (Stainless steel 304)
< 2000 mg/l (Duplex)
- 6 □ pH □ 8

DIMENSIONS



		FV/35	FV/50
A	mm	1585	1830
B	mm	390	390
C	mm	200	200
D	mm	542	542
E	mm	125	125
F	mm	645	645
G	mm	80/80/125	100/100/150
H	mm	1610	1880
I	mm	800	800
Weight empty	Kg	182	220

DOMESTIC HOT WATER PERFORMANCE

		FV/35	FV/50
Operating at 80 °C			
Peak delivery at 40 °C ($\Delta T = 30$ °C)	L/10'	283	377
Peak delivery at 40 °C ($\Delta T = 30$ °C)	L/60'	1024	1485
Continuous delivery at 40 °C ($\Delta T = 30$ °C)	L/h	920	1352
Tank refill time at 60 °C			
Initial heating time	minutes	20	13
After drawing off 140 L at 45° C	minutes	10	8

GENERAL FEATURES

		FV/35	FV/50
Input	L/10'	34.9	50
Output	L/60'	32.62	46.75
Maintenance loss at 60 °C as % of rated value	%	0.8/0.7	0.6/0.45
Total capacity	L	127	162
Primary capacity	L	62	82
Heating connection	Ø	1"	1"
Domestic hot water connection	Ø	3/4"	3/4"
Hot water tank heat exchange surface	m²	1.99	2.46
Combustion efficiency	%	94.7	93.5
Average CO ₂	%	13	13
Mass rate of combustion products	g/sec.	14.8	21.2

INSTALLATION

BOILER ROOM

Important

- Keep vents free at all times.
- Do not store inflammable products in the boiler room.
- Take care not to store corrosive products near the boiler, such as paints, solvents, chlorine, salt, soap and other cleaning products.

Access

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

- front	500
- behind	150
- sides	100
- above	700

Ventilation

The boiler room must be fitted with top and bottom vents as shown in illustration "L".

The table below is an example compliant with the Belgian standard.

		FV/35	FV/50
Ventilation			
Min. fresh air requirement	m ³ /h	63	90
Top vent (A)	dm ²	1.5	1.5
Bottom vent (B)	dm ²	1.5	2
Draught regulator (C)	∅	80	100

Note:

(B) and (C) only for B23 type connections

For other countries, refer to their regulations.

Base

The base on which the boiler rests must be made of noncombustible materials.

CHIMNEY CONNECTIONS



IMPORTANT

Boilers must be installed by a qualified heating engineer, in accordance with the prevailing local standards and regulations.



The chimney diameter must not be less than the diameter of the boiler connection.

Chimney connection type: B23 (See illustration L)

The boiler is connected to the chimney by a metal pipe rising at an angle from the boiler to the chimney.

Un raccord de cheminée est nécessaire.

- A. Ventilation haute
- B. Ventilation basse
- C. Régulateur de tirage
- D. Regard de visite
- E. Hauteur de la cheminée tubée
- F. Diamètre de la cheminée

		FV/35	FV/50
Chimney			
E = 5 m ∅ min. F	mm	213	236
E = 10 m ∅ min. F	mm	179	199
E = 15 m ∅ min. F	mm	162	179



Note:

Since the regulations vary from one country to another, the table above is given for information only.



Due to the high efficiency of our boilers, the flue gases are released at high temperature.

Therefore there is a risk of condensation in these flue gases, which could damage some chimneys.

To avoid this risk, it is strongly recommended to line the chimney.

Contact your installer for more information.

Chimney connection type: C...

(see illustrations M and N)

- C 13 : concentric horizontal connection
- C 33 : concentric vertical connection
- C 43 : Concentric chimney connection

Maximum length for concentric type : 6 metres

Note:

A pipe bend of 90° = an equivalent length of one metre



There should be a drain outlet close to the boiler to prevent chimney condensates entering the boiler.



To prevent condensation water running out of the terminal, all horizontal pipes should slope down to the boiler.

HEATING CONNECTION

Example of a basic circuit configuration

(see illustration G)

1. 3-way motorised mixing valve
2. Safety valve set to 3 bar with pressure gauge
3. Circulator
4. Non-return valve
5. System filling valve
6. Expansion tank
7. ACV 13 controller (see controller kit page 7)
8. Central heating isolating valve
9. Drain cock

Hydraulic kit + ACV heating kit (see illustration F)

ACV offers an optional pre-assembled circulation kit comprising:

- a circulator.
- a 3-way manual motorisable valve.
- connecting pipes including a second optional circuit.
- two isolating valves.
- adapters for mounting safety valve with pressure gauge and filling valve to right or left of expansion tank. The expansion tank is not included.

HOT WATER CONNECTION

Pressure reducer

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

Safety unit

The tank safety unit must be ACV approved and calibrated to 7 bar. The valve discharge must be connected to the sewer drain.

Hot water expansion tank

Installing a hot water expansion tank avoids any risk of pressure surges due to water-hammer or pressure variations.

Hot water circulation

If the tank is situated a long way from the point of use, then installing a closed return circuit can provide a faster supply of hot water always available.

Example of connection with thermostatic valve

(see illustration H)

1. Safety unit
2. Pressure reducer
3. Thermostatic mixing valve
4. Hot water circulator
5. Non-return valve
6. Hot water type expansion tank
7. Cold water feed valve
8. Drawoff tap
9. Drain cock
10. Bleed valve
11. Isolating valve



IMPORTANT

As a safety measure against burns, we strongly recommend installing a thermostatic mixer.

Optional fittings available

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

CONTROLLER KITS

KIT 1: ACV 13.00 / Basic (see illustration C)

Basic kit for regulating flow temperature according to weather conditions.

It comprises: temperature regulator with analogue timer, water temperature detector (-30°/130 °C), outside temperature detector (-30°/50 °C), 230V - 3 spindle servomotor SQY 31 and intermediate socket.

KIT 2: ACV 13.00 / Standard (see illustration D)

Basic kit for regulating flow temperature according to weather conditions.

It comprises: temperature regulator with analogue timer, water temperature detector (-30°/130 °C), outside temperature detector (-30°/50 °C), 230V - 3 spindle servomotor SQY 349 and intermediate socket.

Wiring diagram of ACV controller kits

(see illustration E)

- B2. Temperature probe
- B9. Outside temperature probe
- B5. Analogue/digital room thermostat
- P1. Central heating pump
- Y1/Y2/N. Mixer valve (SQK 349)
 - bl. Blue N
 - n/z. Black Y2
 - br. Brown Y1

INSTALLATION

ELECTRICAL CONNECTION

Power supply

The boiler operates with a 230 V - 50 Hz single phase supply. An on-off mains 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.

Conformity

Boiler installation must comply with the prevailing local technical standards and legislation.

Safety

The stainless steel tank must be earthed separately.



The power to the boiler must be switched off before any work is carried out.

Boiler electrical wiring (see illustration A)

1. Control thermostat (60/90 °C)
2. On/off switch
3. Summer/winter selector
4. Safety thermostat (103 °C max.)
5. Boiler power connection
6. Heating circulator connection
7. Burner connection
8. Room thermostat
9. Cut-off thermostat (95 °C)
10. Boiler power plug

- B. Blue
- Br. Brown
- Gr. Green
- Or. Orange
- R. Red

Y/Gr. Yellow / Green

BMV1 and BMV2 oil burner electric wiring

(see illustration P)

The burner is supplied with power by a 3-core cable, to be plugged into the connector situated on the burner. Instructions for connection are given in the burner technical manual.

- A1. Automatic igniting device
- M. Burner motor
- QRB. Photoelectric resistor
- OH. Heater
- Z. Transformer
- BV1. Magnetic valve
- X1. Burner Euro plug connector
- X2. Boiler plug connector

- B. Blue
- Br. Brown
- Bk. Black
- W. White
- Y/Gr. Yellow / Green

OIL SUPPLY

System construction and installation must be in accordance with DIN 4755. Local regulations must be followed.

Oil pipes must be brought sufficiently close to the burner so that the tubes can be connected without strain. On the aspiration side of the line, fit a filter with a quick closing valve. Install a check valve on the return line.

The Burner can operate with a 1 or 2 line system. In series, the burner is designed to operate with a two-line system. The vacuum in the aspiration line should not exceed 0.4 bar.



Refer to the ACV BMV1 and BMV2 burner manual supplied with them.

Single-line installation (see illustration I)

Height H	Ø 6 mm	Ø 6 mm	Ø 8 mm
4.0 m	100 m	100 m	100 m
3.5 m	100 m	100 m	100 m
3.0 m	100 m	197 m	100 m
2.5 m	100 m	181 m	100 m
2.0 m	100 m	165 m	100 m
1.5 m	197 m	149 m	177 m
1.0 m	165 m	132 m	151 m
0.5 m	132 m	116 m	126 m
Nozzle	uo to 2.5 Kg	uo to 5.0 Kg	uo to 10.0 Kg

Dual-line installation (see illustration J)

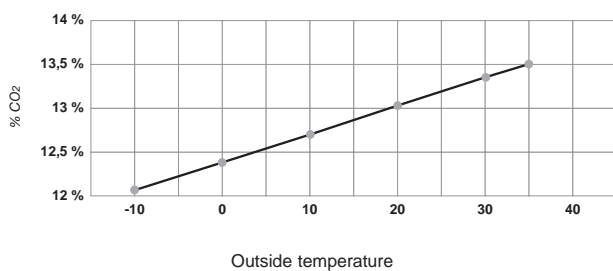
Height H	Ø 6 mm	Ø 8 mm	Ø 10 mm
0.0 m	17 m	53 m	100 m
0.5 m	15 m	47 m	100 m
1.0 m	13 m	41 m	199 m
1.5 m	11 m	34 m	184 m
2.0 m	19 m	28 m	168 m
2.5 m	17 m	22 m	153 m
3.0 m	15 m	15 m	137 m
3.5 m	13 m	19 m	122 m

ACV BMV1 AND BMV2 OIL BURNERS

Description

For the Delta Performance oil-fuelled balanced flue model, we have opted for the all-new technology of the ACV BMV1 and BMV2 oil burner, manufactured from high quality components combining performance with perfect combustion.

CO₂ chart for the ACV BMV1 and BMV2 burner



ACV BMV1 AND BMV2 BURNER CAPTIONS

(see illustration O)

1. Control unit
2. Nozzle line protection
3. Warning lamp
4. Electric plug connector
5. Attachment bracket
6. Burner blast tube
7. Ignition unit
8. High tension ignition cable
9. Oil pump
10. Oil aspiration line connection (*circuit with return only*)
11. Oil return connection
12. Motor condenser
13. Motor
14. Pump / nozzle connecting pipe
15. Burner casing
16. Nozzle line adjustment screw

ACV BMV1 AND BMV2 BURNER FACTORY SETTINGS

Burner		FV/35	FV/50
		BMV1	BMV2
Input	kW	34.9	50
Nozzle	gal/h	0,75	1.25
Nozzle angle		60°H	60°H
Oil flow	Kg/h	2.95	4.22
Pump pressure	bar	11.8	9.5
Flue gas index		0 - 0.5	0 - 0.5
Air reducer	%	37	60
Air inlet	%	90	90
Nozzle line pressure	mbar	3.5 - 4	3.5 - 4
Nozzle line	mm	10	10
Weight	Kg	14.5	14.5

WARNING: Set the % of CO₂ as per the data in the diagram above

FILLING THE DOMESTIC HOT WATER AND HEATING CIRCUITS (see illustrations B, G et H)



IMPORTANT

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

1. Fill the domestic hot water circuit and bring it up to pressure.
2. Fill the heating circuit taking care not to exceed the 2 bar pressure limit.
3. Vent the air from the top of the boiler.
4. After venting the air from the system, bring the pressure up to the static head plus 0.5 bar: 1.5 bar = 10m -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 boiler thermostat to between 60 and 90 °C.
7. Set the Summer/Winter selector to the desired position.
8. Switch the on/off switch to the ON position.
9. Check the oil supply (and return).
10. Carry out the required venting, measurement and setting procedures.

STARTING ACV BMV1 AND BMV2 BURNERS

Refer to the ACV BMV1 and BMV2 burner manual supplied with them.

RECOMMENDATION

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

SERVICING THE BOILER (see illustration K)

1. Switch off the power at the mains switch outside the boiler and shut off the oil supply.
2. Set the on/off switch on the control panel to the OFF position.
3. Remove the top cover of the boiler (2) and take off the top of the chimney reduction (3).
5. Remove the turbulators (23) from the flue pipes (22) for cleaning. Change them if in poor condition.
6. Unscrew the burner chamber plate (10).
7. Brush the flue pipes (22).
8. Clean the burner chamber (18) and the burner.
9. Check the condition of the burner chamber plate insulation.

SERVICING THE SAFETY DEVICES

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

SERVICING THE BURNER

Refer to the ACV BMV1 and BMV2 burner manual supplied with them.

EMPTYING THE BOILER



Water flowing out of the drain cock is extremely hot and can cause severe burns. Keep people away from discharges of hot water.

Emptying the heating circuit (see illustration G)

1. Set the on/off switch on the control panel to the OFF position, turn off the power at the external mains switch and close the oil feed valve.
2. Close the isolating valves (8).
3. Connect a hose to the drain cock (9).
4. Open the drain cock to empty the primary circuit.

Emptying the hot water circuit (see illustration H)

1. Set the on/off switch on the control panel to the OFF position, turn off the power at the external mains switch and close the oil feed valve.
2. Lower the pressure in the heating circuit until the pressure gauge indicates zero bar.
3. Close the valves (7 and 11).
4. Open valves (9) and (10) (first 9 then 10).
5. Let the water empty into the drain .



For the tank to be emptied, valve (9) must be situated at ground level.

USING THE BOILER



Have your system serviced every year by a qualified heating engineer. If the boiler is subject to heavy usage, it may need more frequent servicing. If this is the case, ask your installer for advice.

Starting the burner:
In normal operation, the burner starts automatically whenever the boiler temperature falls below the set temperature.



Before doing any work on the boiler, switch off the power at the mains switch installed in the boiler room by the electrician.
On the control panel, switch off the ON/OFF switch.

Getting to know the control panel *(see illustration B)*



The user should not access the components inside the control panel.

1. Control thermostat - 60 to 90 °C

When the boiler is used only to produce domestic hot water, the temperature can be set between 60 and 90 °C. If the boiler is used for both hot water and heating, the control thermostat will, as a general rule, be set to 80 °C to ensure optimum operating conditions.

2. ON/OFF switch

Used to start and stop the boiler.

3. Summer/winter selector

Starts and stops the heating pump *(if fitted)*.

4. Thermometer

Shows the boiler temperature in the primary circuit. The temperature should not exceed 90 °C. If it does, switch off the boiler and check the thermostat settings. If there is a fault, call a heating engineer.

5. Controller

See the user instructions supplied with the unit if you have chosen this option.

6. Burner reset

7. Burner indicator lamp

Safety valve *(heating)*

If water flows from one of the safety valves, shut off the boiler and call your heating engineer.

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.



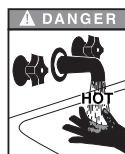
If a fault occurs after this short trial, call the installing engineer.

Safety unit *(domestic hot water)*

A monthly inspection is recommended.
Lift the lever on the emptying device for a few seconds to ensure that the safety unit is working properly.



If a fault occurs after this short trial, call the installing engineer.



Water flowing out of the safety valve or safety unit may be extremely hot and can cause very serious burns.

RESETTING ACV BMV1 AND BMV2 BURNERS

(see illustration Q)

If the burner is not working:

1. Remove the protective cover of the burner.
2. If the red light is lit, press the button to start the burner.
3. If the burner lights, replace the cover.



If the burner does not operate, switch off the power before removing the front cover panel.

4. Reset the safety thermostat on top of the boiler. (see illustration R).



Wait until the boiler temperature is below 60 °C then replace the front cover panel.

5. If the burner lights, replace its cover.
6. If the fault persists, notify the installing engineer.

Starting the burner

In normal operation, the burner starts automatically whenever the boiler temperature falls below the set temperature.



To ensure your system operates properly, have it professionally serviced once a year before the central heating season begins.



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