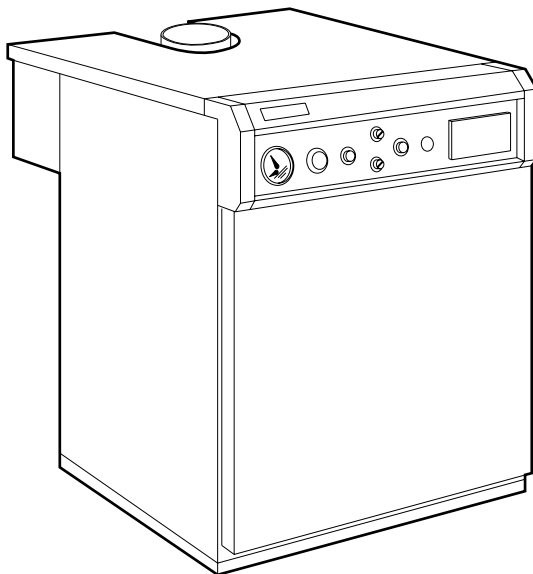




# INSTALLATION AND MAINTENANCE INSTRUCTIONS



## PEGASUS F2

**GAS-FIRED CAST-IRON BOILERS  
WITH ELECTRONIC IGNITION  
AND FLAME RECTIFICATION MONITORING**

Models 51 - 68 - 85 - 102



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## 1. GENERAL TECHNICAL DATA

### 1.01 Introduction

The **Pegasus F2**, with CE approval, is designed for use with natural gas (G20) or LPG (G31) for indirect central heating and hot water.

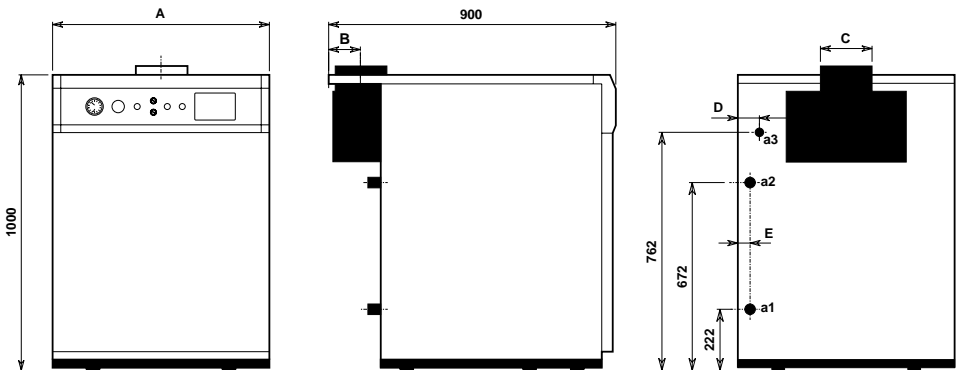
### 1.02 Installation requirements

Only CORGI registered installers should fit the Pegasus boilers.

The boiler installation should comply with relevant British Standards Specifications, codes of practice, and Current Building Regulations, together with any special Regional Requirements of the Local Authorities, gas supplier and Insurance Companies.

## 2. DIMENSIONS AND TECHNICAL DATA

### 2.01 Dimensional data (see fig. 1 and table 2)



*Fig. 1*

- a1** - Return      1" 1/2
- a2** - flow        1" 1/2
- a3** - Gas inlet    3/4"

## 2.02 Technical data

The standard cast-iron **PEGASUS F2** boiler is set to operate on natural gas (G20).

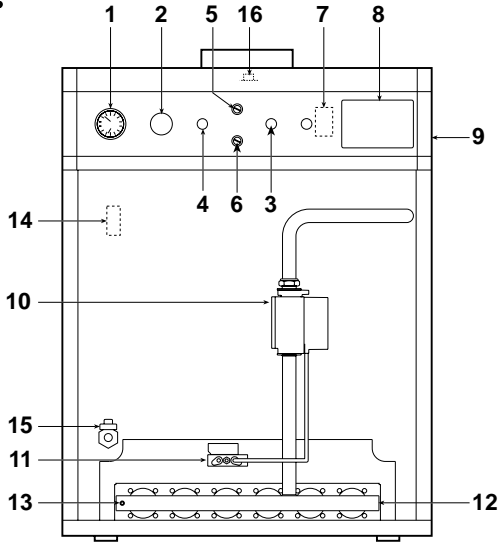
The boiler is designed to operate with a flow temperature of 82°C and a maximum  $\Delta t$  of 20°C.

| Table 1 | MODEL          | NUMBER OF SECTIONS | HEAT OUTPUT kW | HEAT INPUT (NETT) kW | HEAT INPUT (GROSS) kW |
|---------|----------------|--------------------|----------------|----------------------|-----------------------|
|         | Pegasus F2 51  | 4                  | 51             | 56                   | 62,2                  |
|         | Pegasus F2 68  | 5                  | 68             | 74,8                 | 83                    |
|         | Pegasus F2 85  | 6                  | 85             | 93,5                 | 103,8                 |
|         | Pegasus F2 102 | 7                  | 102            | 112                  | 124,3                 |

| Table 2        | MODEL         | DIMENSIONS |       |        |      |        | CONNECTIONS |           |          | WEIGHT INCLUDING PACKAGE Kg. | WATER CONTENT (liter) | MAX OPERATING PRESSURE (bars) |
|----------------|---------------|------------|-------|--------|------|--------|-------------|-----------|----------|------------------------------|-----------------------|-------------------------------|
|                |               | A mm       | B mm  | C Ø mm | D mm | E mm   | RETURN a1 Ø | FLOW a2 Ø | GAS a3 Ø |                              |                       |                               |
|                | Pegasus F2 51 | 550        | 96,5  | 180    | 43   | 35     | 1 1/2"      | 1 1/2"    | 3/4"     | 260                          | 22                    | 4                             |
|                | Pegasus F2 68 | 640        | 96,5  | 180    | 46   | 38     | 1 1/2"      | 1 1/2"    | 3/4"     | 300                          | 26                    | 4                             |
|                | Pegasus F2 85 | 720        | 106,5 | 200    | 44   | 36     | 1 1/2"      | 1 1/2"    | 3/4"     | 350                          | 30                    | 4                             |
| Pegasus F2 102 | 800           | 106,5      | 200   | 42     | 34   | 1 1/2" | 1 1/2"      | 3/4"      | 400      | 34                           | 4                     |                               |

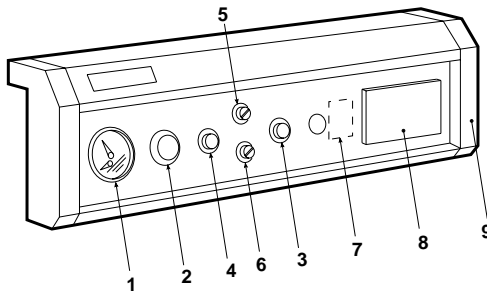
| Table 3        | MODEL | No. OF MAIN BURNERS | PRINCIPALES INJECTORS Ø mm |            | PILOT INJECTORS Ø mm |            | GAS SUPPLY PRESSURE (mbars) |         | GAS PRESS. AT BURNER MANIFOLD (mbars) |         | GAS FLOW RATE |              |
|----------------|-------|---------------------|----------------------------|------------|----------------------|------------|-----------------------------|---------|---------------------------------------|---------|---------------|--------------|
|                |       |                     | Nat. G20                   | G.P.L. G31 | Nat. G20             | G.P.L. G31 | Nat. G20                    | LPG G31 | Nat. G20                              | LPG G31 | Nat. G20 m³/h | LPG G31 kg/h |
|                |       |                     | Pegasus F2 51              | 3          | 3,5                  | 2,15       | 0,4                         | 0,24    | 15 to 23                              | 37      | 13,3          | 36           |
| Pegasus F2 68  | 4     | 3,5                 | 2,15                       | 0,4        | 0,24                 | 15 to 23   | 37                          | 13,3    | 36                                    | 7,9     | 5,79          |              |
| Pegasus F2 85  | 5     | 3,5                 | 2,15                       | 0,4        | 0,24                 | 15 to 23   | 37                          | 13,3    | 36                                    | 9,9     | 7,24          |              |
| Pegasus F2 102 | 6     | 3,5                 | 2,15                       | 0,4        | 0,24                 | 15 to 23   | 37                          | 13,3    | 36                                    | 11,8    | 8,68          |              |

### 2.03 Main components



**Front view of the boiler without front casing**

*Fig. 2a*



**Control panel**

*Fig. 2b*

**Key**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>1 Temperature-pressure gauge</li> <li>2 Boiler control thermostat</li> <li>3 Ignition lockout re-set button</li> <li>4 Boiler on/off switch</li> <li>5 Flue gas safety thermostat</li> <li>6 Limit thermostat reset button</li> <li>7 Ignition PCB</li> <li>8 Electronic panel (not available UK)</li> </ul> | <ul style="list-style-type: none"> <li>9 Control panel</li> <li>10 Gas valve</li> <li>11 Pilot burner assembly</li> <li>12 Gas burner manifold</li> <li>13 Gas pressure test point</li> <li>14 Automatic air vent</li> <li>15 Drain cock</li> <li>16 Flue gas sampling point</li> </ul> |
|---|---|

### 2.04 Characteristic pressure drop curve

Water pressure drop in all models is shown in fig. 3. The following diagram shows the pressure drop in the boiler as a function of the water flow rate.

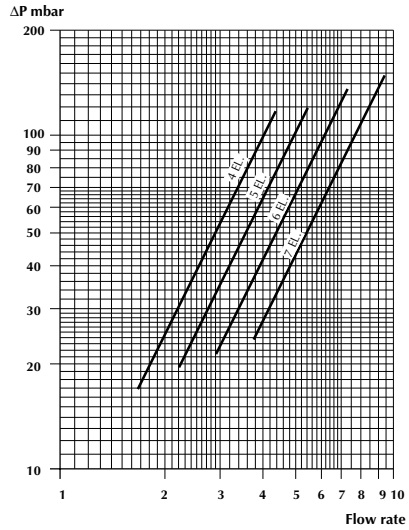


Fig. 3

### 2.05 Safe discharge of combustion products

The boiler comes with a FLUE GAS SAFETY THERMOSTAT, which provides a high level of safety and control over the discharge of combustion products. This thermostat cuts off the supply of gas to the burner in the event of a faulty flue draft.

If the FLUE GAS SAFETY THERMOSTAT has been activated, you should unscrew the protection cover (part no. 5 in fig. 2a and 2b) and manually “reset” the thermostat. After that, the boiler will return to normal operation.

If the FLUE GAS SAFETY THERMOSTAT needs to be replaced, use original manufacturer’s parts only and make sure the electric connections and positioning of the bulb (see fig. 4) are correct; NEVER UNDER ANY CIRCUMSTANCES LEAVE THE FLUE GAS SAFETY THERMOSTAT DISCONNECTED FROM THE ELECTRIC CIRCUIT.

In case of frequent tripping of the thermostat switch, contact qualified personnel only.

During cleaning of the draft diverter, be careful not to damage the thermostat phial.

Boiler rear view

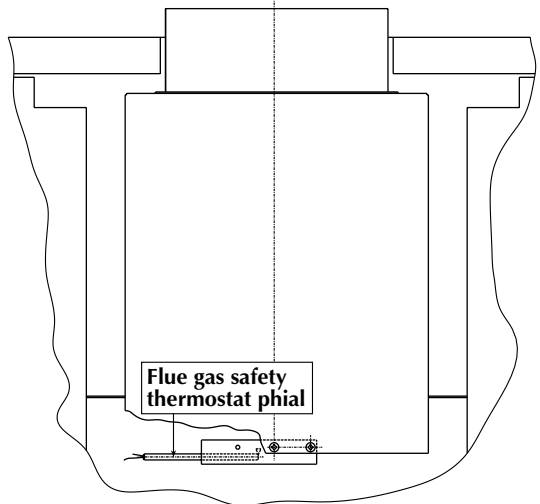


Fig. 4

### **3. BOILER INSTALLATION**

(To be performed by qualified personnel only)

#### **3.01 General warnings**

The boiler should be installed according to current regulations (see para 1.02).

We suggest fitting isolating valves between the boiler and the heating system to isolate the boiler from the system if necessary.

The rise in temperature of the heating water (the difference between the water flow and return temperatures) should not exceed 20°C. This is so as to prevent possible damage caused by condensation forming in the boiler.

Combustion products should be discharged through a flue with a cross section in accordance with current standards and not less than the boiler flue outlet connection.

Connect the gas to the boiler in accordance with current regulations. The diameter of the boiler gas inlet gas pipe does not dictate the choice of diameter for the pipe between the boiler and the gas meter should be calculated based upon its length and pressure drop.

#### **3.02 Boiler water characteristics**

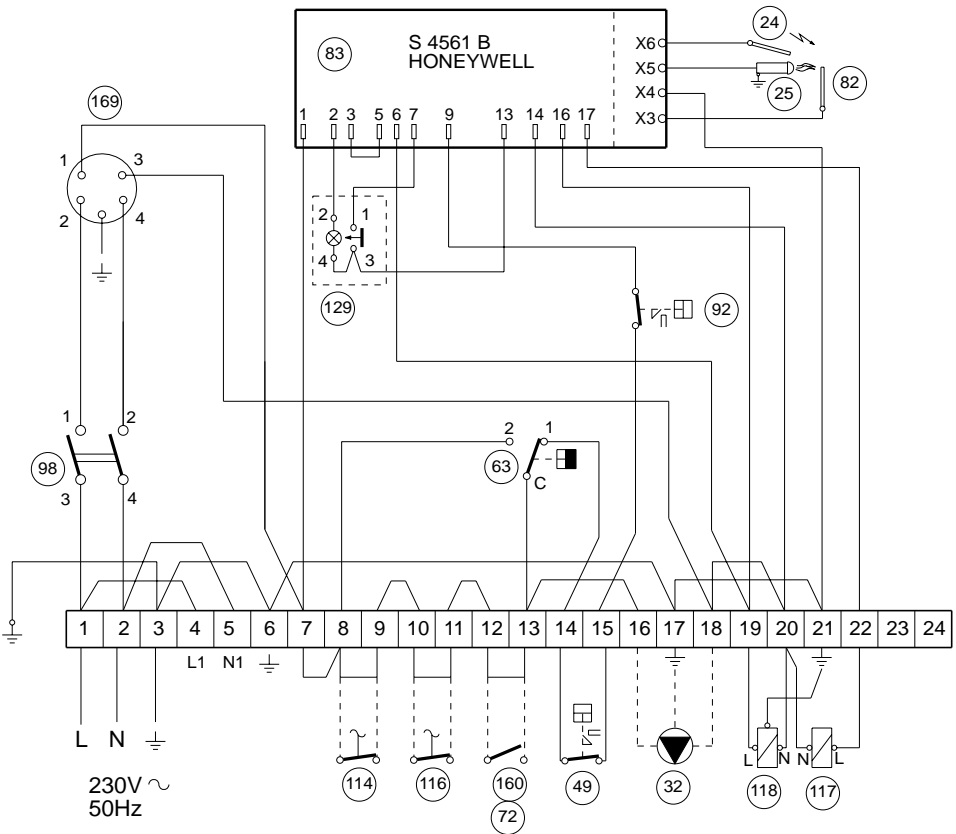
When the water supply has a hardness of more than 25 - 30 Fr., it should be treated before entering the heating system to prevent both scaling (caused by hard water) and corrosion (caused by aggressive water) in the boiler. Please remember that because of their low thermal conductivity, even small scales just a few millimetres thick cause the boiler walls to overheat considerably with serious consequences.

**You must treat the water used for the heating system in the following cases:**

- A) Very large systems (with large volumes of water).**
- B) Systems where partial or complete draining - and water refilling - are frequent.**



**Electrical connections diagram for mod. 51-68-85**



*Fig. 5b*

**Key**

- |                                    |   |                                    |
|------------------------------------|---|------------------------------------|
| 24 Spark electrode                 | 82 Ionization probe                           | 116 Gas pressure switch            |
| 25 Pilot burner                    | 83 Ignition PCB                               | 117 Main gas valve                 |
| 32 Pump (not supplied)             | 92 Flue gas thermostat                        | 118 Pilot light gas valve          |
| 49 Limit thermostat (manual reset) | 98 Boiler on/off switch                       | 129 Ignition lockout re-set button |
| 63 Boiler control thermostat       | 114 Water flow pressure switch (not supplied) | 160 Auxiliary contact              |
| 72 Room thermostat                 |   | 169 Suppression filter             |

**Note:**

- Dotted lines indicate connections to be performed during installation.
- Terminals L1, N1, 6 are reserved for connecting an electronic compensator (not available in UK)

**General wiring diagram for mod. 102**

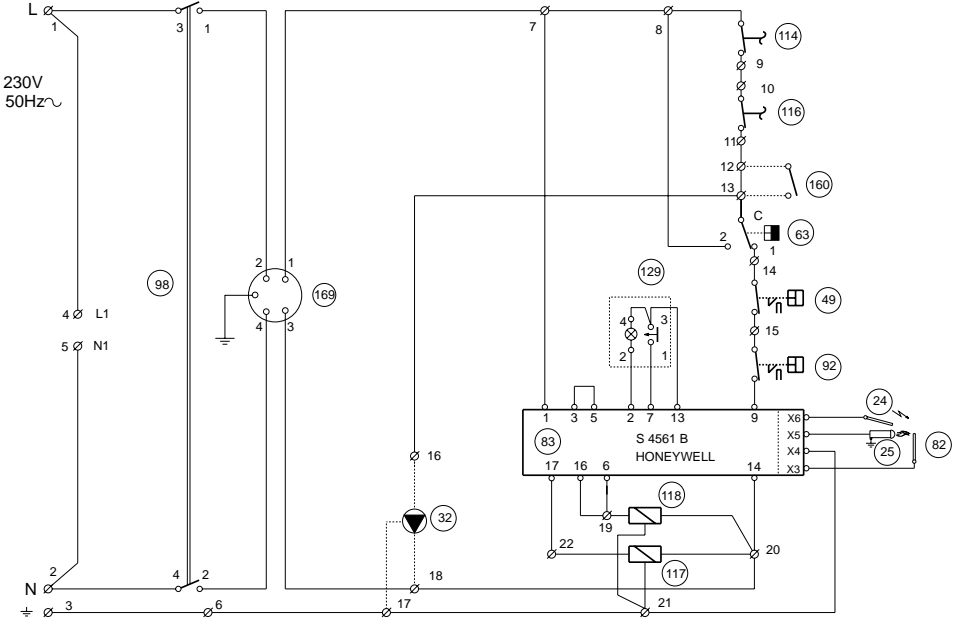


Fig. 5c

**Key**

- |                                    |   |
|------------------------------------|---|
| 24 Spark electrode                 | 98 Boiler on/off switch                       |
| 25 Pilot burner                    | 114 Water flow pressure switch (not supplied) |
| 32 Pump (not supplied)             | 116 Gas pressure switch                       |
| 49 Limit thermostat (manual reset) | 117 Main gas valve                            |
| 63 Boiler control thermostat       | 118 Pilot light gas valve                     |
| 82 Ionization probe                | 129 Ignition lockout re-set button            |
| 83 Ignition PCB                    | 160 Auxiliary contact                         |
| 92 Flue gas thermostat             | 169 Suppression filter                        |

**Note:** Dotted lines indicate connections to be performed during installation.  
 Terminals L1, N1, 6 are reserved for connecting an electronic compensator (not available in UK)

**Electrical connections diagram for mod. 102**



*Fig. 5d*

**Key**

- |   |   |
|---|---|
| <b>24</b> Spark electrode                 | <b>98</b> Boiler on/off switch                  |
| <b>25</b> Pilot burner                    | <b>114</b> Water pressure switch (not supplied) |
| <b>32</b> Pump (not supplied)             | <b>116</b> Gas pressure switch                  |
| <b>49</b> Limit thermostat (manual reset) | <b>117</b> Main gas valve                       |
| <b>63</b> Boiler control thermostat       | <b>118</b> Pilot light gas valve                |
| <b>82</b> Ionization probe                | <b>129</b> Ignition lockout reset button        |
| <b>83</b> Ignition PCB                    | <b>160</b> Auxiliary contact                    |
| <b>92</b> Flue gas thermostat             |   |

**Note:** Dotted lines indicate connections to be performed during installation.  
 Terminals L1, N1, 6 are reserved for connecting an electronic compensator (not available in UK)

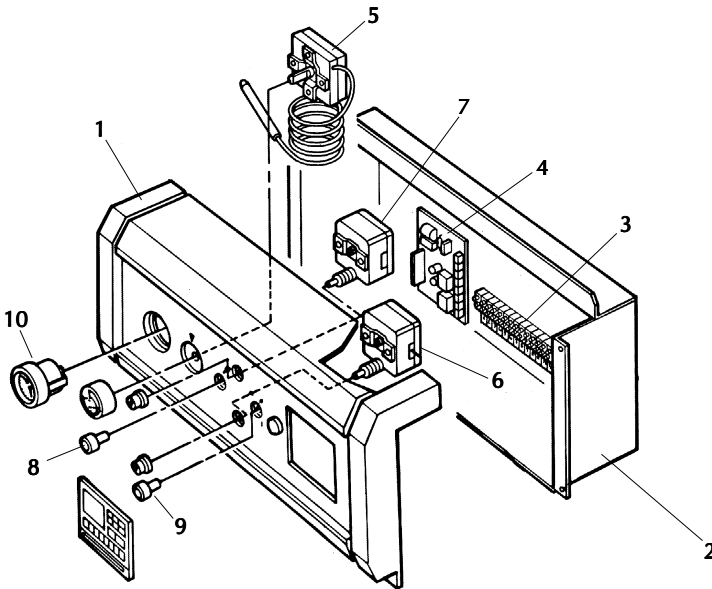
### 4.02 Access to the control panel internal components

For access to the terminal block and the internal components of the control panel, proceed as follows:

- a - Shut off the power supply to the boiler.
- b - Lift off the boiler cover (held in place by slot pins).
- c - Unscrew the two screws that hold the plastic panel against the side of the boiler .
- d - Rotate the panel all the way round to its locked position.
- e - Carry out the work and reassemble in reverse order.

**Caution:** Handle the flame control electronic board (part 4 in fig. 6) and its connections with particular care.

### 4.03 Exploded view of the control panel (fig. 6)



*Fig. 6*

**Key**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1. Control panel</li> <li>2. Wiring harness protection plate</li> <li>3. Terminal block</li> <li>4. Ignition PCB</li> <li>5. Boiler control thermostat</li> </ul> | <ul style="list-style-type: none"> <li>6. Limit thermostat (manual reset)</li> <li>7. Flue gas thermostat</li> <li>8. Boiler on/off switch</li> <li>9. Ignition lockout reset</li> <li>10. Combined temperature and pressure gauge</li> </ul> |
|--|---|

## 5. STARTUP AND SHUTDOWN

### 5.01 Checks to be carried out at first startup

It is good practice to check the following at first startup: that the cutoff valves between the boiler and heating system are open; that all is well pressurized and vented; that there are no gas or water leaks from the water system or boiler; that the electrical connections are correct and the earthing cable connected to a good earthing system; that there are no inflammable liquids or materials in the immediate vicinity of the boiler and that the flue is not blocked.

### 5.02 Startup procedure

- Set the boiler control thermostat knob to the desired temperature (not below 50°C).
- Open the gas cock upstream from the boiler.
- Vent gas supply pipework.
- Switch on boiler.

At this point the electronic control unit takes over and after a preset pause sends a command to the pilot valve to open and triggers off the discharge to the spark electrodes, igniting the pilot burner.

The pilot burner flame, ionizing the detection electrode, sends a signal to the electronic control unit which in turn sends a command to the main valve to open, igniting the main burner.

The boiler now functions automatically, controlled by the boiler control thermostat and/or by any other command/control devices (room thermostat, electronic thermostat board, etc.).

**Note:** If after having closely followed the startup procedure the burners fail to light and the reset button warning light on the electronic control unit is lit, it means that the board has locked out and you should wait about 10 seconds before pressing the reset button.

After resetting, the board repeats the startup cycle.

If the burners still fail to light after the second attempt, read paragraph 9, "Fault finding".

In the event of the electric power supply to the boiler being cut off, the burners shut down and light up again automatically when the power returns.

### 5.03 Temporary shutdown

To turn the boiler off temporarily, simply switch off the power supply to the boiler. The electrical components will be without power and the main and pilot burners will remain off.

### 5.04 Long-term boiler shutdown

Turn off inlet gas cock to the boiler and switch off the power supply.

**Caution:** If the boiler remains unused for long periods during the winter, in order to avoid frost damages you should pour a suitable anti-freeze into the system or drain it completely.

### **5.05 Inspections and controls after startup**

At first startup:

- Make sure the gas supply is perfectly leakproof.
- Make sure the pilot light is adequate and well adjusted.
- Test boiler ignition by starting it and turning it off using the control thermostat.
- Check that no flue products escapes from the boiler draft diverter indicating that either the flue is blocked or the draft is insufficient.
- Check the efficiency of the flue while the boiler is working.
- Check that there are no leaks from the points where the boiler/flue connects to the boiler and the flue.
- Check that gas consumption, measured by the gas meter, matches the figure indicated in the technical data table.
- Check that the water is circulating properly between the boiler and heating units.
- Make sure that when the pilot flame is extinguished, the safety devices are activated, shutting off the main gas burners.

## 6. REGULATING

As described above, the boiler is set up to operate on natural gas (G20); gas pressure has been tested and calibrated by the manufacturer.

However, due to possible differences in pressure in the gas supply system, at first startup you should check and if necessary adjust the pressure at the injectors to match the pressure level shown in table 3 (paragraph 2.02) of the technical data.

### 6.02 Gas pressure adjustment with the "Honeywell VR 4601 CB" valve in models 51-68-85

Adjust the supply pressure at the main burners by turning the stabilizer screw 7 (fig. 7).

To increase the pressure, turn the screw clockwise. To decrease the pressure, turn the screw anticlockwise.

The pilot light requires no adjustment.

**Caution:** Pressure measured at pressure test points 1 and 2 (fig. 7) is displayed 30 seconds or more after making the adjustment.

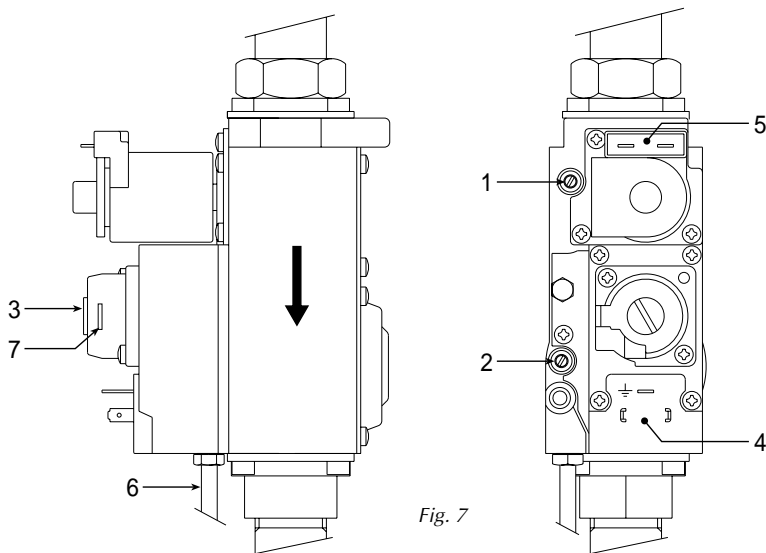


Fig. 7

**Key:**

- 1. Inlet pressure test point
- 2. Outlet pressure test point
- 3. Screw block stabilizer
- 4. Pilot coil electric connections
- 5. Main burner coil electric connections
- 6. Pilot burner supply
- 7. Main burner gas pressure adjustment screw

**6.03 Gas pressure adjustment with the “DUNGS MBDLE 407 BO1” valve in model 102**

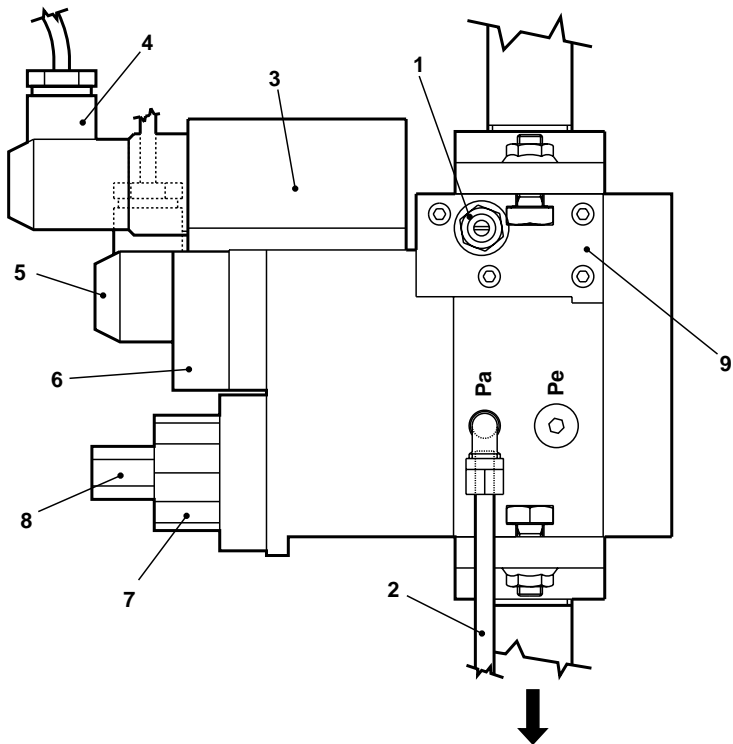


Fig. 8

**Key:**

- 1. Inlet gas pressure test point  
(Burner pressure is measured at test point on burner manifold)
- 2. Pilot burner supply
- 3. Integral gas pressure switch
- 4. Gas pressure switch connector (grey)
- 5. V1-V2 gas valve power connector (black)
- 6. Gas governor
- 7. Gas flow rate regulator (valve V2)
- 8. Slow startup regulator (under the cover)
- 9. Cover protecting the incoming gas filter.



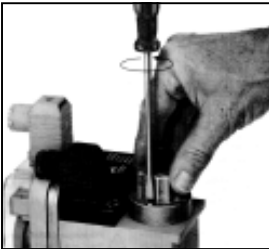
**Gas pressure adjustment:**

- Move the protective cover by turning it on its hinges.
- Using a small screwdriver (no. 3), turn the regulating screw to set the required pressure.

**Note:** The pilot light requires no adjustments.

*Fig. 8a*

---



**Main gas flow rate adjustment (valve V2)**

- Loosen the securing screw using a screwdriver.
- Turn the knob to the required setting, then re-tighten the securing screw.

**Note:** Pressure measured at pressure test points is displayed 30 seconds or more after performing the adjustment.



*Fig. 8b*

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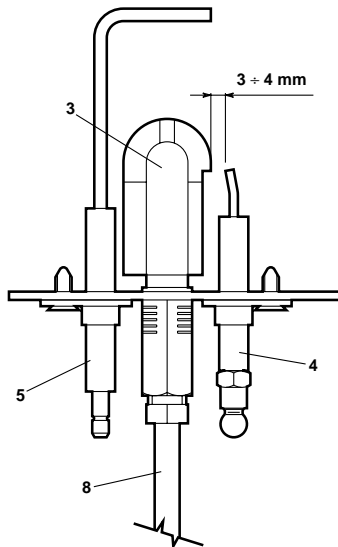
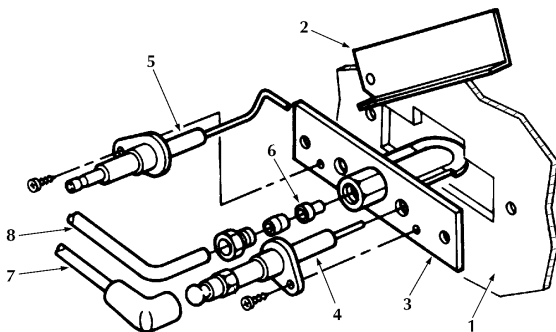
**Slow startup adjustment**

- Unscrew the black plastic cap
- Using the cap as a tool turn the pin under it to the desired setting.
- Screw the plastic cap back.

*Fig. 8c*

---

**6.04 Pilot burner unit (fig. 9)**



*Fig. 9*

**Key**

- 1 Combustion chamber cover plate
- 2 Inspection window
- 3 Pilot burner
- 4 Ignition electrode
- 5 Flame rectification probe
- 6 Pilot injector
- 7 Ht lead
- 8 Pilot gas supply

## 7. FUEL CONVERSION (from natural to L.P.G. Gas)

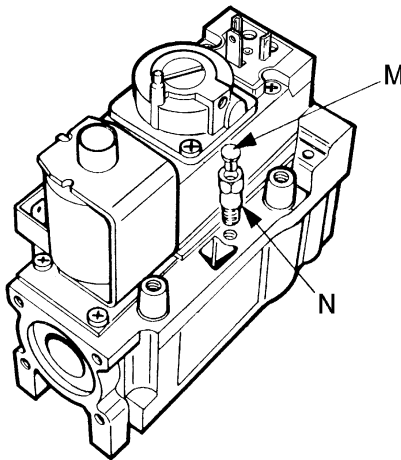
In order to carry out such operation it must replace the main nozzles and that pilot, proceeding in the following way:

- Turn off the gas and switch off the power supply to the boiler.
- Remove the main gas burners.
- Disassemble the pilot burner (fig. 8).
- Remove the main burners from manifold.
- Replace the main and pilot injectors taking care not to spoil the main injector sealing gaskets. If they have been damaged, replace them.
- Re-assemble with care.
- Carefully screw in fully the pressure regulating screw 7 (fig. 7) on the "Honeywell VR 4601 CB" gas valve in models 51-68-85 and the screws (fig. 8a and 8b) on the "DUNGS MBDLE 407 BO1" valve in model 102.
- Check that the boiler functions correctly and that there are no gas leaks.

Moreover for the version with "Honeywell VR 4601 CB" gas valve (for models 51-68-85) should be mounted on the body valve the appropriate calibrated adapter of slow ignition (supplied on request), operating in the following way:

- remove from the body valve gas the plastic protection cover "M" (fig. 10)
- screw the adapter N to the body gas valve
- replace the of protection cover "M" on the adapter.

**REMEMBER:** The L.P.G. injector kit may be obtained from our Commercial boiler sales department.



*Fig. 10*

## 8. MAINTENANCE AND CLEANING

The following operations are to be performed by qualified personnel only.

### 8.01 Seasonal inspection of the boiler and flue

Before the beginning of winter you should perform a general inspection of the boiler, heating system and flue. The inspection should verify:

That the boiler flueways, burner and flue are clean.

That the water in the system is at the correct pressure – or correct level in the case of an open system.

That all control and safety devices operate properly.

That the probe and spark electrode are free of carbon deposits.

That the pilot flame correctly aligns with the probe.

That circulation pumps are free running.

That there are no gas leaks.

That the gas flow rate and pressure are correct.

That the pressure in the expansion vessel is as indicated in table 3 (paragraph 2.02).

### 8.02 Cleaning the boiler and the flue

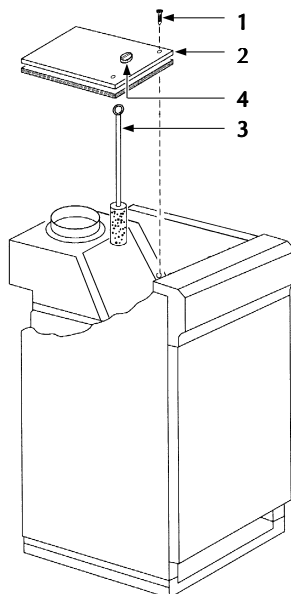
To clean the boiler and the flue, remove the burner bars from the combustion chamber.

For access to the cast-iron exchanger, proceed as follows (fig. 11): Remove the cover of the casing secured by slot pins; pull out the insulation covering the draft diverter, remove the smoke-box inspection cover 2 and its insulation, secured with self-threading screws 1.

Now you may clean all the smoke passages in the boiler using a pipe brush 3. Remember you should check and if necessary clean the flue and its connection to the boiler. Be careful not to damage the Flue gas safety thermostat phial or capillary.

**Important** - Do not clean the burners with chemicals or a steel brush, as these might change the air-gas mixture outlet holes.

When cleaning is complete, re-assemble carefully and in the correct position. Then check the seal along the gas and smoke circuits, functioning of the control and safety devices and gas pressure and rate of flow.



*Fig. 11*

#### Key

- 1 Securing screws
- 2 Inspection cover with insulation
- 3 Flue cleaning brush
- 4 Flue gas sampling point

## 9. FAULT FINDING

### **Fault**

**After a few startup attempts, the electronic control unit fails to ignite the boiler**

### **Cause and Corrective Action**

*The pilot burner is clogged or dirty.*

*Check that the gas flow to the boiler is normal and that air in the pipes has been removed.*

*Check that the electrodes are in their correct position and free from scales (see fig. 9).*

*Make sure the boiler is connected to the power supply and is well earthed.*

*Check that the pilot gas valve is powered up.*

*Check the connections to the detection and spark electrodes.*

**At startup, there is no electric discharge between the electrodes**

*Check that the electrodes are in their right position and free from scales.*

*Regulating thermostat is set too low.*

*Check the power supply.*

*Check the connections to the electronic control unit.*

*Make sure the NEUTRAL-PHASE connections have not been reversed and the earth connection is effective.*

*Check incoming gas pressure and make sure the gas pressure switch is open.*

*Reset the Flue gas safety thermostat.*

*Reset the safety thermostat.*

**No pilot ignition**

*No or little gas*

*Air is held in the pipes.*

*Vent it as described in the chapter on startup.*

*Pilot injector is clogged or dirty.*

*Clean the injector with compressed air.*

**Poor pilot flame**

*Pilot injector is dirty.*

**Poor main burner flame: too high, too low or too yellow**

*Gas valve filter is dirty.*

*Check that gas pressure at the burner is normal (see table 3 paragraph 2.02).*

*Injectors are dirty.*

**Smell of unburnt gas**

*Check the boiler is clean.*

*Check that draft is sufficient.*

*Check that gas consumption is not excessive.*

**No rise in temperature while the boiler is working**

*Make sure the regulating thermostat works.*

*Check that gas consumption is not below specifications.*

|   |  |
|---|--|
|   | <p><i>Check that the boiler is perfectly clean.</i></p> <p><i>Check that the boiler rating is in proportion to the system.</i></p>   |
| <p><b>System water temperature is too high or too low</b></p>                       | <p><i>Check the functioning of the regulating thermostat.</i></p> <p><i>Check the pump is not blocked.</i></p> <p><i>Make sure the pump characteristics are in proportion to the size of the system.</i></p> |
| <p><b>Flare-ups at the burner</b><br/><b>Delayed ignition</b></p>                   | <p><i>Check that the gas pressure is sufficient and that the boiler body is not dirty.</i></p>   |
| <p><b>Regulating thermostat restarts with too high a temperature difference</b></p> | <p><i>Check that the bulb is properly inserted.</i></p> <p><i>Replace the thermostat.</i></p>  |
| <p><b>Boiler forms condensate</b></p>   | <p><i>Check that the boiler is not running at too low a temperature.</i></p> <p><i>Check that gas consumption is normal. Make sure the burner flame is well adjusted.</i></p>                                |
| <p><b>Boiler becomes dirty quickly</b></p>  | <p><i>Check that the burner flame is adjusted properly and that gas consumption is in proportion to the boiler power.</i></p>  |
| <p><b>Boiler shuts off for no apparent reason</b></p>                               | <p><i>Flue gas safety thermostat tripped.</i></p> <p><i>Safety thermostat tripped after safe working temperature has been exceeded.</i></p>  |

**Remember:** to avoid unnecessary expense, before contacting Service Department, make sure that any boiler failure is not due to the absence of electric power or gas supply.





ALL SPECIFICATIONS SUBJECT TO CHANGE

Lichfield Road, Branston Industrial Estate, Burton Upon Trent, Staffordshire DE14 3HD  
Tel. 08707 282 885 - Fax 08707 282 886

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