Installation, Commissioning & Servicing Instructions

Models covered by these instructions

J15-22 Mk. III

Warm Air Heaters (MODAIRFLOW and Conventional Control)

(56·53)

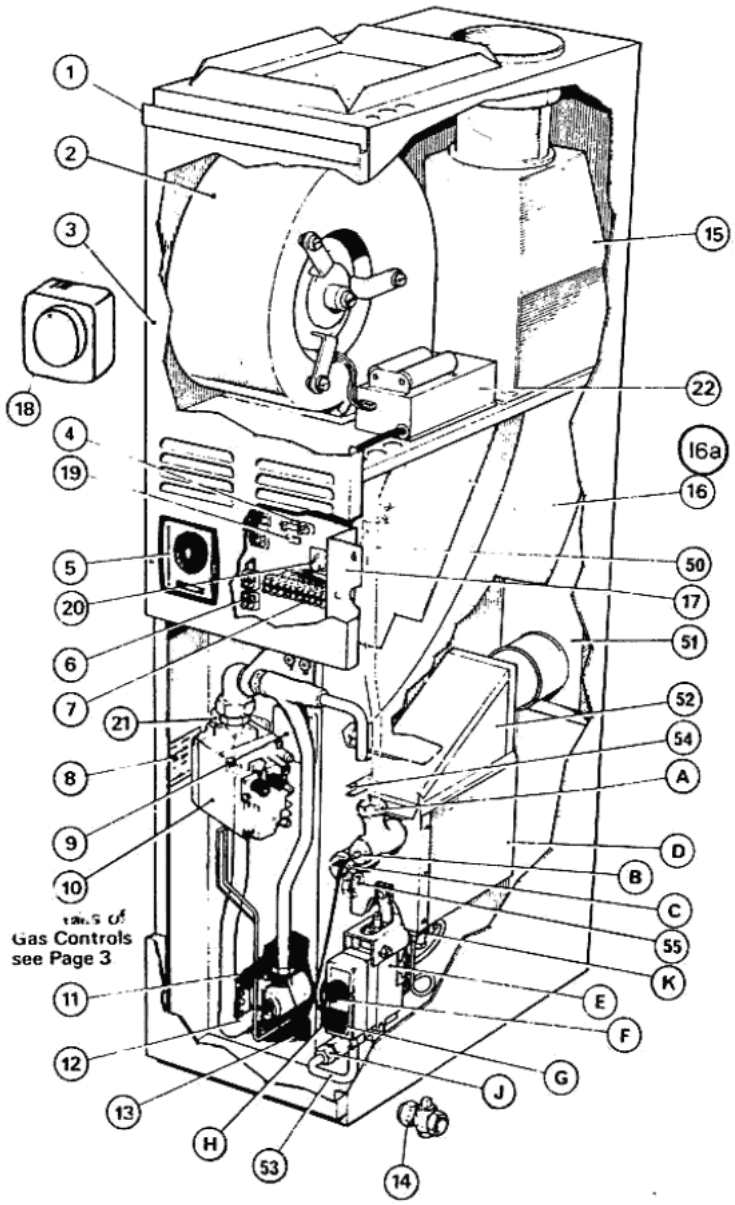
UDC 697 3

INSTALLATION INSTRUCTIONS

1. COMPONENTS CHECK

J2203/0760

Fig. 1



Installation shall be in accordance with:

Building Regulations

Gas Safety Regulations

Institute of Electrical Engineers Regulations (I.E.E. Regs.)

British Standard Code of Practice CP 331 Pt. 3

BS 5440 Pt. 1 (Flues for Gas Appliances) in course of preparation and will replace CP 337

BS 5440 Pt. 2 (Air supply for Gas Appliances)

BS 5864

AIR HEATER

1.	Air Filter
2.	AirCirculating Fan
3.	Fan Chamber Door
4.	Fuse
5.	Time Control (clock)
6.	Connection for Thermostat/Thermista-stat
7.	Terminal Block
8.	Heater Data Plate
9.	Overheat Limit Switch
10.	Multifunctional Gas Control
11.	Safety Pilot Burner
12.	Main Burner Assembly
13.	Gas Connection
14.	Service Gas Cock ½" B.S.P. Female (supplied loose)
15.	Draught Diverter
16.	Draught Deflector Plate
16a.	Upper Draught Diverter Plate (J A 33-43 Series only)
17.	Electrical/Electronic Panel

MODAIRFLOW Control Heaters only

18.	Thermista-stat (supplied loose)
19.	Fan Override Switch
20.	Balancing Knob Note: Heaters with conventional control have a five position fan speed selector
21.	Air Flow Sensor Note: Heaters with conventional control have a Fan Switch
22.	Fan Speed Regulator

WATER HEATER FITTINGS FIT

50.	Water 'flow' Elbow and pipe (not provided)
51.	Flue Pipe
52.	Flue cap and connection
53.	Gas feed pipe to Water Heater
54.	Water Heater mounting bracket
55.	Water 'return' elbow and pipe (not provided)

JANUS 3 WATER HEATER

A.	'Flow' connection — ¾" B.S.P. Female
B.	Thermostat Phial
C.	'Return' connection — ¾" B.S.P. Female
D.	Water Heater Body
E.	Burner and Controls
F.	Water Temperature Control Knob
G.	Start Button
H.	Off Button
J.	Gas Connection
K.	Pilot Burner

CORGI

2. VENTILATION REQUIREMENTS

Ventilation of Heater Compartment

		J15-22 Mk III	J25-32 Mk III	JA33-43	
Ventilation from inside building	Low Level Grille	230cm² (35in²)	308cm² (48in²)	372cm² (56in²)	Mini acce free inclu area for J
	High Level Grille	115cm² (18in²)	154cm² (24in²)	186cm² (28in²)	
Ventilation from outside building	Low Level Grille	115cm² (18in²)	154cm² (24in²)	186cm² (28in²)	
	High Level Grille	58cm² (9in²)	77cm² (12in²)	93cm² (14in²)	

Sizing of Air Vents

An open flued appliance with an input rating in excess of 7kW (25,000 8tu/h) requires the room or internal space containing it to have an air vent of minimum effective area 4.5cm^2 for every 1kW in excess of 7kW (1 in^2 for every 5000 Btu/h in excess of 25,000 Btu/h). The air vent should be either direct to outside air, or to an adjacent room or internal space that itself has an air vent direct to the outside

Return Air

Return air grille/s must be connected to the return air opening of the air heater by duct/s. Each heated room, with the exception of kitchens, bathrooms and W.Cs, must have either a return air grille or purpose made relief opening communicating with a collection area served by return air grille/s.

Openings must have minimum areas of 100cm^2 per MJ/h (1 in^2 per 250 Btu/h) of designed heat input to the rooms. Ventilation requirements may also be brought in through return air plenum.

3. PREPARATION

Flues

A single 100m (4 in) lightweight asbestos or suitable twin wall flue is required.

Electrical Connections

MAINS: The heater is supplied complete with mains cable (PVC sheathed, high temp, resistant, 3 core, 5A, 0.75mm^2) connected to the terminal strip and can leave the heater from either side or the top. This cable suitable for 240V, 50Hz, single phase supply, must be protected by a 3A fuse and the earth wire connected. A double pole switch or fused spur box should be used or, a 3 pin plug into an unswitched socket outlet.

THERMOSTAT/THERM1STA-STAT: Should be positioned on an internal wall approximately 1.5m (5ft) from the floor, away from direct sunlight, draughts and local warmth. A two pin plug connection is provided on the heater electrical panel.

IMPORTANT MODAIRFLOW Models only

The plug must be connected to the Thermista-stat and polarity of these wires must be observed i.e. + side on electronic panel to + side on Thermista-stat.

Gas Supply

The gas pipe may enter the heater from either side or through the floor of the cabinet by removal of the appropriate knock-outs.

Heater Installation Clearances

Sides and Back — 3mm (1/8;in) minimum.

NOTE:

When gas and water connections are made at the side, a clearance of 76mm (3in) is required.

Front - 76mm (3in) minimum

A servicing access is required to the front of the heater:

J15-22 Mk III - 380mm (15in)

J25-32 Mk III - 460mm (18in)

JA33-43 - 500mm (20in)

It is recommended that the access door to the heater cupboard be large enough to permit heater removal.

4. AIR HEATER INSTALLATION

NOTE:

If a side Return Air Kit is used, fit before installing heater.

For Side Return Air, Top Closure or Slot Fix installation, refer to fitting instructions in relevant kit.

Electrical Connections

Remove fan chamber door and arrange mains lead to exit from heater through either top of cabinet via the fixed grommet provided or, through twist-out in either side of fan chamber door. Remove twist-out with pliers and push running grommet already present on mains lead into twist-out opening.

Connect mains lead to supply using plug fused 3A.

Thermostat or Thermista-stat wires can enter heater using same route as mains lead. Connect to plug provided on panel.

IMPORTANT:

MODAIRFLOW models only: When connecting the Thermista-stat, correct polarity must be observed i.e. + side on electronic panel connection to. + side on Thermista-stat.

If a summer switch is required, fit switch in a suitable position external to the heater and connect wires to terminals 4 and 12 as shown on wiring diagram.

☆ Installation on Suspended Floors:

Combustible floors must be insulated from the heater.

When a base duct is used, the base duct provides sufficient insulation and no insulation is needed underneath the base duct. When an underfloor warm an plenum is used, insulation can be provided by using a J & S base tray.

For J15-22MK3 and J25-32MK3 use base tray BT32

For JA33-43 use base tray BT43.

5. COMMISSIONING

a) Conventional Control Models only

Check that warm air delivery outlets are open, set room thermostat anticipator to 0-5 and set thermostat pointer to OFF or lowest setting.

Check settings of FAN and LIMIT controls:

J15-22 Mk III and J25-32 Mk III

FAN 100°F OFF (40°DIFF) - Honeywell

FAN 100°F OFF (FIXED DIFF) - Thermodisc

LIMIT 200°F and must not be adjusted.

JA33-43

FAN 100°F OFF (30°DIFF) -Honeywell

FAN 100°F OFF (FIXED DI FF) - Thermodisc

LIMIT 190°F and must not be adjusted.

Fit gas pressure gauge to test point.

Turn on gas supply and bleed off air.

Light Pilot Burner — see instructions on appliance.

Adjust pilot flame if necessary so that it just surrounds thermocouple probe (approximately 15mm in length). To adjust flame, remove cover from adjustment point (see Fig. S2) and turn screw **clockwise to decrease, anti-clockwise to increase** flame.

Switch on electricity.

Turn thermostat to MAXIMUM setting and ensure that Time Control is at an ON period.

Check that main burner lights.

Check for gas soundness.

Balance Warm Air System

Remove Fan Chamber Door and fit fan speed selector plug to a number corresponding with the fan curve selected from Fig. 4.

Adjust burner bar pressure to output required (see appropriate table Fig. 3)

NOTE:

Heaters are factory set to a pressure giving maximum output. To adjust pressure, remove cover from adjustment point (see Fig. S2) and turn screw clockwise to increase, anti-clockwise to decrease pressure.

Enter pressure in space provided on Data Plate — see Fig. 1.

With fan chamber door in place, check velocities to design figures. Adjust fan speed if necessary by fan speed selector plug.

NOTE:

If the system includes ceiling diffusers it is important that the velocity of air through these is at least 1.5m/sec (300ft/min). Special low volume diffusers with a free area of 50cm^2 are available from Johnson & Starley Ltd. For details see Johnson & Starley publication ZZ312.

Check temperature rise across heater (85°-100°F) and adjust fan speed if necessary.

Check 'fail-safe' operation of Multifunctional Control.

With main burner off, reduce pilot burner flame by turning screw at pilot flame adjustment point clockwise until it extinguishes. After 50-90 seconds, a loud click should be heard i.e. control has failed safe.

Reset pilot burner flame so that it just surrounds thermocouple probe (approximately 15mm in length).

Check Overheat Limit Control by operating heater with .nain burner alight and fan disconnected — main burner must extinguish within 3-5 minutes.

Automatic Controls Check — Lighting the heater and allowing to run for a short time checks these controls.

Check for gas soundness.

Check that flue operates effectively with heating system on, all doors closed and extractor fan/s if fitted, running.

b) MODAIRFLOW Models only

Check that warm air delivery outlets are open.

Check LIMIT control is correctly set:

J15-22 Mk III and J25-32 Mk III

LIMIT 200°F and **must not** be adjusted.

JA33-43

LIMIT 190°F and must not be adjusted.

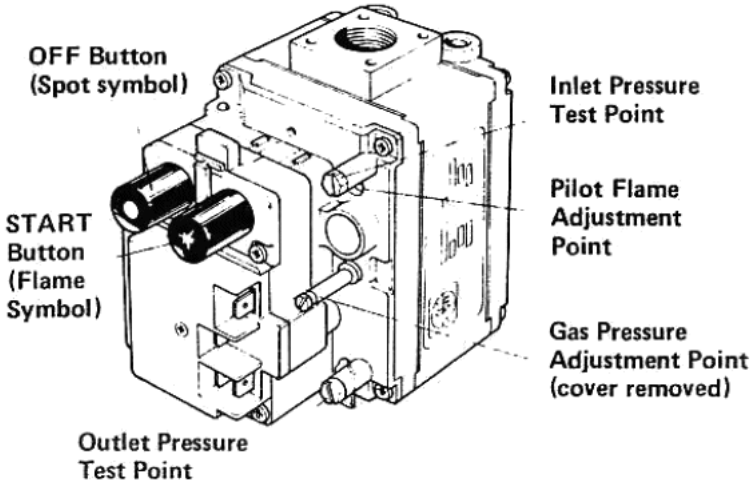
gas pressure gauge to test point.

Turn on gas supply and bleed off air.

Light Pilot Burner - see instructions on appliance.

S.I.T. MULTIFUNCTIONAL GAS CONTROL

Fig. S2



IMPORTANT:

Screw situated beneath this cover and marked No P.R. need only be adjusted for Propane application, when it should be screwed fully anti clockwise. Under no other circumstances should it be touched.

Adjust pilot flame if necessary so that it just surrounds thermocouple probe (approximately 15mm in length). To adjust flame, identify adjustment point (see Fig. H2) and turn screw **clockwise to decrease, anti-clockwise to increase flame.**

Switch on electricity.

Turn Thermista-stat to MAXI MUM setting and ensure that Time Control is at an ON period.

Check that main burner lights.

Check for gas soundness.

Balance Warm Air System:

Remove fan chamber door or access to Electronic Panel.

Set Fan Override Switch to CONTINUOUS.

Turn Balancing Knob to a number corresponding with the fan curve selected from Fig. 4 — fan should run at selected speed.

Adjust burner bar pressure to output required (see appropriate table Fig. 3)

NOTE:

Heaters are factory set to a pressure giving maximum output. To adjust pressure, remove cover from adjustment point (see Fig. H2) and turn screw clockwise to increase, anti-clockwise to decrease pressure.

Enter pressure in space provided on Data Plate — see Fig. 1.

With fan chamber door in place, check velocities to design figures. Adjust fan speed if necessary by using the BALANCING KNOB.

NOTE:

If the system includes ceiling diffusers, it is important that the velocities of air through these (except in very small rooms like bathrooms etc.) is at least 1.5 m/s (300 ft/m). To achieve this, it may be necessary to blank-off part of the outlet face.

Check 'fail-safe' operation of Multifunctional Control. With main burner off, reduce pilot burner flame by turning screw at pilot flame adjustment point clockwise until it extinguishes. After 50-90 seconds, a loud click should be heard i.e. control has failed safe.

Reset pilot burner flame so that it just surrounds thermocouple probe (approximately 15mm in length).

Check Overheat Limit Control, by operating heater with main burner alight and fan disconnected — main burner must extinguish within 3-5 minutes.

Automatic Controls Check — Lighting the heater and allowing to run for a short time checks these controls.

Check for gas soundness.

Check that flue operates effectively with heating system on, all doors closed and extractor fan/s if fitted, running.

HONEYWELL MULTIFUNCTIONAL GAS CONTROL

Fig. H2

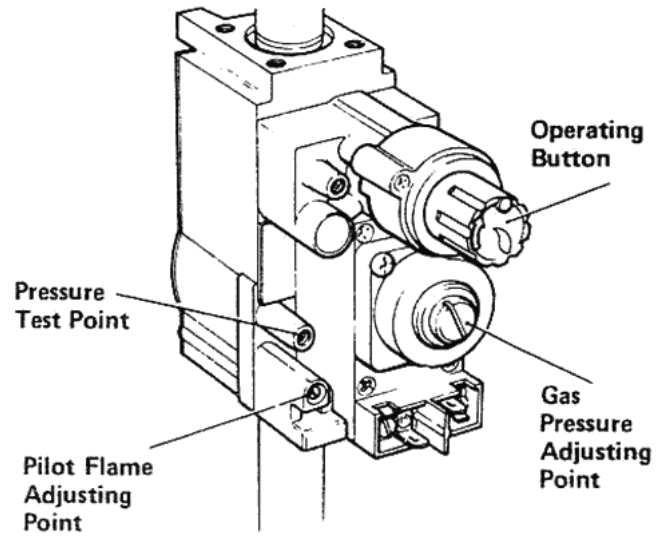
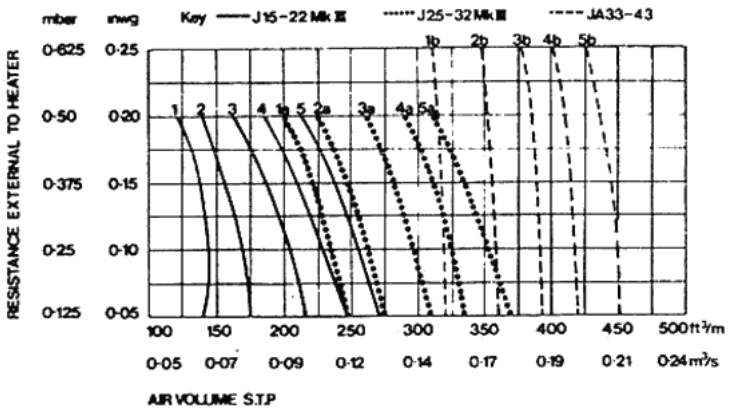


Fig. H2

J15-22 Series		kW	MJ/h	Btu/h	kW	MJ/h	Btu/h	kW	MJ/h	Btu/h
INPUT		5.9	21.1	20,000	7.3	26.4	25,000	8.3	29.8	28,000
OUTPUT		4.4	15.8	15,000	5.6	20.0	19,000	6.5	23.2	22,000
GAS RATE (1000 cv)		0.55 m^3/h		(19.57 ft^3/h)	0.69 m^3/h		(24.3 ft^3/h)	0.78 m^3/h		(27.7 ft^3/h)
GAS	INJECTOR dia. mm.	BURNER BAR GAS PRESSURES (measured hot) 5.3 2.1 8.4 3.4 10.8 4.3								
NATURAL	2.46	5.5mbar		2.2 in. wg	9.1mbar		3.6 in. wg	12.2mbar		4.9 in. wg
PROPANE	1.50	Lower rates not available						35.0		14.0

Fan Performance Curves

Fig. 4



6.SERVICING

Switch off electricity, remove mains plug and turn off service gas cock.

NOTE:

(a) Removal of Burner Assembly

Remove electrical connections from multifunctional control. Disconnect union at input side of control and remove single burner assembly fixing screw from left hand side.

(b) For access to Electrical/Electronic Panel, Fuse, Time Control, Air Circulating Fan and Fan Speed Regulator (MODAIRFLOW Models only), remove Air Filter and Fan Chamber Door. NB Air Filter must be removed before Fan Chamber Door.

Main Burner Cleaning — with burner assembly removed.

Release split pins at rear of burner bar and remove end cap. Brush lightly both inside and out. Under no circumstances should burner holes be enlarged, distorted or brushed strongly.

Injector Cleaning — (Main Burner and Pilot Burner).

Unscrew to remove and clean carefully to avoid damage in each case. When injector replacement is a preferred alternative to cleaning, ensure that replacement injectors are of the.correct orifice size.

Thermocouple

Ensure that thermocouple connection to multifunctional control is tight (finger tight + quarter turn).

Gas Pressure Check

Attach a gas pressure gauge to outlet pressure test point on multifunctional control. Light heater, check pressure and confirm by gas rate check at meter.

Air Circulating Fan Removal and Cleaning

Disconnect fan fly-lead and remove fan retaining plate. Handling with care, lift and withdraw fan assembly. Remove all dust from both impeller and motor, taking care not to disturb the balance of the fan.

Time Control Removal and Replacement

Loosen fixing screw in bottom of Time Control casing, withdraw casing and disconnect electrical leads. Release mounting screw (situated centrally on the rear top face of the mechanism), lift slightly and withdraw mechanism.

Position replacement mechanism onto.the lugs of the mounting plate and lock by a downward movement. Tighten mounting screw, remake electrical connections and replace casing.

Electrical Panel Removal — Conventional Models only

Disconnect fan and withdraw panel fly-lead through fan number door - RETAIN SPLIT GROMMET.

Disconnect at thermostat plug.

Disconnect all leads from terminal block.

Remove Time Control.

Loosen four retaining screws and lift off panel.

Electronic Panel Removal — MODAIRFLOW Models only

Disconnect 3-way, 6-way and Thermista-stat plugs.

Disconnect all leads from terminal block.

Remove Time Control.

Loosen four retaining screws and lift off panel.

Fan Speed Regulator Removal — MODAIRFLOW Models only

Disconnect 3-way and 6-way plugs at Electronic Panel.

Withdraw Fan Speed Regulator fly-lead through fan chamber floor - RETAIN SPLIT G ROMMET.

Remove single fixing bolt situated between large green resistors.

Heat Exchanger Access — All Models

Remove burner bar assembly.

Remove Air Filter and Fan Chamber Door.

Remove access panel from top front face of bulkhead.

Remove cover plate from front of heat exchanger together with gasket.

Heat exchanger can now be inspected and brushed through.

NOTE:

It will be necessary on J15-22 series heaters to displace internal baffle for this purpose.

IMPORTANT:

Ensure baffle (J 15-22 series heaters only) is pushed fully home.

Refit cover plate complete with gasket.

Recommission heater, carrying out checks as detailed in Section 5.

In the event of Heat Exchanger or Burner(s) replacement being necessary contact Johnson & Starley Service Department.

7. FAULT FINDING

NOTE:

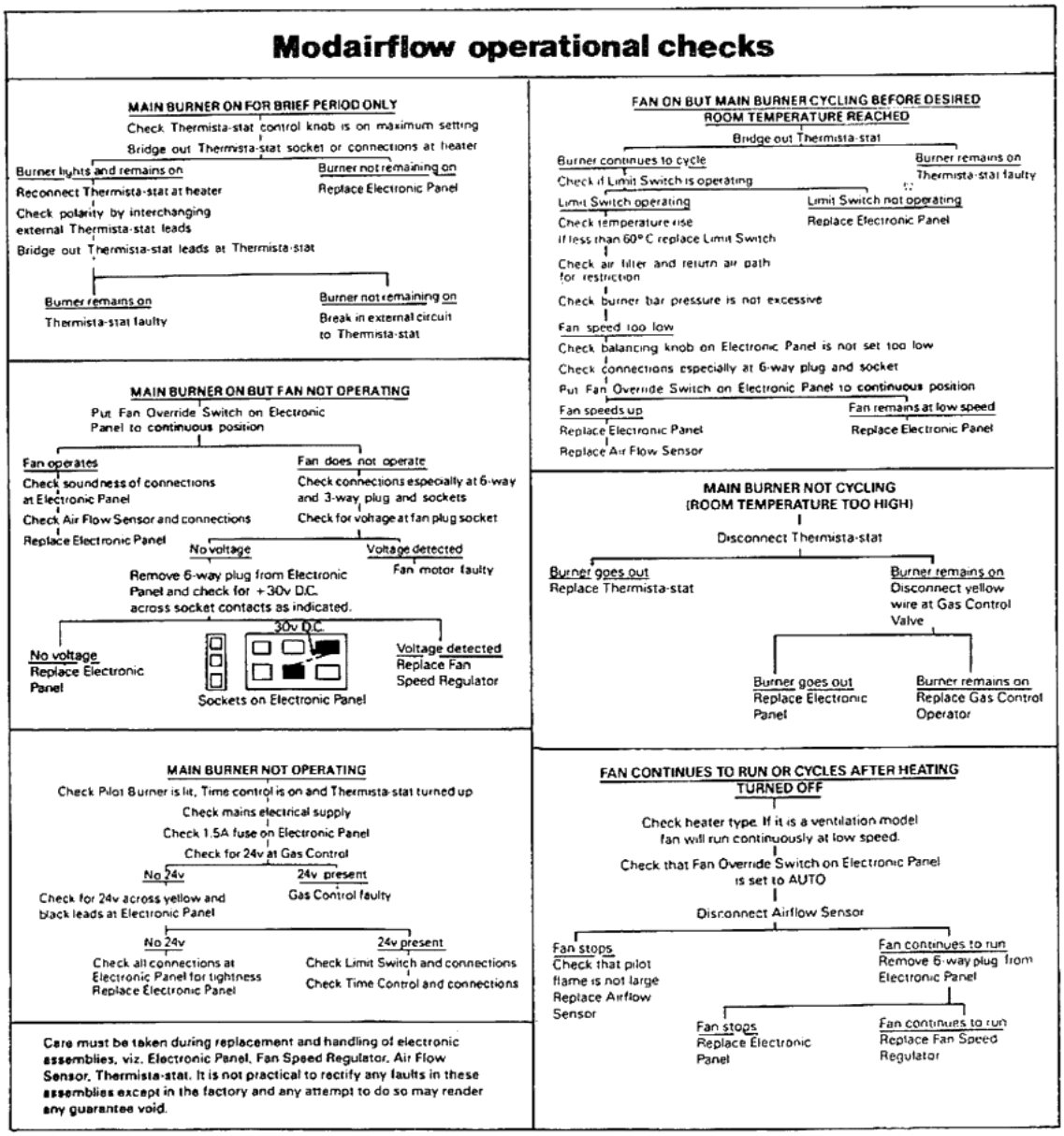
When purging or checking gas supplies, ensure there is adequate ventilation to the room or cupboard and all naked lights are extinguished.

MODAIRFLOW Models only:

Before commencing fault finding, turn Thermista-stat to maximum setting, turn mains supply on and check that Time Control is at an ON position.

Care must be taken during replacement and handling of electronic assemblies, viz Electronic Panel, Fan Speed Regulator, Air Flow Sensor, Thermista-stat. It is not practical to rectify any faults in these assemblies except in the factory and any attempt to do so may render any guarantee void.

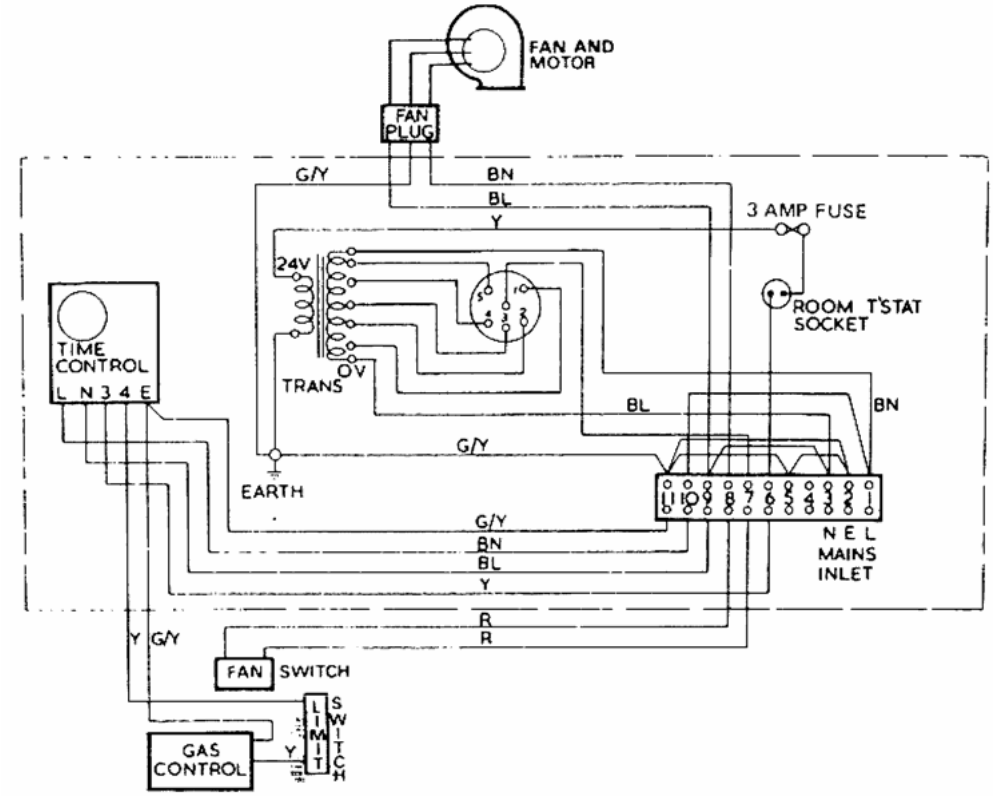
Symptom	Possible Cause	Remedy
(a) Pilot will not light.	(i) No gas supply to heater.	Break service tap union and listen for escape.
	(ii) Gas supply pipe not purged.	Break service tap union until gas is detected.
	(iii) Pilot orifice restricted.	Clear pilot orifice carefully or replace injector.
(b) Pilot lights but goes out onreleasing 'START' button during initial light-up or after normal operation.	(i) Connection between thermocoupleand gas control not secure.	Check connection is secure.
	(ii) Faulty power unit on gas control	Replace power unit.
	(iii) Faulty thermocouple.	Replace thermocouple.
	(iv) Pilot flame of insufficient length.	Adjust.
Conventional Control Heaters only:		
(c) Pilot alight but main burner not igniting	(i) Mains electrical supply notconnected to heater.	Check mains supply.
	(ii) Controls not calling for heat.	Check that time control (if fitted) and room thermostat are calling for heat.
	(iii) 3A fuse failed.	Replace. If failure occurs again, check external room thermostat leads for short to earth.
	(iv) Loose connection on room thermostat. Limit control, gas control head, Time control or transformer.	Check connections for soundness.
	(v) Tranformer open circuited.	Check with test meter and replace electrical panel if necessary.
	(vi) Gas control operator faulty.	Replace operator.
	(vii) Gas control governor faulty.	Replace governor.
	(viii) Faulty Limit control.	Short across control and replace if necessary.
	(ix) Faulty room thermostat or external wiring.	Fit temporary loop in heater room thermostat socket. If heater fires, external circuit or room thermostat is faulty.
(d) Main burner lights but fan fails to run.	(i) Loose electrical connection on fan control or fan plug and socket.	Check connections for soundness.
	(ii) Fan control settings incorrect.	Check settings.
	(iii) Faulty fan assembly.	Replace, taking care not to damage impeller.
	(iv) Faulty Fan control.	Replace.
	(v) Burner bar pressure not correct.	Adjust pressure if necessary.
(e) Main burner operating intermittently with fan running.	(i) Gas rate or burner pressure high.	Check gas rate and burner bar pressure.
	(ii) Temperature rise excessive.	Adjust fan speed or gas rate accordingly.
	(iii) Air filter or return air pathrestricted.	Check filter is clean and return air path is clear
	(iv) Excessive number of outlets closed.	Open additional outlets.
(f) Main burner operating with intermittent fan operation	(i) Gas rate or burner pressure low.	Check gas rate and burner bar pressure.
	(ii) Fan control settings incorrect	Check settings.
(g) Fan runs for excessive period or operates intermittently after main burner shuts down.	Fan control settings incorrect.	Check settings.
(h) Noisy operation.	(i) Gas pressure high.	Check burner bar pressure.
	(ii) Noisy fan motor.	Replace fan motor.
	(iii) Fan speed setting too high .	Adjust fan speed.
(i) Main burner remains ONwith controls set to OFF	(iv) Multifunctional control failsto close down.	Disconnect wire from control. If burner does not extinguish, replace control.



Symptom	Possible Cause	Remedy
(j) Insufficient heating.	(i) Heater gas rate low.	Check and adjust gas rate accordingly.
	(ii) Limit control operation due to	
	(a)Temperature rise set too high.	Adjust fan speed and/or gas rate accordingly.
	(b)Air filter or return air path restricted.	Check filter is clean and return air path is clear.
	(c)Excessive number of outlets closed.	Open additional outlets.
	(d)Limit control out of calibration.	Replace Limit control
	(iii) Incorrect siting of Thermista-stat.	Reposition.
	(iv) Thermista-stat out of calibration.	Replace Thermista-stat.
	(v) Insufficient return air relief.	Check for relief and where no provision has been made, fit grilles to area/s where no positive return air collection is made.
	(vi) Substandard installation e.g. poor insulation, faulty duct connections or damaged ductwork.	Check velocities and underfloor heat losses.
(k) Heater operates outside required periods. Applicableonly when equipped with Time Control.	(i) Time Control motor running slowly.	Replace Time Control.
	(ii) Time Control tappets slipping.	Replace Time Control.
	(iii) Time Control tappets not set in correct sequence.	Refer to Time Control section in User'Vs Instructions and set tappets accordingly.

8. WIRING DIAGRAM

Fig. 5



Voltages of Standard Fan Speed Tappings (No load condition)

J15-22 and J25-32 Heaters

1 112V
2 120V
3 130V
4 145V
5 170V

JA33-43 Heaters

1 145V
2 155V
3 165V
4 172V
5 180V

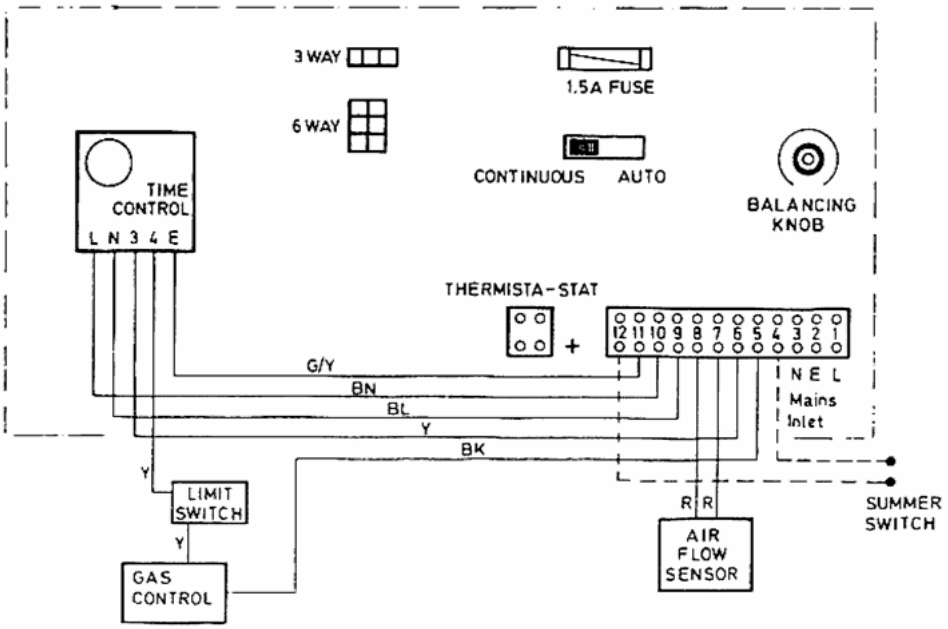
COLOUR CODE

BN — BROWN
BL — BLUE
G/Y — GREEN/YELLOW
R — RED
Y — YELLOW

MODAIRFLOW Control Models

Fig. 6

MODAIRFLOW Control Models



COLOR CODE

BN	—	Brown
BL	—	Blue
G/Y	—	Green/Yellow
R	—	Red
Y	—	Yellow
BK	—	Black