

automatic gas burners

MODEL
CG4
CG4_{H/L}

The Nu-way Model CG4 gas burner is designed for appliances requiring heat inputs in the range 5.1–25.0 therm/h and is arranged for on/off or high/low operation.

The burner complies with the requirements of Gas Council Report 765–70 (standards for automatic gas burners for forced and induced draught).

CONSTRUCTION

Monobloc design with metric dimensions using fasteners to ISO standards.

AIR CONTROL

Spring loaded hinged type damper for accurate control of combustion conditions.

FUEL

Model CG4 burner is available in versions to burn town's or natural gas or LPG (liquified petroleum gas).

CONTROLS

The model CG4 burner may be controlled by suitable thermostats, time switches and frost-stats, etc.

SAFETY FEATURES

Ultra-violet photo-electric cell for flame supervision with Landis & Gyr control box type LFB1.33.

Air pressure switch is adjustable between 0.1 and 1.0 inch wg (2.5–25.0 mm wg : 0.25–2.5 mbar) to suit individual requirements.

OPTIONAL EXTRA FEATURES

Town's gas operation for CG4E burner firing at 20–25 therm/h.

Flame supervision by ionisation probe. Sequence control by Landis & Gyr control box type LFA.1.33.

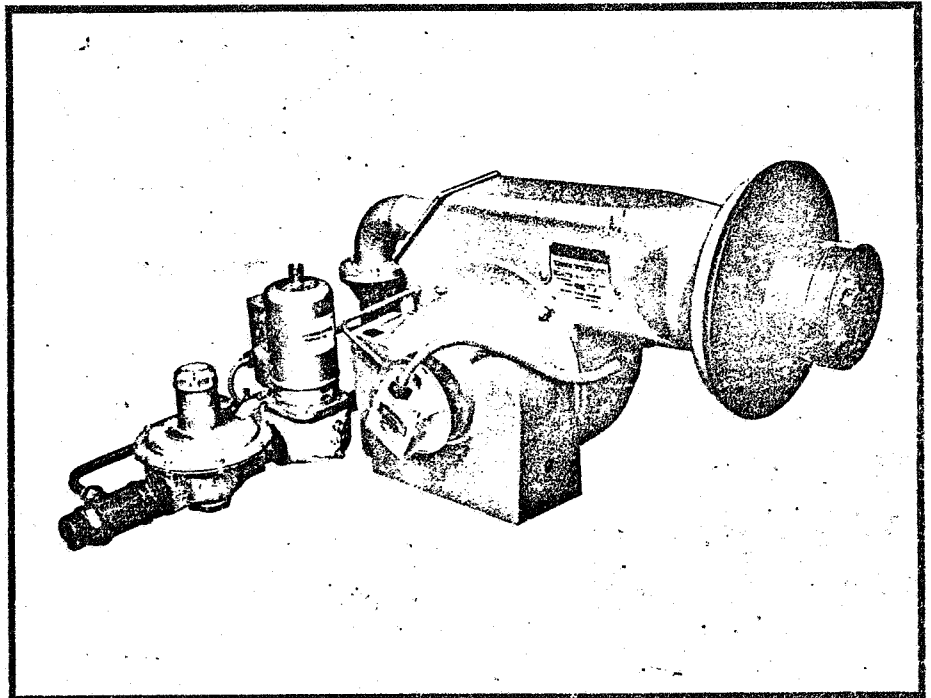
Twin safety shut-off valves (standard on burners rated over 20 therm/h). Valvac and vent valve.

WEIGHT

Without gas train: 104 lb, 47 kg
With standard gas train (town's gas): 155 lb, 70 kg

ELECTRICAL DATA

Supply (V) ±10%	1ph 230	3ph 415
Frequency (Hz)	50	
Motor (kW)	0.56	
Burner start current (A)	30	9
Burner run current (A)	5	1.5
Fuse rating (A)	15	6
Recommended cable size (mm ²)	1.5	1.0
Ignition	Direct spark	



BURNER SELECTION

Burner model	Gas input	Boiler rated output (η=80%)			Maximum boiler resistance		Gas type	Gas pressure	
		Btu/hx10 ³	kW	kcal/h x10 ³	wg	mm wg		wg	mbar
CC4A	5.1 to 7.0	407-560	120-164	102-141	1.38	35	Town's	3	7.5
							Natural	8	20
							LPG	14	35
CG4B	7.1 to 9.0	570-720	167-210	144-181	1.38	35	Town's	3	7.5
							Natural	8	20
							LPG	14	35
CG4C	9.1 to 15.0	730-1200	214-350	184-302	1.38	35	Town's	3	7.5
							Natural	8	20
							LPG	14	35
CG4D	15.1 to 20.0	1220-1600	357-470	307-403	1.38-0.79	35-20	Town's	3	7.5
							Natural	8	20
							LPG	14	35
CG4E	21.0 to 25.0	1680-2000	492-588	424-504	0.68-0.20	17.5	Natural	8	20
							LPG	14	35

NOTES:

1 Burner and boiler ratings shown assume balanced draught conditions at the rear of the boiler.

2 Gas pressure shown is that required at the main governor inlet port and includes allowances for losses in the pipes, valves and lance of the burner downstream of this point.

3 CG4E with burner output of 21–25 therm/h can be offered for use with town's gas : a gas pressure booster is then required.



After unpacking the burner, it is necessary to attach the gas train assembly and the terminal box to the burner.

INSTALLATION

If the burner is being fitted to an existing appliance, the stack, flue passage ways, and heat transfer surfaces must be cleaned.

Prepare boiler frontplate to receive burner. (See Data Sheet).

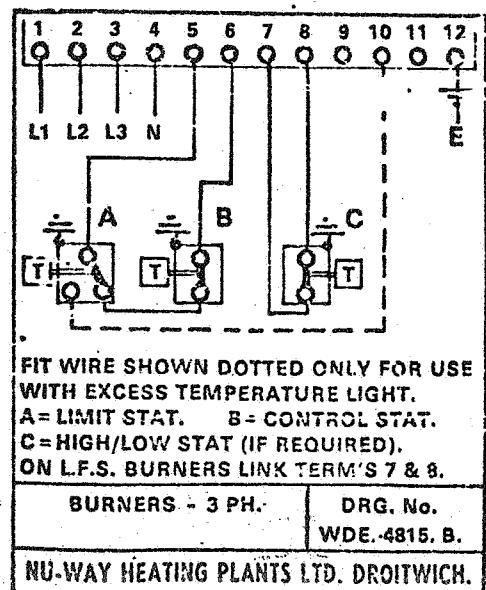
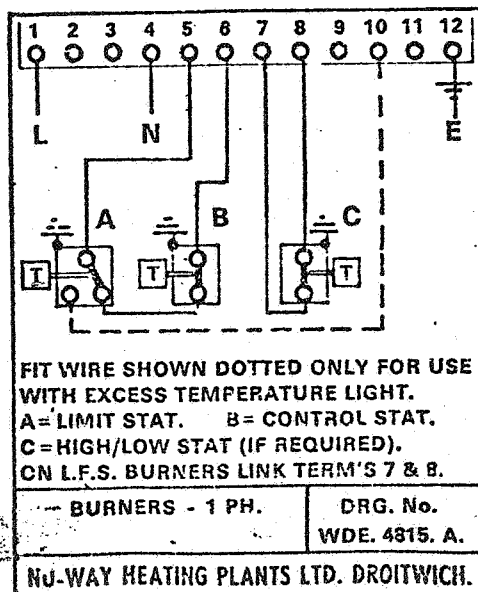
The end of the draught tube must be flush with, or protruding from, the forward face of the quarl or boiler frontplate protection.

Flue and ventilator requirements.

The top of the flue should be above all roofs within a radius of 10 m (30 ft). If a cowl is fitted it should be removed.

The height of the flue from the boiler outlet, should be 4.6-12.2 m. (15 /40 ft.). The corresponding draught over the burner, when firing, should be between 0.5 and 8.0 m. (0.02" and 0.30") w g.

Electrical Connections



A fresh air ventilator is required for the room housing the appliance. The minimum area should be calculated on the basis of 0.16 sq ft (142 sq cm) per 100 000 Btu/h (26.5 Kcal/h). Further high and low level ventilation may be required should the temperature in the boilerhouse exceed 45°C - (110°F).

The gas supply lines

Sized to British Gas recommendations, and made up in accordance with BS1937: or to local gas installation standards.

A manual gas shut-off valve should be fitted upstream of the burner/gas line assembly to permit burner maintenance.

Purge air from the gas supply main.

Electrical supply.

Connect the electrical supply, from the stats, time switches, etc. as appropriate (see appropriate wiring diagram).

OPERATION

To start the burner turn the gas supply valve, the main electrical isolating switch, and where fitted, the separate burner switch to ON.

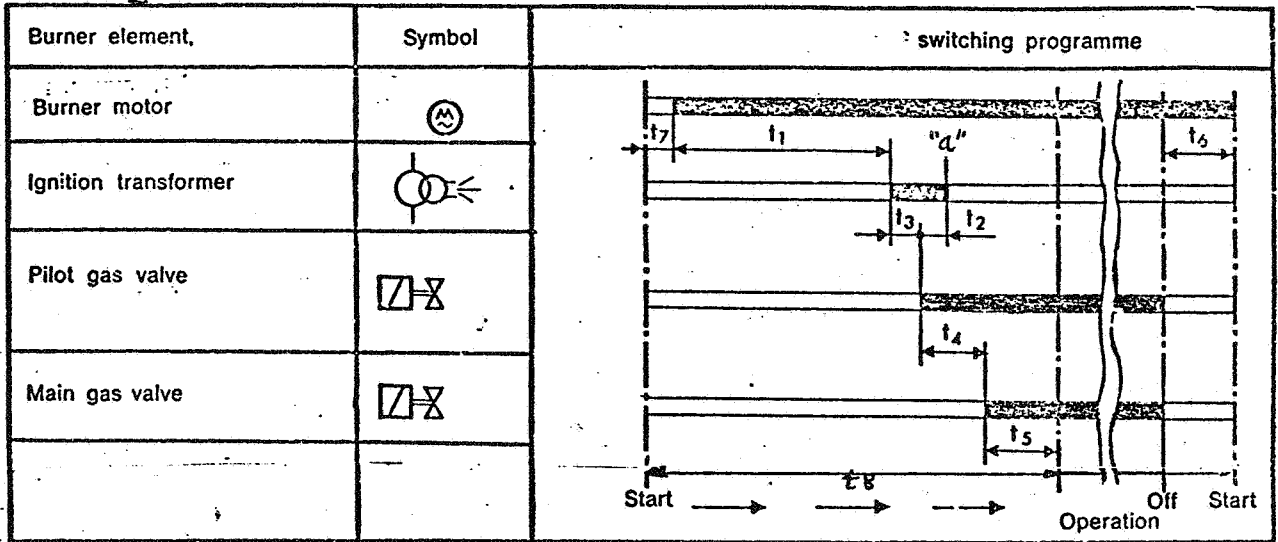
The burner can be stopped in an emergency by opening either of the electrical switches, or by turning off the gas supply.

Ensure that the control box is not in the open "lock-out" condition.

When the burner starts, the switching programme cycle is as

follows:-

Switching programme



	FW46	LFA1.33	LFA1.63
t1	30 secs	30 secs	60 secs
t2	4	3	3
t3	3	3	3
t4	19	12	12

	FW46	LFA 1.33	LFA 1.63
t5	22 secs	28.5 secs	28.5 secs
t6	38	10.5	10.5
t7	5.5	6	6
t8	82	79.5	109.5

The burner continues to run until switched off by:

- a) The control thermostat contacts opening, upon the room or water temperature being reached.
- or
- b) Safety, limit thermostat and time switch contacts opening,
- or
- c) The burner being switched off manually,
- or
- d) Power failure (upon power restoration, burner will restart automatically in the normal way, after the post-purge period).

If the flame fails to be established, the lock-out safety circuit causes the magnetic valves to shut and the lock-out lamp to be illuminated. The lamp is situated on the top of the Elesta FW4GA21 control box and behind the reset button on the Landis & Gyr LFA1.33 and 1.63 control boxes.

4.

The control box and motor will both continue to run until the end of the programme cycle (total cycle time - 120 secs. for FW46A21 and LFA1.63: and 90 secs. for LFA1.33). The red reset button should then be pressed to enable the control box to attempt to restart.

If during normal burner operation the flame is extinguished, the flame detection circuit reacts within 1 second shutting the magnetic valves and illuminating the lock-out lamp.

The control box and motor will both continue to runetc. (as above).

COMMISSIONING

Release the spring pressure on the main gas governor and open the air damper.

Set the air pressure switch to the minimum figure.

Check that all controlling instruments are calling for heat.

Close manual shut-off valves downstream of magnetic valves.

Switch on electrical supply and if necessary, press red lock-out button.

Check that programme runs to position "a" on the switching programme chart, goes to lock-out and then completes the programme cycle.

Open the manual pilot shut-off valve. Press the red lock-out button, check that the burner starts and runs on pilot flame.

Open the manual main shut-off valve. Check that the burner starts and runs on main flame.

Using a manometer, connected to the pressure test nipple downstream of the main gas governor, set the main gas governor to a pressure

suitable for the output required. (an approximate setting is shown on Data Sheet).

Adjust the air inlet damper to give the correct gas flue analysis, using a flue gas sampling kit to determine this.

Finally, increase the air pressure switch setting until the burner shuts down and completes the programme cycle. Turn back the setting knob slightly and allow the burner to restart. (Note: The setting knob may have to be turned back several times until the burner starts up and fires normally).

FAULT FINDING

NOTE

It may be necessary, when rectifying a fault, to check whether the air pressure switch is in the "burner start" or "burner run" position. The following procedure will assist in this check: Ensure that all thermostats are in the shut, "calling for heat", position.

Remove the control box.

"Burner start" position - continuity between terminals 19 and 7 on the Elesta FW46A21 and terminals 8 and 10 on the LFA1.33 and 1.63 control boxes.

"Burner run" position - continuity between terminals 5 and 7 on the Elesta FW46A21 and terminals 3 and 10 on the LFA 1.33 and 1.63 control boxes.

If the air pressure switch is found to be in the "burner run" position turn the setting knob to zero. If continuity is not broken the pressure switch is faulty and should be replaced.

6:

Motor fails to start

Check that power is available and that the burner has been correctly wired. Check all fuses in the supply to the burner. Check that the contacts of the time clock and both the control and safety limit thermostats on the appliance or in the room are closed and therefore calling for heat, if these thermostats are not closed, check thermostat settings.

NOTE

(The safety limit thermostat should be set at least 11°C (20°F) above the control thermostat.)

Check that the air pressure switch is in the "burner start" position (see above).

Check that the control box is not in the "lock-out" position (the signal lamp may be faulty).

Check that a flame is not present - the gas valves may not be totally shut off.

Check the probe setting, that the probe is not being short circuited, also that the insulator is not cracked or dirty.

If the "lock-out" condition cannot be reset, the control box may be faulty and should be replaced.

Fan and control box run continuously. Burner does not start.

Air pressure switch is continually in "burner start" position.

Reset air pressure switch (page 7) and check operation (page 7).

Fan starts, but burner goes to "lock-out".

If the flame fails to be established the "lock-out" safety circuit causes the magnetic valves to shut and the "lock-out" lamp to light.

This lamp is situated on top of the Elesta FW46A21 control box and behind the reset button on the Landis & Gyr LFA1.33 and 1.63 control boxes.

4.

The control box and the motor will both continue to run until the end of the programme cycle (total cycle time - 120 seconds for FW46A21 and LFA1.63 and 90 seconds for LFA1.33). The red reset button should then be pressed to enable the control box to attempt a restart.

Ascertain that gas is reaching the appliance, and that the two (3) magnetic valves are in working order.

Check electrode and probe settings, that neither are being short circuited and that the insulators are not cracked or dirty.

Check operation of the transformer, and high tension leads for continuity.

Check that the mains live and neutral connections are correct and that there is a good earth to the burner.

Check that the pilot gas governor is set at a nominal pressure of, 5" for natural gas and 2 $\frac{1}{2}$ " for town's gas. (The actual figure may differ if the probe electrical signal is insufficient, not less than 8 μ A).

Flame unstable

Check that the burner gas governor has been set at the correct pressure.

Check for blockage in the nozzle and diffuser drillings.

Burner stops after satisfactory running period

If, during normal burner operation, the flame is extinguished, the probe signal reacts within one second, shutting the magnetic valves and illuminating the lock-out lamp. The control box and motor will both continued to run until the end of the programme cycle. The red reset button should now be pressed to enable the control box to attempt a restart.

Check gas supply and pressure.

Check air entry for blockages.

Check that the probe is correctly set and that the insulator is not cracked.

Smell of gas

Check all pipeline joints with soap solution, and tightness of the gas valves. DO NOT SEARCH FOR LEAKS WITH NAKED FLAMES.

Combustion

If there is excessive combustion noise or the flame appears more yellow than usual, contact your installer or service engineer.

Maintenance

Before carrying out any work on the burner, ensure that the electricity and gas supplies are OFF.

No maintenance is required on the pressure switch, control box, magnetic valves or governor unit, apart from checking all cable connections.

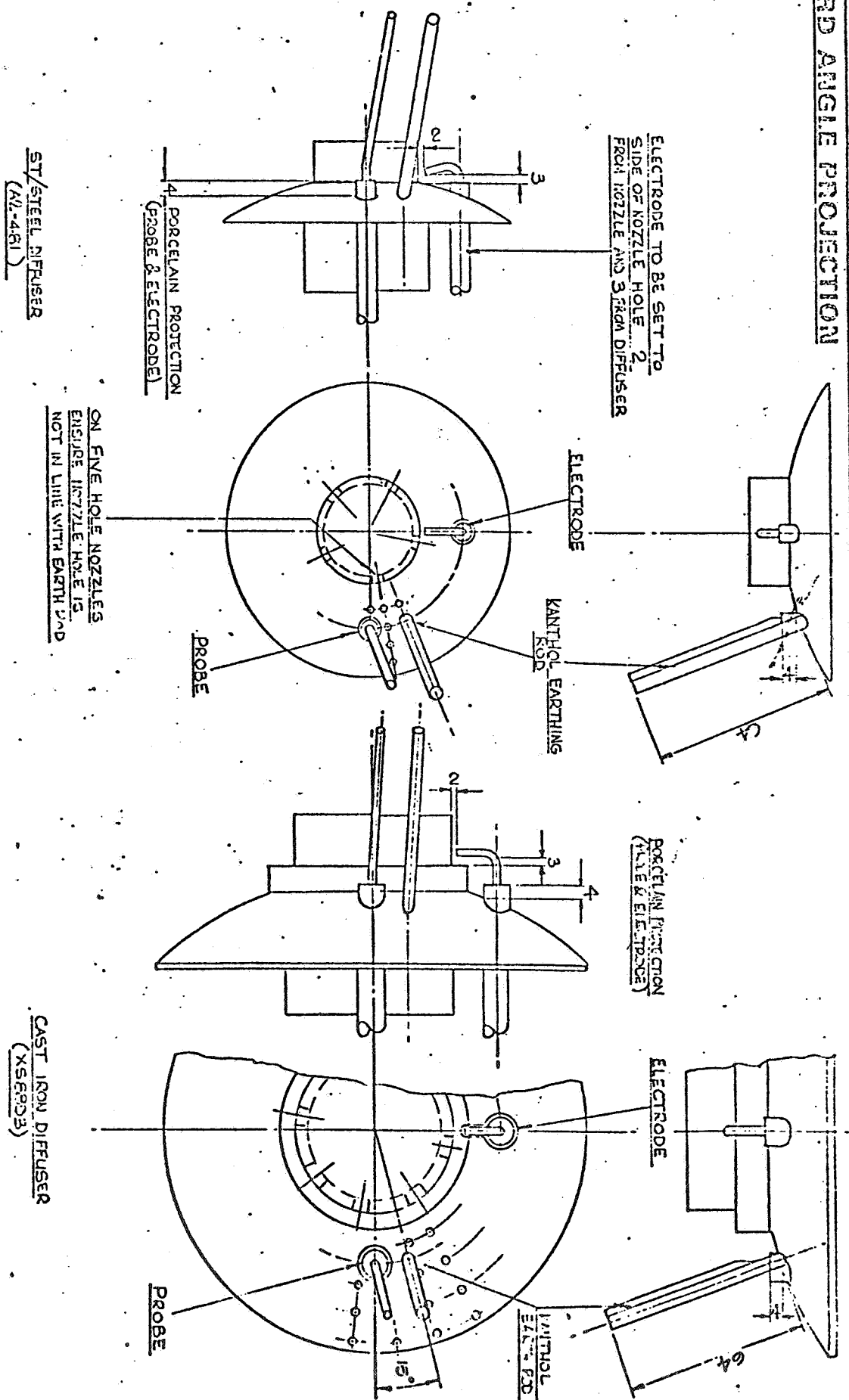
The motor bearings are lubricated for life.

If the fan is damaged, or becomes loose on the motor shaft, it should be repositioned approx. central between the faces of the body casting, taking care that it does not foul any of the air adjustment components.

1 No. A2-433

1	2	3	4	5
7	8	9	10	11

THIRD ANGLE PROJECTION



FIN. CODE	FIN. CODE
MACH. FINISH	ROUGH
DIMENSION TOLERANCE	± 0.5mm

PROTECTIVE FINISH	ROUGH	FINISHED	FINE FINISHED
0-150mm	± 0.5mm	150mm & OVER	± 1.0mm

NU-WAY HEATING PLANTS LTD.
DROITWICH - WORCS

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TITLE

ELECTRODE PROP. & EARTH ROD SETTING (C&T BURILL)

FIN. CODE

MATL. CODE

DRG. No. A2-433

NOTE: EARTH ELECTRODE & PROBE TO RUN PARALLEL TO ONE ANOTHER

ORDERING INFORMATION

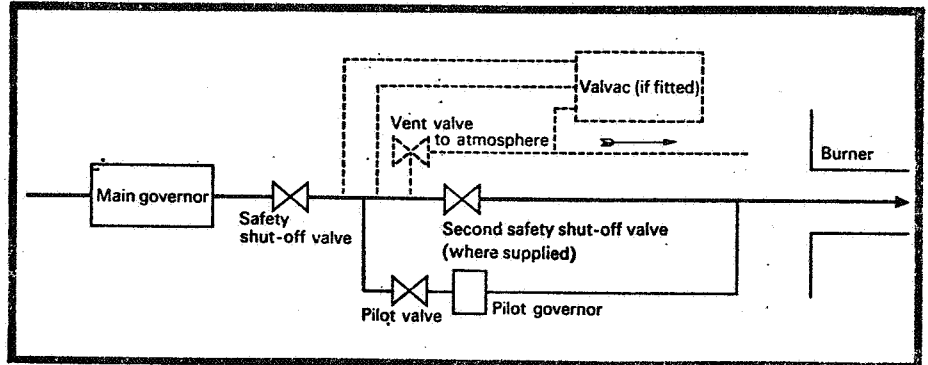
When ordering a Nu-way model CG4 burner please specify the following information in order to expedite your order.

Type of boiler with which the burner is to be used.

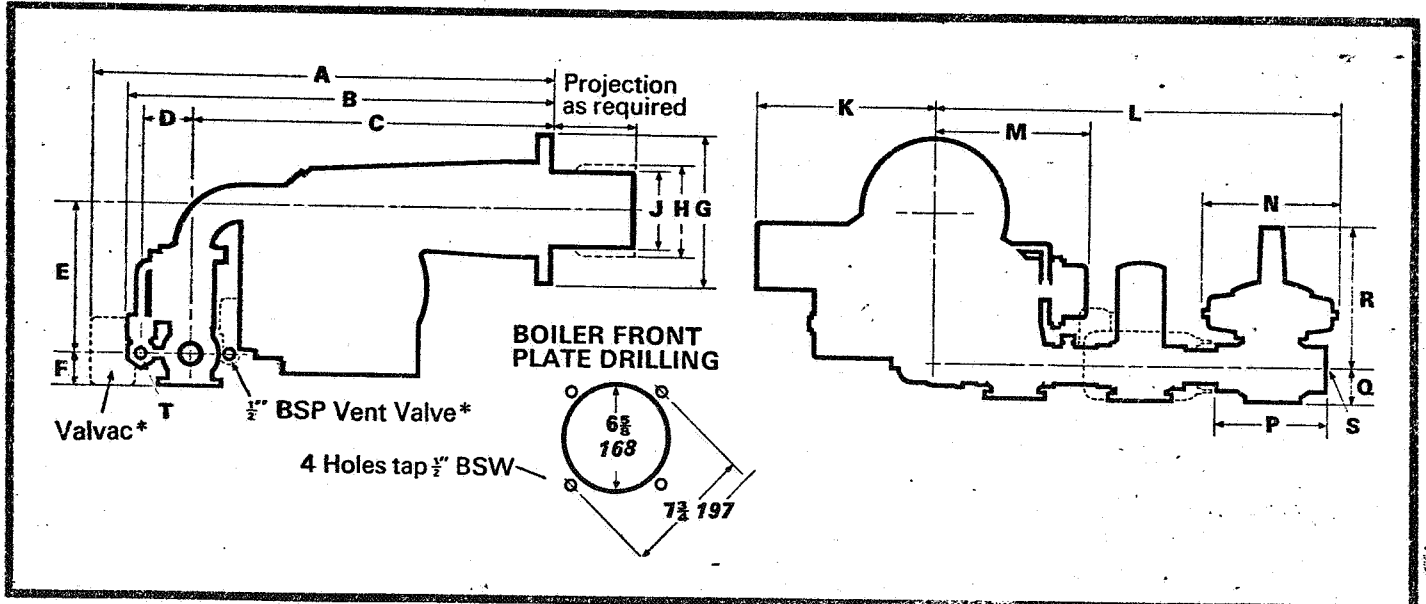
Rating of boiler.

Specification of electricity supply locally available, i.e. voltage, frequency, and whether single or three phase.

Type of gas which is to be consumed by the burner.



DIMENSIONS



*Optional extra features

Burner model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S " BSP	T " BSP
CG4A	34 3/4	31 1/2	25 1/4	5	12	3 1/2	10 1/4		5 1/4	10 5/8	37	10 13/16	8 3/8	7 1/2	2 3/4	9 1/2	2	3/8
CG4B	882	800	641	127	305	89	260		133	270	940	275	213	191	70	241		
CG4C																		
CG4D	35 1/2	31 1/2	25 1/4	5	13 1/2	4 7/8	10 1/4	6 5/8		10 5/8	50	10 13/16	15	11 1/2	4	14 3/4	3	1/2
CG4E	902	800	641	127	343	124	260	156		270	1270	275	381	292	102	375		

NOTES

- Dimensions shown in black, inch; in green, mm.
- Gas connection T is 3/8" BSP on burners rated up to 10 therm/h, 1/2" BSP over 10 therm/h.
- Dimension M is 11 3/4" (298mm) on CG4 high/low burner.

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Nu-way policy is one of continuous improvement. The right to change prices and specifications without notice is reserved.



