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Diamond
catering equipment

HIGH POWER GAS BURNER
MODEL : P31



CE 0370

INDEX:

1.-	TECHNICAL INSTALLATION INSTRUCTIONS	3
2.-	MAIN DIMENSIONS	3
3.-	TECHNICAL DATA	3
4.-	INSTALLATION	5
4.1.-	PLACE OF INSTALLATION	6
4.2.-	ELIMINATION OF COMBUSTION RESIDUES	6
4.3.-	CONNECTION TO THE GAS INSTALLATION	6
4.4.-	OPERATION CONTROL	6
5.-	TECHNICAL MAINTENANCE	7
6.-	INSTRUCTIONS FOR REPLACEMENT OF COMPONENTS	7
6.1.-	PARTS LIST	7
6.2.-	REPLACEMENT OF THERMOCOUPLE	7
6.3.-	REPLACEMENT OF PILOT BURNERS	8
6.4.-	REPLACEMENT OF THERMOELECTRIC SECURITY VALVE	8
7.-	GAS CONVERSION	8
7.1.-	REPLACEMENT OF BURNER INJECTOR	8
7.2.-	REPLACEMENT OF PILOT BURNERS INJECTORS	9
7.3.-	PRIMARY AIR REGULATION	9
7.4.-	BURNER REGULATION	9
8.-	PROBLEMS AND SOLUTIONS	9
9.-	USE AND MAINTENANCE INSTRUCTIONS	10
9.1.-	START-UP	10
9.1.1.-	SWITCHING ON THE BURNER	10
9.1.2.-	SWITCHING OFF THE BURNER	10
10.-	MAINTENANCE	10
11.-	EC CERTIFICATE	10

1. TECHNICAL INSTALLATION INSTRUCTIONS

This manual contains all information needed to install and maintain this device appropriately. Keep this manual in a safe place for consultation in future, if necessary.

Installation and connection as well as conversion to another type of gas must be done by qualified staff following the warnings indicated on the labels stuck to the device and packing.

This equipment is made for professional use and for qualified personnel only.

In case of breakdown please contact an authorized technician and only use original spare parts.

2. MAIN DIMENSIONS

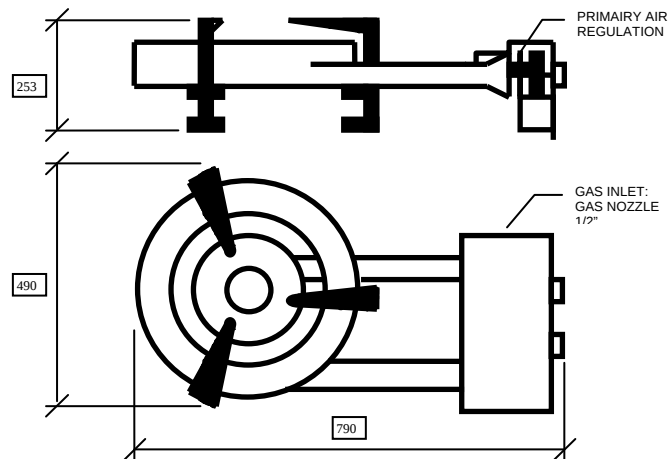


Fig. 1.

3. TECHNICAL DATA

Chart 1: Dimensions

MODEL	EXTERNAL DIMENSIONS			WEIGHT
	Lenght (mm)	Depth (mm)	Height (mm)	(Kg)
P-31	790	490	253	40

Chart 2: Categorías, Gases y presiones de utilización

COUNTRIES	CATEGORY	GAS	PRESSURES
AT, CH, CZ, DK, EE, ES, FI, GB, GR, IE, IT, LT, LV, NO, PT, RO, SE, SI, SK	I2H	G20	20 mbar
DE, LU, PL, RO	I2E		
BE, FR	I2E+	G20	20 (25) mbar
NL	I2L	G25	25 mbar
CY, DK, EE, FR, HU, IT, LT, NL, RO, SE, SI	I3B/P	G30, G31	30 mbar
AT, CH, CY, CZ, DE, FR	I3B/P	G30, G31	50 mbar
BE, CH, CY, CZ, ES, FR, GB, GR, IE, IT, LT, PT, SI	I3+	G30, G31	28-30, 37 mbar
CY, DK, EE, FI, IT, LT, RO, SE, SI, SK	II2H3B/P	G20 / G30, G31	20 mbar / 30 mbar
AT, CH, CY, CZ, SK	II2H3B/P	G20/ G30, G31	20 mbar / 50 mbar
CH, CY, CZ, ES, GB, GR, IE, IT, LT, PT, SI, SK	II2H3+	G20 / G30, G31	20 mbar / 28-30, 37 mbar
NL, RO	II2L3B/P	G25 / G30, G31	25 mbar / 30 mbar
DE, RO	II2E3B/P	G20 / G30, G31	20 mbar / 50 mbar
FR	II2E+3B/P	G20 / G30, G31	20 (25) mbar / 30, 50 mbar
BE, FR	II2E+3+	G20 / G30, G31	20 (25) mbar / 28-30, 37 mbar

(1): Provided with a nozzle according to ISO 228-1.

Chart 3: Injector's diameters (hundredths of mm)

MODEL	P-31 DIAMETER 1/100 mm	
	BIG RING	SMALL RING
Main Burner Liquid Gas LPG G30/G31 at 28-30/37 mbar	215	140
Main Burner Liquid Gas LPG G30 at 50 mbar	190	120
Main Burner Liquid Gas LPG G31 at 50 mbar	200	130
Pilot burner Liquid Gas LPG G30/G31 (3 ^a Family)	20	20
Main burner Methane Gas G20/G25 at 20/25mbar	320	210
Pilot burner Methane Gas G20/G25 (2 ^a Family)	35	35

Chart 4: Nominal pressure, máximo and minimum

GAS TYPE	PRESSURE (mbar)		
	NOMINAL	MINIMUM	MAXIMUM
G 20	20	17	25
G 20 + G 25	20/25	17	25/30
G 30/G 31	30	25	35
G 30 + G 31	28-30/37/50	20/25	35/45

Chart 5: Burner consumptions

NOMINAL CALORIC CONSUMPTION ⁽¹⁾⁽²⁾		kW		NOMINAL CONSUMPTIONS ⁽¹⁾	
			TOTAL		TOTAL
G20	BIG RING	Q _n	19	1,99 (Nm ³ /h)	2,83 (Nm ³ /h)
	SMALL RING	Q _n	8	0,84 (Nm ³ /h)	
	BIG RING	Q _{min}	6,92	0,73 (Nm ³ /h)	1,12 (Nm ³ /h)
	SMALL RING	Q _{min}	3,64	0,39 (Nm ³ /h)	
G25	BIG RING	Q _n	19	2,32 (Nm ³ /h)	3,3 (Nm ³ /h)
	SMALL RING	Q _n	8	0,98 (Nm ³ /h)	
	BIG RING	Q _{min}	6,92	0,85 (Nm ³ /h)	1,3 (Nm ³ /h)
	SMALL RING	Q _{min}	3,64	0,45 (Nm ³ /h)	
G30 (28-30 mbar)	BIG RING	Q _n	19	1,22 (kg/h)	1,74 (kg/h)
	SMALL RING	Q _n	8	0,52 (kg/h)	
	BIG RING	Q _{min}	6,92	0,55 (kg/h)	0,84 (kg/h)
	SMALL RING	Q _{min}	3,64	0,29 (kg/h)	
G31 (37 mbar)	BIG RING	Q _n	19	1,2 (kg/h)	1,71 (kg/h)
	SMALL RING	Q _n	8	0,51 (kg/h)	
	BIG RING	Q _{min}	6,92	0,54 (kg/h)	0,82 (kg/h)
	SMALL RING	Q _{min}	3,64	0,28 (kg/h)	
G30 (50 mbar)	BIG RING	Q _n	19	1,64 (kg/h)	2,29 (kg/h)
	SMALL RING	Q _n	7,5	0,65 (kg/h)	
	BIG RING	Q _{min}	11	1,18 (kg/h)	1,77 (kg/h)
	SMALL RING	Q _{min}	5,5	0,59 (kg/h)	
G31 (50 mbar)	BIG RING	Q _n	19	1,62 (kg/h)	2,26 (kg/h)
	SMALL RING	Q _n	7,5	0,64 (kg/h)	
	BIG RING	Q _{min}	11	1,16 (kg/h)	1,73 (kg/h)
	SMALL RING	Q _{min}	5,5	0,57 (kg/h)	

(1) All consumptions include the pilot burner.

(2) Hi consumption.

4. INSTALLATION

Installation must to be done by qualified persons following the installation norms that are in force locally and according to the instructions of the gas supplying company.

Install the device in a draughty place to avoid unacceptable concentrations of substances harmful to health.

Remove the protective stainless steel plate to have access to the control of components.

Before proceeding with the installation and start-up of the device, read attentively the instructions of this manual and in particular the norms related to security.

This device is intended for professional use and it has to be used by trained persons.

Before connecting the device, check first:

- That all removable parts are in the correct position. If some part moved during transport, first readjust it.
- That the support bench is levelled correctly.

4.1 PLACE OF INSTALLATION

Install the device in a location where adequate combustion and ventilation air are available. Respect the norms that are in force concerning this matter locally.

A minimum of 150mm should be maintained between the fryer and any combustible material.

Install this device individually or integrated in other NT Gas kitchen furniture.

4.2 ELIMINATION OF COMBUSTION PRODUCTS

This is a **Type A_s** device. The device should not necessarily be connected directly to an exhaust duct outdoors.

Considering this device's working characteristics, consumption and working temperature, it's necessary to install the device near to a ventilation hood to assure a perfect elimination of combustion gases. Combustion residues should be eliminated directly or indirectly by a hood to prevent unacceptable concentrations of residues harmful to health.

This device needs an AIRFLOW of 270m³/h for a correct combustion and elimination of combustion residues.

4.3 CONNECTION TO THE GAS INSTALLATION

Before connecting the device, first consult the gas supplying company to check whether your gas network supplies the necessary pressure and flow in order to ensure a proper operation of the device.

Connection of the device to the general gas installation must always be done **by an authorized technician**.

The general installation should be provided with a stopcock. Each device should have its own stopcock in order that the rest of the installation does not remain disabled in case of failure of any of the other devices installed jointly.

This appliance is equipped with a stainless steel front panel that protects the gas valves and the elements that regulate the inlet of combustion air. **Do not cover this part either entirely or partially** in order to ensure a proper combustion and not to alter the combustion air inlet. Leave the upper part uncovered so as to allow a correct elimination of combustion residues.

The device is connected with a male input piece, ½" diameter, according to ISO 7-1, see fig. 1.

The gas type for which this device is configured is indicated on the front panel, next to the gas connection.

Check the gas pressure at the inlet, since pressure loss by the gas network is possible. If necessary, install a pressure regulator or stabilizer to prevent the inlet pressure to the fryer to exceed the pressure indicated on the plate or on chart 4 of these instructions.

Both rigid and flexible pipes can be used. If rigid pipes are used, the gas valve must be installed as close as possible to the connection of the device. In case of flexible tubes, only approved and standardized tubes may be used.

Connect the device as follows:

- a) Make sure that there is no flame around.
- b) Connect the device to the gas network according to the norms in force and check with a manometer or soapy water that the connection is leakproof. Never use a flame to verify if there are leaks. Should there be a gas escape anywhere, close the gas valve and repair. Test again until the connection is leakproof.

4.4 OPERATION CONTROL

• Control of the nominal caloric consumption

When the installation is new, or when the machine is converted to a different type of gas than that for which the device was prepared for initially and after each maintenance operation, an authorized installer of the gas supplying company should check the nominal caloric consumption of the device.

The nominal caloric consumption for each burner is indicated on chart 5.

Install a meter to measure the gas flow according to the values indicated on chart 5.

• Control of the input pressure

Check whether the device is regulated for the type of gas to be used. Verify the information on the characteristics plate of the device or on chart 2 of these instructions. In case the gas type is different, make the conversion following the indications of chapter 7.

Measure the pressure of the device with a "U" manometer with a minimum resolution of 0,1 mbar at the gas input connection. If the pressure is not between the values indicated on chart 4, do not start the device. Report your gas supplying company on this.

- **Primary air control**

The flame has to be stable, dark blue and should hardly have yellow extremities in the basis. If you observe that the flame has yellow extremities, this means that primary air is failing. Regulate the primary air flow by loosening the nut and moving the air regulation ring towards the inlet nozzle. Otherwise, if the flame comes off the burner or the flame base is not stable, move the air regulation ring in the opposite direction.

- **Operation control**

Start up the machine according to the instructions.

- Check the tightness of the gas circuit.
- Check the ignition and quality of the flame.

5. TECHNICAL MAINTENANCE

The maintenance of this device has to be done by an authorized installer, by the manufacturer or by the gas company.

It's advisable to do a general control of the device at least once a year. Check:

- a) The tightness of the gas circuit. Replace joints if necessary.
- b) The ignition system or pilot burner and thermocouple.
- c) Do not grease the gas valves, as mentioned under point 6.4.
- d) If flexible tubes are used, check the expiry date and replace if necessary.

6. INSTRUCTIONS FOR REPLACEMENT OF COMPONENTS

This operation may only be done by an authorized installer or by the manufacturer's staff.

6.1 PARTS LIST

Most important parts to assure a correct working of the device are:

- PILOT BURNER
- THERMOCOUPLE
- THERMOELECTRIC SECURITY VALVE

Before you replace any component, always make sure that the general gas valve is closed. Also make sure there is no flame around.

6.2 REPLACEMENT OF THERMOCOUPLE

Proceed as follows:

- a) Unscrew the hexagonal screw and loosen the control to remove the stainless steel front panel.
- b) Loosen the nut that fixes the thermocouple to the thermoelectric security valve.
- c) Loosen the clamp that attaches the thermocouple to the gas mixing tube.
- d) Assemble the new thermocouple and tighten, but not more than 0,4 kp.m.

6.3 REPLACEMENT OF PILOT BURNER

Proceed as follows:

- a) Unscrew the hexagonal screw and loosen the control to remove the stainless steel front panel.
- b) Remove the clamp that attaches the pilot burner to the gas conducting tube.
- c) Loosen the fitting of the pilot burner tube.
- d) Replace the pilot burner. Torque should not exceed 0,8 kp.m.
- e) Make sure that the circuit is gastight before starting the device again.

6.4 REPLACEMENT OF THE THERMOELECTRIC SECURITY VALVE

VERY IMPORTANT: DO NOT MANIPULATE OR GREASE THE GAS TAP. IN CASE OF BREAKDOWN OR JAMMING OF THE AXIS, THE ENTIRE VALVE MUST BE REPLACED BY AN AUTHORIZED TECHNICIAN.

Proceed as follows:

- a) Unscrew the two hexagonal screws and loosen the controls to remove the stainless steel front panel.
- b) Loosen the nut that fixes the thermocouple to the valve.
- c) Loosen the nut that fixes the pilot burner to the valve.
- d) Unscrew the four flat headed screws that fix the elbow injector holder and primary air regulator ring.
- e) Unscrew the screws of the flange and the valve of the main connection will come off.
- f) Assemble the new valve. Torque should not exceed 2,5kp.m.
- g) Assemble the thermocouple and the pilot burner on the valve.
- h) Make sure the device is completely gastight before starting it again.

7. GAS CONVERSION

Gas conversion to another type of gas must always be done by a qualified installer, by the manufacturer's staff or by the gas supplying company.

Always use manufacturer's original spare parts for gas conversions and repairs. Follow the instructions given under points 7.1, 7.2 and 7.3.

7.1 REPLACEMENT OF BURNER INJECTORS

The device is normally regulated and prepared to operate with G30+G31 gas at pressure of 28-30/37 mbar. A conversion kit for G20 + G25 or G20 gas is included in this device.

- a) Unscrew the two hexagonal screws and loosen the controls to remove the stainless steel front panel.
- b) Unscrew the four flat headed screws that fix the elbow injector holder and primary air regulator ring.
- c) Unscrew the injector counterclockwise, according to fig. 2.
- d) Replace the injector according to chart 3.
- e) The injector diameter is indicated in hundredths of mm on the injector.

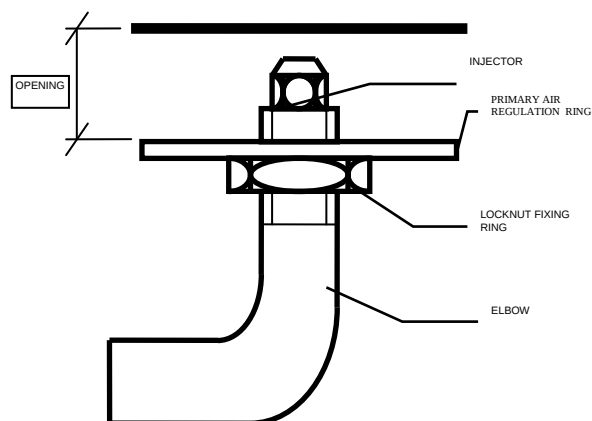


Fig. 2

- f) **IMPORTANT: IMMEDIATELY ATTACH THE PLATE WITH INFORMATION ON THE NEW GAS TYPE. Replacement injectors are supplied together with the corresponding informative plates.**

7.2 ADJUSTMENT OF PILOT BURNER TO NEW GAS TYPE

- a) Loosen the lower nut of the pilot burner (with a fitting spanner of 11mm).
- b) Turn the internal screw with a flat tip screwdriver to the right (for a smaller flame) or to the left (for a bigger flame).
- c) Screw on the lower nut of the pilot burner.

7.3 PRIMARY AIR REGULATION

Primary air is regulated by approaching or moving away the regulating ring. Proceed as follows:

- a) Loosen locknut (fig. 2).
- a) Screw or unscrew the regulator ring of the burner up to opening "D" (fig. 2 & chart 6), according to the gas type to be installed.
- b) Fix the primary air regulator with the locknut.

Chart 6: Opening primary air regulation

BURNER	Opening D for GAS G 20	Opening D for GAS G 30 + G 31
BIG RING	8 mm	6 mm
SMALL RING	7 mm	5 mm

Primary air of the pilot burner is regulated by turning the external part in such a way that more or less air flows through the injector's orifice. Regulation is obtained by turning in one way or the other.

Observe the flame. An excess of primary air produces a short flame that tends to come off the pilot burner. This could hinder the ignition of the pilot injector.

The lack of primary air produces smooth and weak flames with yellow extremities due to an incomplete combustion.

7.4 BURNER REGULATION

Light the burner and keep it burning during a few minutes maximum. Then all at once change from maximum to minimum and to maximum again several times. When doing these tests, if the burner extinguishes at the minimum position or the flames are too big, then proceed to regulate the minimum by turning the thermoelectric security valve to the left to obtain a bigger flame or to the right to obtain a smaller flame.

8. PROBLEMS AND SOLUTIONS

During normal operation of the device, problems can arise. These problems, as well as the possible causes and solutions are listed below.

- **The pilot burner and the main burner do not ignite**

Verify the following:

- a) Make sure the stopcock is open.
- b) Check if there is gas in the network.
- c) Dismantle the pressure regulator that supplies gas to the device (in case it exists) and clean the input filter. There could be an obstruction due to gas impurities

- **The pilot burner extinguishes easily**

Check if the injector is obstructed.

Clean the injectors with high air pressure only. Never use wires or sharp objects that could vary the diameter of the injectors.

If the pilot burner does not retain the flame once these tests are completed, this means that the thermocouple is too separated from the flame or the connection to the valve is loose. In this case, tighten, but not excessively to avoid damaging the thermocouple head.

- **The flame is yellow**

Possible causes are:

- a) The burner is dirty. In this case, clean the burner.
- b) Bad primary air regulation. Follow the instruction given under point 7.3. for regulation of primary air input.
- c) Obstruction in the burner injector. Clean the obstructed injector by blowing air.

For any other type of breakdown, contact our nearest After-sales Technical Service.

9. USE AND MAINTENANCE INSTRUCTIONS

NOTE A - VERY IMPORTANT WARNING: PARTS PROTECTED BY THE MANUFACTURER MAY NOT BE MANIPULATED

NOTE B - SIZE OF THE STOCKPOT OR PAN: for your safety, for a correct combustion and in order to guarantee stability, use a stockpot or pan with the following sizes:

Minimum size: 250 mm (at the basis)
Maximum size: 850 mm (at the basis)

9.1 START-UP

9.1.1 SWITCHING ON THE BURNER

- a) Open the stopcock located outside the device
- b) Put the selector in position pilot burner “*”. To do this, press and simultaneously turn the selector 90° to the left and light the pilot burner maintaining the selector pushed about 20 sec.

NOTE: It is possible that the first ignition takes more time when the pilot burner gas pipe is filled with air.

- c) To ignite the burner, turn the selector another 90° more to the left until the maximum position. If you continue turning the selector until the minimum position power will be reduced progressively.

9.1.2 SWITCHING OFF THE BURNER

Turn the selector from position “maximum” or “minimum” to position “*” (pilot burner). The burner will be switch off and the flame of the pilot burner will keep on burning, facilitating thus a future ignition.

If you want to switch off the burner completely, turn the selector to position “O”. At the end of the day, it's advisable to close the gas valve of the device.

10. MAINTENANCE

To assure a long duration of your burner, follow attentively the maintenance and cleaning instructions.

Clean the stainless steel surface daily with soapy temperate water. Rinse thoroughly with water and dry. Do not use abrasive products, sandy detergents, scourers or steel brushes that could scratch the surface.

Clean the burner ring daily with a steel brush to eliminate spilled food.

Have you technical service make regular checks, minimum once a year and preferably when finishing the main season.

Do not clean the device with direct water jets and especially the interior parts as the functional elements could be damaged.

Do not use chlorine or corrosive substances to clean the device.

Clean the orifices of the burner and pilot burner.

If the device is not going to be used for a long period of time, protect the stainless steel surface by lubricating it with vaseline oil.

To ensure optimum use and safety, check the device periodically, at least once a year.

All controls must be performed by qualified staff or a technician authorized by the manufacturer.

Instructions for maintenance are indicated in chapter 5 - Technical Maintenance.