GB

Light oil burner

Two-stage operation

G 24

CODE	MODEL	TYPE
20096861	G 24	651 M

20097929 (1) - 02/2015

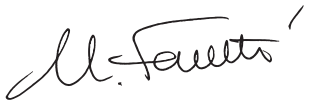
1 Declaration

Declaration of conformity in accordance with ISO / IEC 17050-1		
Manufacturer:	RIELLO S.p.A.	
Address:	Via Pilade Riello, 7 37045 Legnago (VR)	
Product:	Light oil burner	
Model:	G 24	
These products are in compliance with the following Technical Standards:		
EN 267		
EN 12100		
and according to the European Directives:		
MD	2006/42/EC	Machine Directive
LVD	2006/95/EC	Low Voltage Directive
EMC	2004/108/EC	Electromagnetic Compatibility

The quality is guaranteed by a quality and management system certified in accordance with UNI EN ISO 9001.

Legnago, 03.09.2014

Executive General Manager
RIELLO S.p.A. - Burner Department
Mr. U. Ferretti



Research & Development Director
RIELLO S.p.A. - Burner Department
Mr. R. Cattaneo

CONTENTS

1. BURNER DESCRIPTION

1 - Suction line fitting
2 - Return line fitting
3 - Suction gauge fixing point (G 1/8)
4 - Pressure gauge fixing point (G 1/8)
5 - Pump pressure adjuster
6 - Wiring terminal block
7 - Fairleads
8 - Control box reset-button with signal of lock-out
9 - Combustion head control shaft
10 - Photoresistance
11 - Flange with thermal insulation screen
12 - Air damper
13 - Screw for fixing air damper and as point of reference for its adjustment

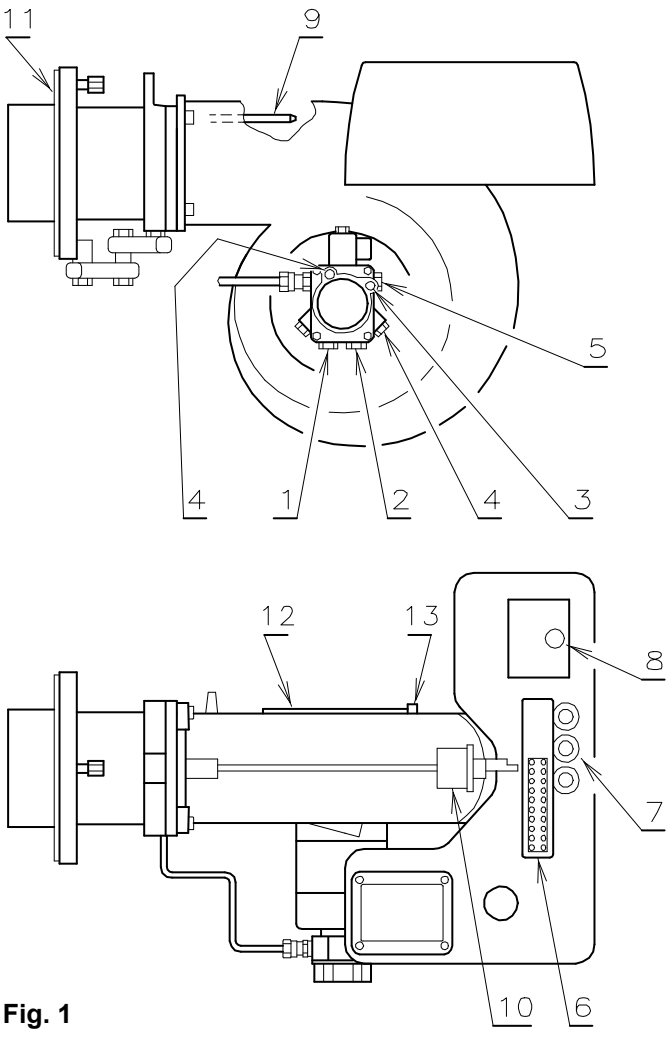


Fig. 1

1.1 STANDARD EQUIPMENT

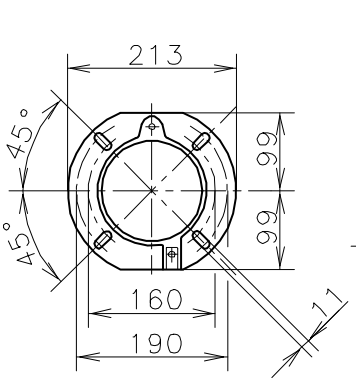
Flexibles oil-lines with nipples and gaskets . N° 2
Flange with thermal insulation screen. . . N° 1
Screws and nuts for flange . . . . . N° 4
Nozzles . . . . . N° 2
Screws with two nuts for flange. . . . . N° 1
Hinge. . . . . N° 1

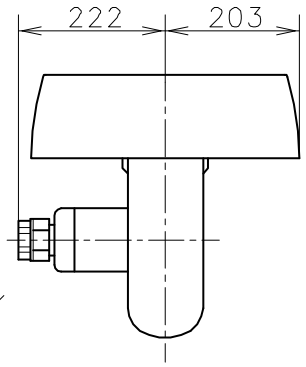
2. TECHNICAL DATA

MODEL	G 24
TYPE	651 M
THERMAL POWER	140 ÷ 237 kW / 120.000 ÷ 240.000 kcal/h
OUTPUT	12 ÷ 24 kg/h
FUEL	Gas oil, max. viscosity at 20 °C: 6 mm^2/s (1.5 °E)
ELECTRICAL SUPPLY	single-phase 220 V +10% -15% ~ 50 Hz
MOTOR	1.85 A / 220 V
CAPACITOR	8 μF / 450 V
IGNITION TRANSFORMER	Primary 1.6 A / 220 V - sec. 30 mA / 1x8 kV
ABSORBED ELECTRICAL POWER	0.4 kW
WEIGHT	21.6 kg
ELECTRICAL PROTECTION	IP 40

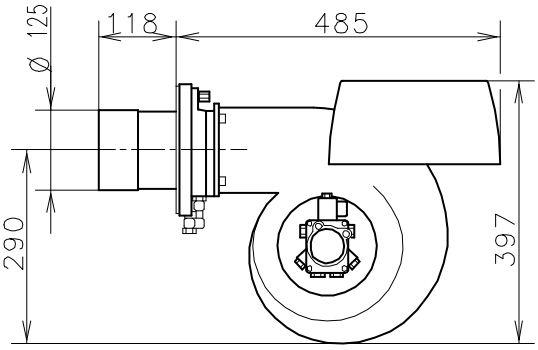
2.1 DIMENSIONS

Flange





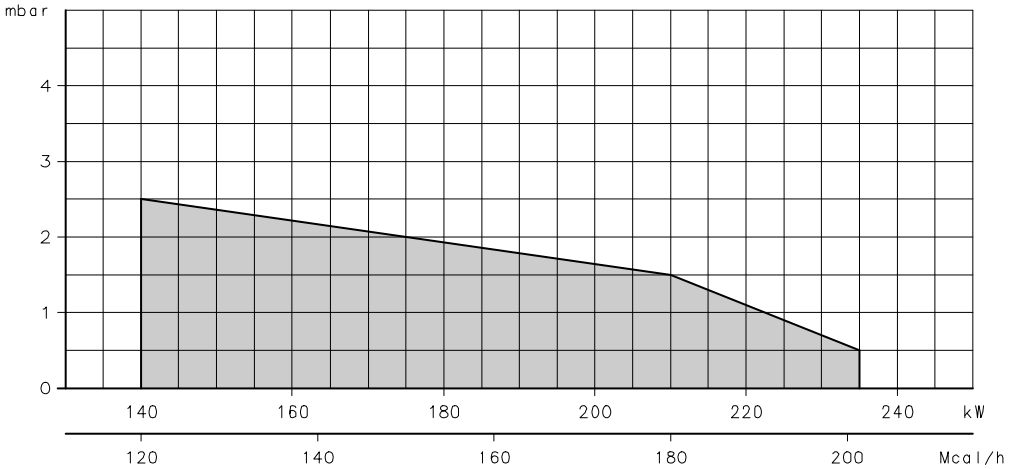
Burner



* with long combustion head kit

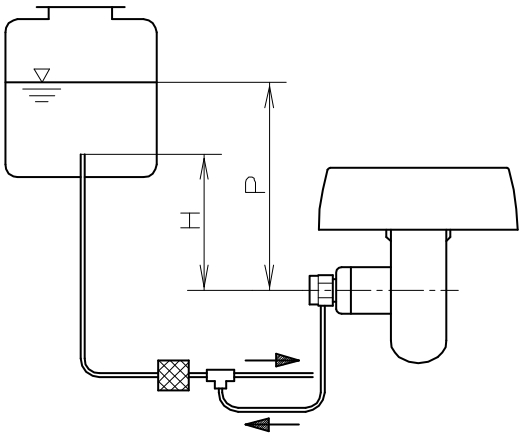
2.2 FIRING RATE

OUTPUT - PRESSURE IN THE COMBUSTION CHAMBER



3. HYDRAULIC SYSTEMS

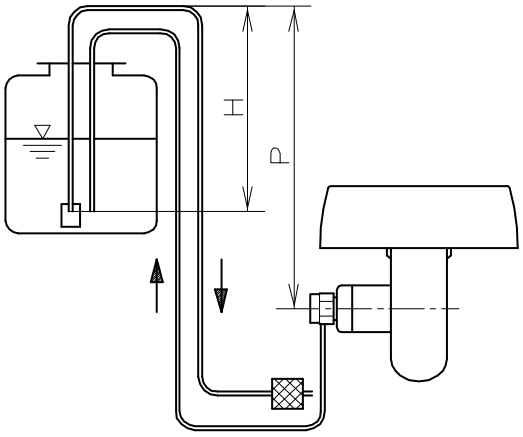
GRAVITY FEED from the bottom of the oil storage tank



H meters	L meters	
	øi 8 mm	øi 10 mm
0.5	5	10
1	10	20
1.5	15	30
2	20	40

The dimension P should not exceed 10 m, to avoid breakage of pump seals.

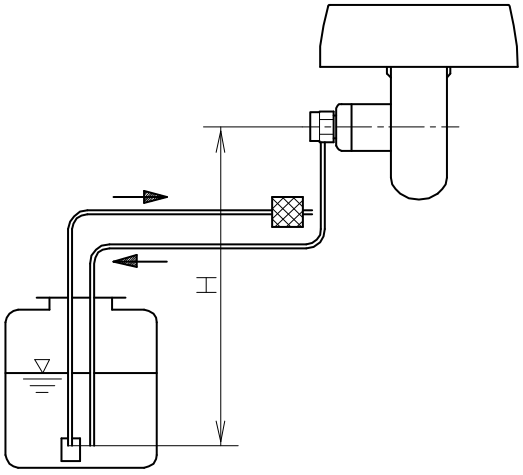
GRAVITY FEED over the top of the oil storage tank



H meters	L meters	
	øi 8 mm	øi 10 mm
0	32	70
0.5	28	62
1	24	55
1.5	20	48
2	16	40
3	7	25
3.5	-	10

The dimension P should not exceed 10 m, to avoid breakage of pump seals.

SUCTION FEED



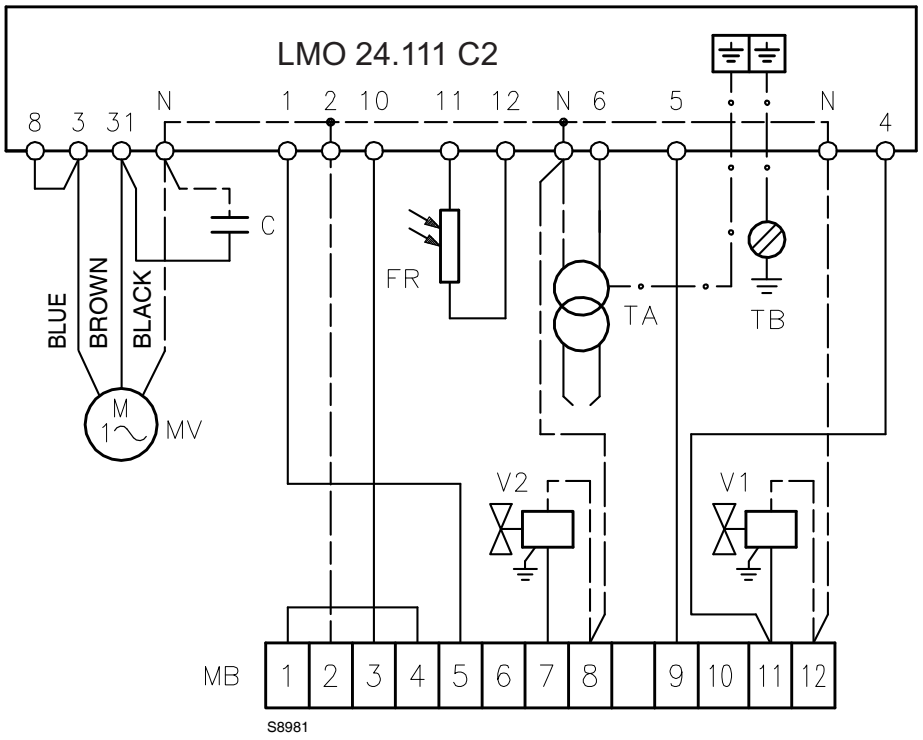
H meters	L meters	
	øi 8 mm	øi 10 mm
0	32	70
0.5	28	62
1	24	55
1.5	20	48
2	16	40
3	7	25
3.5	-	10

Oil lines must be perfectly sealed. The use of copper pipe is therefore recommended.
The pump suction must not exceed 4 m w.c. (30 cm Hg) because beyond this value the pump becomes noisy.
The return line must terminate at the same level as the foot valve; otherwise the pump may become air-locked.

H = Difference in height;
L = Total lenght of the suction line, including the vertical section;
The copper pipes of 8 mm and 10 mm I.D., as shown on the tables above, may be replaced by steel pipes of 1/4" or 3/8" Gas.

4. ELECTRICAL SYSTEM

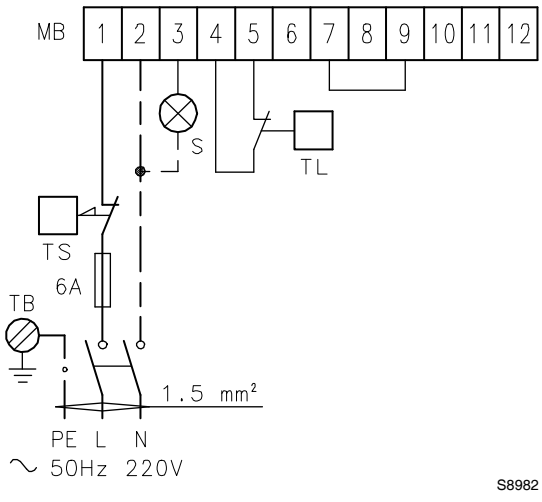
4.1 ELECTRICAL SYSTEM FACTORY-SET



KEY TO LAYOUT

C - Capacitor
FR - Photoresistance
MB - Burner terminal strip
MV - Motor
TA - Ignition transformer
TB - Burner ground (earth) connection
V1 - 1st stage solenoid valve
V2 - 2nd stage solenoid valve

4.2 ELECTRICAL CONNECTION TO THE TERMINAL STRIP (installer-set)



KEY TO LAYOUT

MB - Burner terminal strip
S - Remote lock-out signal
TB - Burner ground (earth) connection
TL - Limit control device system
TS - Safety control device system

NOTE

- Do not exchange the neutral wire with the phase (avoid the plung-pin connection).
- Carry out a safe earth connection.
- Cable section not indicated: 1 mm^2.
- All the electrical wires, which are to be connected to the terminal block shall pass through the fair leads 7 (Fig. 1) to guarantee the electrical protection IP 40.
- Verify the burner stop by opening the boiler thermostat and the burner lock-out by darkening the photoresistance.
- The burner has been type approved for intermittent operation. This means it should compulsorily be stopped at least once every 24 hours to enable the control box to perform checks of its own efficiency at start-up.
  Burner halts are normally provided for automatically by the boiler load control system.
  If this is not the case, a time switch should be fitted in series to TL to provide for burner shut-down at least once every 24 hours.

5. BURNER ADJUSTMENT

Establish, on the basis of the output desired, and in accordance with the table and the diagram underneath:
- the type of nozzle;
- the pump pressure;
- the combustion head setting.

EXAMPLE
The burner has to be matched with a boiler of 220 kW.
Assuming an efficiency of 90%, we need to develop approximately 245 kW i.e. burning reughly 21 kg/h.
Starting from 21 kg/h in the delivery column, we find in the other columns the nozzle necessary (two 2.50 GPH - or one 3.00 GPH and one 2.00 GPH - with 60° atomisation angle), the pump pressure (12 bar), and the position of the combustion head (notch 5).

Burner delivery (1) kg/h +10%	**Nozzle (2)**		**Pump pressure (3)** bar	**Combustion head setting (4)** Notch
	GPH	Angle		
12	1.50 + 1.50 1.75 + 1.25	60°	12	1
15	1.75 + 1.75 2.00 + 1.50	60°	12	2
17	2.00 + 2.00 2.25 + 1.75	60°	12	3
19	2.25 + 2.25 2.50 + 2.00	60°	12	4
21	2.50 + 2.50 3.00 + 2.00	60°	12	5
24	3.00 + 3.00 3.50 + 2.50	60°	12	6

(1) The indicated outputs are drawn from the average statistical data of our tests. Real output may well vary by +10%.
(2) Nozzles of the major existing makers may be used.
It might well be possible however, that for certain specific outputs, one type of nozzle is less suitable than others.
It is recommended not to change the atomizing angle.
(3) The pressure is adjusted by turning screw 5 (Fig. 1) on the pump; it is monitored by installing a pressure gauge on connection 4 (Fig. 1).
The measurement indicated (12 bar) can be varied by +2 bar (e.g. to adjust the delivery); a pressure of 14 bar for low temperature firing is advised.
(4) See below.

5.1 COMBUSTION HEAD ADJUSTMENT

This is effected when the nozzle is fitted, with the blast tube disassembled.
The adjustment depends on the required delivery to the burner and it is done by turning adjustment bar 9 (fig. 1) untill the edge of the blast tube is aligned with the notch indicated by the table on this page (see above).

In figure 3, for example, head is set for a delivery 3.50 GPH at 12 bar; notch 3 on the indicator in fact coincides with the edge of blast tube.

Head adjustments shown on the table on the previous page are correct in the majority of cases; adapting the fan delivery to the burner is normally done only with the air gate valve.
If revision of the head adjustment is required, remember that by turning the adjustment bar clockwise the air delivery is increased. By turning the adjustment bar anti-clockwise the air delivery is reduced.
Do not under any circumstances move the head adjustment more than one notch either side of the measurement obtained from the table.
The burner leaves the factory with the head set at notch 4.

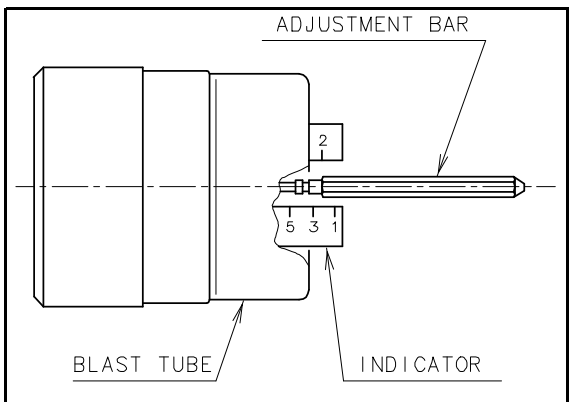


Fig. 3

5.2 AIR DAMPER ADJUSTMENT

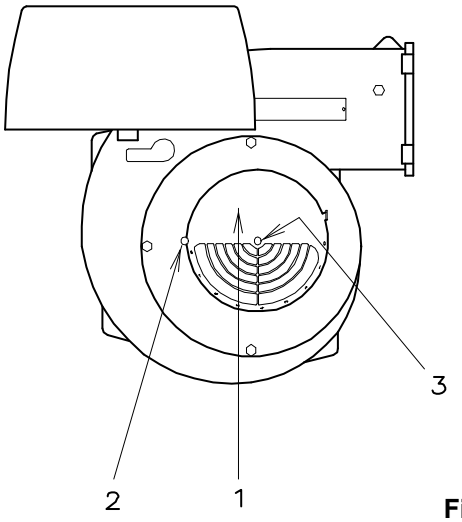


Fig. 4

Adjusting the air delivery effected on the air damper 1 (Fig. 4) after loosening screws 2 and 3.
Once the air damper has been adjusted, tighten 2 and 3 fully down.

5.3 POSITIONING OF ELECTRODES

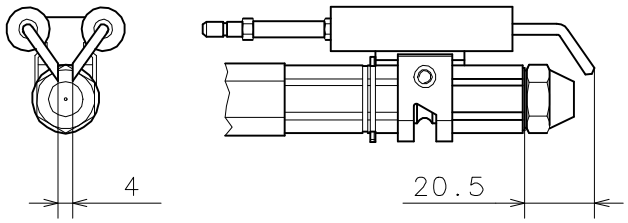


Fig. 5

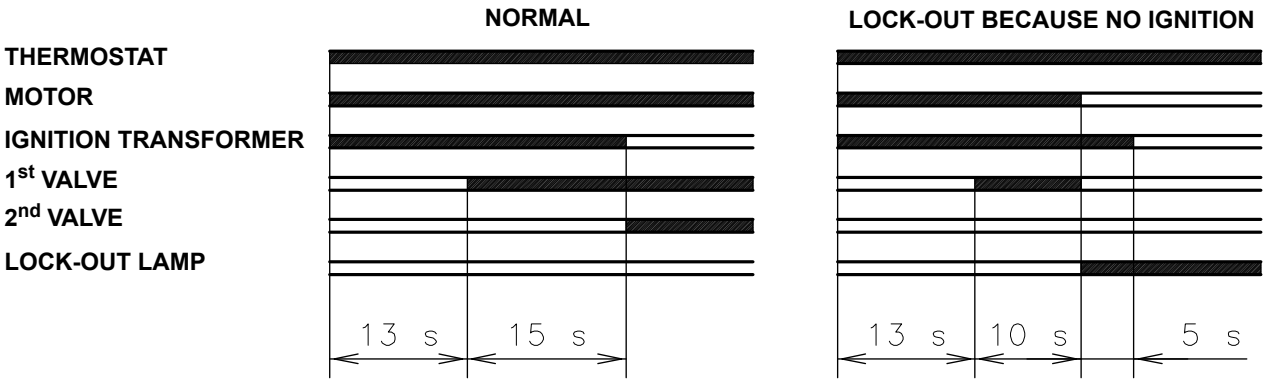
Make sure that the electrodes are positioned as shown in Fig. 5.

6. PRIMING THE PUMP

In case of a gravity feed system, from the bottom of the oil-storage tank (see page 4), loosen the screw of the suction-gauge fixing point 3 (Fig. 1), until the fuel flows out.
In the other two cases, start the burner and bleed the air from the pressure gauge connection by loosening plug 4 (Fig. 1).
Do not illuminate the photoresistance as this would cause an immediate lock-out.
If, during these operations, the burner locks out, reset it and repeat the cycle as many times as necessary.

CAUTION!
Check, before starting the burner, that the return line to the oil-storage tank is not in any way obstructed.
Any obstruction would cause the breakage of the pump seals.

7. BURNER START-UP CYCLE



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