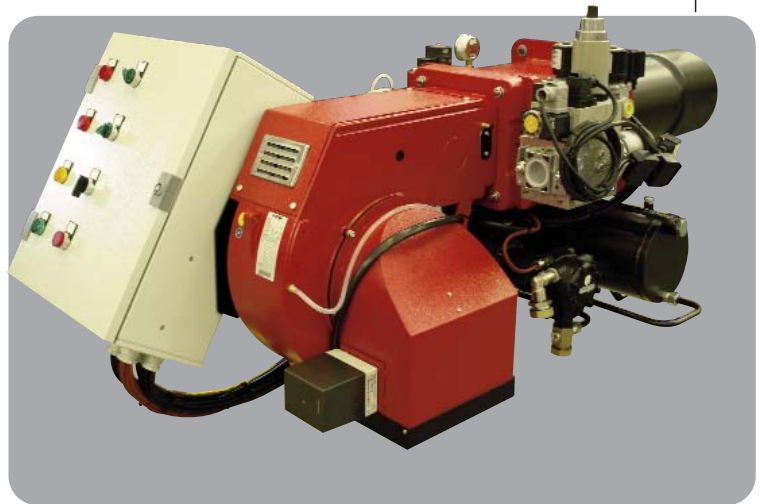


**GAS/HEAVY-OIL DUAL BURNERS**

# Ecoflam

CE



**MULTIFLAM 50 AB**  
**MULTIFLAM 70 AB**  
**MULTIFLAM 120 AB**

Natural Gas 20÷300 mbar / Heavy Oil



420010281702

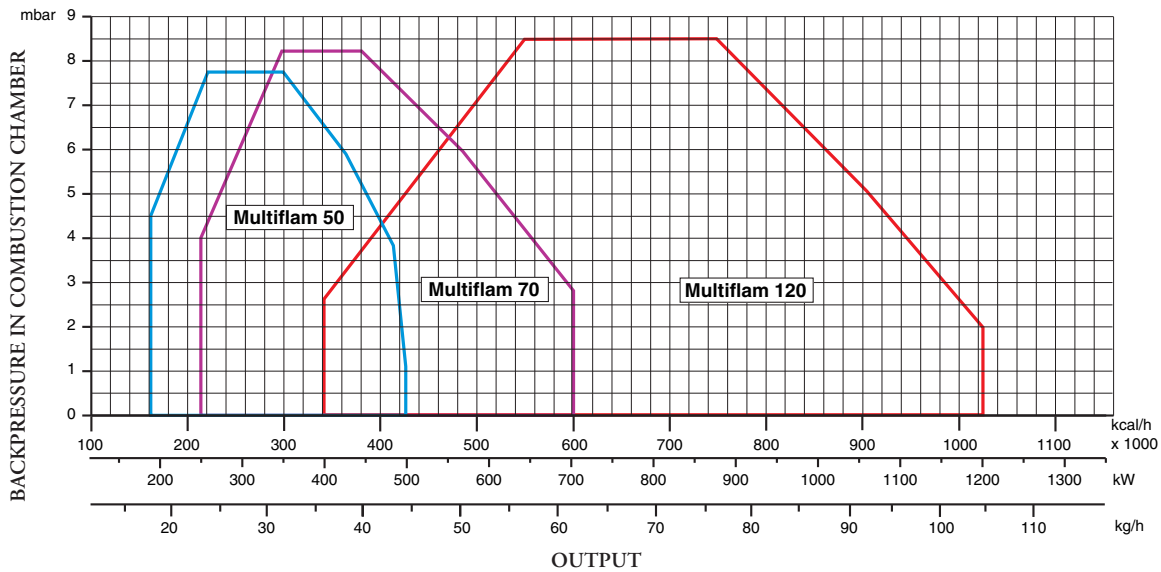
**420010281702**

21.01.2015

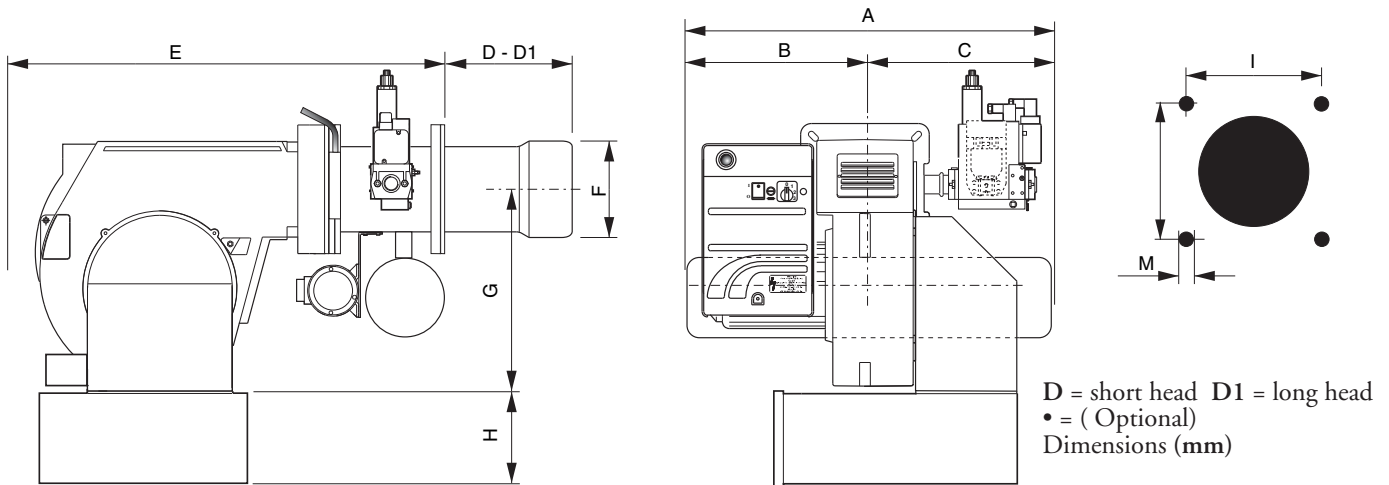
**TECHNICAL DATA**

MODELS		50	70	120
Thermal power max.	kW	500	700	1.200
	kcal/h	430.000	602.000	1.032.000
Thermal power min.	kW	190	250	400
	kcal/h	163.400	215.000	344.000
Min. natural gas pressure	mbar	20÷300	20÷300	20÷300
Voltage 50 Hz	V	230/400	230/400	230/400
Motor	kW	0,55	1,5	2,2
Rpm	N°	2800	2800	2800
Fuel :	Natural Gas (L.C.V. 8.570 kcal/Nm <sup>3</sup> ), Heavy oil (L.C.V. 9.800 kcal/kg max. visc 50°E at 50°C)			

**WORKING FIELDS**



**OVERALL DIMENSIONS**

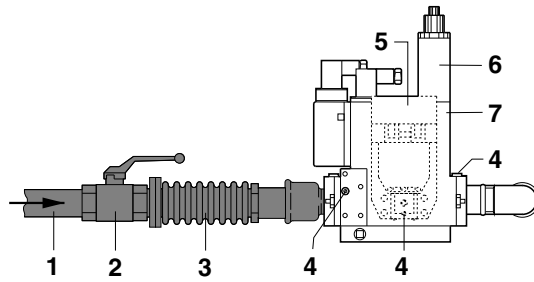


MODELS	A	B	C	D	D1	E	F	G	H	I	L	M
Multiflam 50 PAB	895	500	395	212	432	900	180	376	215•	230	230	M14
Multiflam 70 PAB	895	500	395	212	432	900	180	376	215•	230	230	M14
Multiflam 120 PAB	895	500	395	310	460	1050	215	376	215•	230	230	M14

## GAS TRAIN INSTALLATION

1. Main gas pipe
2. Cut-off valve
3. Antivibrating coupling
4. Pressure gauge port
5. Leakage control device
6. High flame valve

7. Multiblock set On-Off version, complete with:
  - gas filter
  - gas governor
  - safety gas valve
  - low flame valve



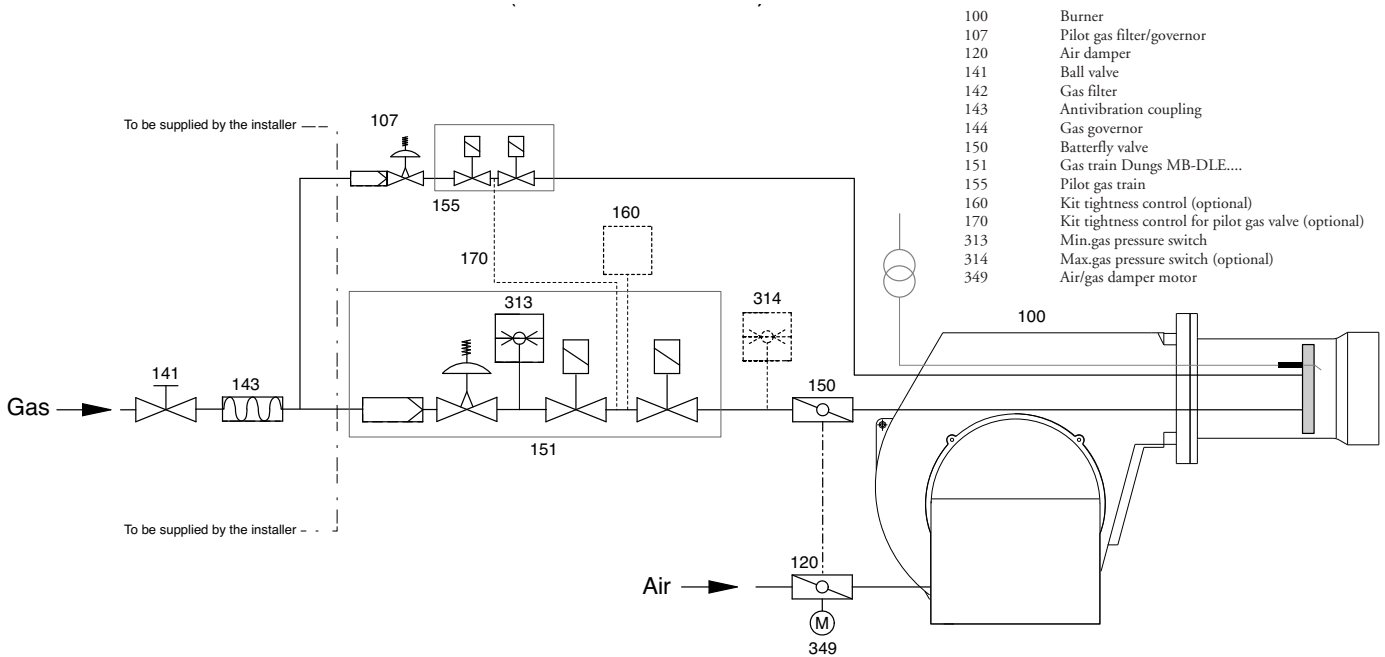
## ELECTRICAL CONNECTIONS

All burners factory tested at 400 V 50 Hz three-phase for motors and 230 V 50 Hz monophase with neutral for auxiliary equipment. If mains supply is 230 V 50 Hz threephase without neutral, change position of connectors on burner as in fig. Protect burner supply line with safety fuses and any other devices required by safety standards obtaining in the country in question.

## CONNECTION TO THE GAS PIPELINE

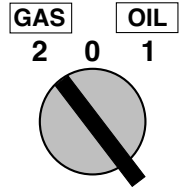
Once connected the burner to the gas pipeline, it is necessary to control that this last is perfectly sealed. Also verify that the chimney is not obstructed. Open the gas cock and carefully bleed the piping through the pressure gauge connector, then check the pressure value through a suitable gauge. Power on the system and adjust the thermostats to the desired temperature. When thermostats close, the sealing control device runs a seal test of valves; at the end of the test the burner will be enabled to run the start-up sequence.

## CONNECTION DIAGRAM FOR BURNERS WITH SEPARATE PILOT (gas train Dungs MB-DLE...)



### OPERATION OF BURNER WITH GAS

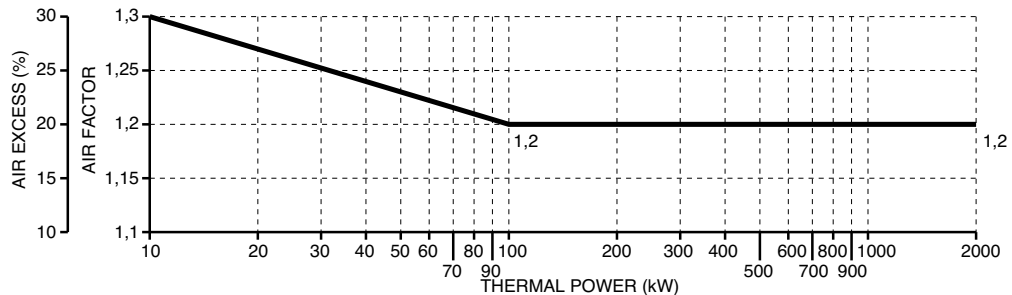
Before starting the burner, make sure it is mounted correctly. Then check connections are correct according to the diagram and piping is appropriate to the system. Before connecting the burner to the electricity supply, make sure voltage corresponds to burner plate data. The connection diagram and start-up cycle are shown separately. For wiring from control box to burner, see the enclosed connection diagram. Pay particular attention to neutral and phase connections : never exchange them!. Vent air and impurities of gas pipe. Check gas pressure conforms to the limits stated on the burner plate when connecting a master gauge to the test port provided on the burner. Blower motor starts and pre-purging begins. Since pre-purging has to be carried out with the max. air delivery, the burner control circuit turns the air damper to the max. delivery position by the air servocontrol in approximately 30 seconds time. When the servocontrol is fully open, a signal to the electronic control unit starts the 66 seconds pre-purge cycle. At the end of the prepurging time, the air servocontrol gets to the Low Flame position so that burner ignition is ensured at min. output. Simultaneously the ignition transformer receives voltage and after 3 seconds (pre-ignition) opens the pilot gas valve. Fuel flows to the combustion head and ignites. Two seconds after pilot gas valves have opened, the ignition transformer is excluded from the circuit. In case of no ignition the burner goes to lock-out within two seconds. After 6 sec. open the working gas valve, governed by the gas firing butterfly valve. Now the burner is operating at the min. firing rate (about 30% of the max. firing rate). The air servocontrol runs at the Low Flame position and in case the temperature control has to be set at the max. output it goes to a fully open position of air damper and butterfly valve. During the burner-off periods the air damper closes up fully.



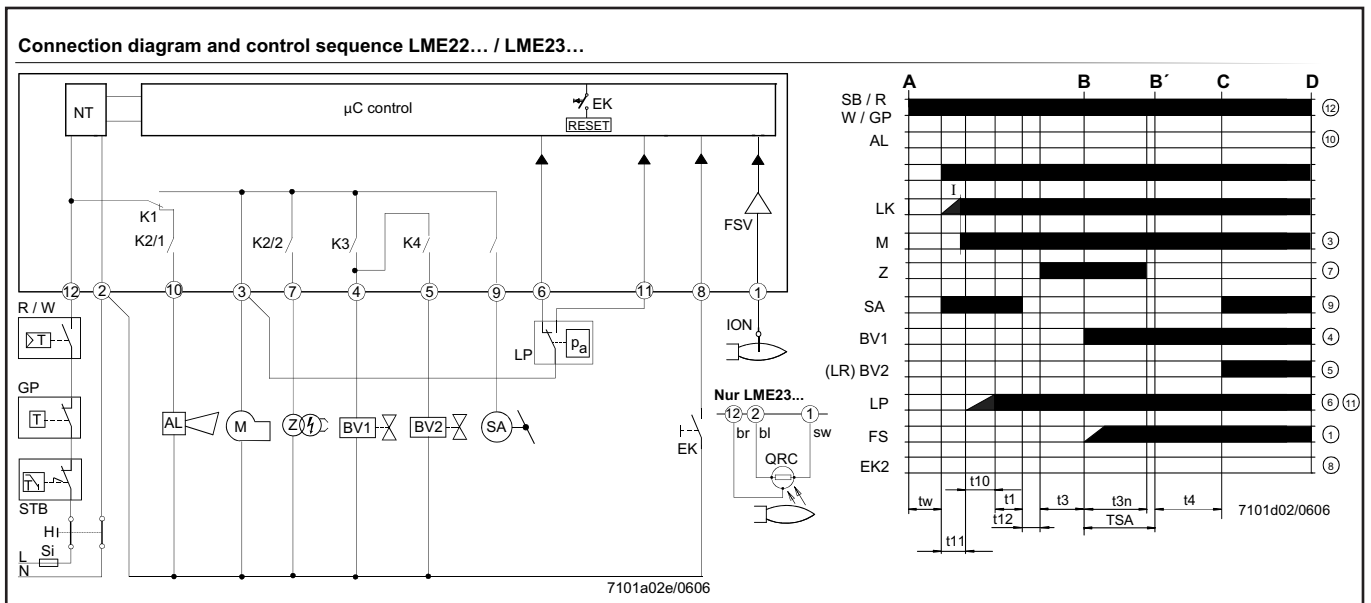
### ADJUSTING THE COMBUSTION PROCESS

**IMPORTANT:** to obtain the right adjustment of the combustion and thermal capacity it is important to analyze the reducts of combustion with the aid of suitable instruments. The combustion and thermal capacity adjustment is done simultaneously, together with the analysis of the products of combustion, making sure that the measured values are suitable and that they comply with current safety standards. On this matter, please refer to the table and figure below. **THESE OPERATIONS MUST BE DONE BY PROFESSIONALLY-QUALIFIED TECHNICIANS.**

	Natural G.
CO <sub>2</sub>	9,6%
CO	<100 ppm
	GPL
CO <sub>2</sub>	11,7%
CO	<50 ppm



### CONTROL BOXES LME22



AGK25...	PTC resistor	LP	Air pressure switch	reached
AL	Error message (alarm)	LR	Load controller	C-D
V...	Fuel valve	M	Fan motor	Burner operation (generation of heat)
CPI	Closed Position Indicator	R	Control thermostat / pressurestat	D
DBR...	Wire link	SA	Actuator	t1
EK	Lockout reset button (internal)	STB	Safety limit thermostat	t3
EK2	Remote lockout reset button	Si	External pre-fuse	t3n
ION	Ionization probe	t	Time	t4
FS	Flame signal	W	Limit thermostat / pressure switch	t10
FSV	Flame signal amplifier	Z	Ignition transformer	t11
GP	Pressure switch	ZV	Pilot gas valve	t12
H	Main switch	A	Start command (switching on by «R»)	TSA
HS	Auxiliary contactor, relay	B-B'	Interval for establishment of flame	tw
K1...4	Internal relays	C	Operating position of burner	Waiting time
KL	Low-fire			
LK	Air damper			
LKP	Air damper position			

Status	Color code	Color
Waiting time «tw», other waiting states	○ .....	Off
Ignition phase, ignition controlled	●●●●●●●●●●●●●●●●●●●●●●	Flashing yellow
Operation, flame o.k.	□.....	Green
Operation, flame not o.k.	□□□□□□□□□□□□□□□□□□	Flashing green
Extraneous light on burner startup	□▲□▲□▲□▲□▲□▲□▲□▲□▲□▲	Green-red
Undervoltage	●▲●▲●▲●▲●▲●▲●▲●▲●▲●▲●▲	Yellow-red
Fault, alarm	▲.....	Red
Error code output (refer to «Error code table»)	▲○▲○▲○▲○▲○▲○▲○▲○▲○▲○	Flashing red
Interface diagnostics	▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲	Red flicker light
Legend: .....	▲ Red □ Green ○ Off ● Yellow	

### CALCULATION OF WORKING OUTPUT OF THE BURNER

To calculate the burner’s working output, in kW, proceed as follows:  
 - Check at the meter the quantity of supplied litres and the duration, in seconds, of the reading, then calculate the burner’s output through the following formula:

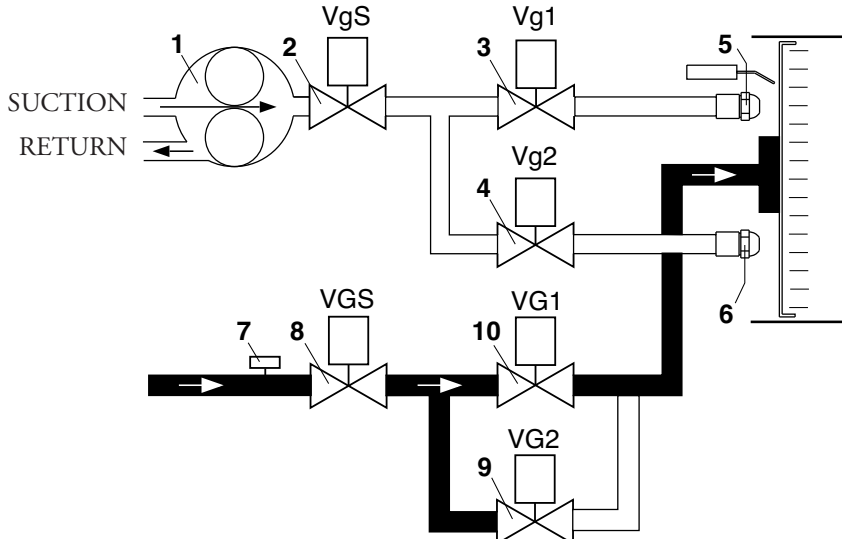
$$\frac{e}{s} \times f = \text{kW}$$

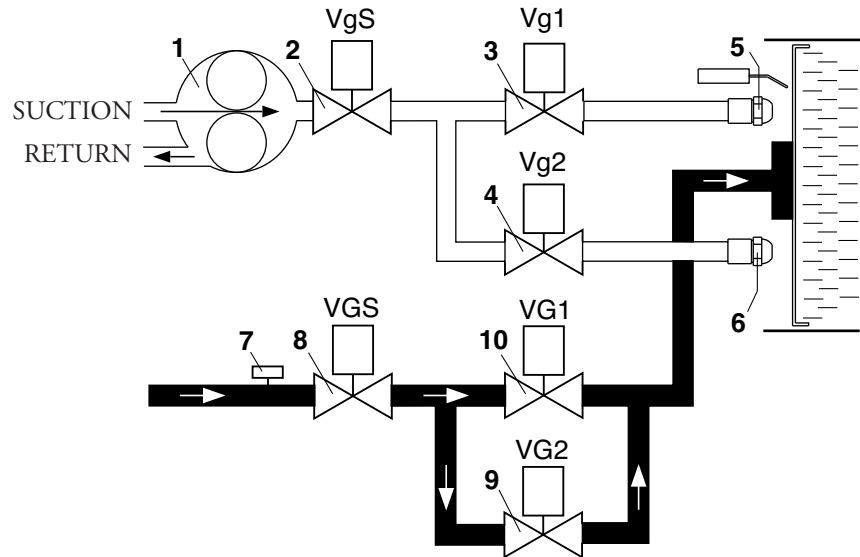
$e$  = Litres of gas  
 $s$  = Time in seconds  
 $f$ 

[	G20 = 34,02
	G25 = 29,25
	G30 = 116
	G31 = 88

### GAS CIRCUIT

- 1 - PUMP
- 2 - SAFETY OIL VALVE
- 3 - LOW FLAME OIL VALVE
- 4 - HIGH FLAME OIL VALVE
- 5 - LOW FLAME NOZZLE
- 6 - HIGH FLAME NOZZLE
- 7 - GAS PRESSURE SWITCH
- 8 - SAFETY GAS VALVE
- 9 - LOW FLAME GAS VALVE
- 10 - HIGH FLAME GAS VALVE



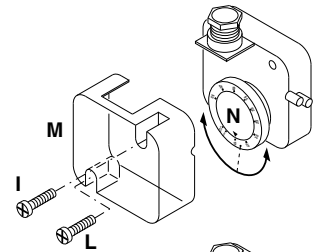


**Min gas pressure switch**

The gas pressure switch has the function to check that the gas pressure before the gas valve does have the minimum pressure to make the burner running correctly.

Unscrew off and remove cover M.

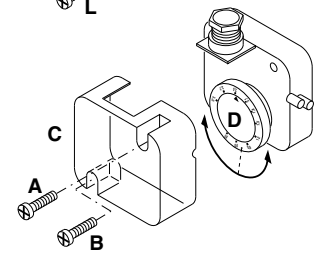
- Set knob N to a value equal to 60% of gas nominal feed pressure (i.e. for natural gas nom. pressure = 20 mbar, set knob to a value of 12 mbar; for LPG nom. pressure of G30/G31- 30/37 mbar, set knob to a value of 18 mbar). Screw up cover M.



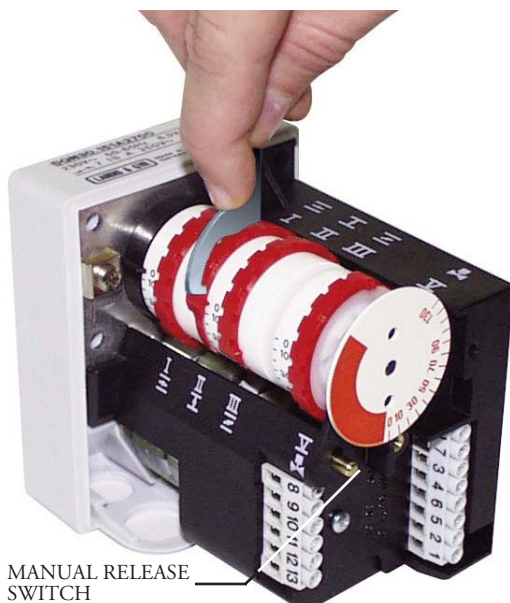
**Air pressure switch calibration**

The air pressure switch is provided for monitoring the pressure of the combustion air fan. Unscrew screws A and B and remove cover C.

- Adjust the combustion with air pressure switch (APS) set at minimum.
- Start to obstruct the air inlet with a paper paying attention to O2 and CO values red on the analyzer.
- Progressively increase air inlet obstruction till the CO value is slightly more than 1000 ppm. Stop obstruction in this position.
- Increase APS setting up to burner lock out.
- Now the APS is set to avoid CO production during the combustion.
- Remove air obstruction and fit again APS cover C.



**ADJUSTEMENT OF THE COMBUSTION AIR  
SIEMENS SQN 30 151A2700 AIR DAMPER MOTOR**



Remove cover to gain access to the adjusting cams. The cams are to be adjusted through the suitable key provided for. Description:

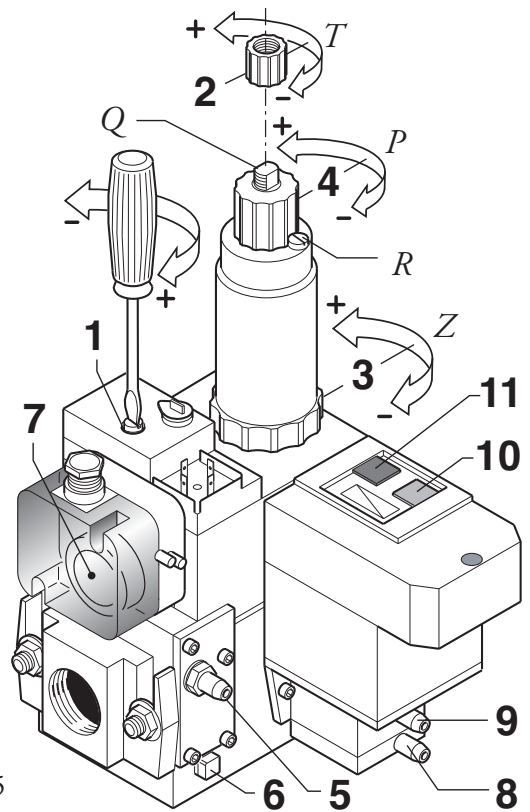
- I - Limit switch for air damper “High Flame” position adjustment (Max. power)
- II - Limit switch for the air damper position at burner’s shut down
- III - Limit switch for air damper “Low Flame” position adjustment (Min. power)
- V - Limit switch for 2nd stage’s solenoid valve opening release

NOTE : Cam V (to allow the 2nd stage’s solenoid valve opening) must be adjusted to an intermediate position between the Low and High Flame ones (to an angle approximately 5° greater than the low flame position).

MANUAL RELEASE SWITCH

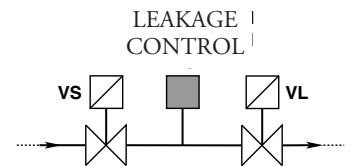
## DUNGS MB-ZRDLE

- 1 Pressure governor adjustment
- 2 Fast opening hydraulic brake's adjustment
- 3 Low flame flow rate adjustment
- 4 High flame flow rate adjustment
- 5 Inlet pressure port
- 6 Pressure governor membrane's bleed
- 7 Minimum pressure switch adjustment (VPS 504)
- 8 Pressure port after gas filter
- 9 Pressure port after pressure governor. During leakage control test, is used to measure test pressure (~150 mbar). When burner is running, it is used to measure governor's outlet pressure.
- 10 Working lamp (yellow)
- 11 Leakage control device rearm button (red)



### LEAKAGE CONTROL DEVICE VPS 504

When the thermostats are closed, the gas leakage control device checks the valve seals by pressurizing the circuit between the two gas valves. When test pressure is reached the device remains in stand-by for about 25 seconds. At the end of the test the yellow pilot light on the control device lights up and the burner is enabled to carry out the start-up cycle. If the seal on one of the valves is faulty and this causes a drop in test pressure, the device puts the system into the safety condition and the red pilot light on the device lights up. The flame control device starts the burner fan to carry out pre-washing of the combustion chamber, checking fan air pressure via the air pressure switch. After pre-ventilation the ignition transformer starts operating, generating a spark between the electrodes and simultaneously the gas valves open (safety gas valve VS and first stage operating valve VL). If the flame does not ignite or goes out, total safety is ensured by an ionization detection probe. The safety time limit in the event of no flame is less than 2 seconds at start-up and less than 1 during operation. In the event of no gas being supplied or of a considerable drop in pressure the minimum gas pressure switch interrupts burner operation. About 20/30 seconds after ignition the flame control device commands operation of the second stage via the gas valve and air servocontrol, thus taking the burner to maximum power.



### COMBUSTION ADJUSTMENT

**WARNING:** In order to have a correct combustion and thermal output adjustments, these must be carried out together with a combustion analysis, to be executed through suitable devices, taking care that the values are the correct ones and are in accordance with the local safety regulations. The adjustments must be carried out by qualified and skilled technicians authorised by Ecoflam S.p.A.

### ADJUSTMENT OF PRESSURE GOVERNOR

The adjustment procedure is the same for both single-stage (MB-DLE) and two-stage (MD-ZRDLE) versions. Check that gas pipe pressure is not higher than the maximum one specified for the governor, then operate through a screw driver fitted into the suitable seat as shown in the figure. Adjustments must be made with the burner running, in function of the working pressure and needs of each installation. The working fields are as follows: inlet pressure range 0÷100 mbar; outlet pressure range 3,6÷20 mbar. Between the minimum and maximum outlet pressure there are approx. 60 adjusting screw's turns. The governor is adjusted to an intermediate position during the tests.

### ADJUSTMENT OF GAS FLOW RATE FOR SINGLE-STAGE VERSION (MB-DLE)

To adjust the gas flow rate, loosen screw R and turn the regulator; to the right (screwing) to reduce; to the left (unscrewing) to increase. At the end tighten screw R.

### ADJUSTMENT OF GAS FLOW RATE FOR TWO-STAGE VERSION (MB-ZRDLE)

Low flame: Loosen screw R and turn regulator P. To the right (screwing) to reduce flow rate; to the left (unscrewing) to increase. At the end tighten screw R. High flame: loosen screw R and turn regulator P. To the right (screwing) to reduce flow rate; to the left (unscrewing) to increase. At the end tighten screw R.

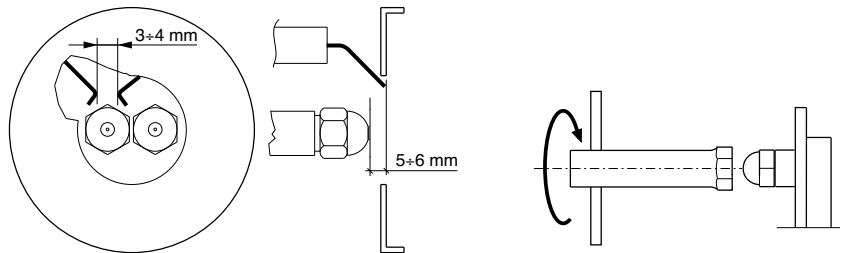
### ADJUSTMENT OF FAST OPENING'S HYDRAULIC BRAKE

The adjustment procedure is the same for both single-stage (MB-DLE) and two-stage (MD-ZRDLE) versions. To adjust the fast opening's hydraulic brake, unscrew cover T and through its upper side turn pin Q. Screw to reduce the opening speed; unscrew to increase. Screw cover T after regulation.

### NOZZLE CLEANING AND REPLACEMENT

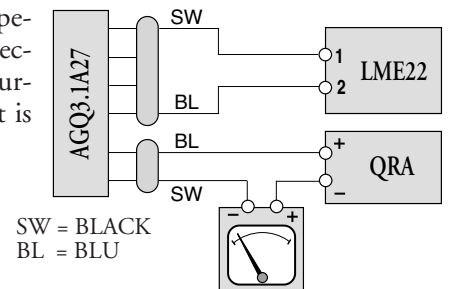
Use only the suitable box wrench provided for this operation to remove the nozzle, taking care to not damage the electrodes. Fit the new nozzle with the same care.

**Note:** Always check the position of electrodes after having replaced the nozzle (see illustration). A wrong position could cause ignition troubles.



### FLAME DETECTOR SYSTEM CHECK

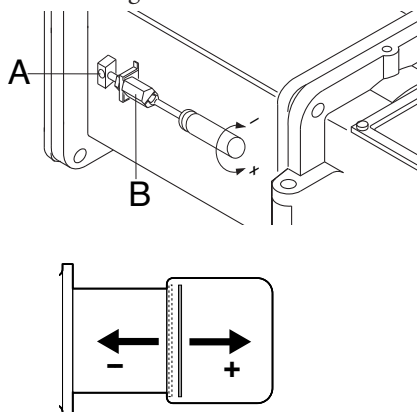
The control of the detector current shall be carried out by plugging a microammeter with full scale at 1000  $\mu$ A (D.C.) in series with the UV-cell. If the detector current is too low verify the connection between phase and neutral of the burner and the grounding of the burner itself. Minimum required detector current is 200  $\mu$ A.



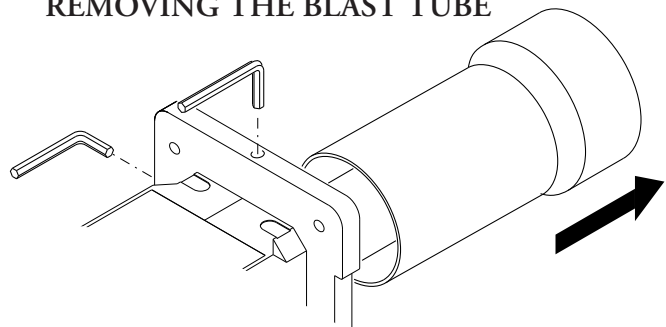
### SETTING THE FIRING HEAD

The firing head position adjustment is made in order to obtain the best combustion efficiency. When used with minimum outputs the firing head is adjusted in rear position. With high output, the firing head is adjusted in forward position.

**Adjustment:** - Loosen screw A through a suitable Allen key.- By a screwdriver act on the hex. head screw B until is reached the desired position. - Tighten screw A

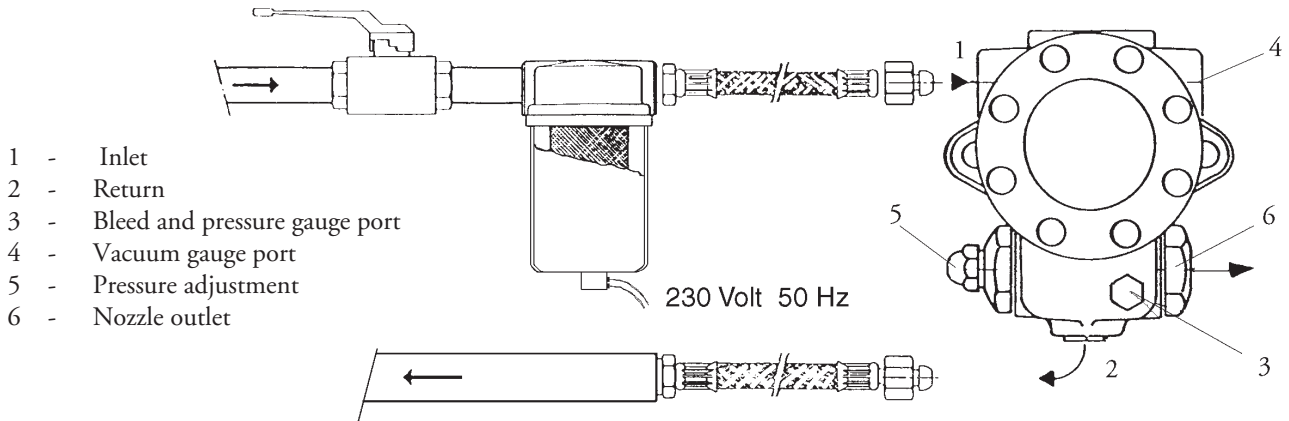


### REMOVING THE BLAST TUBE





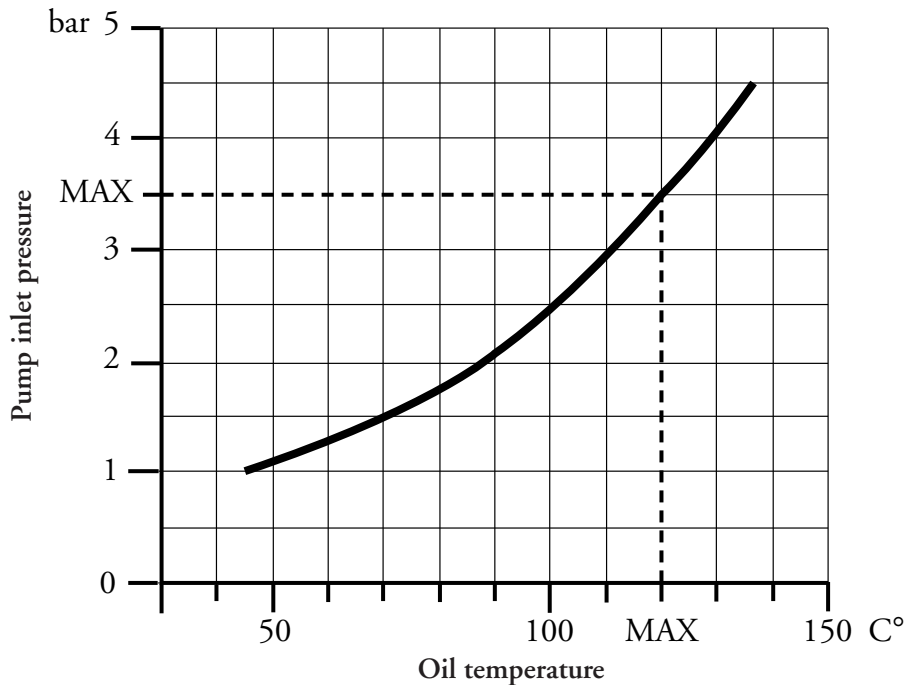
**HEAVY OIL FEEDING**



Oil temperature: Max. 120° in the pump  
 Inlet and return pressure: 3,5 bar max.  
 Suction height: 0,5 bar max. vacuum  
 0,4 bar advised to prevent air separation from oil

**PUMP'S PRESSURE / OIL TEMPERATURE DIAGRAM**

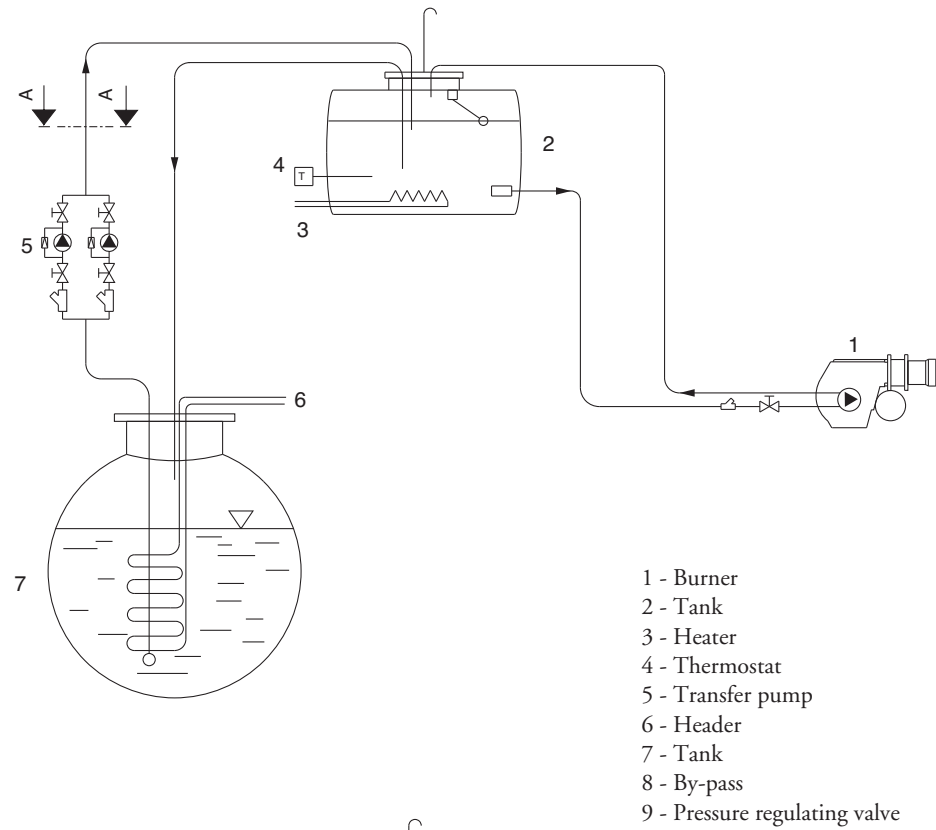
The gasification of volatile fractions in preheated heavy oil seems to be the main cause of premature fuel pump wear. To avoid such a problem, adjust pump pressure according to the diagram hereinafter.



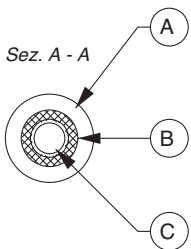
**WARNING:** For a correct working of the pump, verify what follows:

Pump : SUNTEC E4NC 1069 / SUNTEC E6NC 1069  
 Oil temperature at the pump: Max. 120 °C  
 Maximum allowable pressures: Max. 3,5 bar on inlet

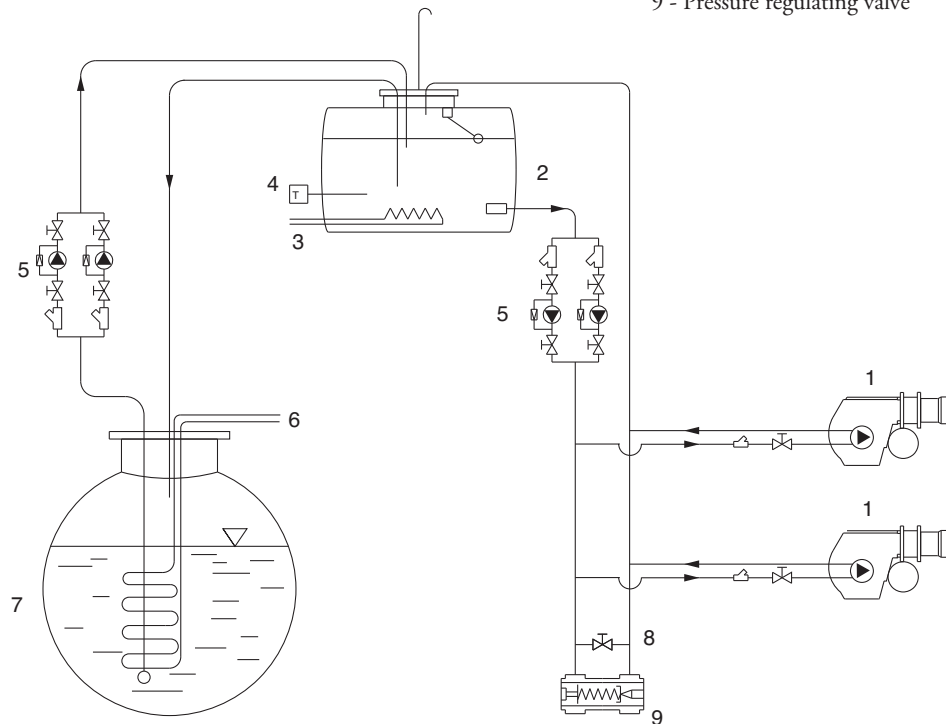
### HEAVY OIL FEED SYSTEM



- 1 - Burner
- 2 - Tank
- 3 - Heater
- 4 - Thermostat
- 5 - Transfer pump
- 6 - Header
- 7 - Tank
- 8 - By-pass
- 9 - Pressure regulating valve



- A - Isolation gasket
- B - Heater
- C - Pipe heavy oil



**IMPORTANT:** All fuel pipings are heated (see section A-A of the picture)

**NOZZLE OUTPUT FOR HEAVY OIL**

GPH	Pump pressure bar																													
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30									
0,60	2,5	2,6	2,7	2,9	3,0	3,1	3,2	3,3	3,4	3,4	3,4	3,5	3,6	3,7	3,8	3,9	4,0	4,0	4,1	4,2	4,3	4,3								
0,65	2,7	2,8	3,0	3,1	3,2	3,3	3,4	3,5	3,6	3,7	3,8	3,9	4,0	4,1	4,2	4,3	4,4	4,4	4,5	4,6	4,6	4,7								
0,75	3,1	3,3	3,4	3,5	3,7	3,8	3,9	4,0	4,2	4,3	4,4	4,5	4,6	4,7	4,8	4,9	5,0	5,1	5,2	5,3	5,4	5,4								
0,85	3,5	3,7	3,8	4,0	4,1	4,3	4,4	4,6	4,7	4,8	4,9	5,1	5,2	5,3	5,4	5,5	5,6	5,8	5,9	6,0	6,1	6,1								
1,00	4,2	4,4	4,6	4,8	5,0	5,1	5,3	5,5	5,6	5,8	5,9	6,1	6,2	6,4	6,5	6,6	6,8	6,9	7,0	7,2	7,3	7,3								
1,10	4,6	4,8	5,0	5,2	5,4	5,6	5,8	6,0	6,2	6,3	6,5	6,7	6,8	7,0	7,1	7,3	7,4	7,6	7,7	7,8	8,0	8,0								
1,20	5,0	5,2	5,5	5,7	5,9	6,1	6,3	6,5	6,7	6,9	7,1	7,2	7,4	7,6	7,7	7,9	8,1	8,2	8,4	8,5	8,7	8,7								
1,25	5,2	5,5	5,7	5,9	6,2	6,4	6,6	6,8	7,0	7,2	7,4	7,5	7,7	7,9	8,1	8,2	8,4	8,5	8,7	8,9	9,0	9,0								
1,35	5,6	5,9	6,1	6,4	6,6	6,9	7,1	7,3	7,5	7,7	7,9	8,1	8,3	8,5	8,7	8,9	9,0	9,2	9,4	9,5	9,7	9,7								
1,50	6,2	6,5	6,8	7,1	7,3	7,6	7,8	8,1	8,3	8,5	8,8	9,0	9,2	9,4	9,6	9,8	10,0	10,2	10,4	10,6	10,7	10,7								
1,65	6,9	7,2	7,6	7,9	8,2	8,5	8,7	9,0	9,3	9,5	9,8	10,0	10,2	10,5	10,7	10,9	11,1	11,3	11,5	11,8	12,0	12,0								
1,75	7,3	7,7	8,0	8,3	8,6	8,9	9,2	9,5	9,8	10,1	10,3	10,6	10,8	11,1	11,3	11,5	11,8	12,0	12,2	12,4	12,6	12,6								
2,00	8,3	8,7	9,1	9,5	9,8	10,2	10,5	10,8	11,1	11,4	11,7	12,0	12,3	12,6	12,9	13,1	13,4	13,6	13,9	14,1	14,4	14,4								
2,25	9,4	9,9	10,3	10,7	11,1	11,5	11,9	12,3	12,6	13,0	13,3	13,6	13,9	14,3	14,6	14,9	15,2	15,4	15,7	16,0	16,3	16,3								
2,50	10,4	10,9	11,4	11,9	12,3	12,7	13,2	13,6	14,0	14,3	14,7	15,1	15,4	15,8	16,1	16,4	16,8	17,1	17,4	17,7	18,0	18,0								
3,00	12,5	13,1	13,7	14,3	14,8	15,3	15,8	16,3	16,8	17,2	17,7	18,1	18,5	19,0	19,4	19,8	20,2	20,5	20,9	21,3	21,7	21,7								
3,50	14,6	15,3	16,0	16,6	17,3	17,9	18,5	19,0	19,6	20,1	20,6	21,2	21,7	22,1	22,6	23,1	23,5	24,0	24,4	24,9	25,3	25,3								
4,00	16,6	17,4	18,2	18,9	19,6	20,3	21,0	21,6	22,3	22,9	23,5	24,1	24,6	25,2	25,7	26,2	26,8	27,3	27,8	28,3	28,8	28,8								
4,50	18,7	19,6	20,5	21,3	22,1	22,9	23,7	24,4	25,1	25,8	26,4	27,1	27,7	28,4	29,0	29,6	30,2	30,7	31,3	31,8	32,4	32,4								
5,00	20,8	21,8	22,8	23,7	24,6	25,5	26,3	27,1	27,9	28,7	29,4	30,1	30,9	31,5	32,2	32,9	33,5	34,2	34,8	35,4	36,0	36,0								
5,50	22,9	24,0	25,1	26,1	27,1	28,0	29,0	29,9	30,7	31,6	32,4	33,2	34,0	34,7	35,5	36,2	36,9	37,6	38,3	39,0	39,7	39,7								
6,00	25,0	26,2	27,4	28,5	29,6	30,6	31,6	32,6	33,5	34,5	35,4	36,2	37,1	37,9	38,7	39,5	40,3	41,1	41,8	42,6	43,3	43,3								
6,50	27,1	28,4	29,7	30,9	32,1	33,2	34,3	35,3	36,4	37,4	38,3	39,3	40,2	41,1	42,0	42,8	43,7	44,5	45,3	46,1	46,9	46,9								
7,00	29,1	30,5	31,9	33,2	34,4	35,6	36,8	37,9	39,0	40,1	41,2	42,2	43,2	44,1	45,1	46,0	46,9	47,8	48,7	49,6	50,4	50,4								
7,50	31,2	32,7	34,2	35,6	36,9	38,2	39,5	40,7	41,9	43,0	44,1	45,2	46,3	47,3	48,3	49,3	50,3	51,3	52,2	53,1	54,0	54,0								
8,30	34,5	36,2	37,8	39,3	40,8	42,3	43,6	45,0	46,3	47,6	48,8	50,0	51,2	52,3	53,4	54,5	55,6	56,7	57,7	58,8	59,8	59,8								
9,50	39,5	41,4	43,3	45,0	46,7	48,4	50,0	51,5	53,0	54,4	55,9	57,2	58,6	59,9	61,2	62,5	63,7	64,9	66,1	67,3	68,4	68,4								
10,50	43,7	45,8	47,9	49,8	51,7	53,5	55,3	57,0	58,6	60,2	61,8	63,3	64,8	66,3	67,7	69,1	70,5	71,8	73,1	74,4	75,7	75,7								
12,00	49,9	52,3	54,7	56,9	59,0	61,1	63,1	65,1	66,9	68,8	70,6	72,3	74,0	75,7	77,3	78,9	80,5	82,0	83,5	85,0	86,4	86,4								
13,80	57,4	60,2	62,9	65,4	67,9	70,3	72,6	74,8	77,0	79,1	81,2	83,2	85,1	87,1	88,9	90,8	92,6	94,3	96,0	97,7	99,4	99,4								
15,30	63,7	66,8	69,8	72,6	75,4	78,0	80,6	83,1	85,5	87,8	90,1	92,3	94,5	96,6	98,7	100,7	102,7	104,7	106,6	108,5	110,3	110,3								
17,50	72,8	76,4	79,7	83,0	86,1	89,2	92,1	94,9	97,7	100,3	103,0	105,5	108,0	110,4	112,8	115,1	117,4	119,6	121,8	124,0	126,1	126,1								
19,50	81,2	85,2	89,0	92,6	96,1	99,4	102,7	105,9	108,9	111,9	114,8	117,7	120,4	123,1	125,8	128,4	130,9	133,4	135,9	138,3	140,6	140,6								
21,50	89,5	93,9	98,0	102,0	105,9	109,6	113,2	116,7	120,1	123,4	126,6	129,7	132,7	135,7	138,7	141,5	144,3	147,1	149,8	152,4	155,0	155,0								
24,00	99,9	104,8	109,4	113,9	118,2	122,4	126,4	130,3	134,0	137,7	141,3	144,8	148,2	151,5	154,8	158,0	161,1	164,2	167,2	170,1	173,0	173,0								
28,00	116,5	122,2	127,6	132,8	137,8	142,7	147,4	151,9	156,3	160,6	164,8	168,8	172,8	176,7	180,5	184,2	187,9	191,4	194,9	198,4	201,8	201,8								
30,00	124,9	131,0	136,8	142,4	147,8	153,0	158,0	162,8	167,6	172,2	176,6	181,0	185,3	189,4	193,5	197,5	201,4	205,2	209,0	212,7	216,3	216,3								

OUTPUT Kg/h

### CHECKS TO BE MADE TO ENSURE A PROPER INSTALLATION:

Before proceeding with the filling of the fuel system and subsequent burner start up, it is advisable to carry out the following checks:

- Power line must be adequate to system's adsorbed load
- Fuses must be adequate to the system's load
- Boiler's thermostats must have been properly connected
- Voltage and frequency must be within the specified limits
- Fuel type must be the one specified by the burner manufacturer
- Feed piping section must be adequate to the requested fuel flow rate
- Filters, cocks as well as fittings must have been properly installed
- Blast tube length must be the one specified by the boiler manufacturer
- Nozzle's flow rate of the burner must be adequate to boiler's output

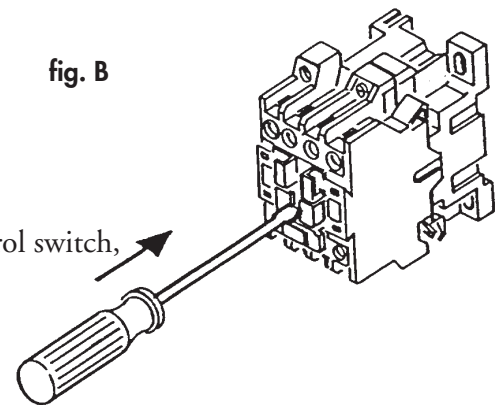
### BEFORE PROCEEDING WITH THE FILLING OF THE OIL SYSTEM, CHECK THE FOLLOWING POINTS:

- Motor's direction of rotation (with 3phase version)
- There must be fuel in the tank.
- Fuel cocks must be open.
- Fuel return piping must be free from obstructions.

After having checked all the above items, proceed as follows:

- Connect a fuel pressure gauge.
- Disconnect the resistors power cable from the motor's remote control switch, and insulate it temporarily.
- Unplug the safety box.
- To press manually with a screwdriver on the pump motor's remote control switch, until the oil system is filled up (fig.B).

**Note:** the oil system can be considered filled when pressure gauge will show a constant reading. When done, restore initial conditions.



### OPERATION OF BURNER WITH HEAVY OIL

When all the controls, as shown in previous paragraphs, have been accomplished, it will be possible to proceed with the burner start up.

- Switch-on the burner. When reaching the preset temperature on the working thermostat, and with boiler's thermostat closed, the control box starts the fan, the fuel pump and the ignition transformer. At the same time, the balancing resistors are activated, to keep fuel temperature into the heater at a constant value.

- It begins, in this way, the combustion chamber prepurging, as well as the fuel circulation in the whole circuit, so as to obtain an uniformity of temperature which allows a correct flowing of the same. The fuel pressure, during prepurging, shall be around 16÷18 bar. If not, adjust the pressure to the specified value through the regulator "D", purposely installed on the heating circuit (see figure).

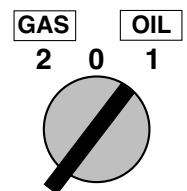
- At the end of the prepurging, the control box shut off the solenoid valve "O" while opening the 1st stage valve (for example valve "A"), allowing the burner ignition in Low Flame.

Afterwards, it will be opened the 2nd stage valve "B" which, while allowing the fuel flowing through both nozzles, permit the burner's High Flame ignition, i.e. at the full power.

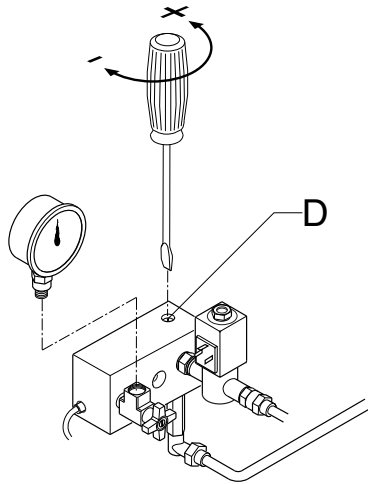
- In order to have a correct combustion, adjust the combustion air flow for both Low and High flame.

During flow rate adjustment, it is possible to manually switch from Low Flame to High Flame and viceversa, through the LOW/HIGH manual switch. When all adjustments are made, leave the switch in II (HIGH) position.

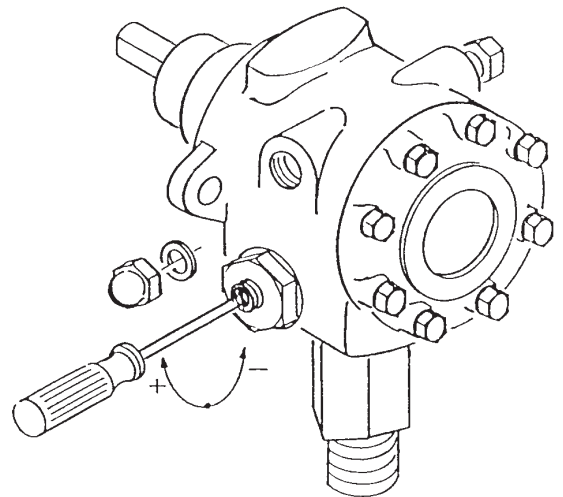
- The fuel pressure during burner's working shall be set to 23 bars.



## ADJUSTEMENT OF PRESSURE IN PREPURGING PHASE



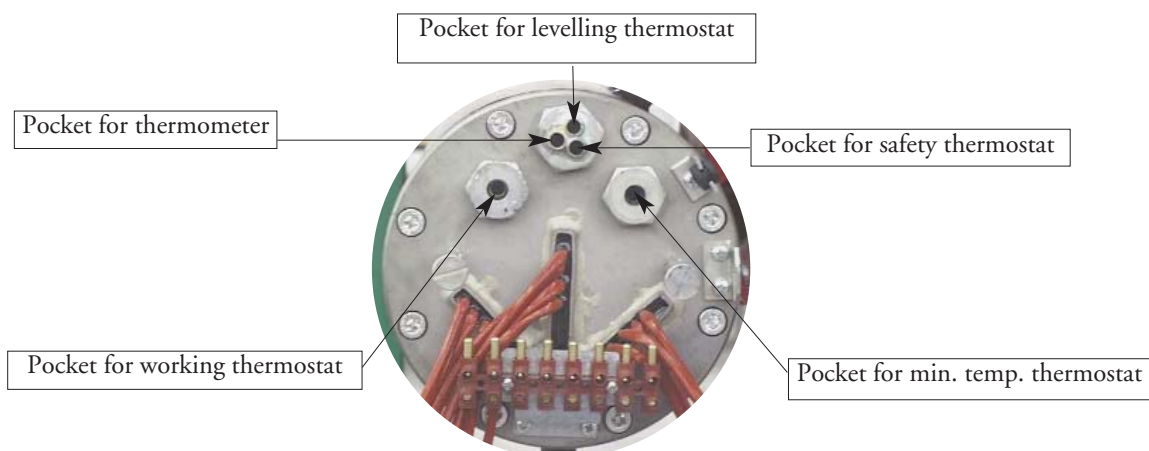
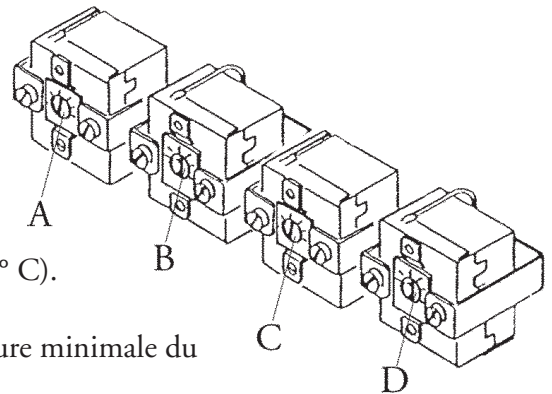
## ADJUSTEMENT OF PUMP PRESSURE



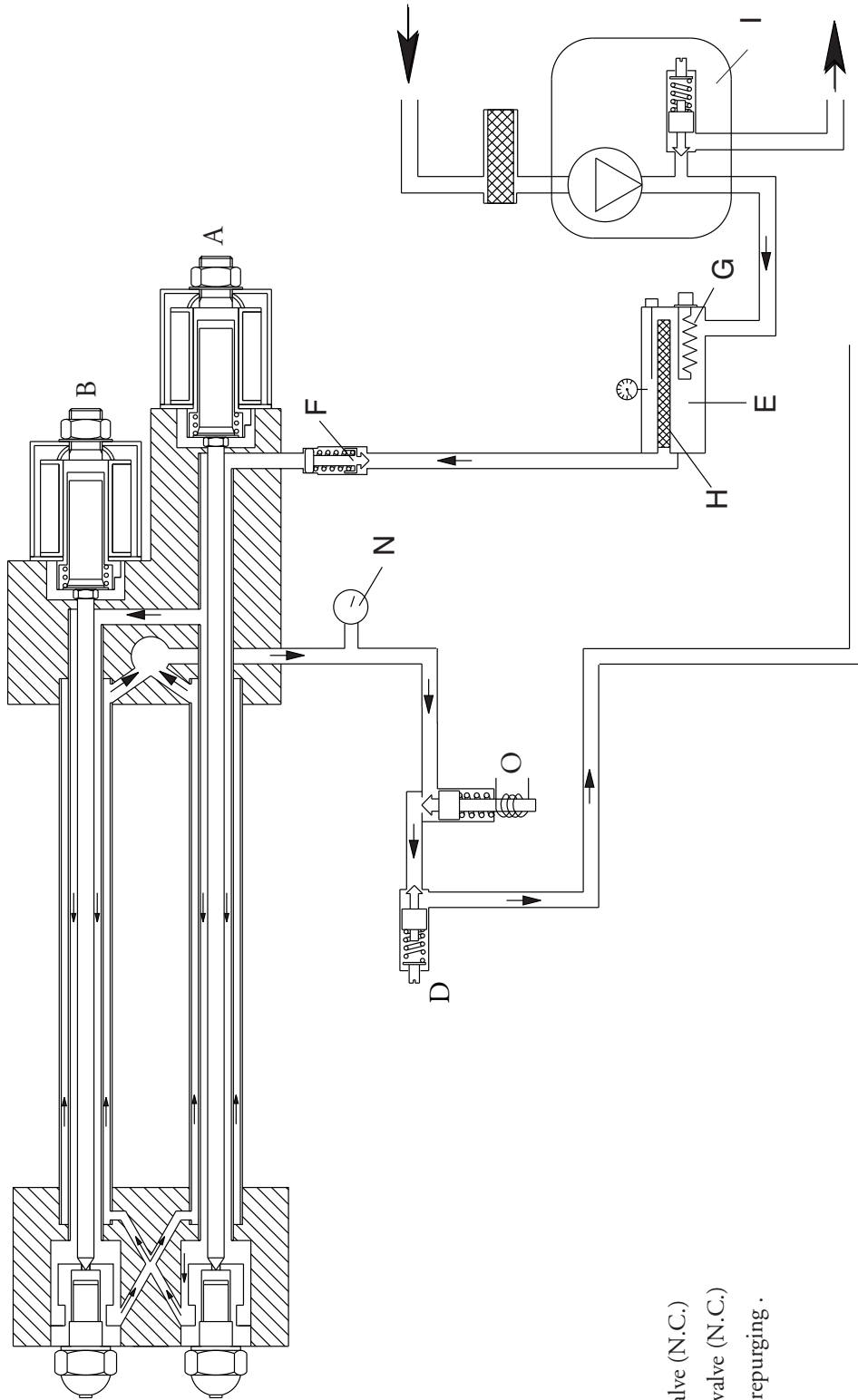
## ADJUSTMENT OF FUEL THERMOSTATS

The working resistor thermostat must be set to 120 °C, while the safety one to 160 °C. Said adjustments can be slightly modified following the type of fuel and particular uses.

- A - Termostato di sicurezza / Safety thermostat  
Thermostat de sécurité / Termóstato de seguridad (160° C).
- B - Termostato di lavoro / Working thermostat  
Thermostat de travail / Termóstato de trabajo (120° C).
- C - Termostato di livellamento / Levelling thermostat  
Thermostat de nivellement / Termóstato de nivelación (130° C).
- D - Termostato di min. temperatura olio combustibile  
Heavy oil min. temp. thermostat / Thermostat de température minimale du fioul lourd / Termóstato de minima fuel pesado (90° C).



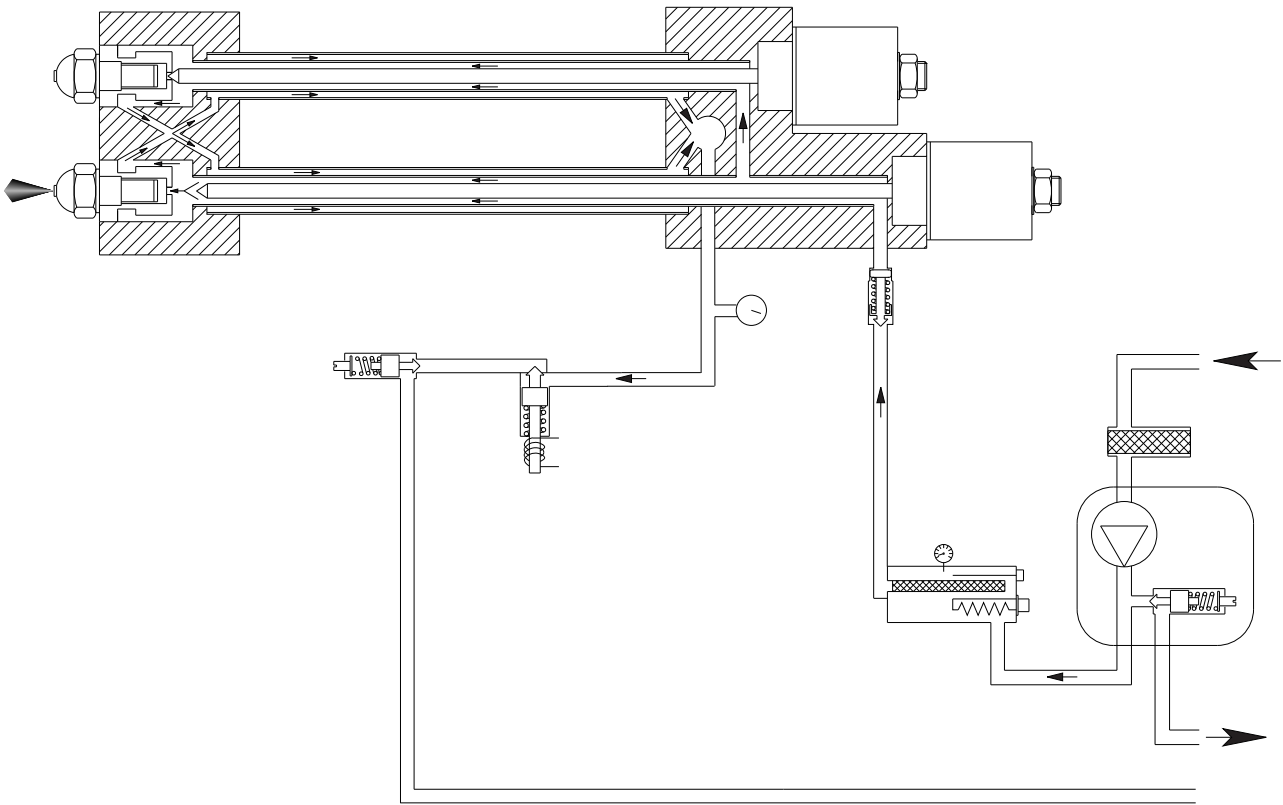
PREPURGING PHASE



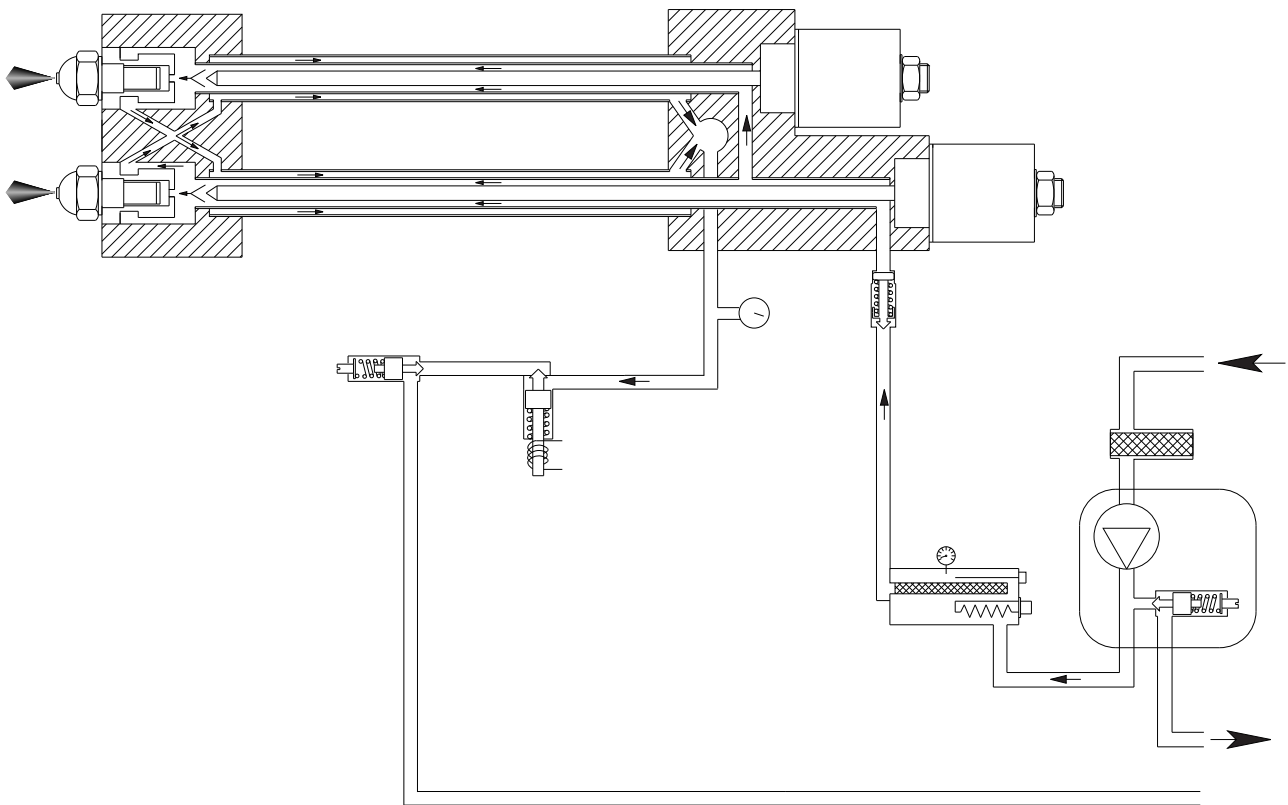
Legend :

- A. Low Flame solenoid valve (N.C.)
- B. High Flame solenoid valve (N.C.)
- D. Fuel flow adjuster in prepurging .
- E. Heater
- F. Anti-gas valve
- G. Resistors
- H. Filter
- I. Fuel pump
- N. Manometer
- O. Solenoid valve (N.O.)
- N.C. = Norm. closed
- N.O. = Norm. open

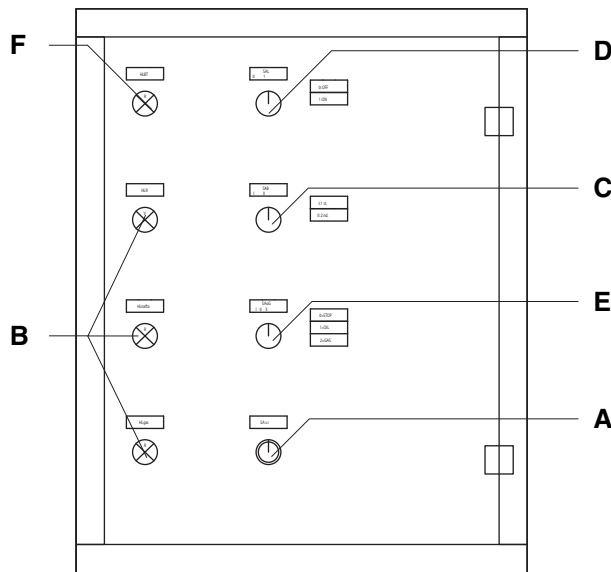
## Low Flame



## High Flame



## DESCRIPTION OF THE CONTROL PANEL OF THE BURNER



- A** - reset key  
**B** - operating lamps  
 (orange=light-oil; green= gas; red=heater)  
**C** - selector:  
 HIGH= operation at max. output  
 LOW = operation at min. output  
**D** - ON/OFF switch  
**E** - selector:  
 0= STOP  
 1= light-oil operation  
 2= gas operation  
**F** - thermal lock-out lamp

The burners are produced with connections suitable for power supply 400 V three-phase.

The burners with electric motors of an output lower or equal to 7,5 kW can be adapted to 220-230 V (please follow the instructions on the backside); motors with higher output can only work 380-400 V three-phase.

In case of request of burners different from the above mentioned standard, it is recommended to make specific mention in the order.

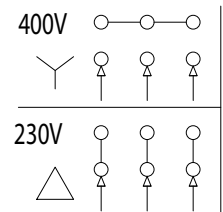
### Instructions: how to adapt electric motors of an output lower or equal to 7,5 kW to 220-230 V power supply

It is possible to change the voltage of the burner by operating as follows:

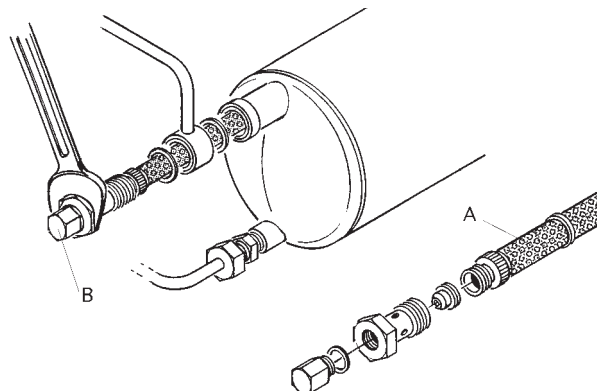
1. change the connection inside the electric box of the motor, from star to delta (see picture);
2. change the setting of the thermal relay, referring to the absorption values indicated in the motor nameplate. If necessary, replace the thermal relay with another one of suitable scale.

This operation is not possible on motors above 7.5 kW.

*For more information, please contact the Ecoflam staff.*



## CLEANING AND MAINTENANCE OF FILTERS MOUNTED ON THE PREHEATER



### REMOVING OF THE FILTER

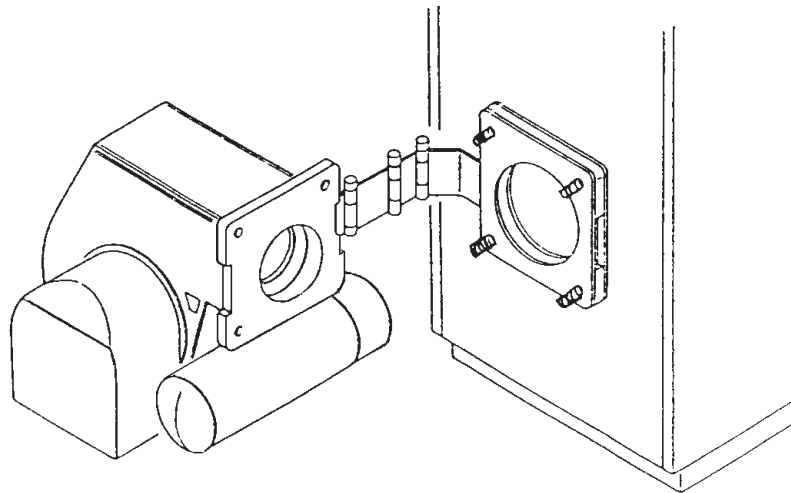
1. Switch-off the burner.
2. Loosen screw B and drain part of the fuel from the heater, until the fuel level drop below the filter.
3. Unscrew and pull out the stem filter A from its seat.
4. Clean the filter and reassemble the parts as shown by the picture, then fit it in its own seat.

It is advisable to replace all filter and valve gaskets whenever they are removed.

**Note that when the burner is working the heater has a pressure of abt. 23 bar, and that it becomes very dangerous to carry out said operations with the burner running.**



## BURNER MOUNTING



## MAINTENANCE

### ANNUAL CHECK

The burner (combustion head, electrodes, etc.) must be checked regularly by an authorized technician, once or twice a year, depending on how much it is used. Before proceeding with the maintenance check-up on the burner, it is advisable to check the general condition of the burner and take the following steps: Disconnect the burner (remove the plug).

- Close the gas shut-off cock.
- Remove the cover from the burner, clean the fan and air intake.
- Clean the combustion head and check the position of the electrodes.
- Re-install the parts.
- Check the seal on the gas connectors.
- Check the state of the flue.
- Start the burner.
- Check the combustion parameters

### BEFORE TAKING ANY ACTION, CHECK:

- that there is power in the circuit and the burner is connected;
- that the gas pressure is right and the gas shut-off cock is open;
- that the control systems are properly connected. If all these conditions have been satisfied, start the burner by pressing the reset button. Check the burner cycle.

### IF THE BURNER FAILS TO START:

check the switch, the thermostats, the motor and the gas pressure, fuses burnt, resistors failure, heater thermostats open.

### IF THE BURNER PROCEEDS WITH PREVENTILATION BUT CUTS OUT AT THE END OF THE CYCLE:

check the air pressure and the fan. Check the air pressure switch, UV cell failure, premature ignition due to oil leakage from solenoid valve.

### IF THE BURNER PROCEEDS WITH PREVENTILATION BUT DOES NOT LIGHT:

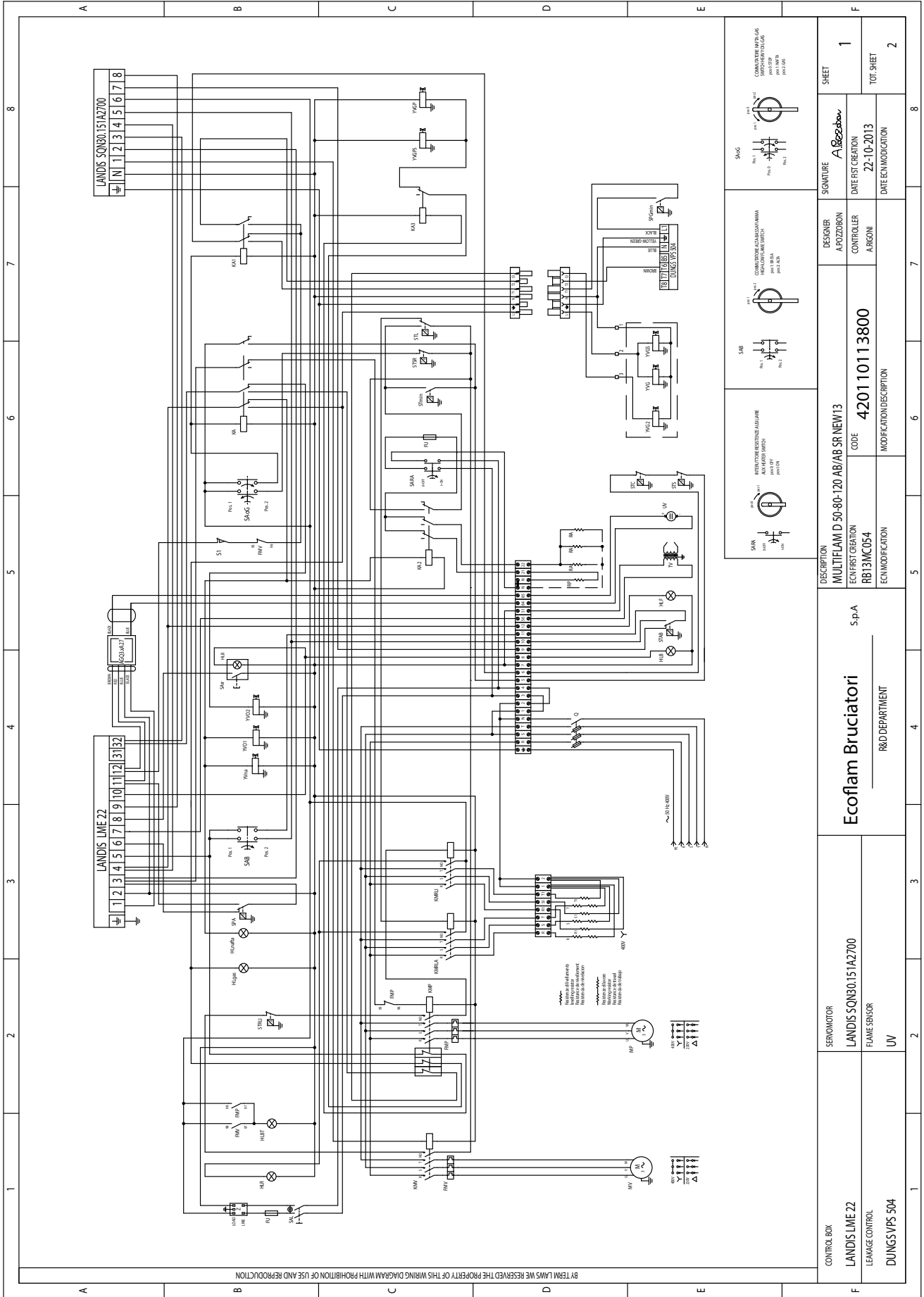
check the installation and position of the electrodes. Electrodes dirty. Nozzles clogged. Check the ignition cable. Check the ignition transformer. Check the safety device. Eccles of combustion air related to nozzles flow rate.

### IF THE BURNER LIGHTS BUT CUTS OUT AFTER THE SAFETY INTERVAL:

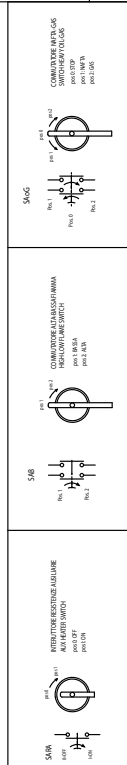
check that the phase and neutral wires are connected correctly. Check the gas solenoid valve. Check the UV cell. Check the safety device. The oil pressure during prepurging is too low. Filters clogged. Nozzles are too worn. The oil temperature is too low (flame jumps). Eccles of combustion air related to nozzles flow rate

### IF THE BURNER LIGHTS BUT CUTS OUT AFTER OPERATING FOR A FEW MINUTES:

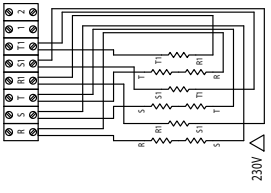
check the pressure regulator and gas filter. Check the gas pressure with a pressure gauge. Check the detector value (at least 200  $\mu$ A).



CONTROL BOX LANDIS LME 22 LEAKAGE CONTROL DUNGS VPS 504	SERVO MOTOR LANDIS SQN30.151A2700	Ecoflam Bruciatori S.p.A	DESCRIPTION MULTIFLAM D 50-80-120 AB/AB SR NEW13		DESIGNER A-POZZOBON	SIGNATURE <i>A. Pozzobon</i>	SHEET 1
	FLAME SENSOR UV		ECOFIRST CREATION RB13MC054	CODE 420110113800	CONTROLLER A-ROGNI	DATE/FIRST CREATION 22-10-2013	TOT. SHEET 2
R&D DEPARTMENT			ECOMODIFICATION	MODIFICATION/DESCRIPTION			



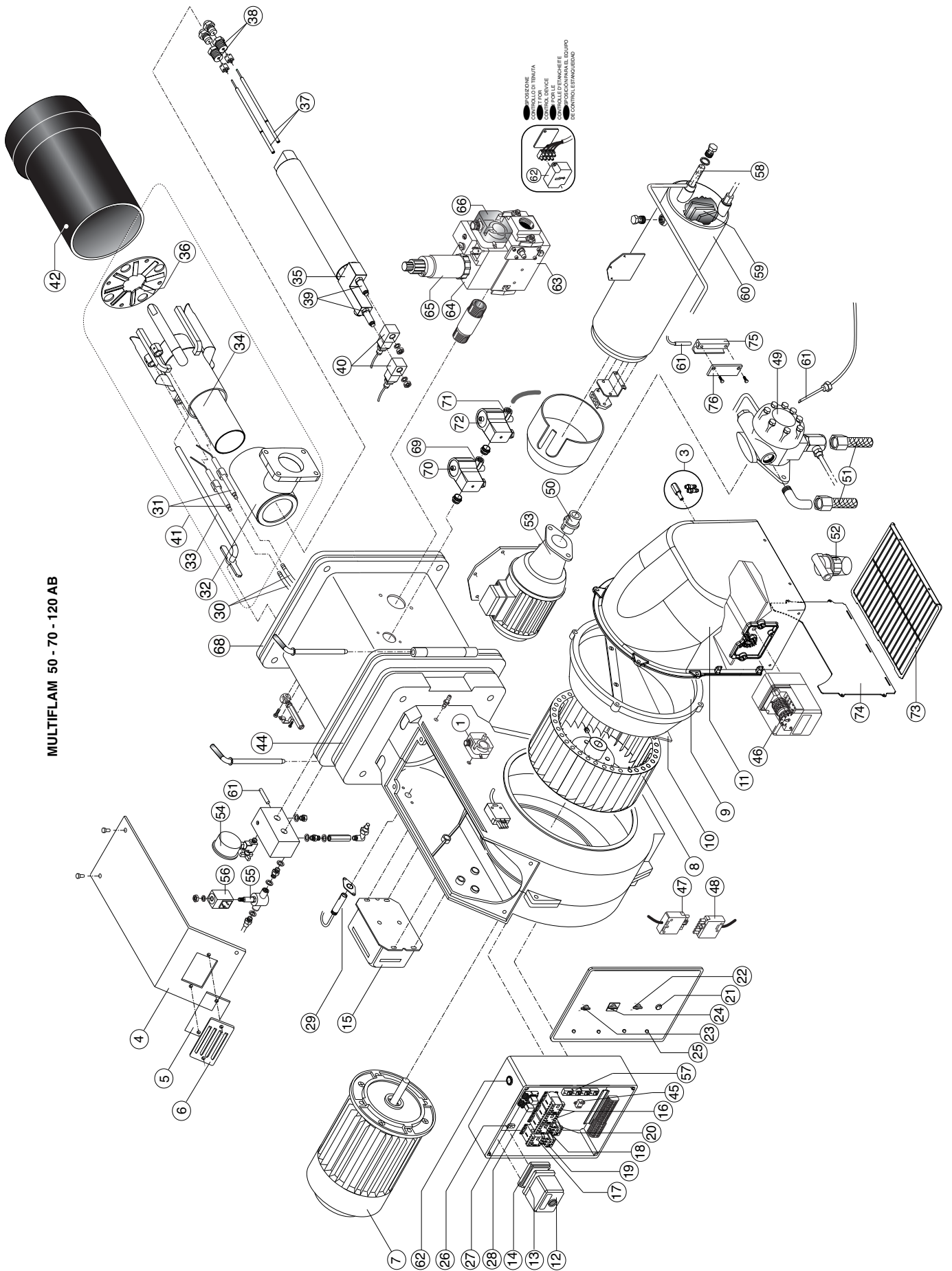
1		2		3		4		5		6		7		8	
Q01	INTERRITTORE GENERALE CON FUSIBILE GENERAL SAFETY THERMOSTAT WITH FUSIBLE INTERRUPTEUR GENERAL AVEC FUSIBLE INTERRUPTOR GENERAL CON FUSIBLE	HLR	LAMPADA RESISTENZE THERMOSTAT RESISTENCES INDICADOR RESISTENCIAS INTERRUPTOR RESISTENCIAS	KMILL	CONVITTORE RESISTENZE DI LIVELLAMENTO LEVELLING THERMOSTAT INTERRUPTOR DE LAS RESISTENCIAS DE NIVELACION										
Z	FILTRO ANTICONTURBO ANTI-KNOCK FILTER FILTRE ANTIPARASITES FILTRO DE PROTECCION ANTIDORTURBIO	KMP	CONVITTORE MOTORE POMPA PUMP MOTOR CONTROL SWITCH CONTACTEUR MOTEUR POMPE ENPALE MOTOR BOMBA	SPGm	PRESSOSTATO GAS DI MINIMA GAS PRESSURE SWITCH MIN PRESOSTAT GAZ DE MINIMA PRESOSTATO GAZ DE MINIMA POT.										
FU	FUSIBILE FUSIBLE FUSIBLE	KMV	CONVITTORE MOTORE VENTILATORE MOTOR CONTROL SWITCH (FAN MOTOR) CONTACTEUR MOTEUR VENTILATEUR TELERUPIDOR MOTOR VENTILATOR	Stm	TERMOSTATO DI MINIMA THERMOSTAT MIN THERMOSTAT DE MINIMA										
KA	RELE RELAY RELAIS	SAB	DEVITTORE ALTA-BASSA FIAMMA HIGH-LOW FLAMES SWITCH THERMOSTAT GRANDE-PETITE ALLURE CONVITTORE DI ALTA-BASSA LLAMA	YMG	ELETTROVALVOLA GAS PILOTA PILOT FLAMES SOLENOID GAS VALVE ELECTROVALVE GAZ PILOTE ELECTROVALVULA GAS PILOTO										
KA1	RELE RELAY RELAIS	SAL	INTERRITTORE DI LINEA LINE INTERRUPTOR INTERRUPTEUR DE LIGNE INTERRUPTOR DE LINEA	YMG5	ELETTROVALVOLA GAS PILOTA DI SICUREZZA PILOT FLAMES SOLENOID GAS VALVE OF SAFETY ELECTROVALVE GAZ PILOTE DE SECURITE ELECTROVALVULA GAS PILOTO DE SEGURIDAD										
KA2	RELE RELAY RELAIS	SPA	PRESSOSTATO ARIA AIR PRESSURE SWITCH PRESOSTAT AIRE	SI	FINE CORSO LIMIT SWITCH INTERRUPTEUR DE FIN DE COURSE LIMITADOR DE CARRERA										
KA3	RELE RELAY RELAIS	STC	TERMOSTATO CALDAIA BOILER THERMOSTAT THERMOSTAT CHAUDIERE THERMOSTATO CALDERA	HBT	LAMPADA DI BLOCCO TERMICO THERMAL LOCK-OUT LAMP LAMPE DE THERMAL DE SECURITE ESPA DE BLOQUEO DELE TERMICO										
MP	MOTORE POMPA OIL PUMP MOTOR MOTOR BOMBA	STL	TERMOSTATO DI LAVORO WORKING THERMOSTAT THERMOSTAT DE TRAVAIL THERMOSTATO DE TRABAJO	YMG	ELETTROVALVOLA GAS PILOTA PILOT FLAMES SOLENOID GAS VALVE ELECTROVALVE GAZ PILOTE ELECTROVALVULA GAS PILOTO										
MV	MOTORE VENTILATORE MOTOR VENTILATEUR MOTOR VENTILADOR	STS	TERMOSTATO DI SICUREZZA SAFETY THERMOSTAT THERMOSTAT DE SECURITE THERMOSTATO DE SEGURIDAD	SABA	INTERRITTORE RESISTENZE AUSILIARIE AUXILIAR RESISTANCES INTERRUPTOR INTERRUPTOR RESISTENCIAS AUXILIARES INTERRUPTOR RESISTENCIAS AUXILIAR										
RP	RESISTENZA POMPA PUMP RESISTOR RESISTENCIA BOMBA	STAB	TERMOSTATO ALTA-BASSA FIAMMA HIGH-LOW FLAME THERMOSTAT THERMOSTAT GRANDE-PETITE ALLURE THERMOSTATO DE ALTA-BASSA LLAMA	SAEF	BULBANTE DI SBLOCCO A RIECCHIA TURBA RESET LOCK-OUT BUTTON BOITON DE DEBLOCAGE DU COFFRE DE SECURITE BARRNE DE LA CENTRALITA										
TV	TRASFORMATORE IGNITION TRANSFORMER TRANSFORMATEUR D'ALLUMAGE TRANSFORMADOR	STBR	TERMOSTATO DI SICUREZZA RESISTENZE RESISTOR SAFETY THERMOSTAT THERMOSTAT DE SECURITE RESISTENCIAS THERMOSTATO DE SEGURIDAD RESISTENCIAS	YMG2	ELETTROVALVOLA GAS DI SECONDA FIAMMA SECOND STAGE GAS SOLENOID VALVE ELECTROVALVE GAZ GRANDE ALLURE ELECTROVALVULA GAS DE 2ª LLAMA										
UV	FOTOCELLULA UV CELL UV	STRL	TERMOSTATO RESISTENZE DI LIVELLAMENTO LEVELLING RESISTANCES THERMOSTAT THERMOSTAT DE LAS RESISTENCIAS DE NIVELACION												
RA	RESISTENZA AUXILIARIA AUXILIARY RESISTOR RESISTENCIA AUXILIAR RESISTENCIA AUXILIARA	YVGT	ELETTROVALVOLA GAS DI PRIMA FIAMMA FIRST STAGE GAS SOLENOID VALVE ELECTROVALVE GAZ PETITE ALLURE ELECTROVALVULA GAS DE 1ª LLAMA												
FMP	RELE TERMICO MOTORE POMPA MOTOR PUMP THERMAL RELAY RELAIS THERMIQUE MOTEUR POMPE RELE TERMICO MOTOR BOMBA	YVGS	ELETTROVALVOLA GAS DI SICUREZZA EXTRA SAFETY GAS SOLENOID VALVE ELECTROVALVE GAZ DE SECURITE ELECTROVALVULA GAS DE SEGURIDAD												
FMV	RELE TERMICO MOTORE VENTILATORE MOTOR THERMAL RELAY (FAN MOTOR) RELAIS THERMIQUE MOTEUR VENTILATEUR RELE TERMICO MOTOR VENTILADOR	YVha	ELETTROVALVOLA NORMALMENTE APERTA NORMALLY OPEN SOLENOID VALVE ELECTROVALVE NORMALEMENT AVERT ELECTROVALVULA NORMALMENTE ABIERTA												
HLgs	LAMPADA GAS GAS LAMP ESPA DE 1ª LLAMA	YVOT	ELETTROVALVOLA OILO DI PRIMA FIAMMA FIRST STAGE HEAVY OIL SOLENOID VALVE ELECTROVALVE FUEL PESADO DE 1ª LLAMA ELECTROVALVULA FUEL PESADO DE 1ª LLAMA												
HLrftb	LAMPADA FIAMMA OIL LAMP LAMPE DE 2ª ALLURE ESPA DE 2ª LLAMA	YV02	ELETTROVALVOLA OILO DI SECONDA FIAMMA SECOND STAGE HEAVY OIL SOLENOID VALVE ELECTROVALVE FUEL PESADO DE 2ª LLAMA ELECTROVALVULA FUEL PESADO DE 2ª LLAMA												
HLB	LAMPADA DI BLOCCO LOCK-OUT LAMP LAMPE DE SECURITE ESPA DE BLOQUEO	KMIRA	CONVITTORE RESISTENZE DI LAVORO WORKING RESISTOR SWITCH INTERRUPTEUR DE RESISTENCES DE TRAVAIL INTERRUPTOR DE LAS RESISTENCIAS DE TRABAJO												



BRITISH LAMPS WMS RESERVED THE PROPERTY OF THIS WIRING DIAGRAM WITH PROHIBITION OF USE AND REPRODUCTION

CONTROL BOX LANDIS LIME 22 LEAKAGE CONTROL DUNGS VP5504	SERVO MOTOR LANDIS SON30.151/AZ700 FLAME SENSOR UV	Ecoflam Bruciatori		MULTIFLAM D 50-70-120 AB/AB SR NEW13		DESIGNER A-POZZORON	SIGNATURE A. Pozzoron	SHEET 2
		s.p.a		CODE 42011013800		CONTROLLER ARIGONI	DATE FIRST CREATION 22-10-2013	TOT. SHEET 2
		R&D DEPARTMENT		MODIFICATION/DESCRIPTION			DATE EC MODIFICATION	

MULTIFLAM 50 - 70 - 120 AB



N°	DESCRIPTION		Multiflam 120 AB GN 100 mbar
			code
1	AIR PRESSURE SWITCH	dungs LGW10A2P	65323047
2	PRESSURE GAUGE		65321341
3	AIR INTAKE SET		65324718
4	COVER		65324052
5	GLASS		65320487
6	PEED WINDOM FRAME		65320488
7	MOTOR	2200 W	65322841
8	FAN	260x110	65321775
9	AIR CONVEYOR		65320639
10	FAN SCOOP		65320623
11	AIR INTAKE		65324054
12	CONTROL BOX BASE	SIEMENS	65320092
13	CONTROL BOX	SIEMENS AGQ3.1A27	65113521
14	ADAPTER	SIEMENS LME22.331C2	65324042
15	IGNITION TRANSFORMER	Brahma T8 13000/35	65323222
16	REMOTE CONTROL SWITCH	AEG LS05.10	65323132
		AEG LS4K.10	65323133
17	REMOTE CONTROL SWITCH (MOTOR)	AEG LS4K.10	65323133
18	REMOTE CONTROL SWITCH (PUMP)	AEG LS05.10	65323132
19	MOTOR THERMAL RELAY (MOTOR)	AEG 4-6,3A	65323117
20	MOTOR THERMAL RELAY (PUMP)	AEG 2,2-3,2A	65323122
21	RESET BOTTON	COMEPI art.ECX1201	65324101
22	GAS/HEAVY OIL SWITCH	COMEPI art.ECX1370	65324099
23	MAIN SWITCH	COMEPI art.ECX1252	65324098
24	HIGH / LOW SELECTOR	COMEPI art.ECX1350	65324278
25	LAMP	LYVIA 10x28 BA9S	65324100
26	FUSE SUPPORT	HK 520	65324279
27	RELAY BASE	FINDER 95.75	65323152
		Finder 5534	65323150
28	RELAY	FINDER MINI 40.52	65323142
		Finder 5534	65323140
29	UV CELL	SIEMENS QRA	65320075
30	IGNITION CABLE	TC	
		TL	65320947
31	IGNITION ELECTRODES SET		65322165
32	PIPE	TC	65324280
		TL	65324281
33	ROD	TC	65324282
		TL	65324283
34	FIRING HEAD GAS	TC	65324284
		TL	65324285
35	FIRING HEAD HEAVY OIL	TC	65324286
		TL	65324287
36	FRONT DISC		65324288
37	ROD NOZZLE HOLDER	TC	65324289
		TL	65324290
38	NOZZLE HOLDER		65321683
39	OIL VALVE	PARKER GM120.8 JB18	65323629
40	COIL	parker	65323781
41	INNER ASSEMBLY		
42	BLAST TUBE	TC	65320419
		TL	65320420
43	BLAST TUBE END		-
44	GASKET ISOMART	260X255d200	65321119
45	ANTIJAMMING FILTER		65323170

46	AIR DAMPER MOTOR	SIEMENS SQN30.151A2700	65322897
47	WIELAND PLUG	6 pin	65322072
48	WIELAND SOCKET	6 pin	65322073
49	OIL PUMP	SUNTEC E6 NC	65322955
50	COUPLING		65322919
51	HOSES	TN 25X1500 1'	65323181
52	OIL FILTER	70501/03	3142087
53	PUMP MOTOR	SIMEL 740 W	65322832
54	MANOMETER	CEWAL R1/4 D50 40 BAR	3142096
55	OIL VALVE	PARKER SCEM 120.8AR JB 18	65323628
56	COIL	PARKER	65323781
57	THERMOSTAT	IMIT TR2 40/200	65323147
58	FILTER		65321171
59	HEATER	7050 W	65323083
60	OIL TANK		65321151
61	HEATING ELEMENT PUMP	50 W	65323072
62	COVER		65320489
63	GAS VALVE	DUNGS MB-ZRDLE 412	65323611
64	COIL	1° st.stage DUNGS 420	
65	COIL	2° nd.stage DUNGS 420	
66	GAS PRESSURE SWITCH	DUNGS LGW10 A2P	65323047
67	LEAKAGE CONTROL	DUNGS VPS 504	65323657
68	GASKET ISOMART		65321124
69	PILOT GAS VALVE	BRAHMA EG12°SR	65324108
70	COIL	BRAHMA EG12°SR	
71	PILOT GAS VALVE	BRAHMA EG12°SR	65324108
72	COIL	BRAHMA EG12°SR	
73	PROTECTION		65324049
74	SHEET CLOSING		65324050
<b>Version D</b>			
75	PREHEATED'S AUX. RESISTOR HOLDER		65321716
76	FIXING PLATE		65321717

TC = SHORT HEAD TL = LONG HEAD



*La ECOFLAM BRUCIATORI S.p.A si riserva il diritto di apportare ai prodotti quelle modifiche che riterrà necessarie o utili, senza pregiudicarne le caratteristiche principali.*

*ECOFLAM BRUCIATORI S.p.A. reserves the right to make any adjustments, without prior notice, which it considers necessary or useful to its products, without affecting their main features.*

*La Maison ECOFLAM BRUCIATORI S.p.A. se réserve le droit d'apporter les modifications qu'elle jugera nécessaires ou utiles à ses produits sans pour autant nuire à leurs caractéristiques principales.*

*ECOFLAM BRUCIATORI S.p.A. se reserva el derecho a introducir en sus productos todas las modificaciones que considere necesarias o utiles, sin perjudicar sus características.*

*“Экофлам С.п.А.” оставляет за собой право вносить в конструкцию оборудования любые необходимые изменения без особого предупреждения.*

# **Ecoflam**

**Ecoflam Bruciatori S.p.A.**

via Roma, 64 - 31023 RESANA (TV) - Italy - tel. 0423.719500 - fax 0423.719580

<http://www.ecoflam-burners.com> - e-mail: [export@ecoflam-burners.com](mailto:export@ecoflam-burners.com)

"società soggetta alla direzione e al coordinamento della Ariston Thermo S.p.A., via A. Merloni, 45 - 60044 Fabriano (An) CF 01026940427"