

OIL BURNERS

# Ecoflam

CE



MAIOR P 45 PR

MAIOR P 60 PR

MAIOR P 80 PR

MAIOR P 120 PR



420010619600

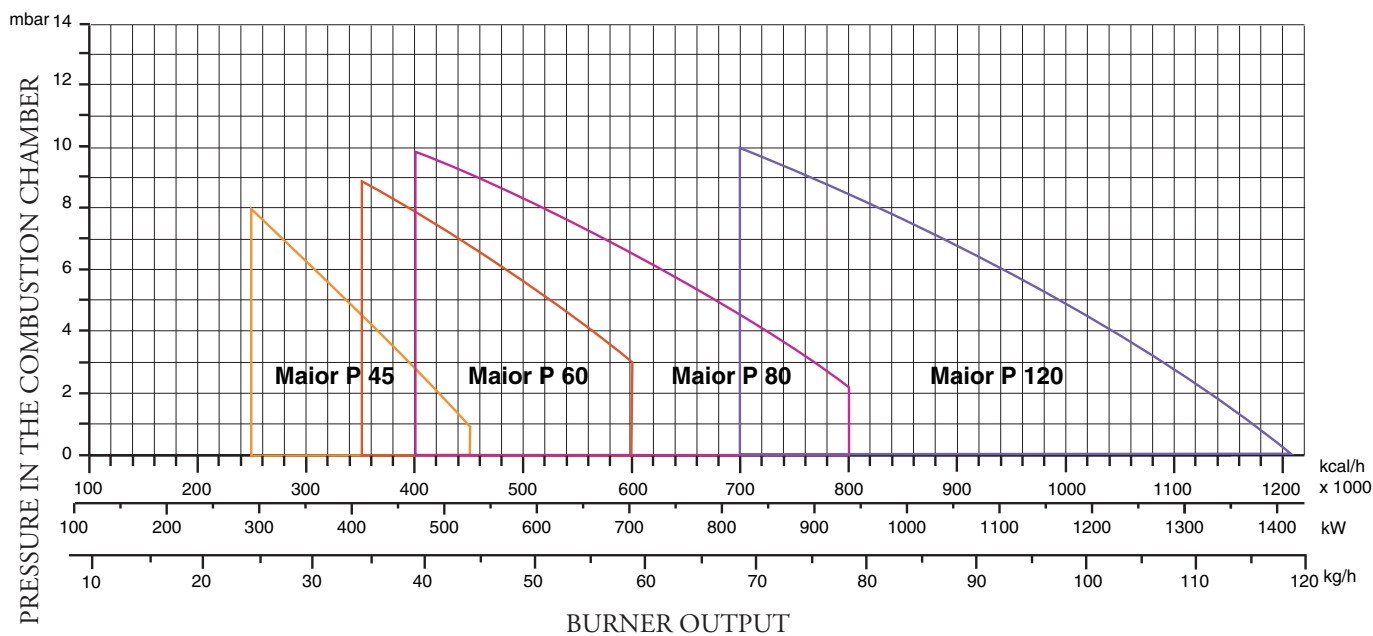
420010619600

27.01.2015

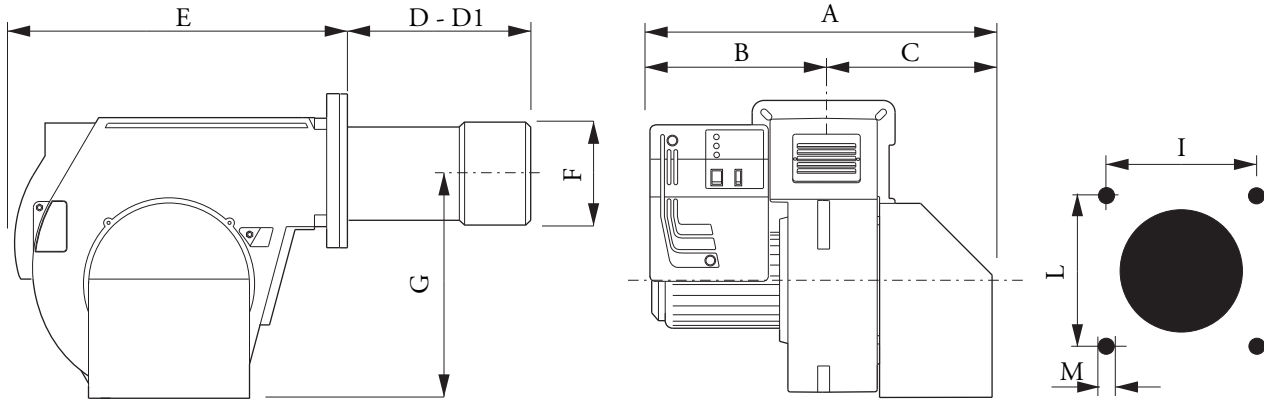
## TECHNICAL DATA

MODELS		MAIOR P 45	MAIOR P 60	MAIOR P 80	MAIOR P 120
Thermal power max.	kcal/h	459.000	600.000	800.000	1.200.000
	kW	532	710	949	1423
Thermal power min.	kcal/h	255.000	350.000	400.000	700.000
	kW	296	415	474	830
Max. flow rate light oil	kg/h	45	60	80	120
Min. flow rate light oil	kg/h	25	35	40	70
Feeding power	50 Hz V	230/400	230/400	230/400	230/400
Motor	kW		1,5		
Rpm	Nº	2.800	2.800	2.800	2.800
Ignition transformer	kV/mA	2x5 /20	2x5 /20	2x5 /20	2x5 /20
Control box	SIEMENS	LOK16.250A27	LOK16.250A27	LOK16.250A27	LOK16.250A27
Fuel : light oil	kcal/kg	10.200 max. visc 1,5°E a 20°C			

## WORKING FIELDS



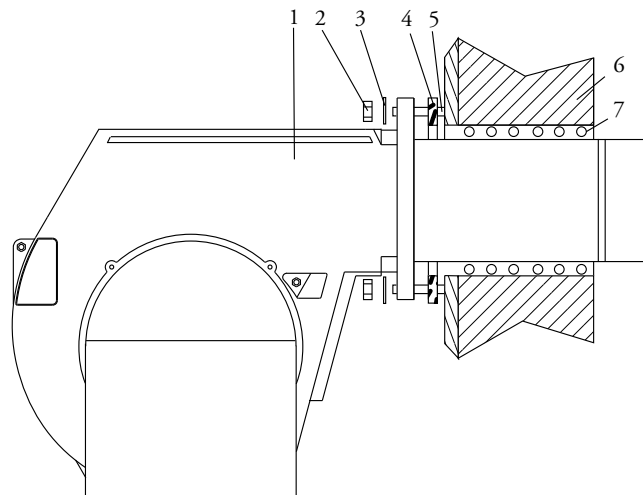
## OVERALL DIMENSIONS



MODELS	A	B	C	D	D1	E	F	G	I	L	M
MAIOR P 45 PR	630	370	260	200	390	555	160	390	190	190	M10
MAIOR P 60 PR	630	370	260	235	395	555	180	390	190	190	M10
MAIOR P 80 PR	630	370	260	235	395	555	180	390	190	190	M10
MAIOR P 120 PR	710	370	340	225	445	555	190	390	190	190	M10

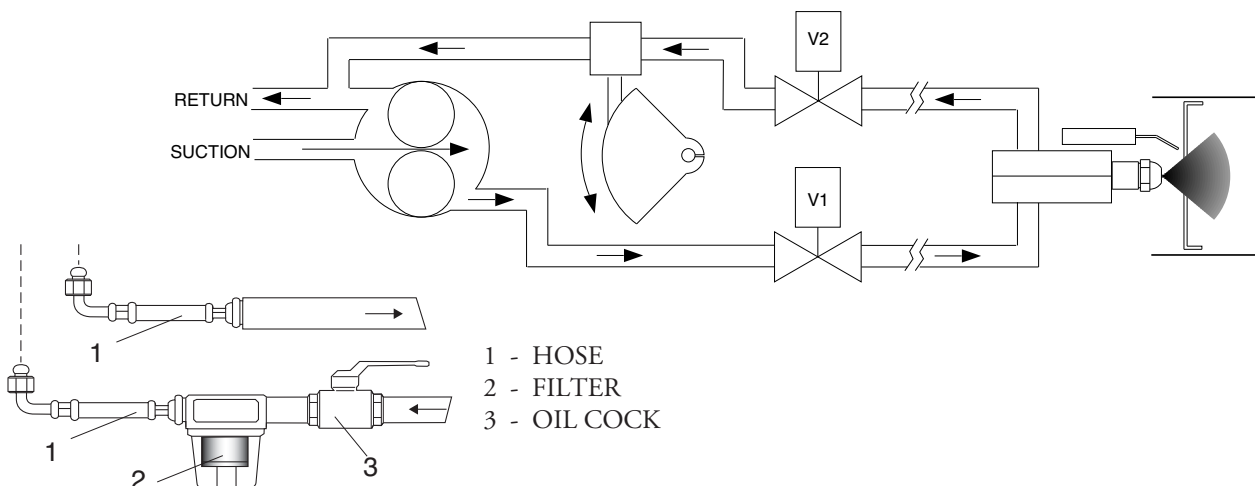
D = short head D1 = long head

## BURNER INSTALLATION



- 1 - BURNER
- 2 - NUT
- 3 - WASHER
- 4 - GASKET
- 5 - BOLT
- 6 - BOILER
- 7 - GASKET

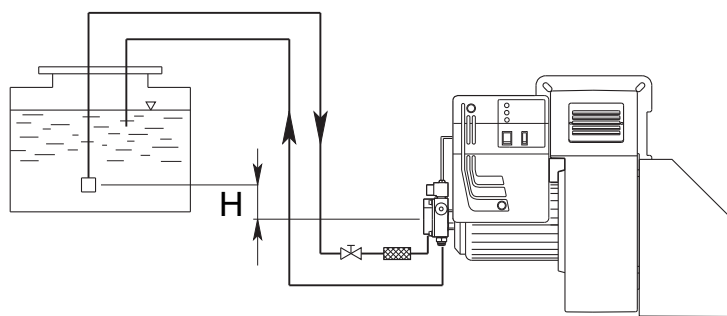
## HYDRAULIC CIRCUIT



- 1 - HOSE
- 2 - FILTER
- 3 - OIL COCK

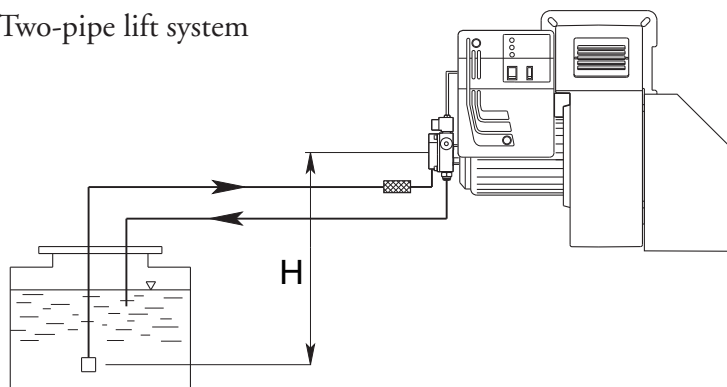
## MAXIMUM LENGTH OF SUCTION LINES FOR TWO-PIPE SYSTEM

Two-pipe siphon feed system



H (m)	Pipe length			
	AS 67 / AN 77 (m)		AJ 6 (m)	
	ø 10 mm	ø 12 mm	ø 14 mm	ø 16 mm
0	32	90	22	38
0,5	36	90	25	45
1	40	90	30	50
2	48	90	35	60
3	56	90	38	70
3,5	60	90	40	80

Two-pipe lift system



H (m)	Pipe length			
	AS 67 / AN 77 (m)		AJ 6 (m)	
	ø 10 mm	ø 12 mm	ø 14 mm	ø 16 mm
0	25	70	25	45
0,5	21	62	20	38
1	18	54	18	33
2	10	38	10	20
3	5	20	5	10
3,5	---	10	2	4

To correct length of pipes is calculated by summing up the length of all vertical and horizontal right sections and bends. The static suction head will be the distance between the non-return valve and the burner's pump axle. The depression must not be greater than 0.45 bar; should it be higher, some damages could occur to the pump, with consequent increase in mechanical noises and ,eventually, a failure.

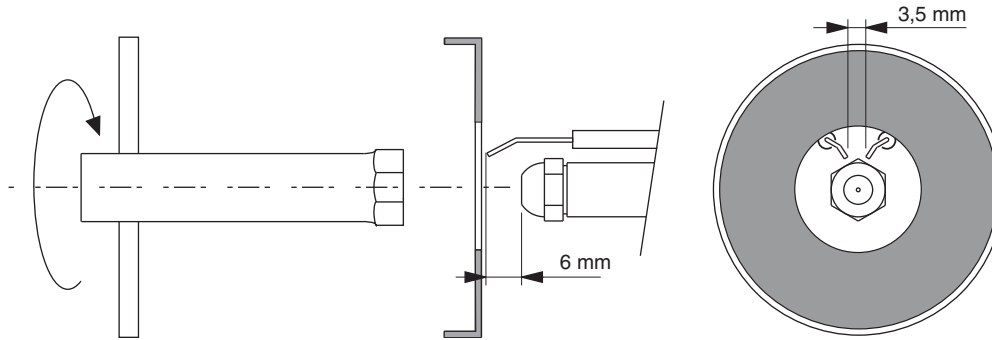
## NOZZLE OUTPUT TYPE : MONARCH F80-BPS

NOZZLE GPH	RETURN PRESSURE BAR					PUMP PRESSURE
	0	4,218	8,436	12,654	16,872	20 bar CAPACITY kg/h
4.00	7,52	8,91	13	19	-	22,24
4.50	7,52	8,91	13	21,16	-	24,96
5.00	7,52	9,33	13,38	21,39	-	27,68
5.50	7,52	9,36	13,93	25,6	30	30,56
6.00	9,2	11,42	13,93	17,8	33,45	33,28
6.50	9,2	9,49	11,42	20	36,19	36,00
7.00	9,74	13,38	17,27	24,5	39	38,88
7.50	9,74	13,38	18,66	31,2	41,82	41,6
8.00	9,74	10,87	15,6	25,64	44,55	44,16
9.00	11,16	15	18,4	25,64	36,77	49,92
9.50	12	13,38	18,94	29,53	52,9	52,64
10.50	12,8	13,93	22,29	33,7	58,55	58,24
12.00	13,93	15	22,29	34	66,9	66,56
13.80	16,72	20	31,2	57,9	76,89	76,48
15.30	16,72	20	29,27	43,46	72,54	84,8
17.50	20,9	23,42	36,5	66,27	-	96,96
19.50	22,29	29,53	43,49	64,6	108,74	108,16
21.50	22,8	27,3	40,15	61,28	120	119,04
	OUTPUT kg/h					

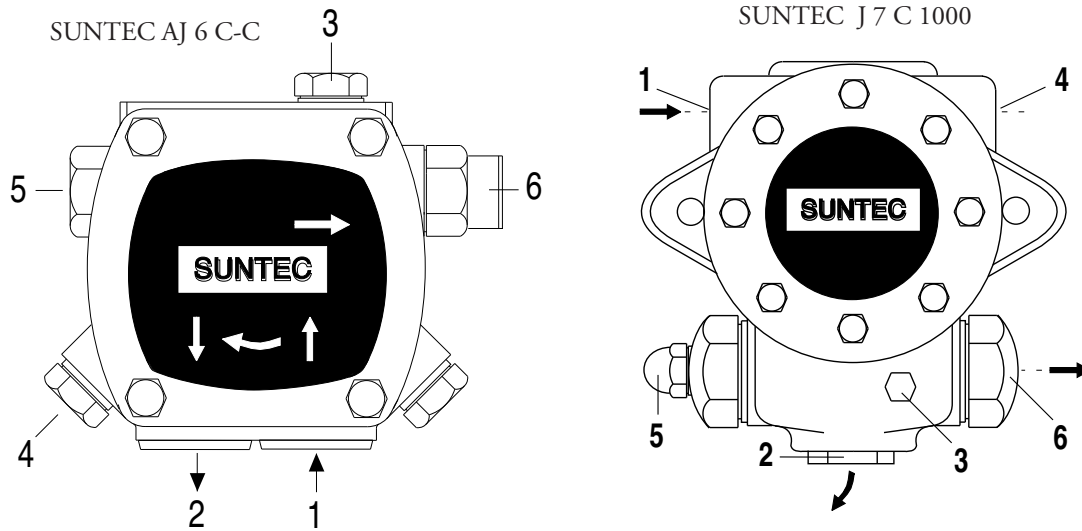
## NOZZLE CLEANING AND REPLACEMENT

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.



## PRIMING AND ADJUSTMENT OF OIL PUMP



- 1 - INLET
- 2 - RETURN
- 3 - BLEED AND PRESSURE GAUGE PORT
- 4 - VACUUM GAUGE PORT
- 5 - PRESSURE ADJUSTMENT
- 6 - TO NOZZLE

### VERIFY:

- That piping system is perfectly sealed;
- That the use of hoses is avoided whenever is possible (use copper pipes preferably);
- That depression is not greater than 0,45 bar, to avoid pump's cavitation;
- That check valve is suitably designed for the duty;

The pump pressure is set at a value of 22-25 bar during the testing of burners. Before starting the burner, bleed the air in the pump through the gauge port. Fill the piping with light-oil to facilitate the pump priming.

Start the burner and check the pump feeding pressure. In case the pump priming does not take place during the first prepurging, with a consequent, subsequent lock-out of the burner, rearm the burner's lock-out to restart, by pushing the button on the control box. If, after a successful pump priming, the burner locks-out after the prepurging, due to a fuel pressure drop in the pump, rearm the burner's lock-out to restart the burner. Do never allow the pump working without oil for more than three minutes. Note: before starting the burner, check that the return pipe is open. An eventual obstruction could damage the pump sealing device.

**BURNER START-UP AND ADJUSTMENT**

Once having installed the burner, check the following items:

- The burner power feeding and the main line protection fuses
- The correct length of pipes and that the same are sealed.
- The type of fuel, which must be suitable for burner.
- The connection of boiler's thermostats and all the safeties.
- The motor rotation direction.
- The correct calibration of the motor's thermal protection.

When all the above mentioned conditions are checked and accomplished, it is possible to go on with burner's tests. Power the burner. The control box feeds the ignition transformer and the burner's motor at the same time, which will run a prepurging of the combustion chamber for about 20 sec.

At the end of prepurging, the control box opens solenoid valves and the burner starts. After a safety interval of 5 seconds and a correct ignition, the control box turns off the ignition transformer and, 10 seconds later, sets the motorised air damper to its maximum opening (High flame). In case of faulty ignition, the control box switches the burner into safety condition within 5 second. In such a case, the manual rearming of the burner shall not take place before 30 seconds have elapsed from the burner's safety shutdown. In order to obtain an optimal combustion, it is necessary adjust the LOW - HIGH flame air flow, according to the instruction given further on. During such a phase, it will be possible to manually switch between HIGH and LOW flame and viceversa, through the High/Low flame switch. At the end of the adjusting phase, leave the switch in position AUTO.

**OIL DELIVERY ADJUSTMENT**

The diagram illustrates the fuel feeding system of these types of burners, which incorporates a bypass nozzle with oil flow regulation on its return pipe. The oil supply is varied by acting on the nozzle through the pressure in the return line. Max. oil supply is therefore reached when the pressure in the pump line is about 22 bar and the return line is fully closed; min. oil supply when the return line is fully open. Relevant pressure readings in the return line are as follows:

**Pump pressure 22-25 bar.**

**Max Burner output, return oil pressure:**

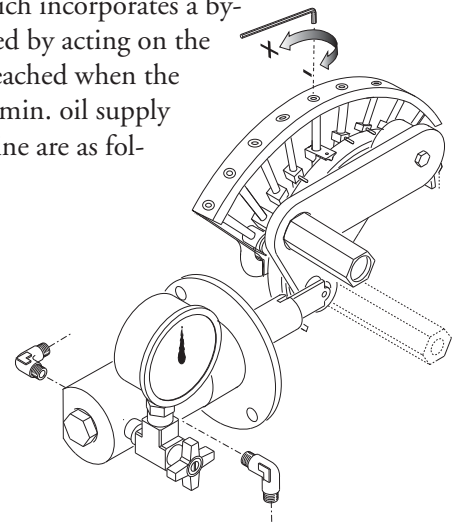
FLUIDICS nozzle : 16 ÷ 19 bar.

BERGONZO nozzle : 20 ÷ 24 bar.

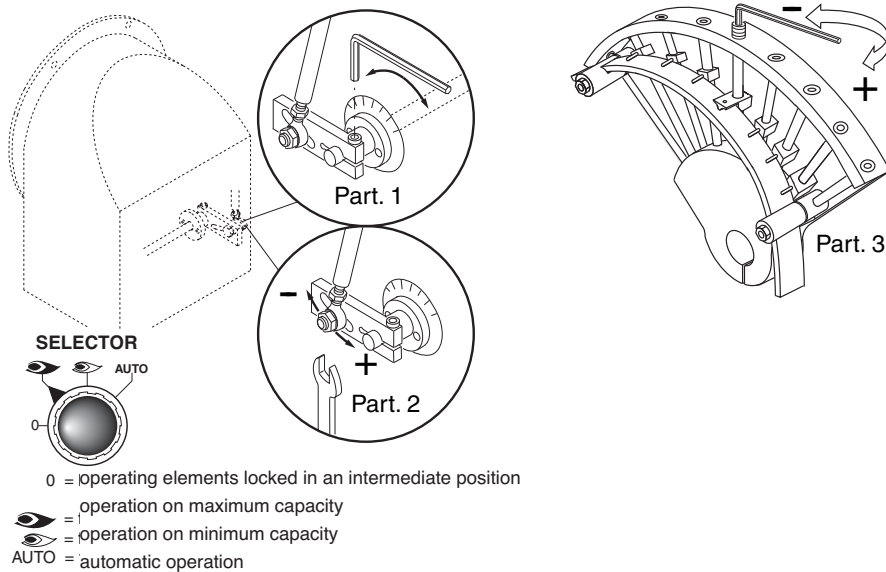
**Min Burner output, return oil pressure:**

FLUIDICS nozzle : 6 ÷ 9 bar

BERGONZO nozzle : 4 ÷ 8 bar



## AIR ADJUSTMENT



### MINIMUM CAPACITY ADJUSTMENT OF THE BURNER

Position the selector, situated on the control panel, on position 2 and proceed as follows:

**Adjustment the minimum light oil flow rate (see figure, Nozzle diagram):**

- using a suitable allen key, change the position of the cam guide blade; screwing the cam in, the light oil flow increases, while unscrewing it, it decrease.

**Adjustment the minimum air flow rate (see figure, detail 1):**

- loosen the Allen screw on the air damper clamp;
- turn the air damper until you reach the correct air flow, as established by analyzing the combustion process.
- tighten the Allen screw in place once again.

### MAXIMUM CAPACITY ADJUSTMENT OF THE BURNER

Position the selector, situated on the control panel, on position 1 and proceed as follows:

**Adjustment the maximum light oil flow rate (see figure, Nozzle diagram):**

- using a suitable allen key, change the position of the cam guide blade ; screwing the cam in, the light oil flow increases, while unscrewing it, it decrease.

**Adjustment the maximum air flow rate (see figure, detail 2):**

- loosen the nut holding the air damper transmission rod;

### ADJUSTMENT THE INTERMEDIATE BURNER CAPACITIES

Using the selector, start the servomotor (closing or opening) and position on 0 to stop the stroke; the adjustment is made as outlined below. Repeat the operation for the other cam points.

**Adjustment the intermediate light oil flow rates (see figure, detail 3):**

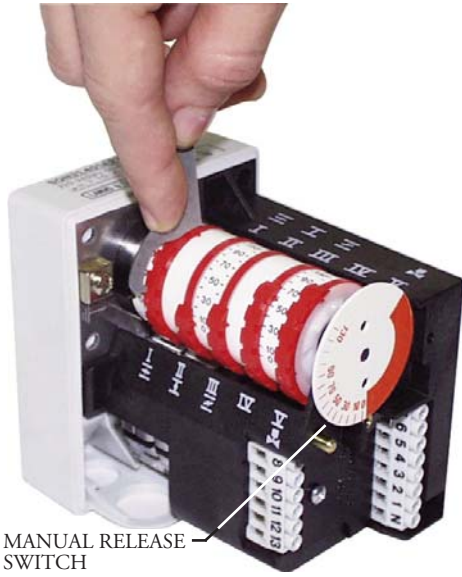
- using a suitable Allen wrench, change the position of the cam guide blade; if you screw it down, the flow rate is reduced; if you unscrew it, the flow rate increases.

**COMBUSTION AIR FLOW ADJUSTMENT (HIGH-LOW FLAME)**

**SIEMENS SQN 30 401A2700**

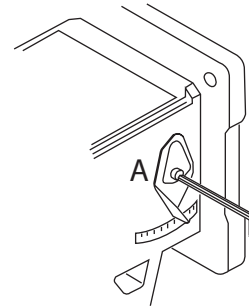
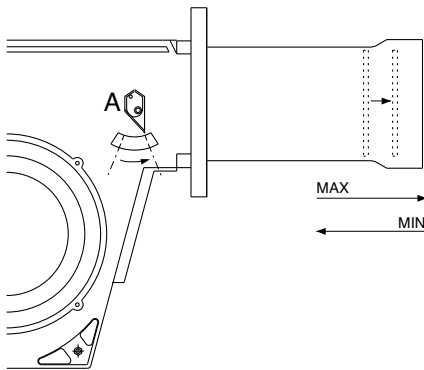
Remove cover to gain access to the adjusting cams. The cams are to be adjusted through the suitable key provided for. Description:

- I - Limit switch for air damper "High Flame" position adjustment.
- II - Limit switch for the air damper position at burner's shut down.
- III - Limit switch for air damper "Low Flame" position adjustment.
- IV - Limit switch for ignition flame "Min power" position adjustment..
- V - Limit switch "NOT USED".



**FIRING HEAD SETTING**

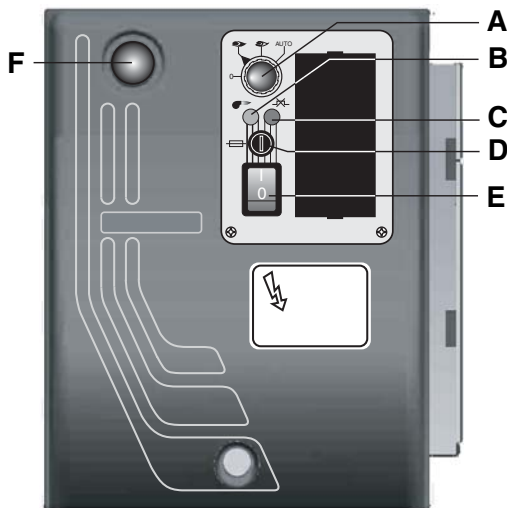
The main feature is the capability to adjust the head to obtain maximum result from different types of plant. The position of the mixing head determines the speed of the air flow according to pressure upstream from mixing mixer device.



**ELECTRICAL CONNECTIONS**

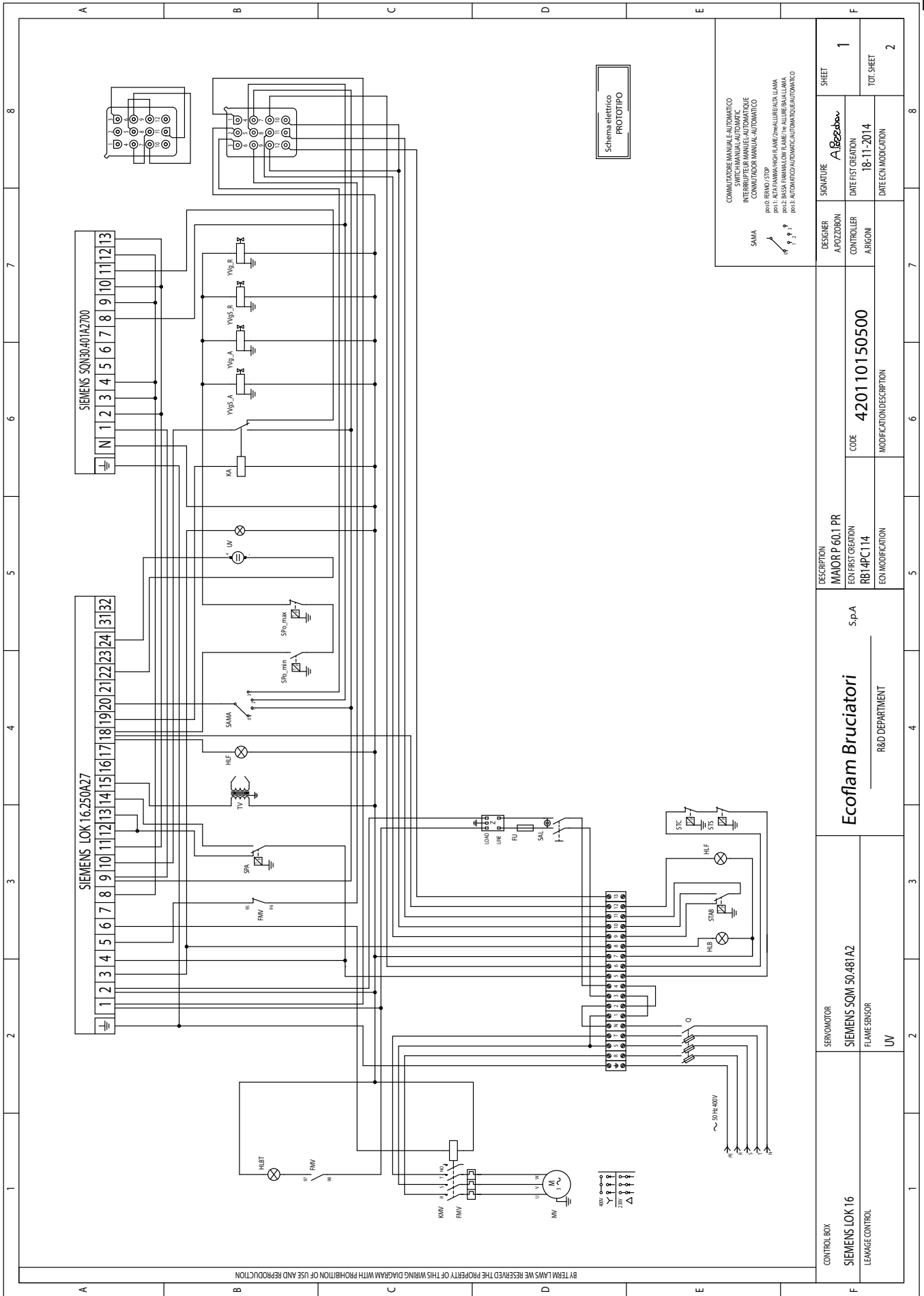
All burners are factory tested at 400V - 50Hz 3-phase for motors, and 230V - 50Hz single phase with neutral for auxiliary equipments. Should it be necessary to power the burner with 230V - 50Hz, modify the connections on motor and the terminal board as shown in the picture. Protect the burner supply line with suitable fuses and/or other safety devices as required by the local regulations on the matter.

**DESCRIPTION OF THE CONTROL PANEL OF THE BURNER**



- A - selector :
  - 0 = operating elements locked in an intermediate position
  - 1 = operation on maximum capacity
  - 2 = operation on minimum capacity
  - 3 = automatic operation
- B - working lamp
- C - thermal lock-out lamp
- D - fuse
- E - main switch I / O
- F - reset key





COMUTADORE MANUALE-AUTOMATICO  
 SWITCH MANUAL-AUTOMATIC  
 INTERRUPTOR MANUAL-AUTOMATICO  
 COMUTADOR MANUAL-AUTOMATICO

SAMA

pos.0: ERANO / STOP  
 pos.1: ALTA MANA / HIGH MANE / MANURE / ALTA LAMA  
 pos.2: AUTOMATICO / AUTOMATIC / AUTOMATICO / AUTOMATICO  
 pos.3: AUTOMATICO / AUTOMATIC / AUTOMATICO / AUTOMATICO

CONTROL BOX SIEMENS LOK 16 LEAKAGE CONTROL	SERVOMOTOR SIEMENS SOM 50-481 A2 FLAME SENSOR UV	DESCRIPTION MAIOR P 60.1 PR ECON FIRST CREATION RB14PC114 ECON MODIFICATION		ECON MODIFICATION		ECON MODIFICATION	
		Ecoflam Bruciatori S.p.A R&D DEPARTMENT		CODE 4201 101 50500		MODIFICATION DESCRIPTION	
		DESIGNER A.POZZEBON	SIGNATURE A.PoZZebon	SHEET 1			
		CONTROLLER A.BRIGNI	DATE FIRST CREATION 18-11-2014	TOT. SHEET 2			

Q		INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE INTERRUPTOR GENERAL CON FUSIBLE	Y95_A Y95_R	ELETTROVALVOLA GASOLIO DI SICUREZZA EXTRA SAFETY OIL SOLENOID VALVE ELECTROVANNE MAZOUT DE SECURITE ELECTROVALVULA DE GASOLEO DE SEGURIDAD
Z	FILTRO ANTISTURBO ANTI-KICK FILTER FILTRE ANTIRASISTES FILTRO DE PROTECCION ANTIDISTURBO		HLF	LAMPADA DI FUNZIONAMENTO WORKING LAMP LAMPE DE FONCTIONNEMENT ESPIA DE FUNCIONAMIENTO
FU	FUSIBILE FUSE FUSIBLE FUSIBLE		KA	RELE RELAY RELS RELE
MV	MOTORE VENTILATORE MOTOR FAN MOTEUR VENTILATEUR MOTOR VENTILADOR		Sp0_min	PRESSOSTATO GASOLIO DI MINIMA LIGHT OIL PRESSURE SWITCH MIN PRESOSTAT OIL DE MINIMA MIN PRESOSTATO OIL DE MINIMA POT.
TV	TRASFORMATORE IGNITION TRANSFORMER TRANSFORMATEUR D'ALLUMAGE TRANSFORMADOR		Sp0_max	PRESSOSTATO GASOLIO DI MASSIMA LIGHT OIL PRESSURE SWITCH MAX PRESOSTAT OIL DE MAXIMUM MAX PRESOSTATO OIL DE MAXIMA POT.
UV	FOTOCELLA UV CELL CELLULE UV FOTOCELULA		SPA	PRESSOSTATO ARIA AIR PRESSURE SWITCH PRESOSTAT AIR PRESOSTATO AIRE
FMV	RELE TERMICO MOTORE VENTILATORE MOTOR THERMAL RELAY (FAN MOTOR) RELAIS THERMIQUE MOTEUR VENTILATEUR RELE TERMICO MOTOR VENTILADOR			
HLB	LAMPADA DI BLOCCO LOCKING LAMP LAMPES DE BLOCAGE ESPIA DE BLOQUEO			
RMV	CONTATTORE MOTORE VENTILATORE REMOTE CONTROL SWITCH (FAN MOTOR) CONTACTEUR MOTEUR VENTILATEUR TELEINTERRUPTOR MOTOR VENTILADOR			
SAL	INTERRUTTORE DI LINEA INTERUPTEUR DE LIGNE INTERRUPTOR DE LINEA			
STC	TERMOSTATO CALDAIA BOILER THERMOSTAT THERMOSTAT CHAUDIERE TERMOSTATO CALDERA			
STS	TERMOSTATO DI SICUREZZA SAFETY THERMOSTAT THERMOSTAT DE SECURITE TERMOSTATO DE SEGURIDAD			
HLBT	LAMPADA DI BLOCCO TERMICO THERMAL LOCKING LAMP LAMPES DE BLOCAGE THERMIQUE ESPIA DE BLOQUEO RELE TERMICO			
SAMA	COMUTATORE MANUALE AUTOMATICO SWITCH (MANUAL-AUTOMATIC) INTERRUPTEUR MANUEL-AUTOMATIQUE COMUNICADOR MANUAL-AUTOMATICO			
STAB	TERMOSTATO DI ALTA-BASSA FIAMMA HIGH-LOW FLAME THERMOSTAT THERMOSTAT GRANDE-PETITE ALLURE TERMOSTATO DE ALTA-BAJA LLAMA			
Y9A Y9R	ELETTROVALVOLA GASOLIO OIL SOLENOID VALVE ELECTROVANNE MAZOUT ELECTROVALVULA DE GASOLEO			

REGOLAZIONE CAMME MAIOR P 60 PR

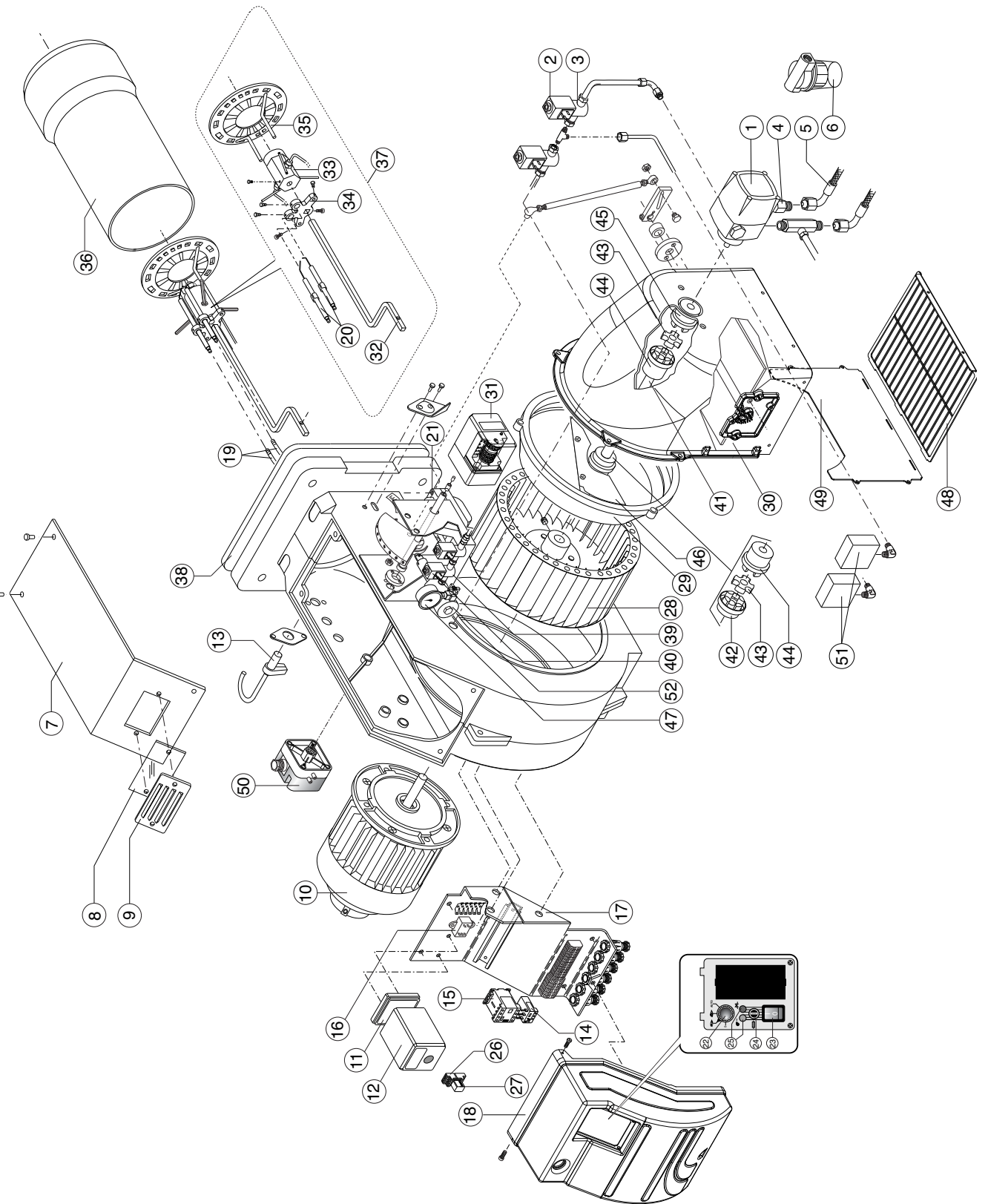
SIEMENS SQN30401A2700														
≡	N	1	2	3	4	5	6	7	8	9	10	11	12	13

- I: CAMMA DI REGOLAZIONE ARIA DI MASSIMA
- II: CAMMA DI CHIUSURA TOTALE
- III: CAMMA DI REGOLAZIONE ARIA DI BASSA
- IV: CAMMA DI REGOLAZIONE ARIA DI ACCENSIONE
- V: CAMMA NON UTILIZZATA
- VI: CAMMA NON UTILIZZATA
- VII: CAMMA NON UTILIZZATA
- VIII: CAMMA NON UTILIZZATA

BY TRM LAMWS WE RESERVED THE PROPERTY OF THIS WIRING DIAGRAM WITH PROHIBITION OF USE AND REPRODUCTION

F	CONTROL BOX SIEMENS LOK 16 LEAKAGE CONTROL	SERVO MOTOR SIEMENS SOM 50481A2 FLAME SENSOR UV	Ecoflam Bruciatori S.p.A R&D DEPARTMENT		DESCRIPTION MAIOR P 60.1 PR EQV FIRST CREATION RB14PC114	DESIGNER ARZOBONI CONTROLLER ARGONI	SIGNATURE Arzoboni	SHEET 2
			CODE 420110150500	MODIFICATION DESCRIPTION	DATE FIRST CREATION 18-11-2014	DATE MODIFICATION	TOT. SHEET 2	

MAIOR P 45 - 60 - 80 - 120 PR/MD



			MAIOR P 60 PR
N°	DESCRIPTION		code
1	OIL PUMP	SUNTEC AJ6 CC 10004P	65322950
2	COIL	SIRAI L159C3	65323769
3	OIL VALVE	SIRAI L159C3	65323739
4	NIPPLE	TN 10X1200 3/8 G/BIS 3/8 A	65323187
5	HOSES	TN 18X1500	65323182
6	FILTER	ART.70301-01P	65324051
7	COVER		65324052
8	GLASS		65320487
9	VIEWING WINDOW		65320488
10	MOTOR	1500 W	65325708
11	CONTROL BOX BASE	SIEMENS	65320091
12	CONTROL BOX	LOK16.250A27	65300268
13	PHOTORESISTOR	RAR 9	65325453
14	MOTOR THERMAL RELAY	AEG 3-4,7A	65323116
15	REMOTE CONTROL SWITCH	AEG LS05.10	65323132
16	ANTI JAMMING FILTER		65323170
17	BOX SUPPORT		65320478
18	BOX		65320473
19	CABLE	TC	65320940
		TL	65320942
20	ELECTRODES		65324855
21	IGNITION TRANSFORMER	COFI 1020 CM	65323223
22	MANUAL / AUTOMATIC SELECTOR		65323067
23	MAIN SWITCH	cod.4010011509	65323064
24	FUSE HOLDER	Fusir FH-B528	65322181
25	LAMP	EL/N-SC4 Elettrospring	65322053
26	RELAY BASE	94.72 SMA (R.5532)	65323149
27	RELAY	FINDER 5532 8	65323139
28	FAN	250 x 84	65321781
29	AIR CONVEYOR		65320639
30	COVER AIR INLET		65324277
31	AIR DAMPER MOTOR	SQN S 30.401A2700	65322892
32	ROD	TC	65324511
		TL	65324512
33	NOZZLE HOLDER		65324514
34	SUPPORT DIFFUSER		65324515
35	DIFFUSER		65325812
36	BLAST TUBE	TC	65320408
		TL	65320409
37	INNER ASSEMBLY	TC	
		TL	
38	GASKET		65321116
39	OIL VALVE	SIRAI L159C3	65323739
40	COIL	SIRAI L159C3	65323769
41	ROD		65324358
42	COUPLING (FAN)		65321785
43	UNION		65321786
44	COUPLING		65321782
45	COUPLING (PUMP)		65324165
46	FAN SCOOP		65320623
47	MANOMETER	CEWAL RI/4 D50-40 BA R	65324105
48	PROTECTION		65324049
49	SHEET CLOSING		65324050
50	AIR PRESSURE SWITCH	LGW 10 A2P 1-10MB	65323047
51	OIL PRESSURE SWITCH	KPS 39 1/4 F	65325377
52	ADJUSTMENT OIL PRESSURE		65322350

TC = SHORT HEAD TL = LONG HEAD