IT *BRUCIATORI DI GASOLIO*
EN *OIL BURNERS*
FR *BRULEURS A MAZOUT*
ES *QUEMADOR DE GASOLEO*

Ecoflam

CE

MAIOR P 150.1 AB
MAIOR P 200.1 AB

SISTEMA IDRAULICO
HYDRAULIC SYSTEM
SYSTEME HYDRAULIQUE
SISTEMA HIDRAULICO

420010619500

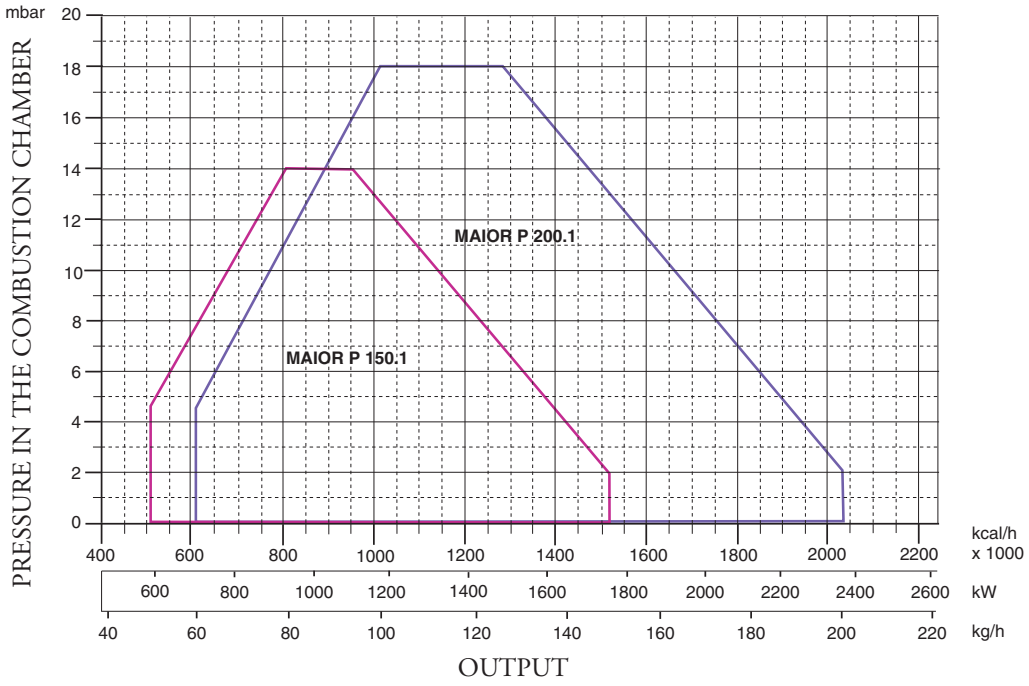
420010619500

15.01.2015

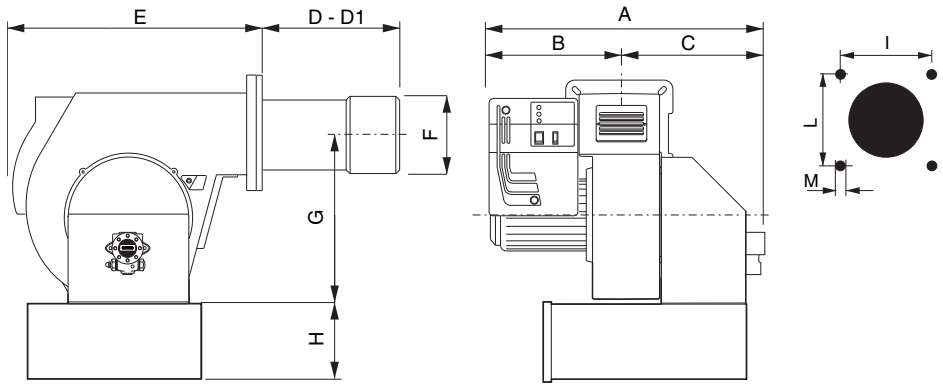
TECHNICAL DATA

MODELS		MAIOR P 150.1 AB	MAIOR P 200 .1 AB
Thermal power max	kcal/h	1.530.000	2.040.000
	kW	1.780	2.372
Thermal power min.	kcal/h	510.000	612.000
	kW	592	710
Max. flow rate light oil	kg/h	150	200
Min. flow rate light oil	kg/h	50	60
Feeding power	50 Hz V	230/400	230/400
Motor	kW	3	4
Rpm	Nº	2.800	2.800
Ignition transformer	kV/mA	10/30	13/35
Control box	SIEMENS	LMO 44	LMO 44
Fuel : light oil	kcal/kg	10.200 max. visc 1,5°E a 20°C	

WORKING FIELDS



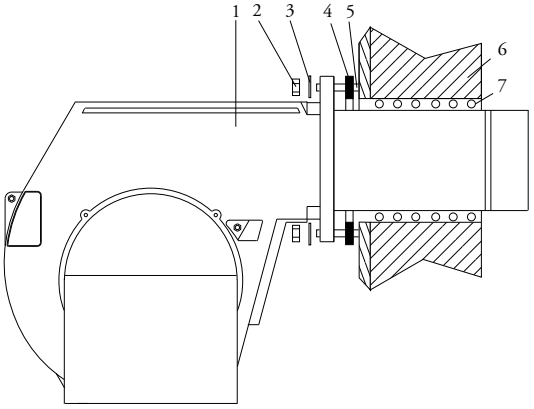
OVERALL DIMENSIONS



MODELS	A	B	C	D	D1	E	F	G	H	I	L	M
P 150.1 AB	775	385	390	285	485	660	250	398	283	240	240	M14
P 200.1 AB	795	405	390	375	535	660	270	398	283	240	240	M14

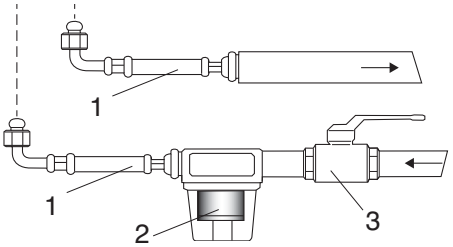
D = short head **D1** = long head

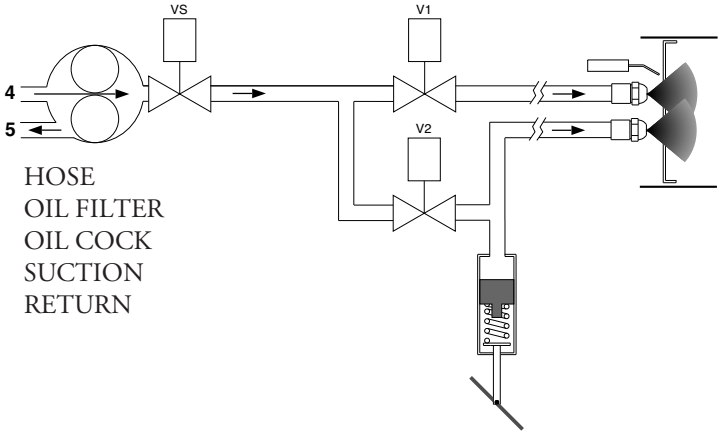
BURNER INSTALLATION



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

HYDRAULIC CIRCUIT

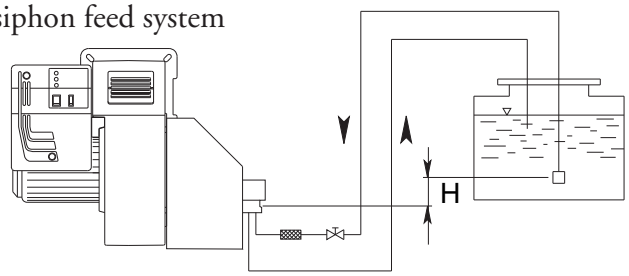




1 - HOSE
2 - OIL FILTER
3 - OIL COCK
4 - SUCTION
5 - RETURN

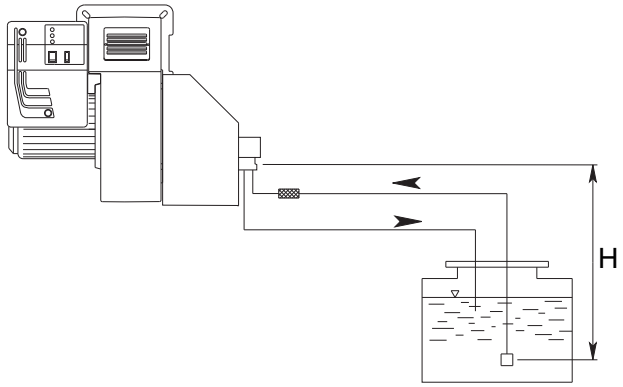
MAXIMUM LENGTH OF SUCTION LINES FOR TWO-PIPE SYSTEM

Two-pipe siphon feed system



H (m)	Pipe length			
	AJ 6 (m)		J 7 (m)	
	ø 14 mm	ø 16 mm	ø 14 mm	ø 16 mm
0	22	38	16	29
0,5	25	45	18	33
1	30	50	20	37
2	35	60	25	44
3	38	70	29	52
3,5	40	80	31	55

Two-pipe lift system



H (m)	Pipe length			
	AJ 6 (m)		J 7 (m)	
	ø 14 mm	ø 16 mm	ø 14 mm	ø 16 mm
0	25	45	16	29
0,5	20	38	14	26
1	18	33	12	22
2	10	20	7	14
3	5	10	3	7
3,5	2	4	1	4

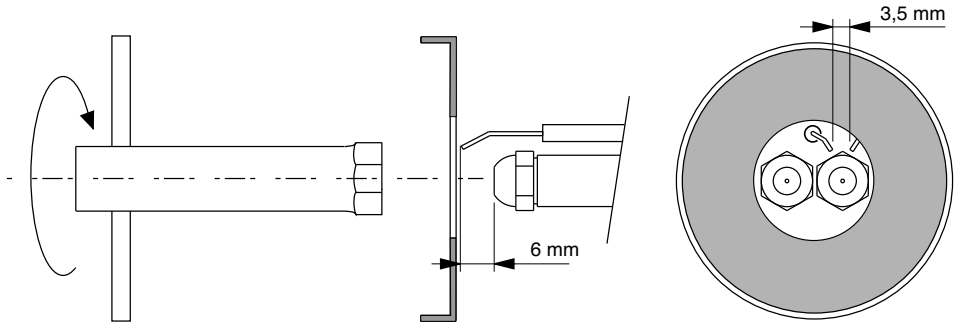
To correct length of pipes is calculated by summing up the length of all vertical and horizontal right sections and bends. The static suction head will be the distance between the non-return valve and the
burner's pump axle. The depression must not be greater than 0.45 bar; should it be higher, some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

NOZZLE FLOW RATE

DELAVAN B - MONARCH PLP - DANFOSS S

NOZZLE	PUMP PRESSURE (bar)						
GPH	**10**	**11**	**12**	**13**	**14**	**15**	**16**
2,50	9,50	9,97	10,41	10,83	11,24	11,64	12,02
3,00	11,40	11,96	12,49	13,00	13,49	13,96	14,42
3,50	13,30	13,95	14,57	15,17	15,74	16,29	16,83
4,00	15,20	15,94	16,65	17,33	17,99	18,62	19,23
4,50	17,10	17,94	18,73	19,50	20,24	20,95	21,63
5,00	19,00	19,93	20,82	21,67	22,48	23,27	24,04
5,50	20,90	21,92	22,90	23,83	24,73	25,60	26,44
6,00	22,80	23,92	24,98	26,00	26,98	27,93	28,84
6,50	23,70	25,91	27,06	28,17	29,23	30,26	31,25
7,00	26,60	27,90	29,14	30,33	31,48	32,58	33,65
7,50	28,50	29,90	31,22	32,50	33,73	34,91	36,05
8,30	31,54	33,08	34,55	35,97	37,32	38,63	39,90
9,50	36,10	37,87	39,55	41,17	42,72	44,22	45,67
10,50	40,06	41,73	43,74	45,41	47,20	48,90	50,50
12,00	45,60	47,80	50,00	52,00	54,00	55,90	57,70
13,80	52,40	55,00	57,50	59,80	62,10	64,20	66,30
15,30	58,10	61,00	63,70	66,30	68,80	71,10	73,60
17,50	66,50	69,80	72,90	75,80	78,70	81,50	84,10
19,50	74,10	77,70	81,20	84,50	87,70	90,80	93,70
21,50	81,70	85,70	89,50	93,20	96,70	100,10	103,40
24,00	91,20	95,70	99,90	104,00	107,90	111,70	115,40
28,00	106,40	111,60	116,60	121,30	125,90	130,30	134,60
30,00	114,00	119,60	124,90	130,00	134,90	139,60	144,20
GPH	OUTPUT kg/h						

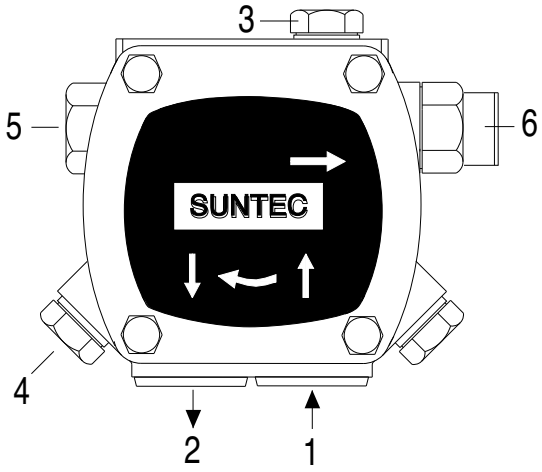
NOZZLE CLEANING AND REPLACEMENT



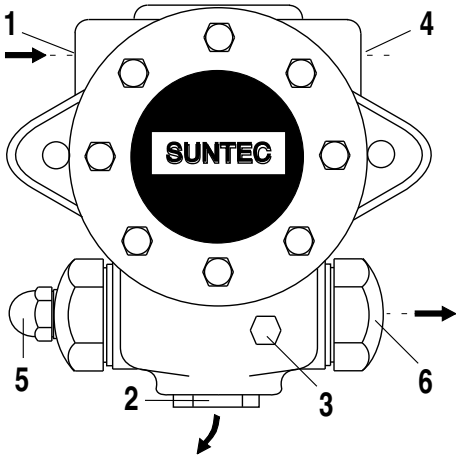
Use only the suitable box wrench provided for this operation to remove the nozzle, taking care to not damage the electrodes. Fit the new nozzle with the same care. Note: Always check the position of electrodes after having replaced the nozzle (see illustration). A wrong position could cause ignition troubles.

PRIMING AND ADJUSTMENT OF OIL PUMP

SUNTEC AJ 6 C-C



SUNTEC J 7 C 1000



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

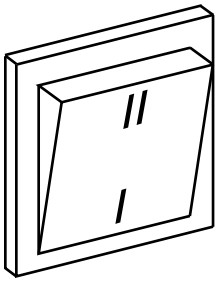
VERIFY:
- That piping system is perfectly sealed;
- That the use of hoses is avoided whenever is possible (use copper pipes preferably);
- That depression is not greater than 0,45 bar, to avoid pump's cavitation;
- That check valve is suitably designed for the duty;

The pump pressure is set at a value of 12 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 26 sec.
At the end of prepurging, the control box opens the fuel pump and the 1st stage (Low flame) solenoid valves, the ignition transformer produces a spark and the burner ignites. After a safety interval of 5 seconds and a correct ignition, the control box turns off the ignition transformer and, 5 seconds later, sets the motorised air damper to its maximum opening and opens the 2nd stage solenoid valve (High flame). In case of faulty ignition, the control box switches the burner into safety condition. 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 (II) and LOW (I) flame and viceversa, through the High/Low flame switch. At the end of the adjusting phase, leave the switch in position II (HIGH flame).
The fuel pump feeding pressure, must remain around 12 bar.



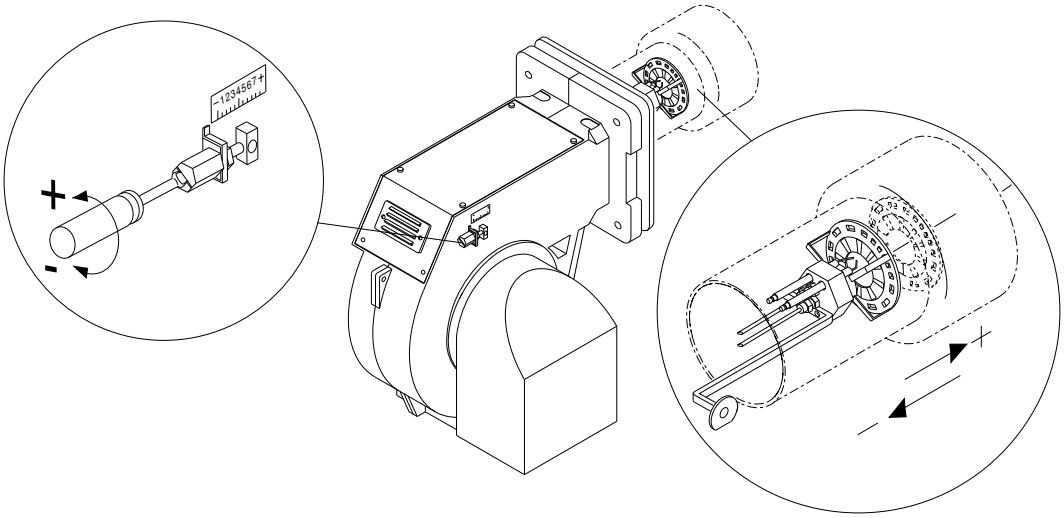
I - 1st Stage.
II - 2nd Stage (with an eventual Low/High automatic switching through a further thermostat connected to the terminal board, as shown by the scheme).

SIEMENS LMO 44 CONTROL INFORMATION SYSTEM

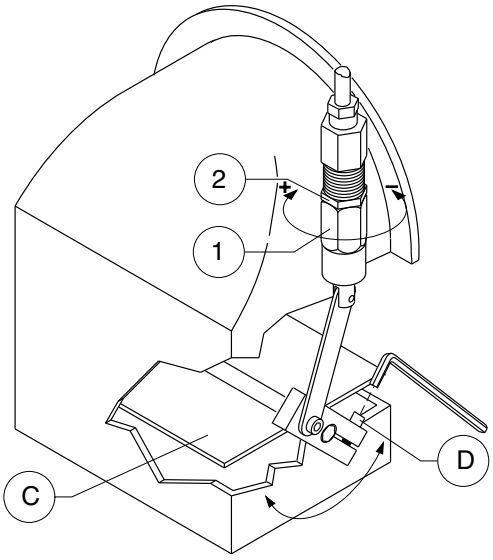
In case of burner lockout, it is possible to read which cause originated it. Proceed as follows: with the burner in lockout mode (red LED switched on) keep pressed the lockout button for more than 3 sec. then release it. The red LED will blink according to the following error code list:

Error Code	Possible cause
2 blinks	No establishment of flame at the end of «TSA» - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner, no fuel - Faulty ignition
3 blinks	Free
4 blinks	Extraneous light on burner start-up
5 blinks	Free
6 blinks	Free
7 blinks	Too many losses of flame during operation (limitation of the number of repetitions) - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner
8 blinks	Time supervision oil pre-heater
9 blinks	Free
10 blinks	Wiring error or internal error, output contacts

FIRING HEAD SETTING



COMBUSTION AIR FLOW ADJUSTMENT (HIGH-LOW FLAME)



Air flow rate adjustment in Low flame running:

1) - Start the burner (checking that the air damper is partially open).
2) - Loosen clamping screw D.
3) - Turn air damper C until obtaining a correct combustion (checked with a combustion gas analysis set).
4) - Tighten clamping screw D.

Air flow rate adjustment in High flame running:

WARNING: due to the presence of oil under pressure in the hydraulic jack when the burner is working in High flame condition, the air flow rate adjustment is to be made with the use of an adjusting ring nut 1 with the burner running in Low flame condition. The combustion checks are to be done once the burner is turned to High flame condition again.

1) - Loosen clamping ring nut 2
2) - Increase or decrease the air flow rate through the adjusting ring nut 1 (Clockwise to increase, counterclockwise to decrease).
3) - Tighten clamping ring nut 2.
4) - Switch manually from Low flame to High flame and check the combustion values.

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.

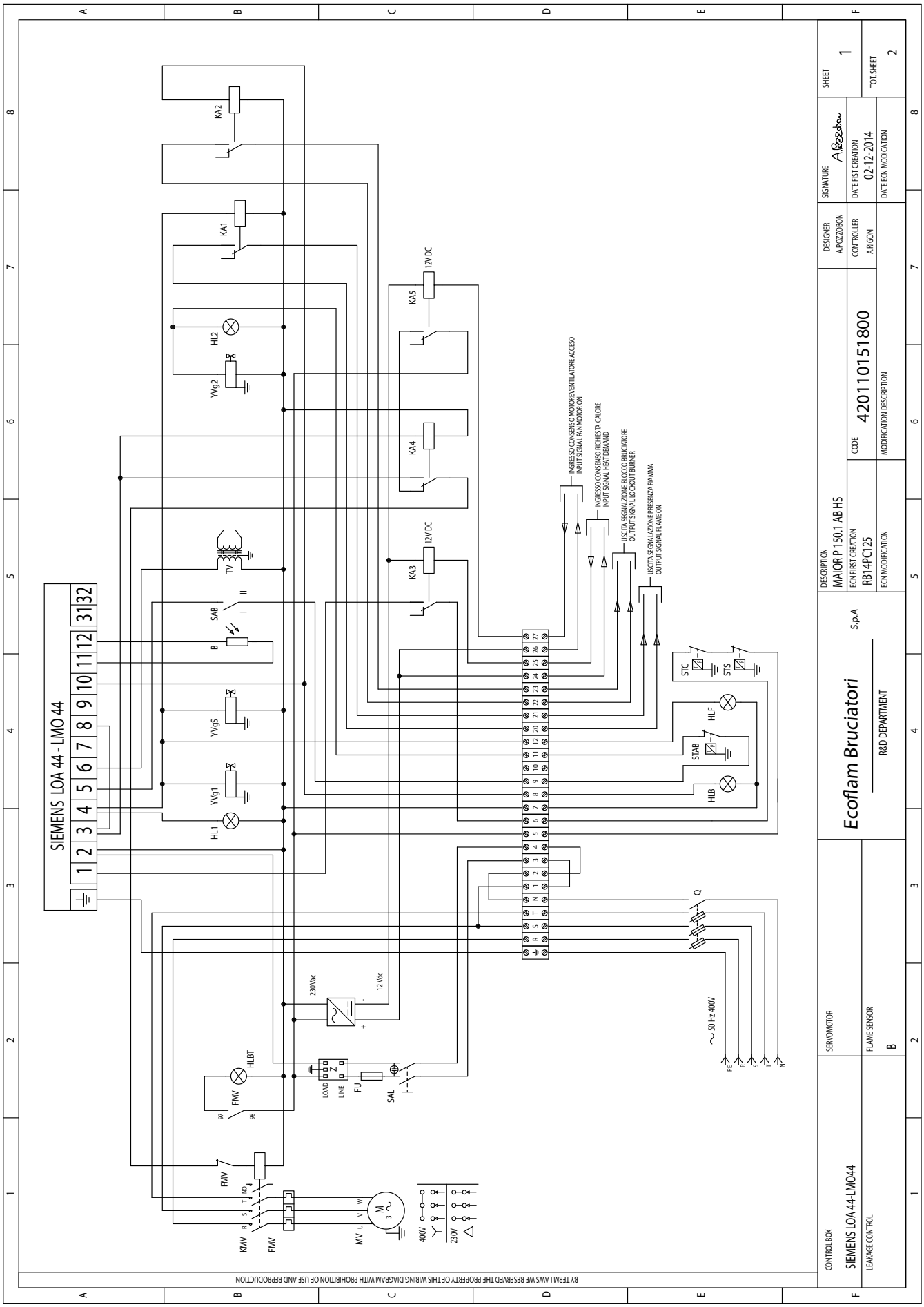
TROUBLESHOOTING

The burner does not start.
- Main switch in “0”.
- Fuses are blown.
- Boiler thermostats are in open position.
- Control box is defective.

The burner runs the prepurging but does not ignite and then switches into safety condition.
- Control box is defective.
- Ignition transformer is defective.
- Electrodes are dirty.
- Electrodes are defective.
- Electrodes are in wrong position.
- Nozzles are clogged.
- Nozzles are too worn.
- Filters are clogged.
- Oil pressure too low.
- Combustion air flow rate excessively high related to nozzle’s flow rate.

The burner ignites but then switches into safety condition.
- Control box is defective.
- Nozzles are clogged.
- Nozzles are too worn.
- The photocell does not detect the flame.
- Filters are clogged.
- Oil pressure too low.
- Combustion air flow rate excessively high related to nozzle’s flow rate.

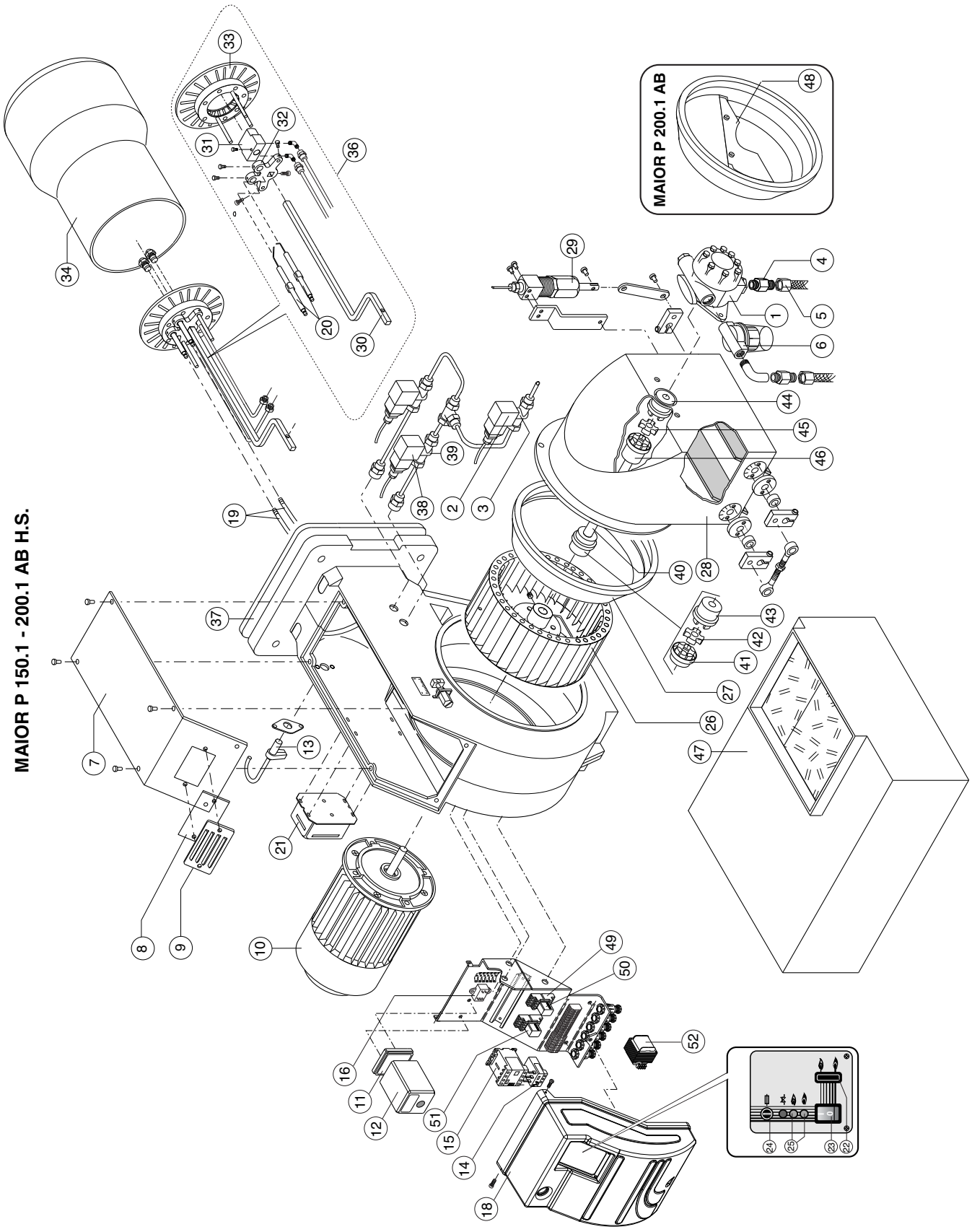
The burner does not switch to High flame.
- 1st(Low flame) and 2nd (High flame) stage manual switch on control board is in wrong position.
- Control box is defective.
- 2nd stage solenoid valve coil is defective.
- Oil pressure too low.
- Filters are clogged.
- 2nd stage nozzle is too worn.
- 2nd stage nozzle is clogged.
- Air damper’s hydraulic jack not properly adjusted or defective.


SIEMENS LOA 44 - LMO 44
1 2 3 4 5 6 7 8 9 10 11 12 31 32
KA1
KA2
KA3
KA4
KA5
12V DC
HL1
HL2
HLBT
HLF
HLB
YVg1
YVg2
YVg5
TV
SAB
B
I
II
FMV
KMV
MV
STC
STS
STAB
Q
FU
SAL
LOAD
LINE
230Vac
12 Vdc
~ 50 Hz 400V
400V
230V
INGRESSO CONSENSO MOTORE/VENTILATORE ACCESO
INPUT SIGNAL FAN MOTOR ON
INGRESSO CONSENSO RICHIESTA CALORE
INPUT SIGNAL HEAT DEMAND
USCITA SEGNALAZIONE BLOCCO BRUCIATORE
OUTPUT SIGNAL LOCKOUT BURNER
USCITA SEGNALAZIONE PRESENZA FIAMMA
OUTPUT SIGNAL FLAME ON
DESCRIPTION
MAIOR P 150.1 AB HS
ECN FIRST CREATION
RB14PC125
ECN MODIFICATION
CODE
42011015180 0
MODIFICATION DESCRIPTION
DESIGNER
A.POZZOBON
CONTROLLER
A.RIGONI
SIGNATURE
DATE FIST CREATION
02-12-2014
DATE ECN MODICATION
SHEET
1
TOT.SHEET
2
Ecoflam Bruciatori S.p.A
R&D DEPARTMENT
CONTROL BOX
SIEMENS LOA 44-LMO44
LEAKAGE CONTROL
SERVOMOTOR
FLAME SENSOR
B
BY TERM LAWS WE RESERVED THE PROPERTY OF THIS WIRING DIAGRAM WITH PROHIBITION OF USE AND REPRODUCTION

B	FOTORESISTENZA PHOTO-RESISTOR PHOTORESISTANCE FOTORESISTENCIA
Q	INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE INTERRUPTOR GENERAL CON FUSIBLE
Z	FILTRO ANTIDISTURBO ANTIJAMMING FILTER FILTRE ANTIPARASITES FILTRO DE PROTECION ANTIDISTURBIO
FU	FUSIBILE FUSE FUSIBLE FUSIBLE
MV	MOTORE VENTILATORE MOTOR FAN MUTEUR VENTILATEUR MOTOR VENTILADOR
TV	TRASFORMATORE IGNITION TRANSFORMER TRANSFORMATEUR D'ALLUMAGE TRANSFORMADOR
FMV	RELE' TERMICO MOTORE VENTILATORE MOTOR THERMAL RELAY (FAN MOTOR) RELAIS THERMIQUE MOTEUR VENTILATEUR RELE' TERMICO MOTOR VENTILADOR
HL1	LAMPADA DI PRIMA FIAMMA 1.ST FLAME LAMP LAMPE DE 1^ ALLURE ESPIA DE 1^ LLAMA
HL2	LAMPADA DI SECONDA FIAMMA 2.ST FLAME LAMP LAMPE DE 2^ ALLURE ESPIA DE 2^ LLAMA
HLB	LAMPADA DI BLOCCO LOCK-OUT LAMP LAMPE DE SECURITE ESPIA DE BLOQUEO
KMV	CONTATTORE MOTORE VENTILATORE REMOTE CONTROL SWITCH (FAN MOTOR) CONTACTEUR MOTEUR VENTILATEUR TELERRUPTOR MOTOR VENTILATOR
SAB	INTERRUTTORE ALTA-BASSA FIAMMA HIGH-LOW SWITCH INTERRUPTEUR GRANDE-PETIRE ALLURE INTERRUPTOR DE ALTA-BAJA LLAMA
SAL	INTERRUTTORE DI LINEA WORKING SWITCH INTERRUPTEUR 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
STAB	TERMOSTATO DI ALTA-BASSA FIAMMA HIGH-LOW FLAMETHERMOSTAT THERMOSTAT GRANDE-PETIRE ALLURE TERMOSTATO DE ALTA-BAJA LLAMA

HLBT	LAMPADA DI BLOCCO TERMICO THERMAL LOCK-OUT LAMP LAMPE DE THERMAL DE SECURITE ESPIA DE BLOQUEO RELE TERMICO
YVg1	ELETTROVALVOLA GASOLIO DI PRIMA FIAMMA FIRST STAGE OIL SOLENOID VALVE ELECTROVANNE MAZOUT PETITE ALLURE ELECTROVALVULA DE GASOLEO 1^ LLAMA
YVg2	ELETTROVALVOLA GASOLIO DI SECONDA FIAMMA SECOND STAGE OIL SOLENOID VALVE ELECTROVANNE MAZOUT GRANDE ALLURE ELECTROVALVULA DE GASOLEO 2^ LLAMA
YVgS	ELETTROVALVOLA GASOLIO DI SICUREZZA EXTRA SAFETY OIL SOLENOID VALVE ELECTROVANNE MAZOUT DE SECURITE ELECTROVALVULA DE GASOLEO DE SEGURIDAD
KA1	RELE' RELAY RELAIS RELE'
KA2	RELE' RELAY RELAIS RELE'
KA3	RELE' 12 V DC RELAY 12 V DC RELAIS 12 V DC RELE' 12 V DC
KA4	RELE' RELAY RELAIS RELE'
KA5	RELE' 12 V DC RELAY 12 V DC RELAIS 12 V DC RELE' 12 V DC

CONTROL BOX: SIEMENS LOA 44-LMO44	SERVOMOTOR:	Ecoflam Bruciatori S.p.A R&D DEPARTMENT	DESCRIPTION: MAIOR P 150.1 AB HS		DESIGNER: A.POZZOBON	SIGNATURE: A.Pozzobon	SHEET: 2
LEAKAGE CONTROL:	FLAME SENSOR: B		ECN FIRST CREATION: RB14PC125	CODE: 420110151800	CONTROLLER: A.RIGONI	DATE FIST CREATION: 02-12-2014	TOT. SHEET: 2
			ECN MODIFICATION:	MODIFICATION DESCRIPTION:		DATE ECN MODICATION:	


MAIOR P 150.1 - 200.1 AB H.S.
MAIOR P 200.1 AB
48
33
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1
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22

			MAIOR P 150.1 AB	MAIOR P 200.1 AB
N°	DESCRIPTION		code	code
1	OIL PUMP	SUNTEC AJ 6CC 1000	65322950	-
		SUNTEC J 7CC 1000	-	65322951
2	COIL	PARKER	65323782	65323782
3	OIL VALVE	PARKER	65323623	65323623
4	NIPPLE	TN 6X1500	65074466	65074466
5	HOSES	TN 14X1200	65323184	65323184
6	FILTER	3/4 70104-03	65324806	65324806
7	COVER		65320676	65320676
8	GLASS		65320487	65320487
9	VIEWING WINDOW		65320488	65320488
10	MOTOR	3000 W	65322831	-
		4000 W	-	65322820
11	CONTROL BOX BASE	SIEMENS	65320092	65320092
12	CONTROL BOX	SIEMENS LMO44.255A2	65320024	65320024
13	PHOTORESISTOR	SIEMENS	65320076	65320076
14	MOTOR THERMAL RELAY	AEG 5,5-8,5A	65323113	-
		AEG 8-12,5A	-	65323119
15	REMOTE CONTROL SWITCH	AEG LS7K.10	65324097	-
		AEG LS11K.00	-	65323135
16	ANTIJAMMING FILTER		65323170	65323170
17	BOX SUPPORT		65320476	65320476
18	BOX		65320473	65320473
19	CABLE	TC	65320942	65320942
		TL	65320946	65320946
20	ELECTRODES		65325056	65325056
21	IGNITION TRANSFORMER	10/30	65323235	-
		13/35	-	65323222
22	HIGH-LOW FLAME SWITCH	cod.360000001	65323065	65323065
23	MAIN SWITCH	cod.40100I1509	65323064	65323064
24	FUSE SUPPORT	FUSIT FH-B 528	65322181	65322181
25	LAMP	EL/N-SC4	65322053	65322053
26	FAN	280 x 140	65321798	65321798
27	AIR CONVEYOR		65320643	65320643
28	COVER AIR INLET		65320555	65320555
29	HYDRAULIC SYSTEM		65322333	65322333
30	ROD	TC	65324824	65324824
		TL	65324825	65324825
31	NOZZLE HOLDER		65320712	65320712
32	SUPPORT NOZZLE DIFFUSER		65324515	65324515
33	DIFFUSER		65320786	65320786
34	BLAST TUBE	TC	65320451	65320453
		TL	65320452	65320454
35	BLAST TUBE END		-	-
36	INNER ASSEMBLY	TC	65322422	65322423
		TL	65322421	65322424
37	GASKET		65321124	65321124
38	COIL	SUN SL1V2805G1/8		
39	OIL VALVE	SUN SL1V2805G1/8	65325784	65325784
40	ROD		65321460	65321460
41	COUPLING (FAN)		65321788	65321788
42	UNION		65321791	65321791
43	COUPLING (ROD)		65321790	65321790
44	COUPLING		65321782	65321782
45	UNION		65321786	65321786
46	COUPLING (PUMP)		65324165	65324165
47	SILENCER		3142077	3142077
48	FAN SCOOP		-	65320626
49	RELAY BASE	FINDER MINI 40.52	65323152	65323152
50	RELAY	FINDER MINI 40.52	65323142	65323142
51	RELAY	FINDER MINI 44.52 12V DC	0R712-4	0R712-4
52	POWER PACK	240VAC 12VDC 2,5A	740090015000	740090015000

TC = SHORT HEAD TL = LONG HEAD