

OIL BURNERS

Ecoflam



MAX 4 AB

MAX 8 AB

MAX 12 AB

HYDRAULIC SYSTEM



420010346202

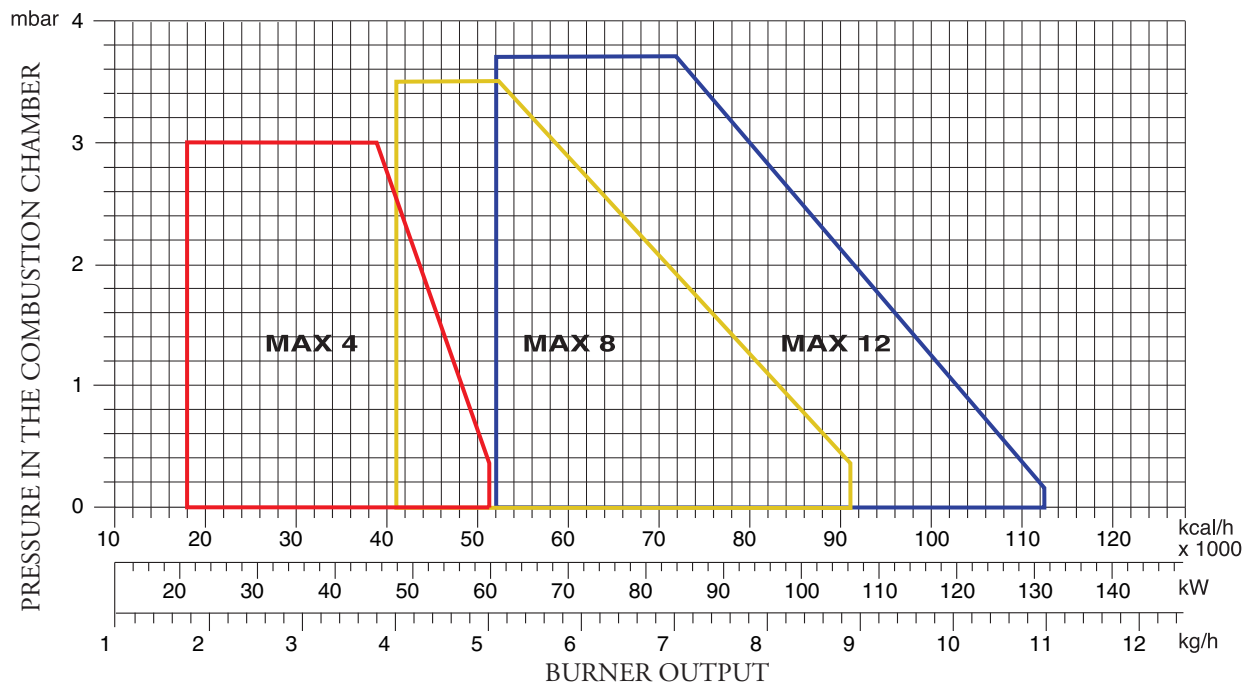
420010346202

28.01.2020

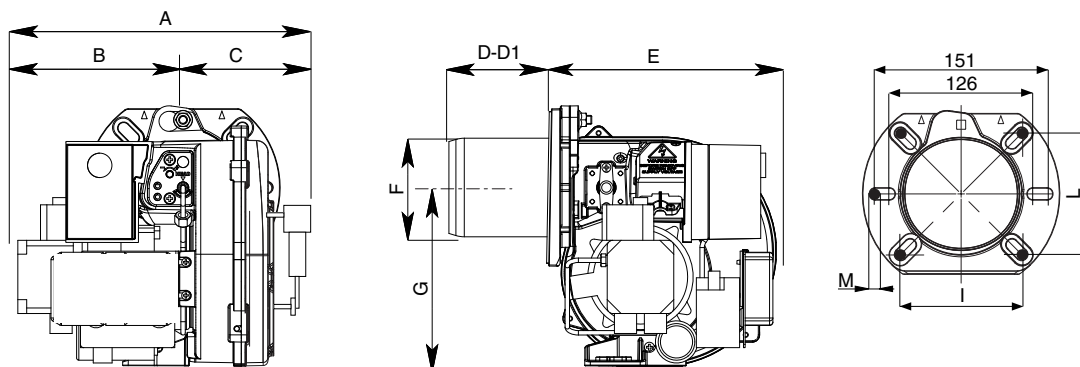
TECHNICAL DATA

MODELS		MAX 4 AB	MAX 8 AB	MAX 12 AB
Thermal power max.	kcal/h	51.000	90.780	112.200
	kW	59	105	130
Thermal power min.	kcal/h	17.340	40.800	52.000
	kW	20	47	60
Max. flow rate light oil	kg/h	5	8,9	11
Min. flow rate light oil	kg/h	1,7	4	5,1
Feeding power	50 Hz V	230	230	230
Motor	W	75	100	130
Rpm	Nº	2.800	2.800	2.800
Ignition transformer	kV/mA	2x12	2x12	2x12
Control box	SIEMENS	LMO 24	LMO 24	LMO 24
Fuel: light oil	kcal/kg	10.200 max. visc 1,5°E a 20°C		

WORKING FIELDS



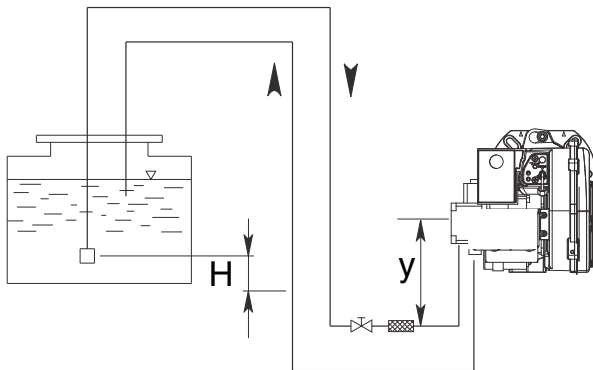
OVERALL DIMENSIONS



MODELS	A	B	C	D	D1	E	F	G	I	L	M
MAX 4 AB HS	288	149	139	90	145	204	89	160	90/107	90/107	M8
MAX 8 AB HS	294	155	139	90	145	204	89	160	100/120	100/120	M8
MAX 12 AB HS	308	169	139	100	155	204	98	160	100/120	100/120	M8
D = short head D1 = long head											

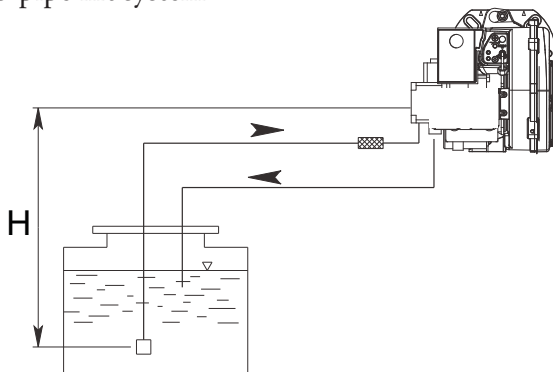
MAXIMUM LENGTHS OF SUCTION LINES FOR TWO-PIPE SYSTEM SUNTEC

Two-pipe siphon feed system



H (m)	Length pipe (m)	
	ø 8 mm	ø 10 mm
0,5	30	65
1	35	70
1,5	40	75
2	45	80
2,5	50	85
3	55	90
3,5	60	95

Two-pipe lift system



H (m)	Length pipe (m)	
	ø 8 mm	ø 10 mm
0,5	23	55
1	21	50
1,5	19	45
2	17	40
2,5	14	34
3	9	28
3,5	4	22

Correction of altitude	
Pump in suction (H +) or charging (H -)	
Altitude (m)	Theoretical H (m)
0-500	0
501-800	0,5
801-1300	1,0
1301-1800	1,5
1801-2200	2,0

e.g.: altitude 1100m Theoretical H = 1m actual H 2m, Corrected H for suction 2 + 1 = 3m Corrected H for charging 2 - 1 = 1m.
Choose the Ø of the piping from the table, based on the length expanded between the tank and pump. If corrected H for suction exceeds 4m; make provisions for a transfer pump (max. pressure 2 bar).

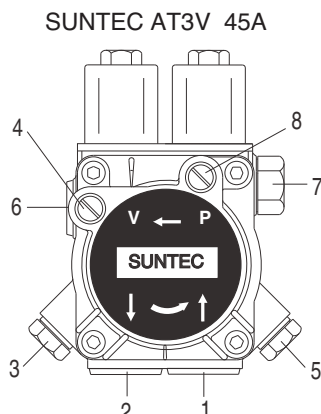
! The length of the tubes apply to burners powered by 50 Hz mains electricity; in case of 60 Hz power, divide the relevant lengths by 1.5.

ADJUSTMENT DATA

NOZZLE		PUMP	OUTPUT	FIRING HEAD SETTING	AIR DAMPER ADJUSTMENT
gph	spry	bar	kg/h	Pos.	Pos.

NOZZLE : DANFOSS H±S 80°±60°; DELAVAN W 60°; STEINEN S 60°

PRIMING AND ADJUSTMENT OF OIL PUMP

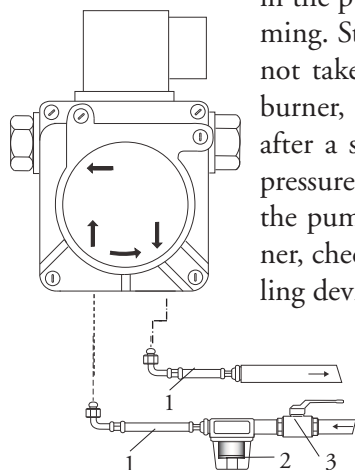


- 1 - INLET
- 2 - RETURN
- 3 - BLEED AND PRESSURE GAUGE PORT
- 4 - VACUUM GAUGE PORT
- 5 - PRESSURE ADJUSTMENT
- 6 - TO NOZZLE
- 7 - PRESSURE ADJUSTMENT
- 8 - SPECIAL PRESSURE PORT

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.

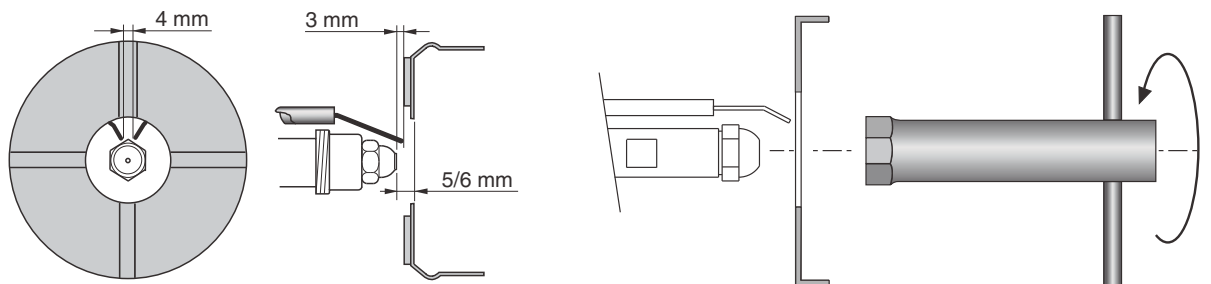
The pump pressure is set at a value of 12 bar during the testing of burners. Before starting the burner, bleed the air in the pump through the gauge port. Fill the piping with light-oil to facilitate the pump priming. Start the burner and check the pump feeding pressure. In case the pump priming does 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.



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

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



BURNER START-UP AND ADJUSTMENT

Once having installed the burner, check the following items:

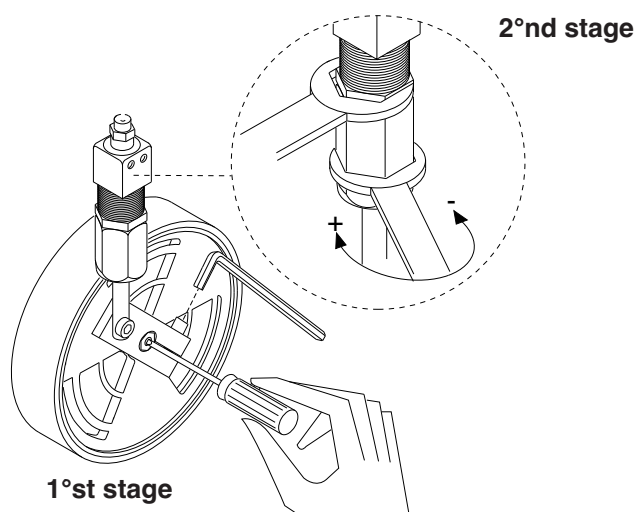
- The burner power feeding and the main line protection fuses
- The correct length of pipes and that same are sealed.
- The type of fuel, which must be suitable for burner.
- The connection of boiler's thermostats and all safeties.
- The motor direction of rotation.
- The correct calibration of the motor's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

When all said conditions are checked and accomplished, it is possible to go on with burner's tests.

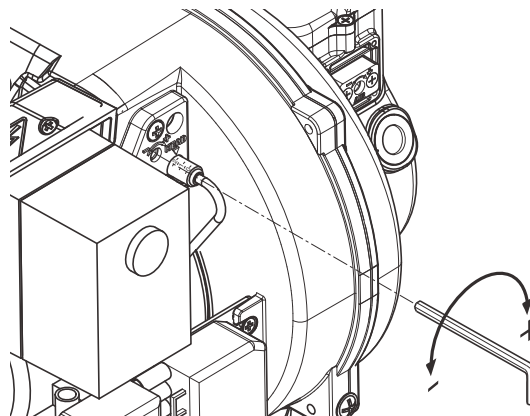
Power the burner. The control box feeds at the same time the ignition transformer and the burner's motor, which will run a prepurging of the combustion chamber for about 12 seconds. At the end of prepurging, the control box opens the fuel pump solenoid valve, the ignition transformer produces a spark and the burner ignites. After a safety interval of 5 seconds and a correct ignition, the control box turns off the ignition transformer. In case of faulty ignition, the control box switches the burner into safety condition within 10 secs.

In such a case, the manual rearming of the burner shall not take place before 30 seconds are elapsed from the burner's safety shutdown. The fuel pump feeding pressure, must keep around 12 bar. Note: With preheated version, the burner runs a preheating of the combustion head for about 1 minute. In such a case, at the boiler's thermostats make, the ignition signal shall be done by the thermostat mounted on the preheater itself.

AIR REGULATION

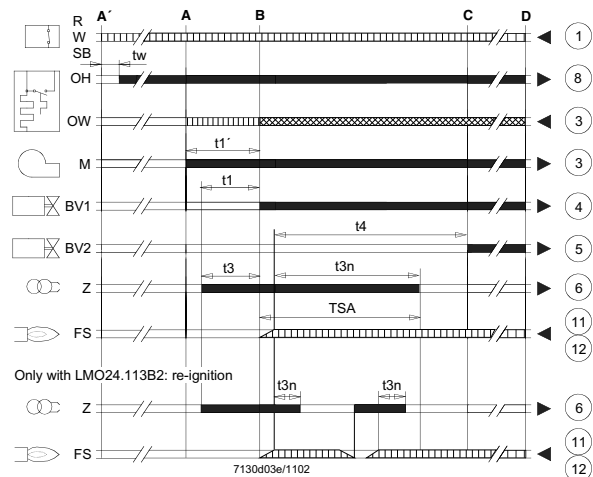
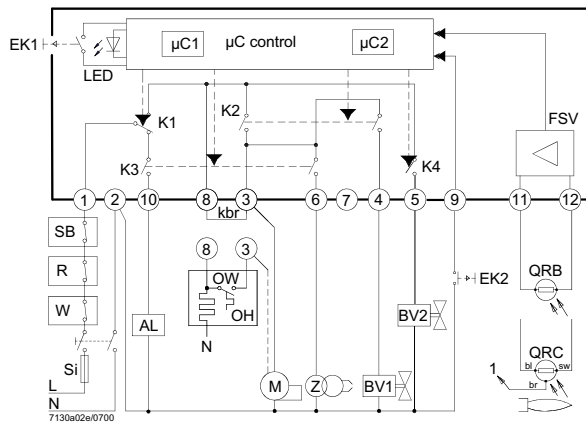


FIRING HEAD SETTING



Connection diagram and internal diagram LMO24...

Control sequence LMO24...



AL Alarm device
 BV... Fuel valve
 EK1 Lockout reset button
 EK2 Remote lockout reset button
 FS Flame signal
 FSV Flame signal amplifier
 K... Contacts of control relay
 kbr Cable link (required only when no oil preheater is used)
 LED 3-color signal lamp
 M Burner motor
 OW Release contact of oil preheater
 OH Oil preheater

QRB... Photoresistive flame detector
 QRC... Blue-flame detector
 bl = blue, br = brown, sw = black
 R Control thermostat or pressurestat
 SB Safety limit thermostat
 Si External primary fuse
 W Limit thermostat or pressure switch
 Z Ignition transformer
 TSA Ignition safety time
 tw Waiting time

t1 Prepurge time
 t1' Purge time
 t3 Preignition time
 t3n Postignition time
 t4 Interval from flame signal to release of «BV2»
 A' Start of startup sequence with burners using an «OH»
 A Start of startup sequence with burners using no «OH»
 B Time of flame establishment
 C Operating position
 D Controlled shutdown by «R»

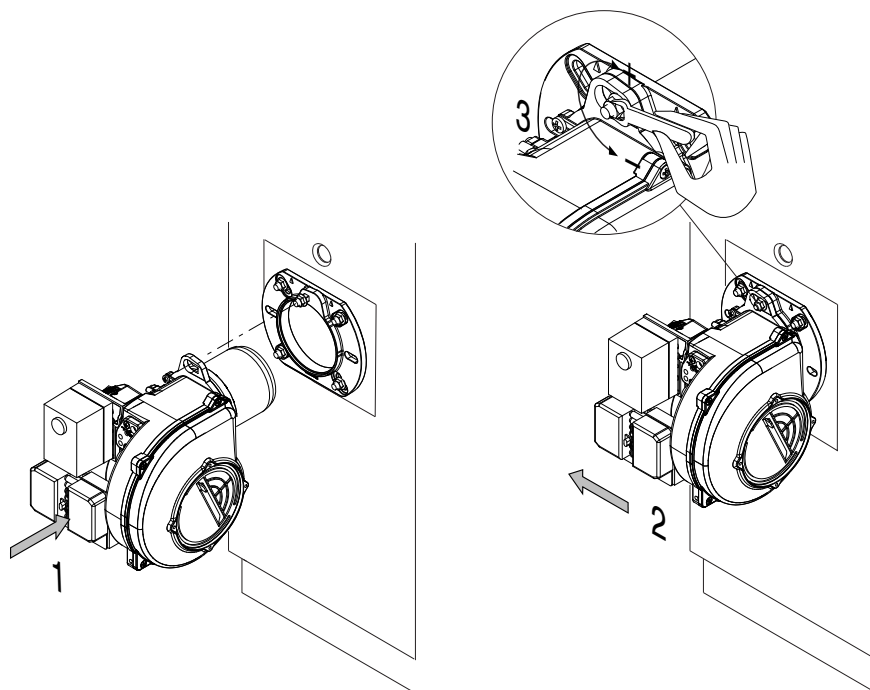
Color code table for multicolor signal lamp (LED)

Status	Color code	Color
Waiting time «tw», other waiting states	○	Off
Oil preheater on, waiting time «tw»	●	Yellow
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:	 Steady on ▲ Red □ Green ○ Off ● Yellow	

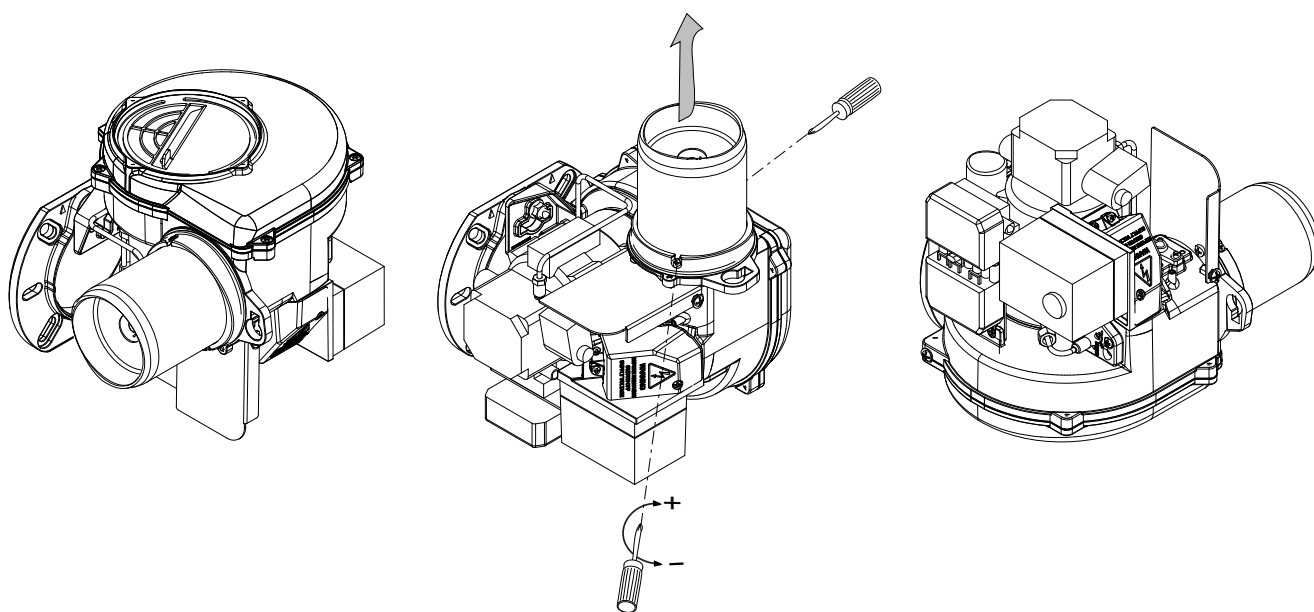
Error code table

Red blink code of signal lamp (LED)	«AL» at term. 10	Possible cause
2 blinks	on	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 equipment
3 blinks	on	Free
4 blinks	on	Extraneous light on burner startup
5 blinks	on	Free
6 blinks	on	Free
7 blinks	on	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	on	Time supervision oil preheater - Oil preheater failed 5 times during prepurging
9 blinks	on	Free
10 blinks	off	Wiring fault or internal fault, output contacts, other faults. 3 times temporary fault of the output contacts

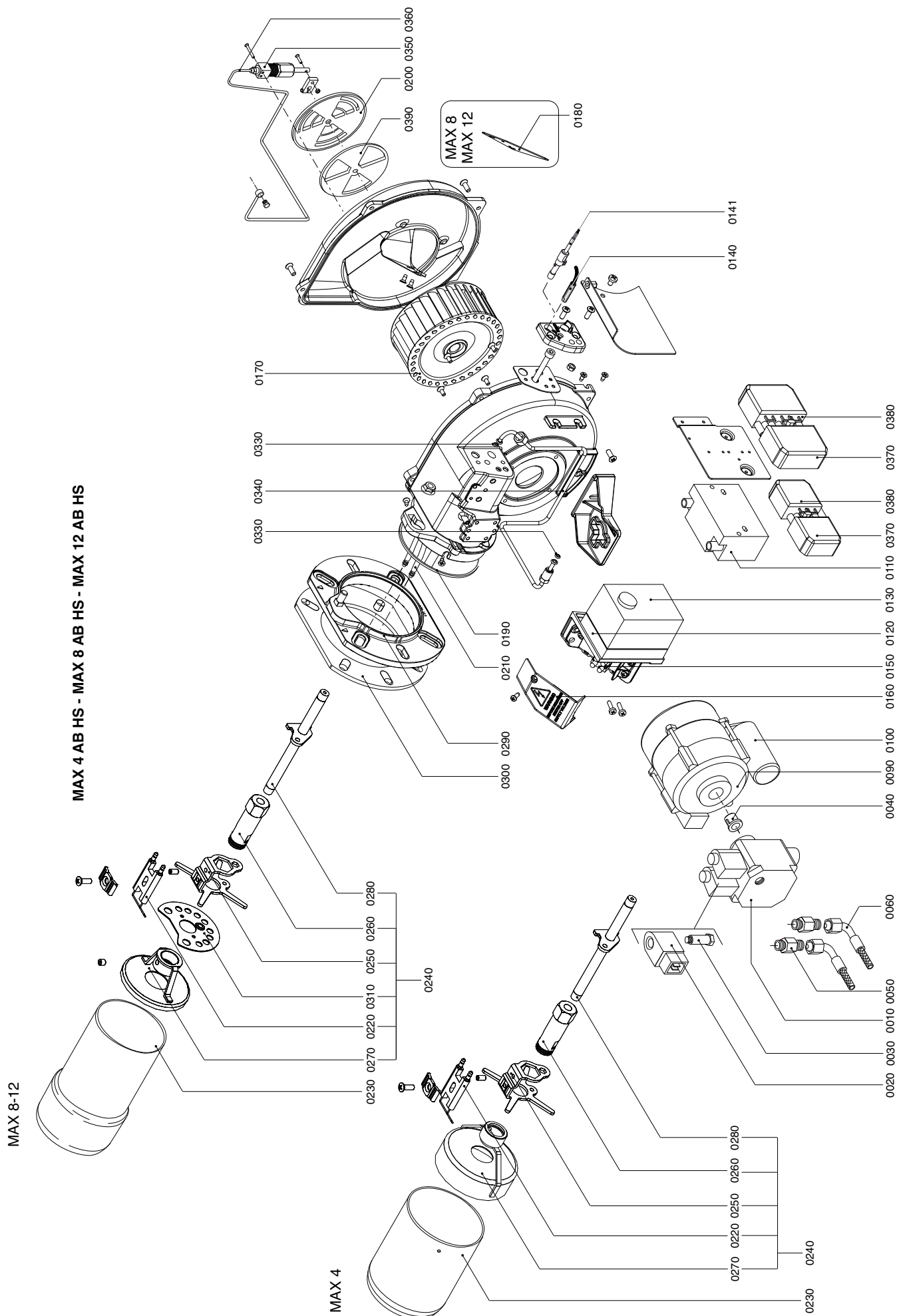
MOUNTING TO THE BOILER



TUBE DISASSEMBLY







			MAX 4 AB HS	MAX 8 AB HS	MAX 12 AB HS
N°	DESCRIPTION		code	code	code
0010	OIL PUMP	SUNTEC AT3V 45A	65325120	65325120	65325120
0020	COIL	SUNTEC	65323767	65323767	65323767
0030	OIL VALVE	SUNTEC	65323744	65323744	65323744
0040	COUPLING		65322920	65322920	65322920
0050	NIPPLE	TN 6 X 700	65321179	65321179	65321179
0060	HOSES	NW 6X700	65323189	65323189	65323189
0070	FILTER	ART.70451-006AV	65325046	65325046	65325046
0080	COVER				
0090	MOTOR	75 W	65322867	-	-
		75 W E.B.R.	65326739	-	-
		100 W	-	65322874	-
		130 W			65322873
0100	CAPACITOR	5 µF SIMEL	65325038	-	-
		4 µF x E.B.R.	65326725	-	-
		6,3 µF SIMEL	-	65325000	65325000
0110	IGNITION TRANSFORMER	FIDA MOD.26/30	65324966	65324966	65324966
0120	CONTROL BOX BASE	SIEMENS	65320092	65320092	65320092
0130	CONTROL BOX	SIEMENS LMO24.111C2	65325119	65325119	65325119
0140	PHOTORESISTOR	SIEMENS	65320076	65320076	65320076
0141	PHOTOTRANSISTOR	FTEB1 F MM 700 W	740040020100	740040020100	740040020100
0150	WIRING TERMINAL BOX		65322076	65322076	65322076
0160	PROTECTION BOX		65320663	65320663	65320663
0170	FAN	120 x 50	65321770	65321770	65321770
0180	FAN SCOOP			65320621	65320621
0190	ORING		65321061	65321061	65321061
0200	COVER AIR INLET		65324964	65324964	65324964
0210	CABLES	TC	65320933	65320933	65320933
		TL	65320934	65320934	65320934
0220	ELECTRODES		65320924	65320924	65320924
0230	BLAST TUBE	TC	65320325	65320298	65320362
		TL	65320326	65320299	65320363
0240	FIRING HEAD	TC	65322554	65322556	65322558
		TL	65322555	65322557	65322559
0250	NOZZLE HOLDER SUPPORT		65320687	65320687	65320687
0260	NOZZLE HOLDER		65320707	65320707	65320707
0270	DIFFUSER		65320747	65320751	65320753
0280	ROD	TC	65320181	65320183	65320187
		TL	65320182	65320184	65320188
0290	FLANGE		65320968	65320972	65320972
0300	GASKET		65321104	65321109	65321109
0310	ANTIJAMMING FILTER				
0320	REAR DISC			65320723	65320726
0330	PIPE GASKET		65321065	65321065	65321065
0340	PIPE		65321500	65321500	65321500
0350	HYDRAULIC SYSTEM		65322331	65322331	65322331
0360	PIPE HYDRAULIC SYSTEM		65321510	65321510	65321510
0370	PLUG WIELAND	7 pin	65322069	65322069	65322069
		4 pin	65322065	65322065	65322065
0380	SOCKET WIELAND	7 pin	65322070	65322070	65322070
		4 pin	65322068	65322068	65322068
0390	AIR DAMPER		65325965	65325965	65320538

TC = SHORT HEAD TL = LONG HEAD R =VERSION PRE-HEATER

FAULT FINDINGBurner does not start up

- Mains switch not on.
- Blown fuse.
- Boiler thermostats not made.
- Fault in control box.

Burner pre-purges and stops

- Fault in control box.

Burner does not ignite during cycle and stops

- Fault in control box.
- Fault in photo-resistor.

Burner does not ignite

- Dirty ignition electrodes.
- Fault at electrodes.
- Electrodes installed wrongly.
- Faulty ignition transformer.
- Blocked nozzle.
- Nozzle needs replacing.
- Oil pressure too low.
- Blocked oil filter.
- Excessive combustion air for nozzle capacity.
- Fault in control box.

Burner ignites and then stops

- Faulty nozzle.
- Photo-resistor does not "see" flame.
- Excessive combustion air for nozzle capacity.
- Fault in control box.
- Oil pressure too low.
- Blocked oil filter.

No high flame at burner (2nd stage)

- 2nd stage valve coil faulty.
- Oil pressure too low
- Dirty filter
- Fault in control box.

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.

Ecoflam

Ecoflam (UK) Limited

12 Goodwood Road , Keytec 7 Business Park, Wyre Road, Pershore, Worcestershire, WR10 2JL England
Tel: 01386 556092 - Fax: 01386 553789

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

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