

OILFLAM 700.1 PR
OILFLAM 800.1 PR
OILFLAM 1000.1 PR
OILFLAM 1200.1 PR



Technical data



Operating instructions



Electric diagrams



Spare parts list

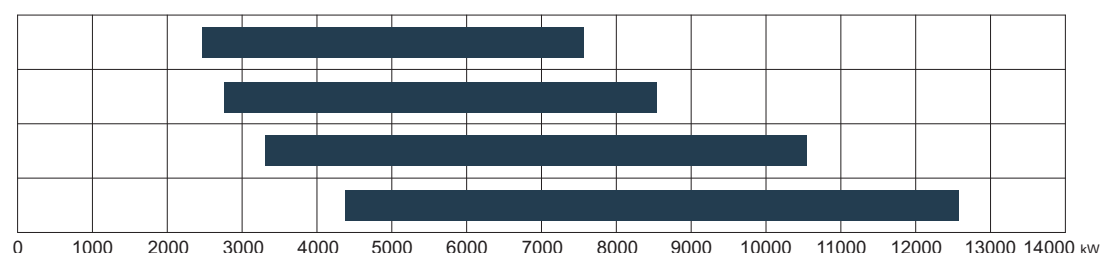


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OILFLAM 700.1 PR TC 230-400-50 NS	3143936
OILFLAM 800.1 PR TC 230-400-50	3142127
OILFLAM 1000.1 PR TC 230-400-50	3145243
OILFLAM 1200.1 PR TC	3145701

INDEX

OILFLAM 700.1
 OILFLAM 800.1
 OILFLAM 1000.1
 OILFLAM 1200.1



General warnings	3
Conformity declaration	4
Burner designation - Modular delivery system	5
Burner description	6
Electrical control panel	6
Technical data	7
Working diagrams	8
Test boiler - Flame dimension	8
Overall dimensions	9
Oil operating mode - General safety functions	10
Installation	11
Fitting the burner to the boiler	11
Heavy oil preparing ring	12
Oil connection	13
Heavy oil preparing ring scheme	14
Feeding line for heavy oil	15
Electrical connections	16
Start-up: Checking procedure, Recording commissioning data	17
Exhaust gas test	18
Start-up	19
Fuel selection - Start-up	19
Adjusting the max air flow rate	19
Firing head setting	19
GEFRAN Setting	20
Adjusting the max oil flow rate	21
Servomotor SQM50 - Air damper motor pre-setting	21
Adjusting the pump pressure	21
Adjusting the intermediate burner capacity	22
Servomotor SQM50 - Final setting	22
Maintenance program	23
Troubleshooting instructions	25
Operating troubles	26
Appendix	27
Control box - Damper actuators	27
Fluidics nozzle chart	28
Bergonzo nozzle tables	31
Pump and pressure regulators	34
Electrical diagrams	37
Spare parts list	46

GENERAL WARNINGS

Important notes

OILFLAM burners have been designed and built in compliance with all current regulations and directives.



All burners comply to the safety and energy saving operation regulations within the standard of their respective performance range.



The burner must not operate outside the working range.

The quality is guaranteed by a quality and management system certified in accordance with ISO 9001:2008.

OILFLAM burners are designed for the low-pollutant combustion of light oil.



The burners comply with standard EN267. Assembly and commissioning must be carried out only by authorised specialists and all applicable guidelines and directives must be observed.

Burner description

OILFLAM PR burners are progressive mechanical fully automatic monoblock devices. Burner head is designed to get the lowest emissions in terms of NOx and unburnt particles in order to maximize the heat generator efficiency. Emissions can be different respect to the ones recorded in the lab because they depends a lot on the generator on which the burner is fit.

The installer must comply with compulsory rules. Avoid for instance dangerous atmosphere or not ventilated rooms.

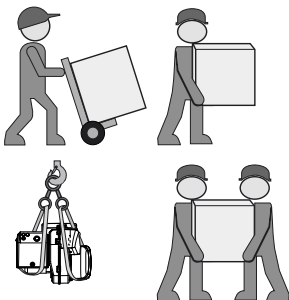
Packaging and handling

Move the burner still in its packaging using a trolley or forklift, taking care not to drop it and elevating it no more than 20cm from ground level. After having removed the packaging, check that the contents are in good condition and correspond with what was ordered. If in doubt, contact the manufacturer.



The burner must be installed by a qualified individual.

If the weight and dimensions do not allow



for manual lifting, ask another operator for help or use a forklift, harness the burner using belts if no eyebolts are available.



Use the accessories provided (flange, gasket, pins and nuts) to install the burner onto the boiler, taking care not to damage the isolating gasket.

We can accept no warranty liability whatsoever for loss, damage or injury caused by any of the following:

- Inappropriate use.
- Incorrect assembly or repair by the customer or any third party, including the fitting of non-original parts.
- non authorised modifications made on the burner.

Provision of the system and the operating instructions

The firing system manufacturer must supply the operator of the system with operating and maintenance instructions on or before final delivery. These instructions should be displayed in a prominent location at the point of installation of the heat generator, and should include the address and telephone number of the nearest customer service centre.

Notes for the operator

The system should be inspected by a specialist at least once a year. It is advisable to take out a maintenance contract to guarantee regular servicing.

Installation location

The burner must not be operated in rooms containing aggressive vapours (e.g. spray, perchloroethylene, hydrocarbon tetrachloride, solvent, etc.) or tending to heavy dust formation or high air humidity. Adequate ventilation must be provided at the place of installation of the furnace system to ensure a reliable supply with combustion air.



BURNER SELECTION: Type of operation and configuration must be done by professional personnel in order to grant correct working of the burner. Installation, start-up and maintenance must be carried out by authorised specialists and all applicable guidelines and regulations (including local safety regulations and codes of practise) must be observed.

CONFORMITY DECLARATION

Burners Division Ariston Thermo Group

elco



Ecoflam

**DICHIARAZIONE DI CONFORMITÀ
DECLARATION OF CONFORMITY**

La scrivente ditta
The writing company

ECOFLAM BRUCIATORI S.p.A.

Con sede in via Roma, 64 – Resana (TV)
Address: via Roma, 64 – Resana (TV)

**DICHIARA
DECLARE**

Sotto la propria responsabilità, che tutti i propri **bruciatori di gasolio tipo MAX ... , MAIOR... , bruciatori di kerosene tipo MAX ... , MAIOR... e di olio combustibile tipo MAXFLAM... , OILFLAM... sono conformi a:**

*Under their sole responsibility that all the **light oil burners MAX ... , MAIOR ... series, kerosene burners MAX ... , MAIOR ... series and heavy oil burners MAXFLAM ... , OILFLAM ... series** comply with requirements included in the following European Directives and Standards:*

- 2014/35/UE Direttiva bassa tensione (Low voltage directive)
- 2014/30/UE Direttiva EMC (EMC directive)
- 2006/42/EC Direttiva macchine (Machine directive)
- 2011/65/EU Direttiva RoHS2 (RoHS2 directive)
- EN 267
- EN 50156-1
- EN 55014-1
- EN 55014-2
- EN 60335-1
- EN 60335-2-102
- EN 61000-6-2
- EN 61000-6-3

Date/Authorized Signature

Title of Signatory

September 2020 / Mr. Alessandro Rubboli

R&D Manager

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Viale Aristide Merloni, 45 - 60044 Fabriano(AN)

P.IVA e CF 00879740264

BURNER DESIGNATION

OILFLAM 300.1 PR TC 230-400-50

RANGE NAME BY FUEL TYPE

OILFLAM Heavy oil

MODEL SIZE (Gas: kW; Oil: kg/h)

OILFLAM 300.1 264 kg/h - 3000 kW

EMISSIONS

Standard Class 1 - OIL EN267 (<250 mg/kWh)

OPERATION TYPE

PR 2 stages progressive mechanical

MD 2 stages modulating mechanical with PID

E 2 stages modulating electronic

HEAD TYPE

TC Short head

TL Long head

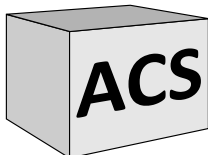
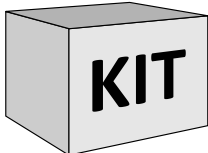
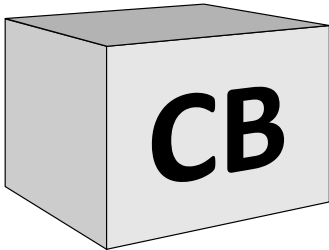
FUEL

Heavy oil

ELECTRICAL POWER SUPPLY

230-400V/50Hz 230-400 Volt, 50 Hz

MODULAR DELIVERY SYSTEM



Heavy oil burners

All heavy oil burners are delivered with electrical pre-heater preassembled into the burner body, including filter and flexible hoses up to 6 MW. Additional accessories and options shall be installed by the installer in accordance to the instruction and local safety regulations and codes of practise.

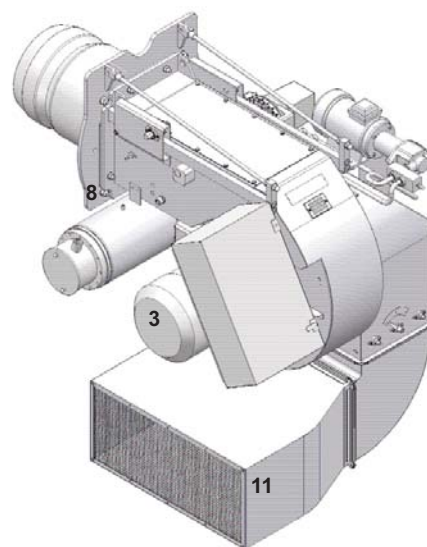
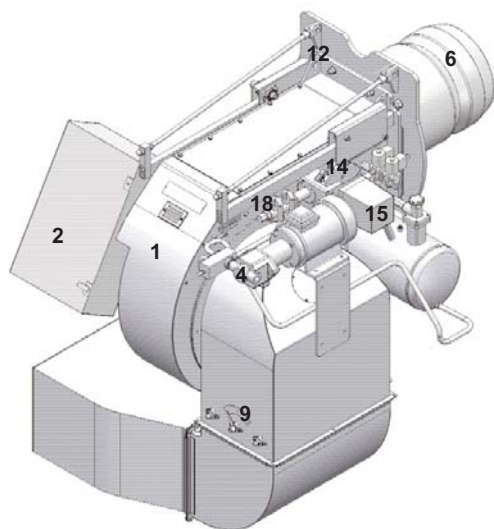
KITS - Accessories

Kits and accessories are managed and delivered separately.

Component type

CB	Complete burner
KIT	Kits
ACS	Accessories

BURNER DESCRIPTION



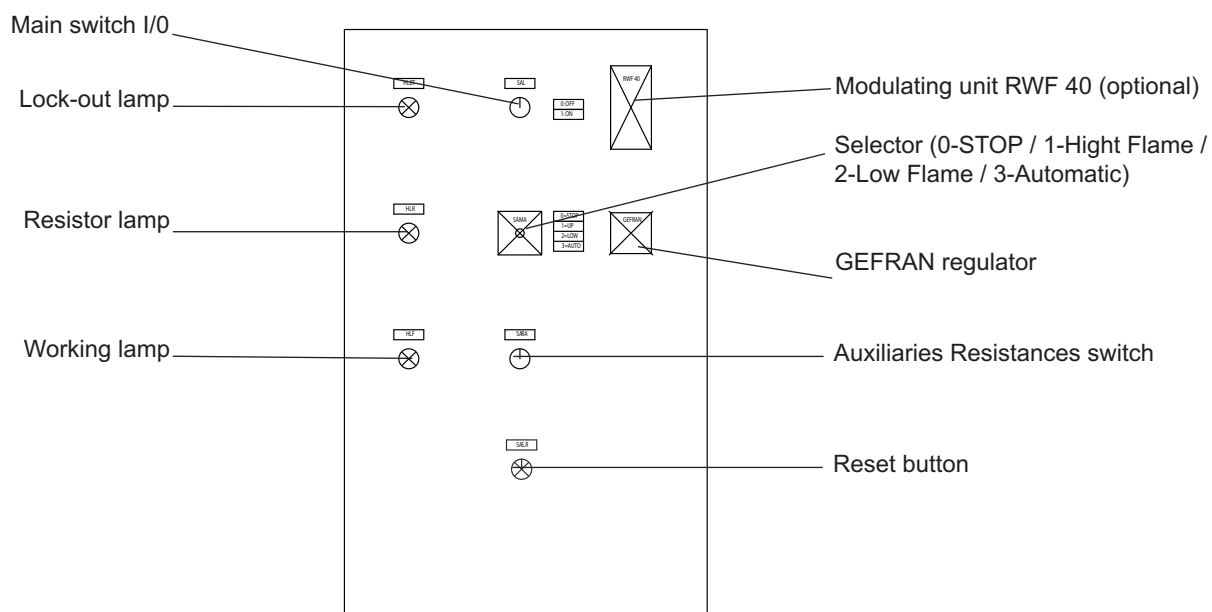
LEGEND

- 1. Housing
- 2. Electrical control panel
- 3. Blower motor
- 4. Pump
- 6. Blast tube
- 8. Burner fixing flange
- 9. Air flap regulation
- 11. Silencer

- 12. Lifting eyebolts
- 14. Mechanical cam oil
- 15. Servomotor
- 18. Oil pressure regulator

Control panel

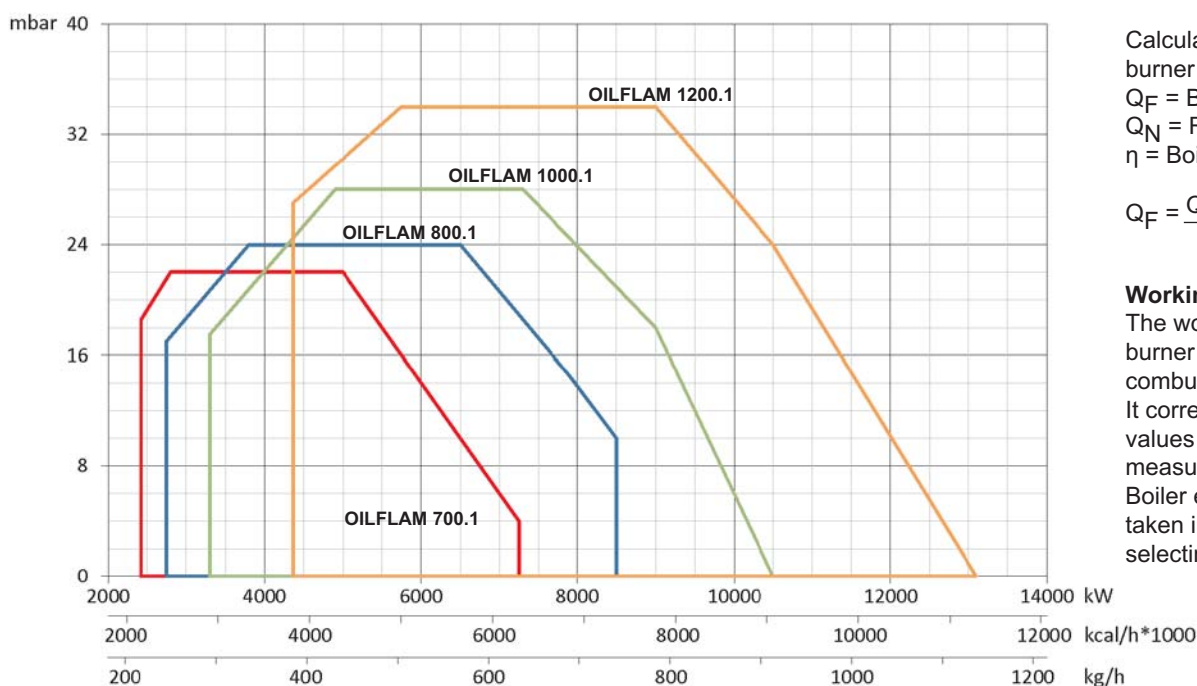
Rumorosità Maior PR



TECHNICAL DATA

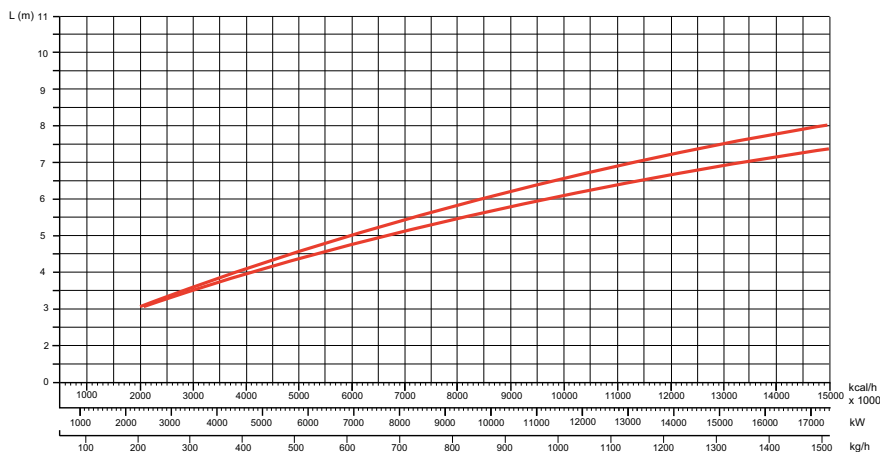
MODEL		OILFLAM 700.1	OILFLAM 800.1	OILFLAM 1000.1	OILFLAM 1200.1
Thermal power max.	kW	7.500	8.500	10.500	12.500
	kcal/h	6.465.000	7.328.000	9.052.000	10.776.000
	kg/h	660	748	924	1.099
Thermal power min.	kW	2.417	2.750	3.300	4.367
	kcal/h	2.096.000	2.385.000	2.862.000	3.788.000
	kg/h	214	243	292	386
Operation mode	Type	Progressive mechanical heavy oil - Modulating with PID			
Regulation ratio nominal	Type	1÷3 HEAVY OIL			
Fuel	Type	Heavy oil (L.C.V. 9.800 kcal/kg max visc. 50°E at 50°C) - (S) Hu = 10,97 kWh/kg			
Emission class	std	N/A			
Control unit	Type	LAL			
Air regulation	Type	Air flap	Air flap	Air flap	Air flap
Air flap control with servomotor	Model	SQM50			
Air pressure switch	mbar	2,5...50 mbar			
Flame monitoring	Type	photoresistor			
Ignitier	Model	BRAHMA / COFI			
Motor	kW	15	18,5	22	37
Rpm	N°	2.800	2.800	2.800	2.800
Voltage	V/Hz	230/400 V - 50 Hz			
Total power consumption operation	W	45.200	49.000	71.000	98.000
Weight body BBCH	Kg	683			
Electrical panel protection level	IP	IP55	IP55	IP55	IP55
Sound pressure level without silencer	dB(A) Lab tests	95	95,6	96,5	96,5
Sound pressure level with silencer		87,9	88,8	89,1	89,1
Ambient temperature storage	Min/Max	-20°...+70° C			
Ambient temperature use		-10°...+60° C			
Oil pump	Model	TA5	TA5	T5+TV	T5+TV
Oil pump motor	kW	-	-	5,5 kW	5,5 kW
Nozzles	Type	according to the output requested			
Fuel thermo regulator	Type	GEFRAN			
Electrical pre-heater	kW	30	30	44	30 x2

WORKING DIAGRAMS

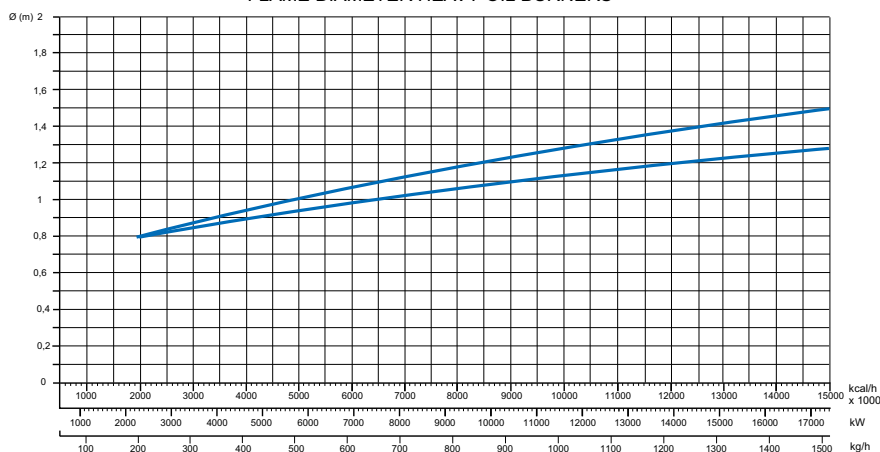


TEST BOILER - FLAME DIMENSIONS

FLAME LENGTH HEAVY OIL BURNERS



FLAME DIAMETER HEAVY OIL BURNERS



The burner/boiler matching does not pose any problems if the boiler is CE type-approved.

If the burner must be combined with a boiler that has not been CE type-approved and/or its combustion chamber dimensions are clearly smaller than those indicated in diagram, consult the manufacturer.

The firing rates were set in relation to special test boilers, according to EN 267 regulations.

The sizes are indicative and depend on the configuration, to the combustion chamber pressure and to the draught. The values have been taken out from tests executed with flame tubes.

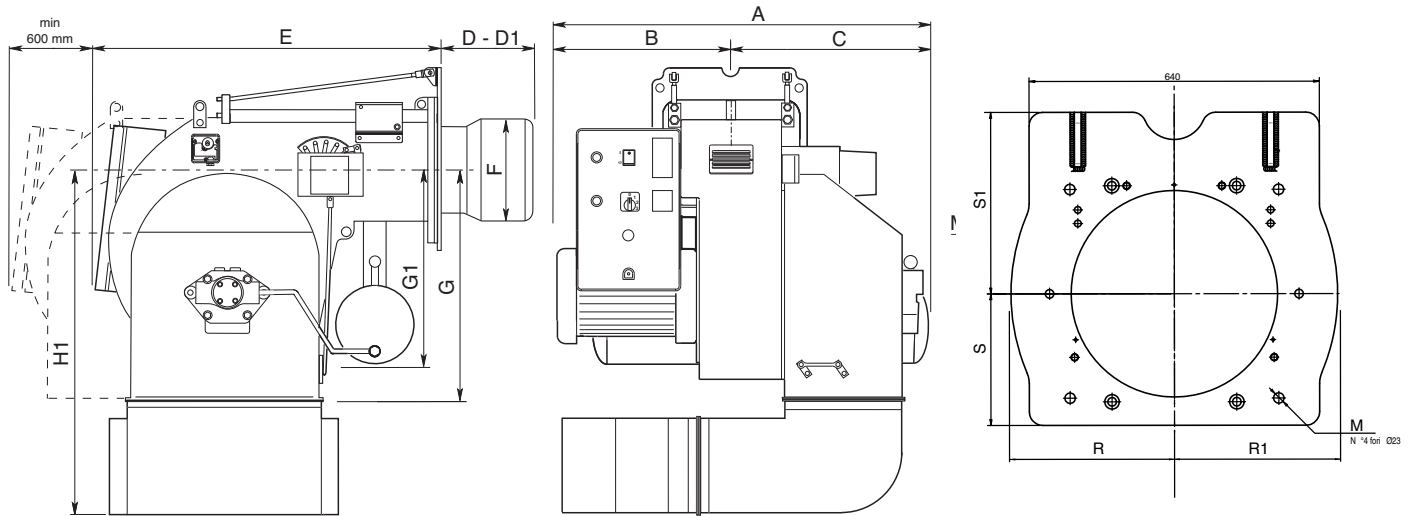
The dimensions of the flame are made in test boiler in laboratory without resistance therefore exists max and min length that take into account the difference in length that comes from the boiler backpressure.

Example:

Burner thermal output = 8000 kW;
 L flame (m) = 5 m (medium value)
 D flame (m) = 1 m (medium value)

WARNING: Some flame modifications can be done in our FLEXSHOP in the factory in order to shape the flame and adapt it to some special boiler or application.

OVERALL DIMENSIONS



D = Short head
 D1= Long head
 Dimensions (mm)

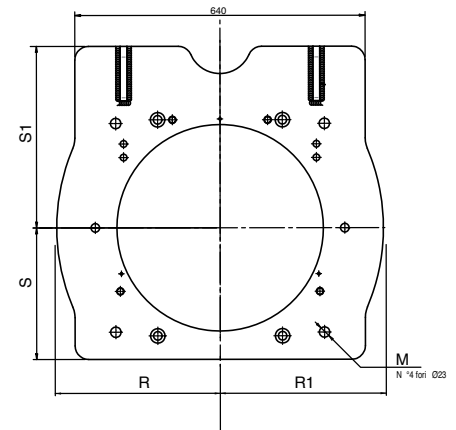
Model	R	R1	S	S1
OILFLAM 7-1200.1	360	360	290	400

Model	A	B	C	D	D1	E	F	G	G1	H1	I	L	M
OILFLAM 700.1	1390	660	730	525	-	1240	385	775	520	1270	460	460	M20
OILFLAM 800.1	1480	660	820	535	-	1240	430	775	520	1270	460	460	M20
OILFLAM 1000.1	1505	685	820	535	-	1240	460	775	520	1270	460	460	M20
OILFLAM 1200.1	1750	800	950	535	-	1410	460	775	900	1270	460	460	M20

Burner-boiler mounting flange

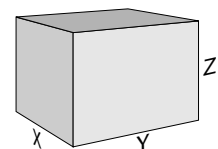
Fixing hole dimensions are "I" and "L" as per dimension table.
 Boiler hole shall be done according to the blast tube dimension "F" plus 15-25 mm in order to be able to extract it during maintenance.

WARNING: Please follow the suggested dimension for the hole on the boiler flange in order to fit the burner. Make sure that between the boiler and the blast tube proper insulation is fitted.



Packaging (only burner)

Model	X	Y	Z	kg
OILFLAM 700.1	1750	2380	1460	
OILFLAM 800.1	1750	2380	1460	883
OILFLAM 1000.1	1750	2380	1460	
OILFLAM 1200.1	1750	2380	1460	



OIL OPERATING MODE - GENERAL SAFETY FUNCTIONS

START-UP MODE

As soon as the furnace system is required to supply heat the burner control circuit will close and the program be started. After the program has run down the burner will start. The air damper is closed when the burner is out of operation.

The automatic furnace controller controls and monitors the starting function.

The electric actuator opens the closed air damper to its full-load position so that the burner will sweep the furnace compartment and exhaust ports at the required air flow rates. Shortly after the pre-ventilation process has been started the lack-of-air cut-out must change over to operating position within a certain time, i.e. the minimum air pressure setting must be reached and maintained until the burner is turned off. At the end of the specified pre-ventilation time the air damper will be moved into its partial load position. This operation will be followed by the pre-ignition procedure and the oil feed start. The solenoid valves will open and thus allow the pressurized oil to flow to the nozzle and to the return line.

The oil will be atomized, mixed with the combustion air and ignited.

A safety period is provided to allow the flame to develop a proper and steady

pattern.

On the termination of the safety period, a flame signal must have been received by the automatic furnace controller via the flame monitor and remain on until the regular shut-off.

The startup program of the burner has now been completed.

OIL OPERATING MODE

After the flame has developed the load regulator will be enabled which brings the burner into its operating position.

The load regulator will now control the burner automatically between its partial-load and full-load stages.

Depending on the heat demand, the electric actuator of the mechanical compound control system will be fed with the OPEN or CLOSE signal via the regulator and thus increase or decrease the oil and air flow rates.

This compound control system will vary the positions of the oil control valve and air damper and thus regulate the oil flow rate in conjunction with the air flow rate. The burner can either be controlled in two-stage sliding mode or, if a respective

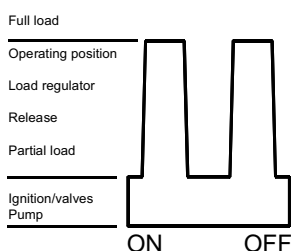
controller is provided, in stepless control mode.

The stepless control will allow the burner to be operated at any desired stage between its partial-load and full-load positions. The burner will be turned off from its partial-load position. The air damper will be closed when the burner is out of operation and will thus prevent cold air flowing through the burner chamber, heat exchanger and chimney.

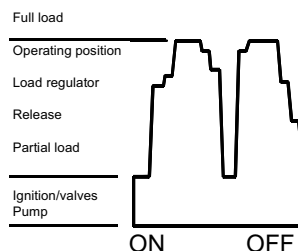
The interior cooling losses will be greatly minimized.

Oil control:

2-stage sliding



Stepless



GENERAL SAFETY FUNCTIONS

In case a flame does not develop when starting the burner (fuel release) the burner will shut off at the end of the safety period (safety lock-out).

A safety lock-out will also occur in the case of flame failure during operation, air flow failure during the pre-ventilation phase and pressure failure during the whole period of burner operation.

Any failure of the flame signal at the end of the safety period and a flame signal during

the pre-ventilation phase (external light control) will result in a safety lock-out with the control box being locked.

The trouble is indicated by the trouble signal lamp lighting up.

The control box can be unlocked immediately after a safety lock-out by pressing the unlocking key. The program unit will return to its starting position and proceed with the restart of the burner.

A voltage failure will result in a regular shut-off of the burner. Upon voltage

recovery there may be an automatic restart unless another interlock is provided, e.g. by the safety system. In any case of trouble the fuel oil supply will be shut off right away. The program unit will stop at the same time causing also the trouble location indicator to stop. The symbols will indicate the kind of trouble.

INSTALLATION

Fitting the burner to the boiler

! **WARNING:** handling and moving operations must be carried out by specialised personnel. Use the eyebolts to lift the burner in order that it will not overturn and fall down.

To perform the installation of the burner into the boiler drill the boiler plate according to the dimension given on this manual and place the burner towards it by lifting and moving the burner by means of eyebolts.

Place the gasket on the burner flange and install the burner into the boiler by fixing nuts into the bolts.

The space between the blast tube and the boiler lining must be sealed with appropriate insulating material.

Burner blast tube insertion depth and brickwork

Unless otherwise specified by the boiler manufacturer, heat generators without a cooled front wall require brickwork or insulation 5 as shown in the illustration. The brickwork must not protrude beyond the leading edge of the blast tube, and should have a minimum conical angle of 60°. Gap 6 must be filled with an elastic, non-combustible insulation material. For boilers with reverse firing, the minimum burner tube insertion depth A as specified in the boiler manufacturer's instructions must be observed.

On boilers the blast tube insertion depth should be observed as per the boiler manufacturer's instructions.

Reverse flame boiler :

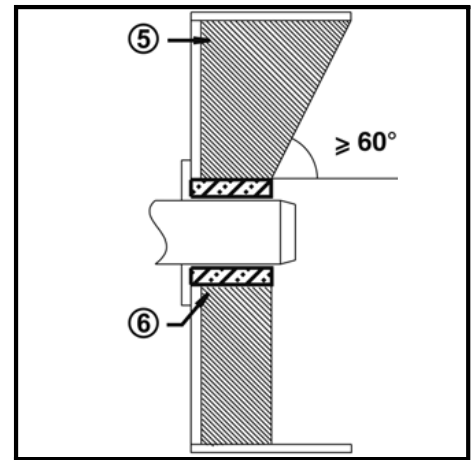
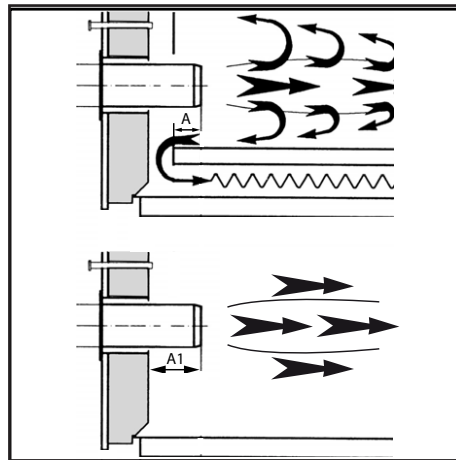
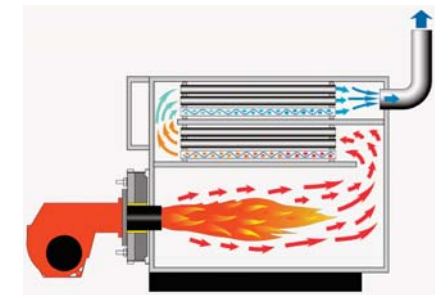
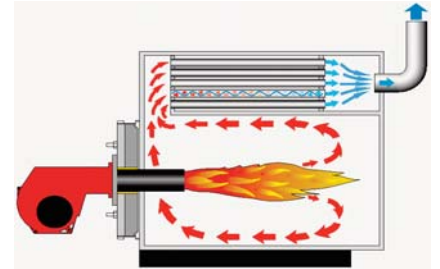
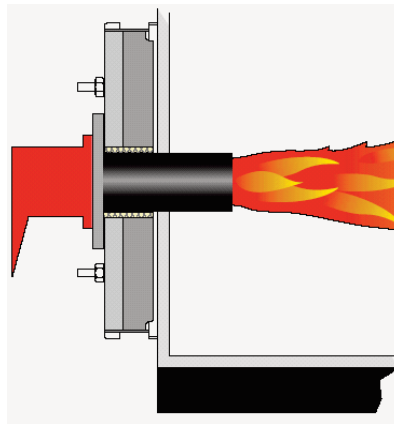
A = 50-100 mm.

Three pass boilers :

A1 = 50-100 mm.

Exhaust system

To avoid unfavourable noise emissions, right-angled connectors should not be used on the flue gas side of the boiler.

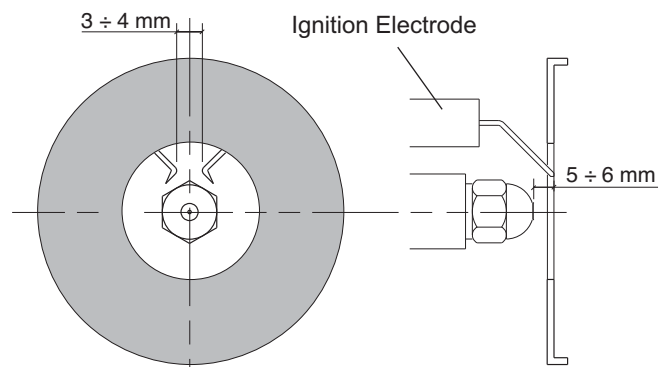


BURNER LINING

Check before burner installation:

1. Depending on the type of boiler (reverse flame or three pass) check the burner blast tube installation depth according to the data specified by the boiler manufacturer or consult the burner producer.
2. From the factory the nozzle for progressive version must be specified from the customer according to boiler output and combustion chamber geometry, otherwise we will select the nozzle for the 80% capacity of the burner.
3. Check the ignition electrodes and the nozzle on the burner head as per factory setting (see figures). The setting of the mixing and ignition unit according to the boiler output will be performed during commissioning procedure.
4. Check that the head is preset at 50%.

Position of the electrodes - nozzle installation



INSTALLATION

Heavy oil preparation ring, kit and accessories connection



WARNING: make sure that the feeding line is properly dimensioned and is in compliance the local safety rules and code of practise in the country of installation.

All installations using heavy oil burners have to be completed with a forced oil preparation ring in order to guarantee oil supply to the burner at suitable temperature and pressure (temperature +/- 50° C, pressure 3 bar). For heavy oil with more than 50°E at 50°C Ecoflam recommends to lower the maximum output of 10-20% and work in excess of air in order to grant better operation and reduce maintenance.

Installation with heavy oil must provide to the burners:

- CONSTANT PRESSURE
- CONSTANT TEMPERATURE

To size correctly the ring for the heavy oil supply consider the diagram of the pre-heating temperature of the heavy oil according to viscosity and the pump pressure according to temperature.

Ecoflam heavy oil and dual fuel heavy oil burners do have in the electrical panel the fuel temperature device GEFTRAN that adjusts the temperature of the heavy oil and grants temperature stability.

STANDARD SYSTEM COMPOSITION FOR LIGHT OIL AND HEAVY OIL HEATING AND PUMPING UNIT

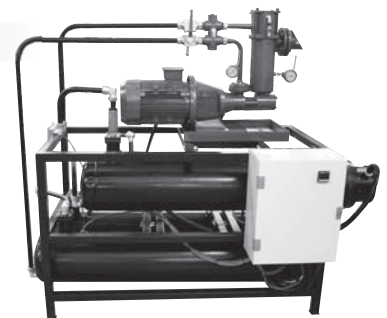
I. Feeding and filtering system

II. Fuel heating system for reducing oil viscosity plus service tank

III. Forced oil supply system "RING"

OIL PREPARATION UNIT

Ecoflam heavy oil burners are delivered with electrical pre-heater assembled into the burner body or in a separate skid. Additional Forced system "OIL RING" can be design and delivered assembled on skid/frame or offered as single component.



ACCESSORIES

Service tanks + Pumps units.
Quotation on request depending on output and configuration.



KITMD-RWF50 PID regulator

All progressive burner can be turned modulation with the installation of the PID that regulates the output combined with a probe.

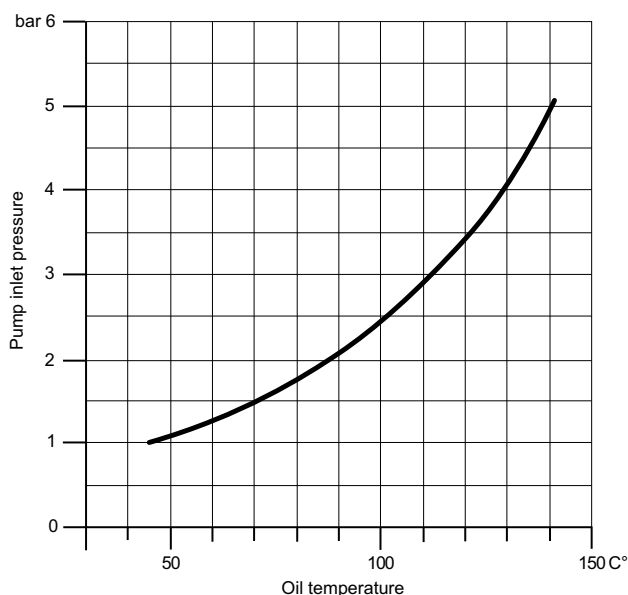
Modulation Kit

KITMD-RWF50

Probe-...



RACOMMENDED OIL SUPPLY PRESSURE



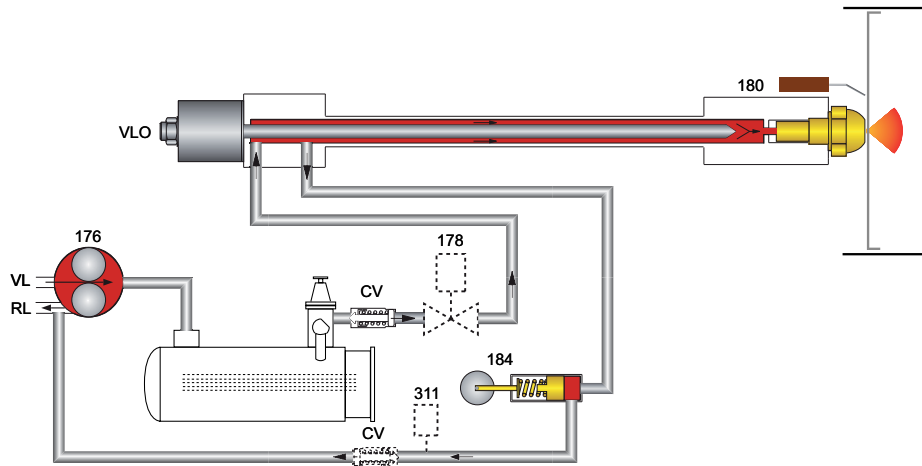
INSTALLATION

Oil connection

! **WARNING:** make sure that the feeding line is properly dimensioned and is in compliance with the local safety rules and code of practise in the country of installation

HYDRAULIC CIRCUIT HEAVY OIL FEEDING

- 176: oil pump
- 178: solenoid valve
- 180: nozzle rod
- 184: output control valve
- 311: return oil pressure switch
- CV: check valve
- RL: return line
- VL: suction line
- VLO: working oil valve



OIL PRESSURE CONTROL (FEED)

The feed pressure is controlled by means of the pressure regulator installed in the pump and should be set at 25 bar. The pressure regulator is operated by turning its screw. Make sure to fill the pump with oil prior to taking into operation.

PUMP BLEEDING

Open the feed and return stop valves and ensure the ring line (if any) is in operation. Reduce the oil pressure at the pressure regulating valve. Turn on the pump by pressing the contactor. Check the pump for proper direction of rotation. Check for proper oil delivery and absence of leaks in the hydraulic oil system. For bleeding the pump open the pressure gauge connection. When taking the burner into operation pro

ceed by gradually increasing the pressure to operating level (25 bar).

CHECKING OIL RING PRESSURE

Refer to diagram at page 11 to define recommended oil pressure.

OIL CONNECTION

Hoses are used for connection to the oil lines and stop valves. The hoses must be installed according to the applicable standards (relieved of tensile load, free of distortion) to avoid kinking and exclude the danger of breakage. Take care when mounting the oil lines to bring their ends as close to the burners as possible and to arrange them in a way that the boiler door and the burner can be swing out without any obstruction. Refer to the technical documentation for

the line dimensions for the feed and return lines from the stop valves to the tank.

OIL FILTER

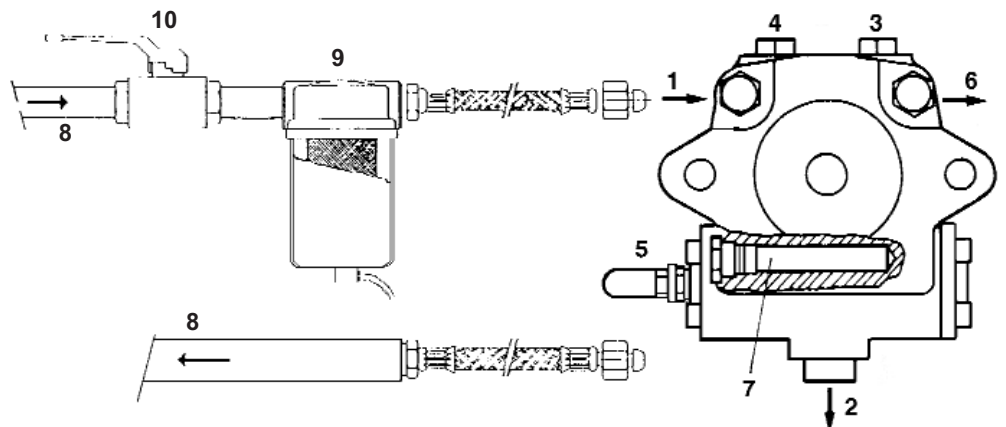
A filter must be installed upstream of the pump to protect the oil pressure pump and the hydraulic system.

INSTALLATION OPTIONS

- Two-line installation (separate feed and return lines without delivery pump).
- Ring line system (with delivery pump and gas-air separator).

LEGEND

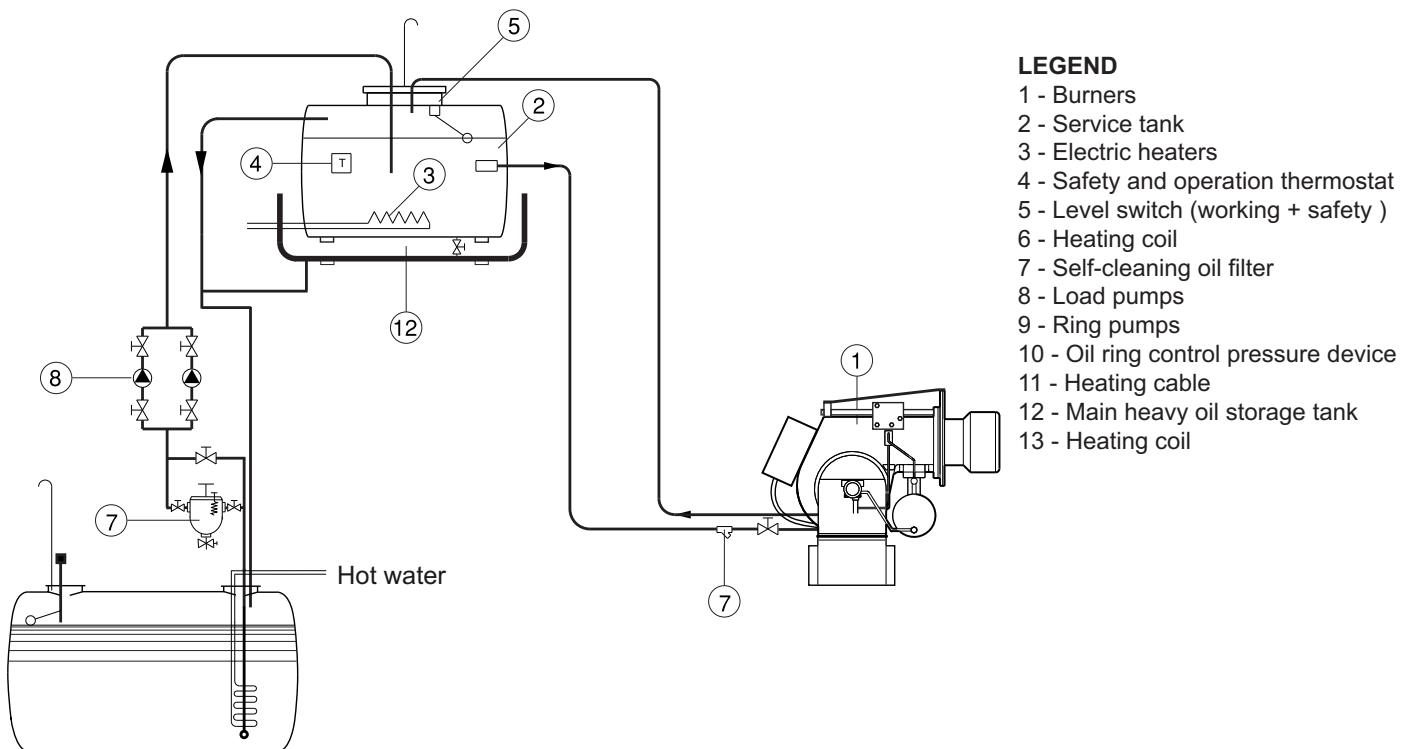
1. Inlet
2. Return
3. Bleed and pressure gauge port
4. Vacuum gauge port
5. Pressure adjustment
6. Nozzle outlet
7. Heater
8. Hose
9. Oil filter
10. Oil ball valve



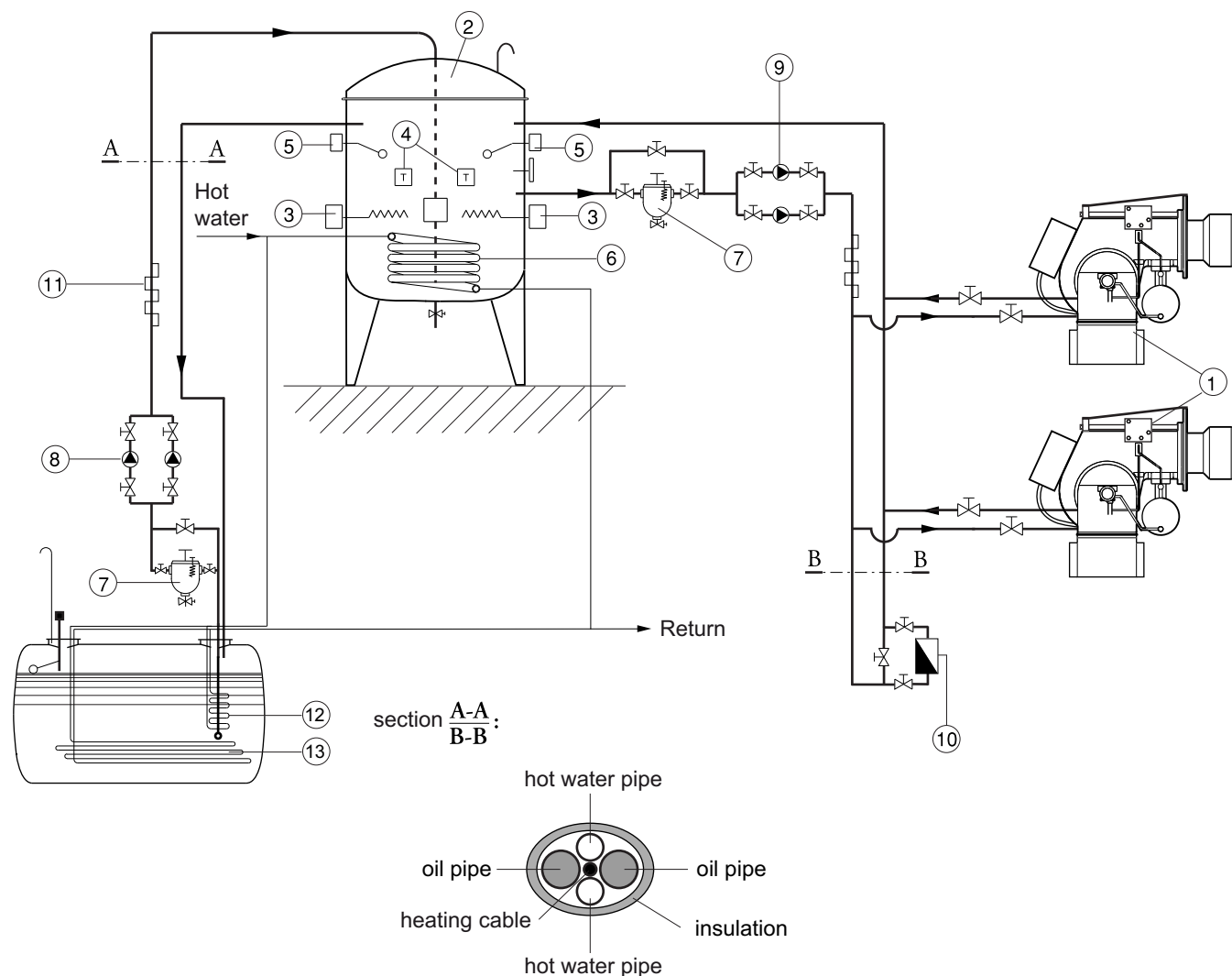
! **WARNING:** Check that the pump rotation is correct and before start up it has been pre-filled

INSTALLATION

Heavy oil preparation ring scheme



- LEGEND**
- 1 - Burners
 - 2 - Service tank
 - 3 - Electric heaters
 - 4 - Safety and operation thermostat
 - 5 - Level switch (working + safety)
 - 6 - Heating coil
 - 7 - Self-cleaning oil filter
 - 8 - Load pumps
 - 9 - Ring pumps
 - 10 - Oil ring control pressure device
 - 11 - Heating cable
 - 12 - Main heavy oil storage tank
 - 13 - Heating coil



INSTALLATION

Feeding line for heavy oil

The pumps that are used can be installed both into single-pipe and double-pipe systems:

Single-pipe system: a single pipe drives the oil from the tank to the pump's inlet that deliver the pressurized oil to the nozzle and part of the oil not used goes back to the pump. With this single pipe the by-pass plug must be removed and the return port must be sealed with steel plug and washer.

Double-pipe system: this is the default solution from the factory. The return pipe send the excess oil from the pump to the tank. Depending on the type of pump used to change from a 1-pipe system to a 2-pipe-system, insert the by-pass plug (as for ccw-rotation referring to the pump shaft).

Note for commissioning: during commissioning, the filter, pipelines and pumps must be pre-filled with fuel oil and vented.

The direction of rotation of the motor should be checked. When commissioning it must be ensured that pump never run dry.

NOZZLE SELECTION

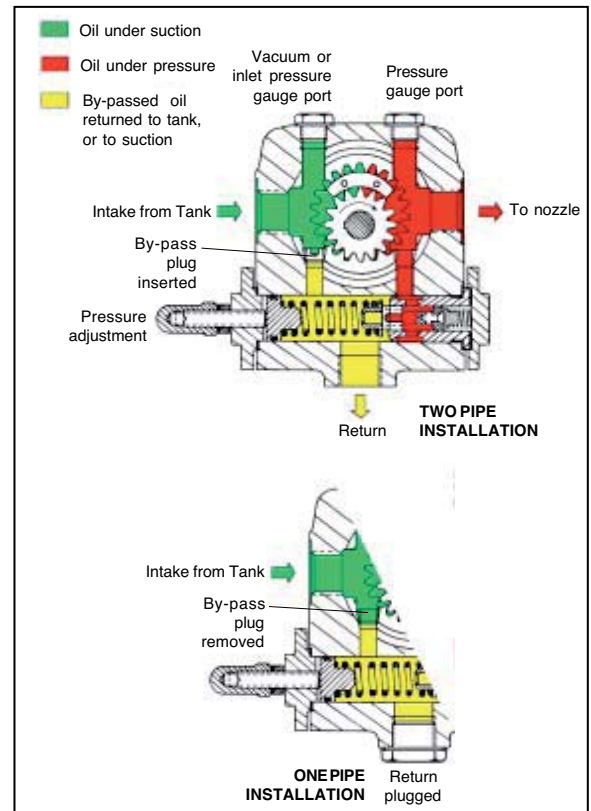
Please refer to diagram to select Ecoflam recommended nozzle for the output that is required given the output necessary in the installation.

Regular maintenance is highly recommended.

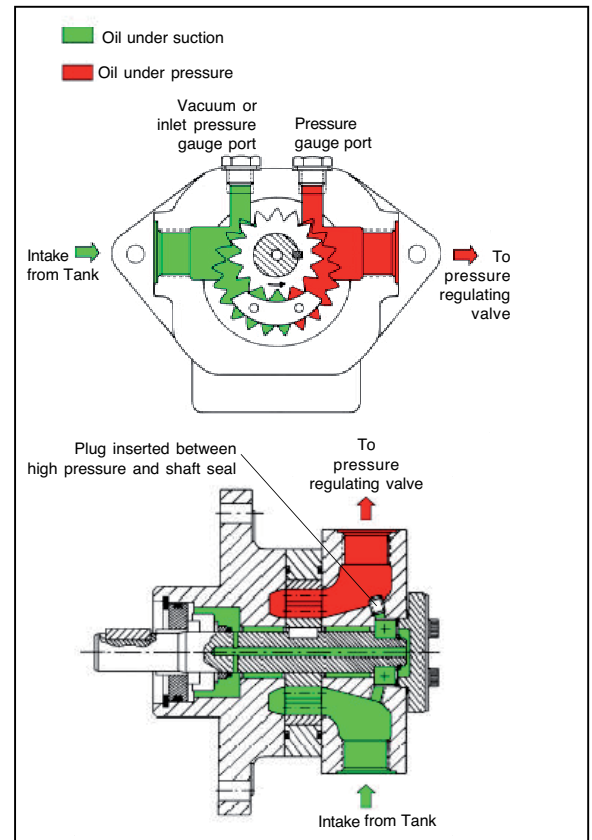
Nozzle has to be cleaned in petrol or paraffin and if filter or other parts are defective or damaged the nozzle must be replaced.

NOZZLE CHART IS AVAILABLE ON APPENDIX PAGE

SUNTEC TA



SUNTEC T



INSTALLATION

Electrical connections

! **WARNING:** Electrical wiring must be carried out with electrical supply disconnected and with burner switch in position OFF. Electrical supply must correspond to the one shown on the burner label.

APPLICABLE STANDARD

The electrical connection work comprising all the installation materials, terminals and earth connections must be carried out in accordance with the applicable regulations. For the electrical installation of the burner care must be taken to observe the circuit diagram made out for the furnace system.

The electrical connection of the burner and instruments shall be entrusted to authorized specialists only.

NOTE: For the installation of the connection cables care must be taken to provide cable loops of sufficient length to allow for the swing-out of the boiler door and burner.

Make sure after the completion of the electrical connection work to check the wiring of the electrical system of the burner. This should include a check of the direction of rotation of the burner motor (fan).

GENERAL WARNINGS:

All applicable electrical safety regulations must be followed. Failure to correctly dimension the suitable input power and earth the equipment may cause damages to person and compromise the correct function of the burner therefore the electrical system shall be checked by qualified personnel.

The manufacturer declines all responsibility for modifications or connections different from those shown in the electrical scheme.

Adapters, multiple plugs and extension cables may not be used for the equipment's power supply.

A multi-pole switch in accordance with current safety regulations is required for the mains supply connection.

ELECTRICAL CONNECTION

1) of the burner

- Built-in electrical cabinet

Use cable gland in order to secure the required level of protection. All the links, power and control, are connected to the terminal block of the cabinet. Provide cables in sufficient length to secure the rotation of the burner body according to the assembly.

Check and adjust the size of the contactors and thermal relays and the wires section according to the motor and supply voltage specs.

ATTENTION: Wiring is not supplied.

2) of the fuel oil motor-pump unit

- Connect the power circuit of the motor (hanging wires) to the plugs on the fuel oil valves.

- Check proper motor rotation.

The burners are produced with connections suitable for power supply 380-400 V three-phase.

The burners with electric motors of an output lower or equal to 3 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 3 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 1);

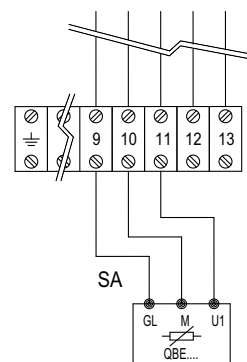
2. change the setting of the thermal relay, referring to the absorption values indicated in the motor nameplate. If necessary, replace the thermal relay with another one of suitable scale.

This operation is not possible on motors above 3 kW.

For more information, please contact the Ecoflam staff.

PROBES CONNECTION

ACTIVE PROBE CONNECTION (FOR MODULATING VERSION)



PASSIVE PROBE CONNECTION (FOR MODULATING VERSION)

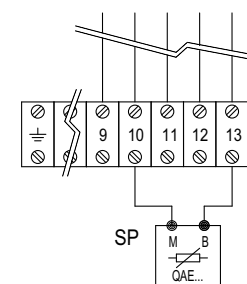
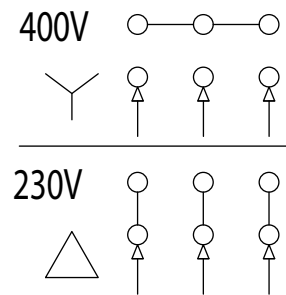
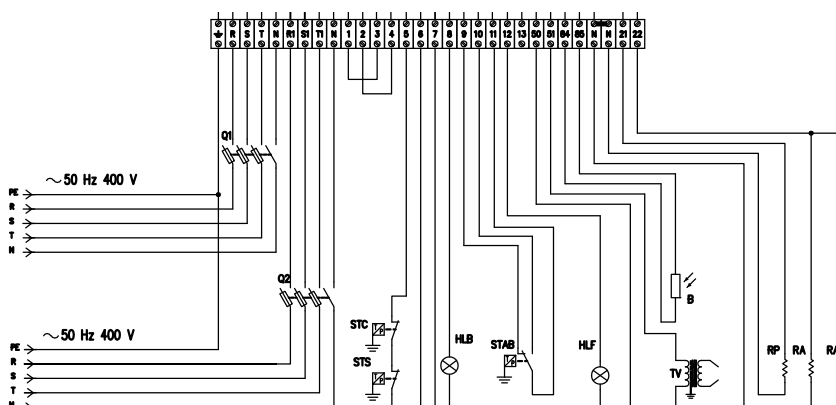


fig.1



LEGEND

HLB: lock-out lamp
STAB: two stages thermostat
HLF: burner on flame lamp
STC: boiler thermostat
STS: safety thermostat
SA: active probe
SP: passive probe



START-UP: CHECKING PROCEDURE

CHECKS BEFORE COMMISSIONING:

- That the burner is assembled in accordance with the instructions given here.
- Setting the combustion components.
- All electrical connections must be correct.
- Check the burner motor for correct direction of rotation.
- The heat generator must be ready for operation, and the operating regulations for the heat generator must be observed.
- The heat generator and heating system must be filled with water and the circulating pumps must be in operation.
- The temperature regulator, pressure regulator, low water detectors and any other safety or limiting devices that might be fitted must be connected and operational.
- The exhaust gas duct must be unobstructed and the secondary air system, if available, must be operational.
- An adequate supply of fresh air must be guaranteed.
- Check tank, lines and oil pump are filled with oil and correct oil nozzle is fitted.
- With burner in starting position check that air damper is in "CLOSED" position.
- Check that control box is unlocked and in its original position.
- A standard-compliant measuring point must be available, the exhaust gas duct up to the measuring point must be free of leaks to prevent anomalies in the measurement results.

OIL START-UP

Open all shut-off valves of oil supply system.

- Set fuel selector switch to its "Oil" position.
- Fill pump with oil.
- Mount pressure gauge in the feed line and return line.
- Mount the pressure gauge for checking the pump suction pressure.
- Make sure that the nozzle is size and mounted correctly.

Bleeding of oil system

Shortly start the burner and check for proper direction of rotation. Bleed the oil line and oil pump.

CAUTION: The hydraulic system has been filled with oil by the manufacturer. This may cause ignition trouble when initially operating the system. When starting the burner take care to increase the oil pressure slowly to the operating level.

Prior to the initial fuel feed start make a functional test of the burner program flow:

Oil system:

- Open all shut-off valves of the oil supply system.
- The oil solenoid valve in the feed line disconnect on the terminal strip (see Circuit Diagram).
- Start burner and check program flow for correct start-up sequence:
 1. Fan starts.
 2. Pre-ventilating damper.
 3. Air pressure check.
 4. Partial-load air damper.
 5. Ignition.
 6. Valves open (disconnected valve remains closed).
 7. Safety lock-out after expiry of safety period (see control box).
- Reconnect the valve.
- Unlock the control box.



Recording commissioning data

Test	n°1	n°2	n°3	n°4
Date				
Model				
Type oil				
Oil calorific value				
Burner output min kW				
Burner output max kW				
Flue gas temperature C°				
Air temperature C°				
CO ₂ %				
CO ppm				
NOx ppm				
Performance %				
Corrective action				
Operator name				
Company				

EXHAUST GAS TEST

To ensure an economically efficient and trouble-free operation of the system it will be necessary to adjust the burner specifically in accordance with the furnace system. This is achieved by means of a fuel-combustion air compound control unit which adjusts the burner to ensure a proper combustion. Exhaust gas tests are required for this purpose.

The percentage CO₂ and O₂ and the exhaust gas temperature will have to be measured to determine the efficiency and combustion quality.

Prior to any measurement make sure to check the boiler and exhaust gas system for absence of leaks.

Secondary air will falsify the measured results

Check that the exhaust gases have a residual oxygen (O₂) content as low as possible and a carbon dioxide (CO₂) content as high as possible.

The carbon monoxide content of the exhaust gases must be below the currently applicable specifications in all load stages. In the fuel oil combustion mode the permissible soot number in the exhaust gas is not allowed to be exceeded

Recommended combustion parameters

Fuel	Recommended (%) CO ₂	Recommended (%) O ₂
Natural gas	10 ÷ 9	3,1 ÷ 4,8
Light oil	13 ÷ 11,5	3,3 ÷ 5,3
Heavy oil	12,5 ÷ 11	4,2 ÷ 6,2

WARNING: if the installation is above sea level the output of the burner vary base on the diagram.

The regulation of the burner in this case shall take into account the reduced power of the burner due to the missing air.

Ratio between O₂- and CO₂-
for natural gas H (CO₂max = 11,7%)

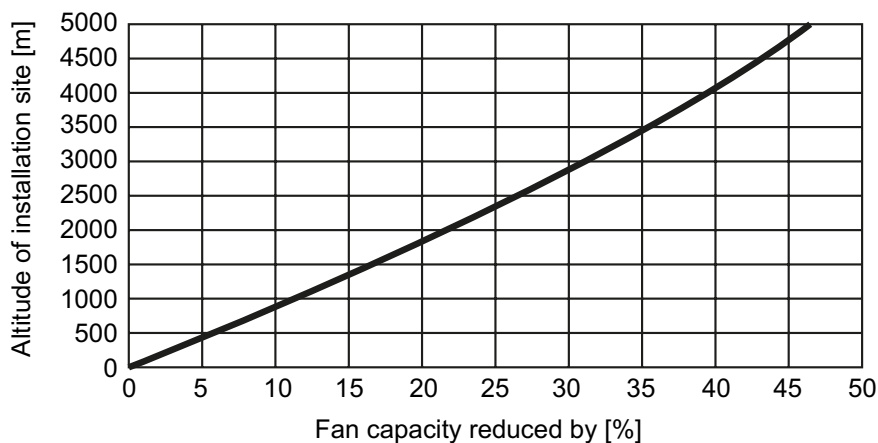
Ratio between O₂- and CO₂-
for light oil EL (CO₂max = 15,40%)

Ratio between O₂- and CO₂-
for heavy oil S (CO₂max = 15,60%)

$$O_2 = 21 \frac{CO_2max - CO_2gem}{CO_2max} = \%$$

CO₂ gem = % CO₂ measured on dry flue gases

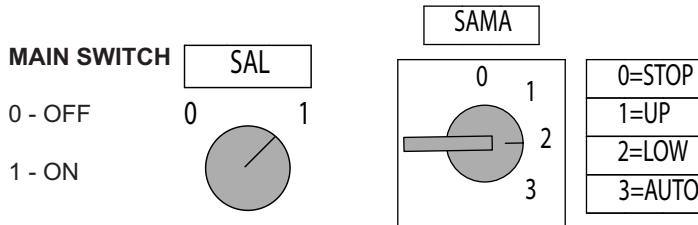
Mean air pressure vs. altitude above sea-level



START-UP

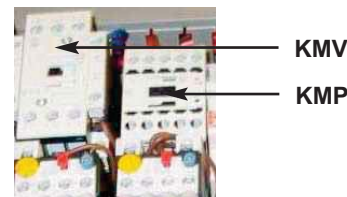
Fuel selection - Start-up

Select the oil operation in order to proceed with start up on the oil side. On the selector put the operation on minimum capacity.



- 0 : operating elements locked in an intermediate position.
- 1 : operation on maximum capacity
- 2 : operation on minimum capacity
- 3 : automatic operation

! KMP - KMV contactor: check the oil pump motor and air fan motor rotation and keep KMP pressed till the oil circuit is loaded. If the rotation is not correct invert the two phases on the power supply.

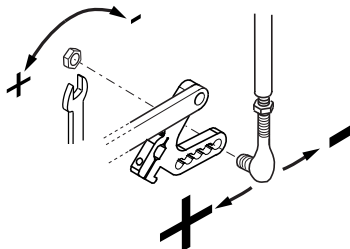


START UP THE BURNER

The control box starts the pre-purge cycle, the fan motor and the oil motor and opens the air flaps in full open position. At the end of pre-purging, the control box drives the servomotor into the ignition position and starts the ignition transformer. After a few seconds the control box opens the oil valve and starts the flame. After the flame stabilisation the control box drives the servomotor in the low flame. In case of faulty ignition, the control box switches the burner into safety condition, in such a case you must rearm the burner. Gradually go step by step using the selector on position 0 to stop the flame, from the low flame to the high flame in order to have a stable flame. For each position from 0 to 90° do oil setting adjusting oil return pressure as described in the next pages. When the servomotor arrives at 90° you have completed first tuning of air and oil flow according to the boiler capacity required. Check the combustion values and adjust the oil pressure.

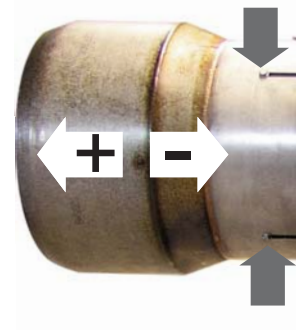
Adjusting the maximum air flow rate

In order to adjust the maximum air flow rate see figure with selector in maximum operation. Loosen the nut holding the air damper transmission rod and correct air flow till you reach the combustion values suggested by reading the value on the combustion analyser. If you do not reach acceptable air flow rate you shall adjust the firing head. Move the blast tube backwards to increase air flow forward to reduce.



Firing head setting

The firing head is pre-adjusted at the 50% from the factory. The setting fully open enables to reach the full power of the burner and full close to reach the minimum power of the burner. The optimal position depends on the output that we need to reach but the default setting shall be modified only when you are not able to reach the suggested combustion value by adjusting the air flow in the maximum flame.



START-UP

Gefran setting



The display shows oil temperature.

The 4 leds are related to the following functions:

- Out 1: contact driving working heaters
- Out 2: contact driving upper heaters KMRL1
- Out 3: contact driving upper heaters KMRL2
- Out 4: burner start driving contact (as the oil reaches this temp the pump is activated)

The temperatures are already properly factory setted:

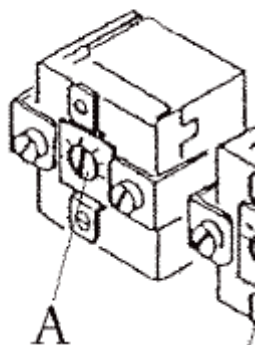
- Out 1 (113°)
- Out 2 (115°)
- Out 3 (120°)
- Out 4 (105°)

WARNING: Burner will start only when the first three led of the temperature will be off so that heavy oil will be in temperature.

To modify factory temperature setting act as follow:

- press key "F"
- the led Out 1 starts to ash, if You need to modify minimum oil temperature press increase or decrease button, after confirm the new value pressing again "F"
- if you need to modify an other temperature press again "F" untill You the relevant led ashes.

Please take care: if key "F" is pressed for a too long time, you enter in "configuration level" phase 1, (see "CF1" on the display); these parameters are factory setted and they have not to be modified: if you enter this function – you see CF1 ashing on the display – wait 10 seconds untill the regulator automatically goes out from "configuration level".



ADJUSTMENT OF FUEL THERMOSTATS

Inside the electrical panel there is a safety thermostat that is set up at 160°C.

Said adjustments can be slightly modified following the type of fuel and particular uses.

START-UP

Adjusting the maximum oil flow rate

Put the selector on the maximum operation. Adjust the oil pressure reading the value on the return manometer / pressure gauge according to the nozzle tables provided in the appendix.

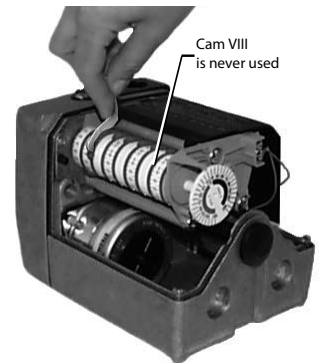
NOTE: the pump pressure is set from the factory at the pressure required nozzle pressure required as per table of nozzle selection in appendix. If the output required is different from the one set from the factory the pressure can be adjusted according to the instruction below.

Servomotor SQM50 - Air damper motor pre-setting

The cams of the servomotor are set from the factory in order to start the burner and reach the maximum output.

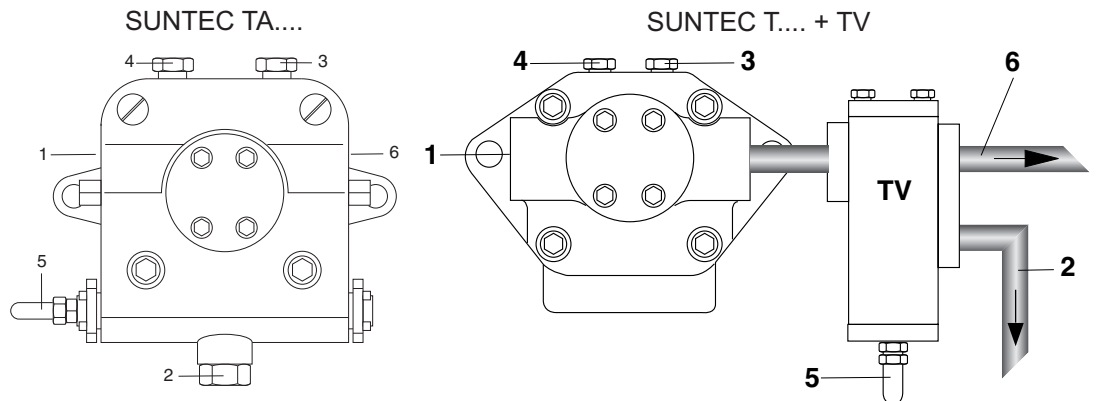
The following setting are the standard one:

- I. High flame position 90° (maximum value 70°).
- II. Air flap position in standby 0° (minimum value 0°).
- III. Ignition position 15°.
- IV. Low flame position 40° (can be modified depending on the minimum output of the boiler).
- V. To VIII not used



Adjusting the pump pressure

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



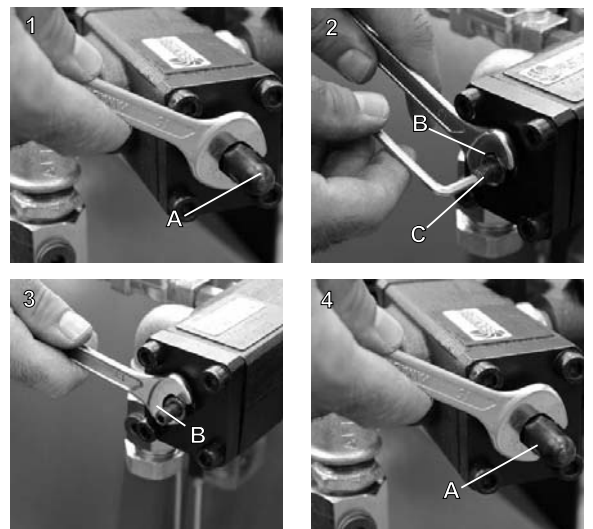
The pump pressure is set at a value of 22-25 bar during the testing of burners. Before starting the burner, bleed the air in the pump through the gauge port.

Fill the piping with heavy 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 pre-purging, 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.

Adjusting the valve TV

1. Remove the cap A of the pressure regulating valve TV.
2. Loosen the fixing nut B and use an Allen wrench on the screw C to adjust the delivery oil pressure. To increase the pressure turn clockwise, to decrease the pressure turn anticlockwise.
3. Tighten the nut B and pay attention not to turn also the adjusting screw.
4. Screw on the cap A, back to its previous position.



START-UP

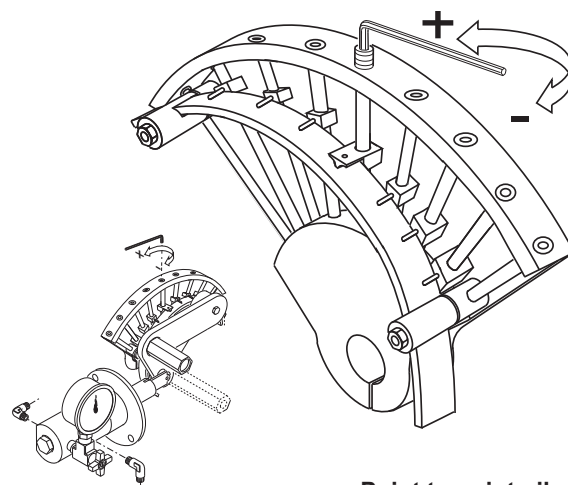
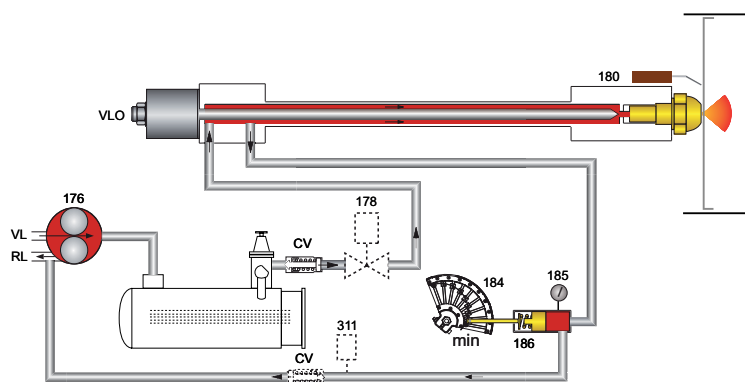
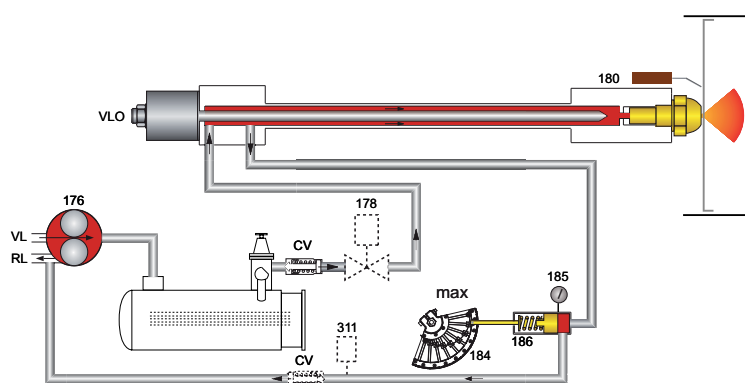
Adjusting the intermediate burner capacity

In order to adjust intermediate capacity of the burner use the selector on position 0 to stop the stroke and regulate the cam on the different screw position.

The adjustment shall be done according to the drawing in order to have the correct combustion value in each point "+/-" switch (different screw positions).

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.

WARNING: the variable profile of the cam shall have a normal proportional curvature in order to have good combustion values and reduce its mechanical stress breakdown.



Point to point oil cam configuration

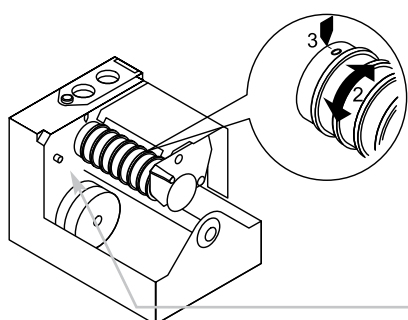


WARNING: Once the setting on the oil has been completed make sure that you close the manometer – pressure switch tap.

LEGEND

- 176: oil pump
- 178: solenoid valve
- 180: nozzle rod
- 184: output control valve
- 185: manometer
- 186: pressure regulator
- 311: return oil pressure switch
- CV: check valve
- RL: return line
- VL: suction line
- VLO: working oil valve

Servomotor SQM50 - Final setting



Once the point to point oil cam setting has been completed we need to set the final minimum output of the burner using the servomotor cam VI (low flame oil). Using the suitable key regulate the grades (" +/- " switch).

The low flame position must be higher than the ignition position cam on the servomotor. Turn the burner off and start it again in order to check if the burner start properly otherwise adjust the ignition oil cam number IV.

OIL SETTING ENDED: switch the selector to automatic position.



WARNING: Do not use the button cam drum release button.

MAINTENANCE PROGRAM

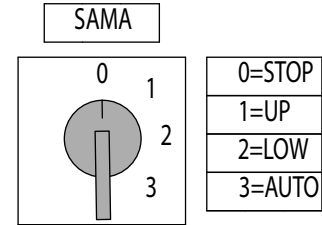


Burner and boiler servicing must only be carried out by authorised qualified personnel at least once a year. Depending on the type of installation, shorter maintenance intervals may be necessary. The system operator is advised to take out a maintenance contract to guarantee regular servicing.
WARNING: Use original spare parts.

SAFETY WARNINGS:

1. Turn off the power supply and protect the system from accidental start-up.
2. Cut oil supply.
3. Make sure there is no residual power in the system and that the actions in points 1 and 2 have been completed.
4. Before opening the burner casing, ensure that the fan motor has stopped completely.

Failure to observe any of these instructions will result in the risk of death or injury!



WORKS RECOMMENDED AS PART OF ANNUAL BURNER MAINTENANCE:

- Emergency stop button function check
- Check burner start characteristics
- Run burner test and input measurement in the boiler room
- Clean the combustion components and replace defective parts if necessary
- Check the combustion head components and make sure that all components are in good condition otherwise replace them
- Replace ignition electrodes and nozzle if necessary and check their correct position after any intervention
- Flame monitor and automatic combustion control unit function check
- Clean the fan wheel and the housing and grease rotating parts if necessary
- Clean the oil filter cartridge with gasoline periodically and check the tightening of the O rings, replace them if necessary
- Make visual inspection of the burner's electrical components and eliminate malfunctions if necessary
- Burner safety devices function check (air pressure/gas pressure switches)
- Commissioning the burner and correct the adjustment values if necessary

NOTES ON REASSEMBLING: Perform the described step in reverse order and make sure to refit components as they were originally assembled and the system is free from leaks. Use only original spare parts.

DRAW UP A MEASUREMENT REPORT ACCORDING TO THE LOCAL REGULATION AND CODES OF PRACTISE OF THE COUNTRY

EXHAUST GAS LOSS

Exhaust gas loss by way of free heat will occur as a result of the temperature difference between the fuel-air mixture entering the furnace chamber and the gases discharged. Any increase in the excess of air and the resultant higher exhaust gas volume will cause the exhaust gas loss to rise. The exhaust gas loss can be calculated as follows:

$$q_A = (t_A - t_L) \frac{A_1}{CO_2} + B$$

- q_A = exhaust gas loss [%]
- t_A = exhaust gas temperature [°C]
- t_L = combustion air temperature [°C]
- CO_2 = volumetric content of carbon dioxide [%]

	Light oil EL	Heavy oil S	Natural gas	Town gas	LPG
A1	0,50	0,490	0,370	0,350	0,420
B	0,007	0,007	0,009	0,011	0,008

Example

Data measured in natural gas mode:
 CO₂ content of exhaust gases: 10,8%
 Exhaust gas temperature: 195°C
 Air intake temperature: 22°C

The exhaust gas loss can be calculated as follows:

$$q_{Af} = (195-22) \left(\frac{0,37}{10,8} + 0,009 \right) = 7,48\%$$

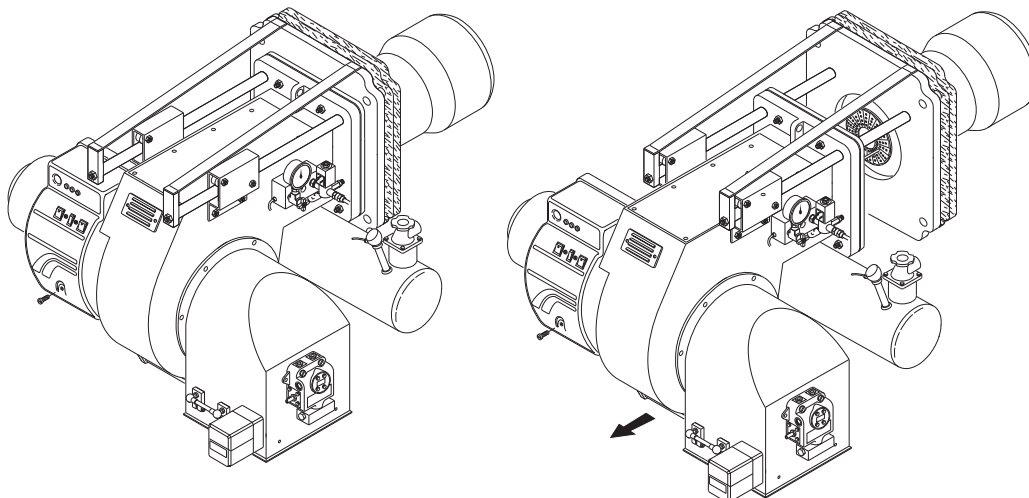
Data measured in fuel oil mode:
 CO₂ content of exhaust gases: 12,8%
 Exhaust gas temperature: 195°C
 Air intake temperature: 22°C

The exhaust gas loss can be calculated as follows:

$$q_{Af} = (195-22) \left(\frac{0,49}{12,8} + 0,007 \right) = 7,83\%$$

MAINTENANCE PROGRAM

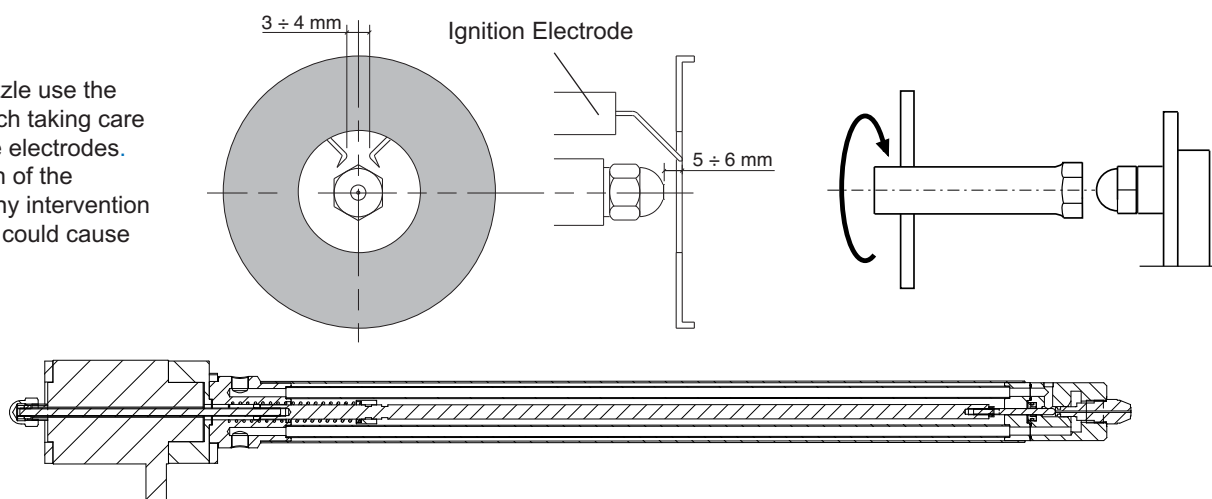
REMOVING THE FIRING HEAD



POSITION OF ELECTRODES

ATTENTION:

to remove the nozzle use the suitable box wrench taking care to not damage the electrodes. Check the position of the electrodes after any intervention as wrong position could cause ignition troubles.



OIL FILTER CLEANING



ATTENTION: Periodically clean oil cartridge with gasoline and replace them if it is necessary!

TROUBLESHOOTING INSTRUCTIONS

The list of faults/causes/possible solutions for a set of main failures is a guideline for professional personell authorised to carry out service and maintenance.

Irregular burner operation or malfunction: check that every adjustment parameter is correctly set as per instruction on this manual.

TROUBLESHOOTING TABLE OIL OPERATION			Burner doesn't start	Fuel pump noisy / unprimes / leaks	Burner starts with continuous pre-purge	Burner starts and then goes into lock-out	Pilot Ignition failure (1st safety time - LFL only)	Main Ignition failure (2nd safety time)	Burner lock-out after flame appearance / pulsation	Flame control repeats the cycle and doesn't give consent	Smoke in flame - dark Bacharach	Burner doesn't switch into Hi flame	Burner lock-out during operation	LFL	LAL
STATUS	CAUSES	REMEDIES													
HEAVY OIL	Preheating period too long	Check GEFRA controller, replace if necessary	X								X		X	YES	YES
	Defective Gefran controller	Replace control unit	X								X		X	YES	YES
PRE-START (MISSING SIGNALS)	Defective control box unit	Replace control box unit	X			X	X	X	X	X		X	X	YES	YES
	No electrical power supply Wrong electrical connections	Check switches/contactors Check connections	X											YES	YES
	Air pressure switch not "closed"	Check contacts	X											YES	YES
	Boiler thermostats open	Check contacts	X											YES	YES
	Fan motor overload intervention	Replace fuse	X											YES	YES
	Auxiliaries fuses interrupted	Replace fuse	X											YES	YES
	Servomotor [CLOSE] position switch not reach	Check servomotor settings	X											YES	YES
PRE-START (OIL PUMP)	High vacuum in oil pipe due to dirty filter	Clean filter or replace filter cartridge		X							X			YES	YES
	Burner is higher than oil tank by more than 3 m	Reduce Height or prepare a ringline pump		X							X			YES	YES
	Air in the oil pipeline	Re-tighten pipe connections		X										YES	YES
SEQUENCE START	Servomotor [OPEN] position switch not reach	Check servomotor settings			X									YES	YES
	Servomotor [MIN] position switch not reach	Check servomotor settings			X									YES	YES
	Extraneous Light	Eliminate light source				X								YES	YES
	Fuel solenoid valve fails to close (Light oil Burner - direct ignition)	Clean valves or replace if necessary				X								YES	YES
LACK OF AIR	Air pressure switch fail to connect to Terminal 14	Check contacts				X								YES	NO
	Fan contaminated/dirty	Clean fan				X					X		X	YES	NO
	Fan motor rotation direction not correct	Check direction and contactor				X					X		X	YES	NO
IGNITION & FLAME STABILISATION PERIOD	Flame supervision circuit internal test failed	Replace control unit				X								YES	NO
	Pilot flame failure - Pilot gas valves not open	Check valves contacts / replace if necessary					X							YES	NO
	Pilot flame establish - weak flame signal	Check flame sensor Replace if necessary					X							YES	NO
	Ignition transformer faulty	Replace					X	X						YES	YES
	Ignition cable & electrodes defective	Replace					X	X						YES	YES
	Electrode bad position	Check setting / replace if necessary					X	X						YES	YES
	Fuel oil solenoid valve fails to open	Check contacts and clean valves. Replace solenoid coil if necessary						X						YES	YES
ONLY FOR OIL BURNER	Air pressure switch not close, Oil pump contactor open	Check air pressure switch contacts						X						NO	YES
	No oil supply	Check shut-off valves Check Pump, replace if necessary						X						NO	YES
	Oil pump coupling broken	Replace pump unit						X						NO	YES
COMBUSTION	Flame sensor signal failure	Clean, re-position or replace if necessary				X	X	X	X				X	YES	YES
	Head adjustment not correct	Check settings							X		X		X	YES	YES
	Oil/Air mixture setting not correct	Check settings							X		X		X	YES	YES
	Dirty combustion head	Clean or replace disk if necessary							X		X		X	YES	YES
	Nozzle dirty or damaged	Clean or replace nozzle if necessary							X		X			YES	YES
	Fuel pressure inappropriate	Adjust pressure or replace pump if necessary							X		X		X	YES	YES
	Capacity reduction	Check filter, pump pressure and nozzle. Replace item if necessary									X			YES	YES
	Load control device does not close	Check load control, replace if necessary										X	X	YES	YES

OPERATING TROUBLE

In case of operating trouble it should be checked whether the system is in proper working order.

Make a check for the following:

1. Availability of fuel oil in the tank.
Correct position of fuel selector switch.
2. Availability of electric power in the burner system.
3. Proper functional order and setting of all control and safety instruments such as temperature controller, safety limiter, water failure cut-out, electrical limit switches, etc.

If the trouble is not found to be due to any of the above-mentioned points it will be necessary to test the burner functions very carefully.

Prevailing conditions:

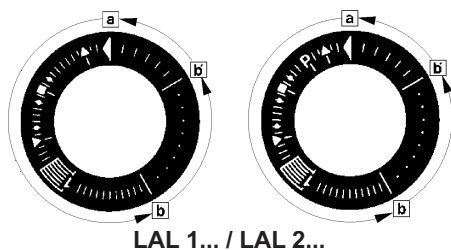
The burner will be found to be out of operation and in faulty and interlocked position. Proceed with searching for the cause of the trouble and eliminate it. Unlock the control box by pressing the fault eliminate key and start the burner.

Do not press the fault eliminate key longer than 10 seconds.

The start-up program will be initiated and should be carefully monitored.

The possible cause of the fault may be quickly found by reference to the fault indicator of the control box and watching the start-up and operating program.

Control program in the case of trouble and fault indicator LAL 1... / LAL 2...



a-b Starting program

b-b' In a number of time versions; idle steps of the program unit to self-stop after burner start-up (b' = operating position of program unit)

b(b')-a After-flushing program after regular stop. In the starting position "a" the program unit will automatically stop or initiate an immediate restart of the burner, e.g. after a fault has been eliminated

- Duration of the safety period for single-tube burners
- Duration of the safety period for burners with ignition gas valve

Basically, any type of trouble will result in the immediate stop of the fuel supply. At the same time, the program unit and consequently the fault indicator will stop. The type of trouble can be identified by the symbol opposite to the reading mark of the indicator:

◀ **No start**, e.g. because the "CLOSED" signal from the "Air Damper CLOSED" limit switch is missing or a contact is not closed between terminals (12) and (4) or (4) and (5); or the contacts of all control and safety units in the controlled system are not closed (e.g. gas pressure or air pressure switches, temperature or pressure regulators).

▲ **Operating stop** because the "OPEN" signal from the "Air Damper OPEN" limit switch is missing. Check and adjust the limit switch concerned.

P **Shut-off on trouble because there is not air pressure** signal at the beginning of the air pressure check (apply only to LAL 2.25).

Any air pressure failure after this time will also lead to a shut-off on trouble.

■ **Shut-off on trouble** because of a fault in the flame monitoring circuit.

▼ **Operating stop** because the position signal of the "Partial Load" limit switch (air damper in "Partial Load" position) is not available on terminal (8). Check and adjust the limit switch concerned.

1 **Shut-off on trouble** because a flame signal is not available on the expiry of the (1st) safety time.

Any failure of the flame signal on the expiry of the safety time will also lead to a shut-off on trouble.

| **Shut-off on trouble** because the flame signal failed during burner operation or a lack of air has occurred.

◀ **Shut-off on trouble** during or after the control program flow due to external light (e.g. by flame not extinguished, leaking fuel valves) or a faulty flame signal (e.g. fault in flame monitoring circuit, or similar); see flame monitor.

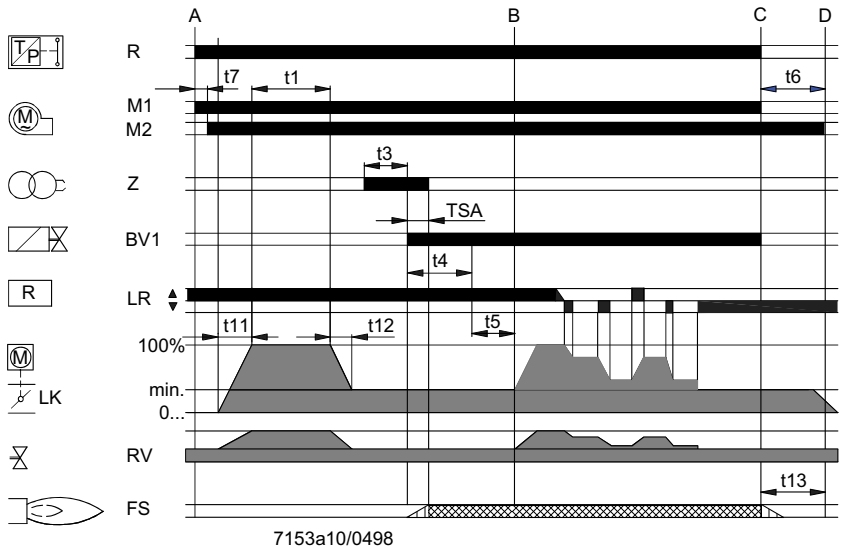
If the shut-off on trouble occurs at any other time between start and pre-ignition that is not identified by a symbol as above, this will normally be due to an early flame signal which is considered to be a faulty flame signal.

The automatic furnace controller may be unlocked immediately after a shut-off on trouble using the unlock button with integrated fault signal lamp or an external switch. After it has been unlocked (and after a defect with resultant operating stop has been eliminated and after a voltage failure), the program unit will in any case return to its starting position with voltage being only supplied to terminals 7, 9, 10 and 11 as preset by the control program. It is only at this stage that the program of the automatic furnace controller will restart the burner.

APPENDIX

Control box - Damper actuators

CONTROL BOX LAL...



A: Starting type interval
 A-B: Flame development interval
 B: Burner has reached operating position
 B-C: Burner operation (heat generation)
 C-D: Regular shut-off
 t1: Pre-ventilating time
 t2: Safety time
 t3: Pre-ignition time
 t4: Fuel valve enable
 t5: Load regulator enable
 t11: "OPEN" run time of air damper
 t12: "CLOSE" run time of air damper

- BV: Fuel valve
- FS: Flame signal amplifier
- LK: Air damper
- LR: Load controller
- M: Fan or burner motor
- R: Control thermostat or pressurestat
- RV: Modulating fuel valve
- Z: Ignition transformer

DAMPER ACTUATORS SQM50...

Description

The SQM actuator is intended for use with two-stage sliding or modulating oil, gas or dual-fuel burners. The reversible actuator is fitted with a synchronous motor which drives a shaft via a gearbox. The shaft end carries a coupling to drive the fuel and combustion air controlling element.

The SQM actuator has been designed for dual-wire control by controller or switching units with change-over contacts.

Potentiometers can be installed for a range of applications on customer's request.

The limit and auxiliary switches are set by means of manually adjustable latching cam plates. Scales are fitted between the disks to facilitate the selection of the switching points.

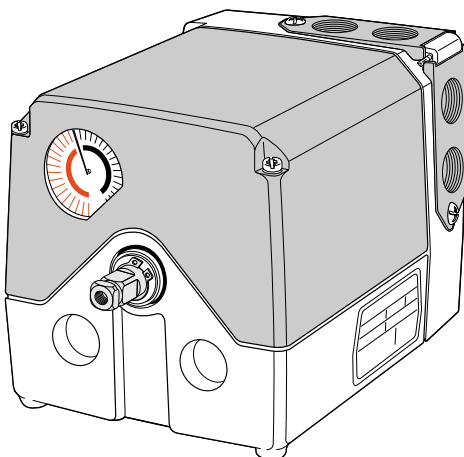
The cam plates are provided with a small pointer for indicating the switching point of a scale between the setting ranges.

An additional scale fitted to the end of the cam roller serves to indicate the position of the actuator.

The drive unit may be disconnected from the controlling element by changing over a rocker arm mounted to the gearbox.

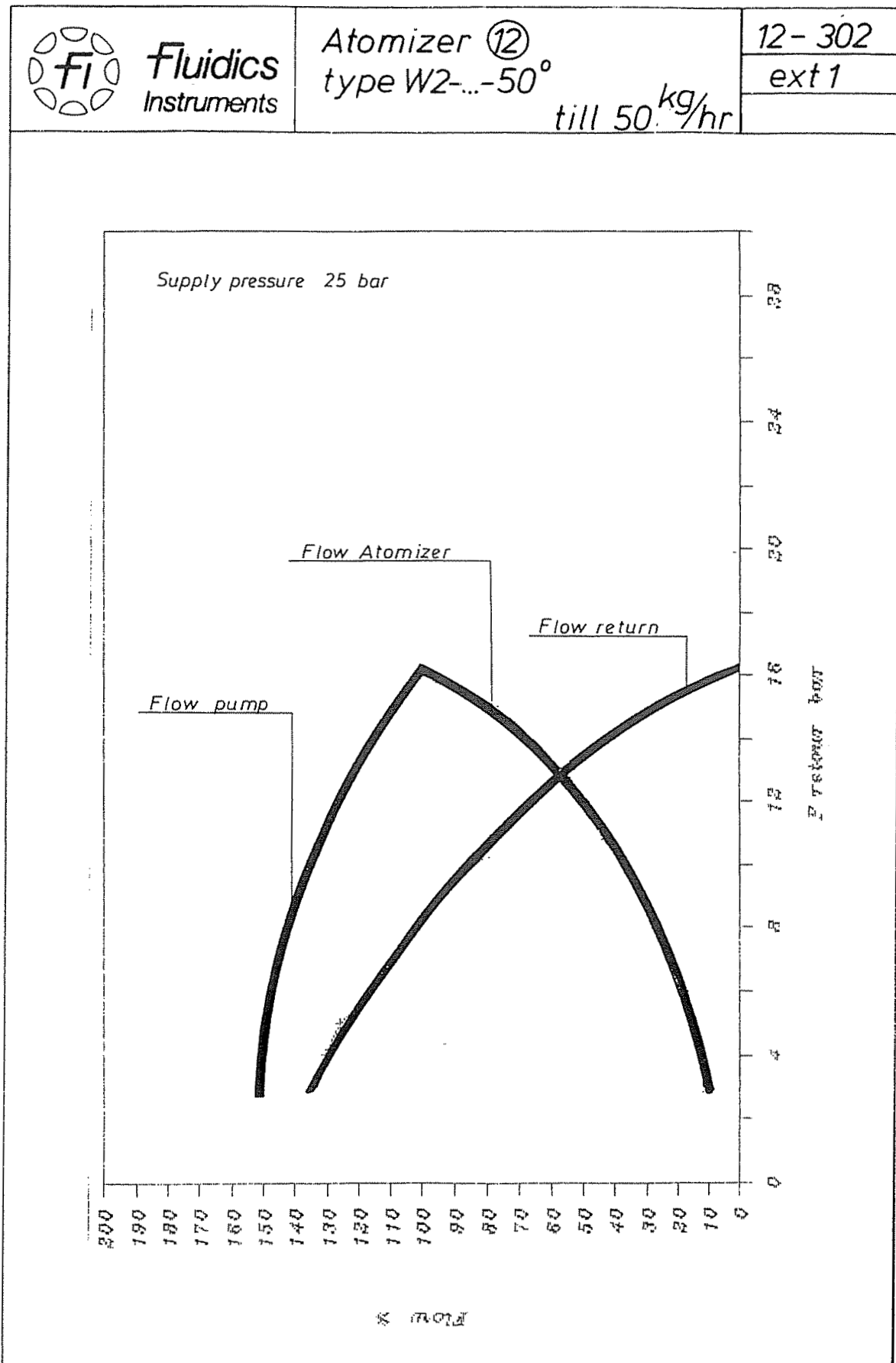
This will allow any desired position of the controller plate to be selected by hand. Drive and output will be coupled in the vertical position of the rocker arm.

The fuel-air curve should be set over the full range of the cam plate so that operating safety will be retained also when the limit switch is overrun.



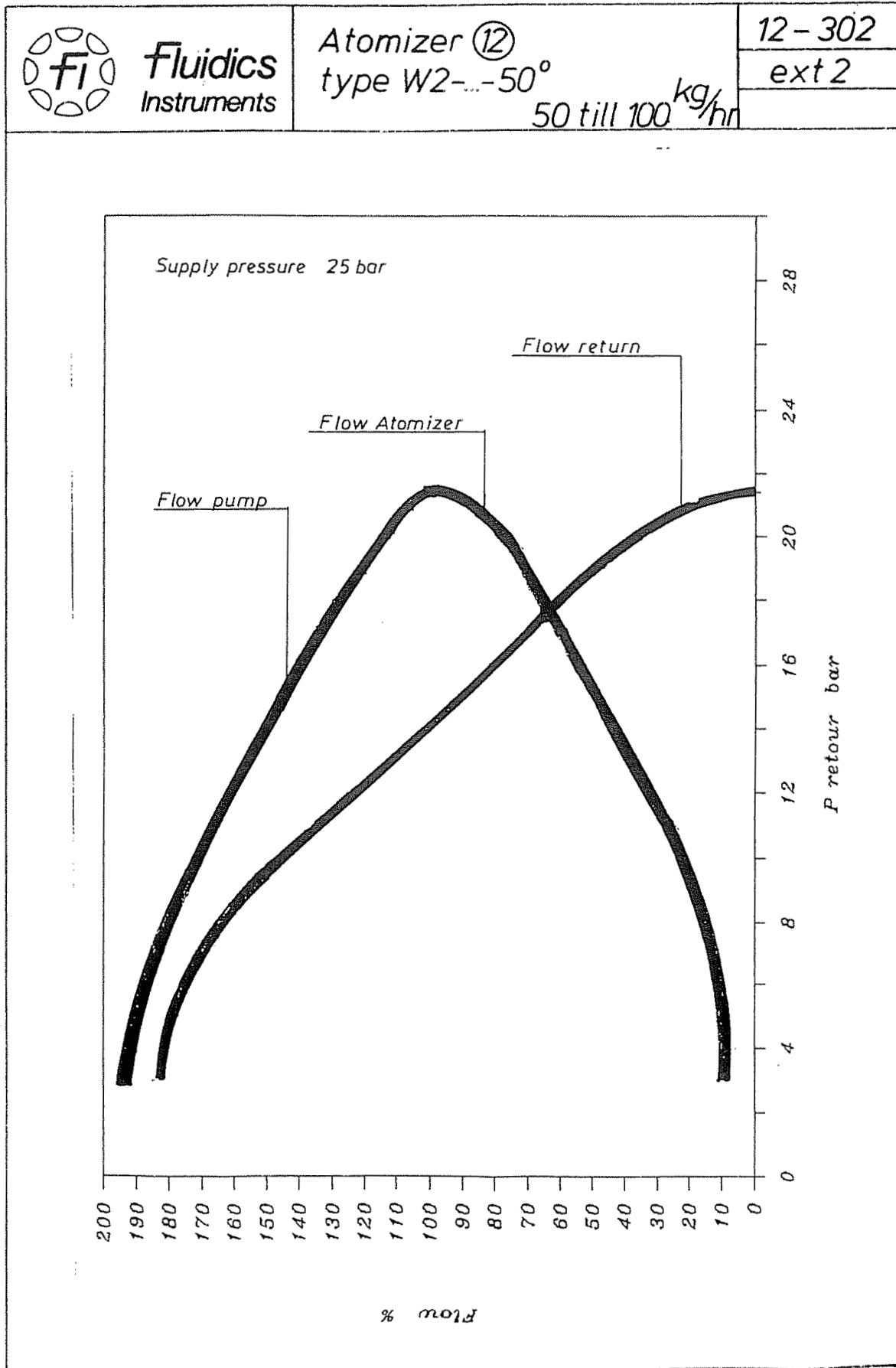
APPENDIX

Fluidics nozzle chart



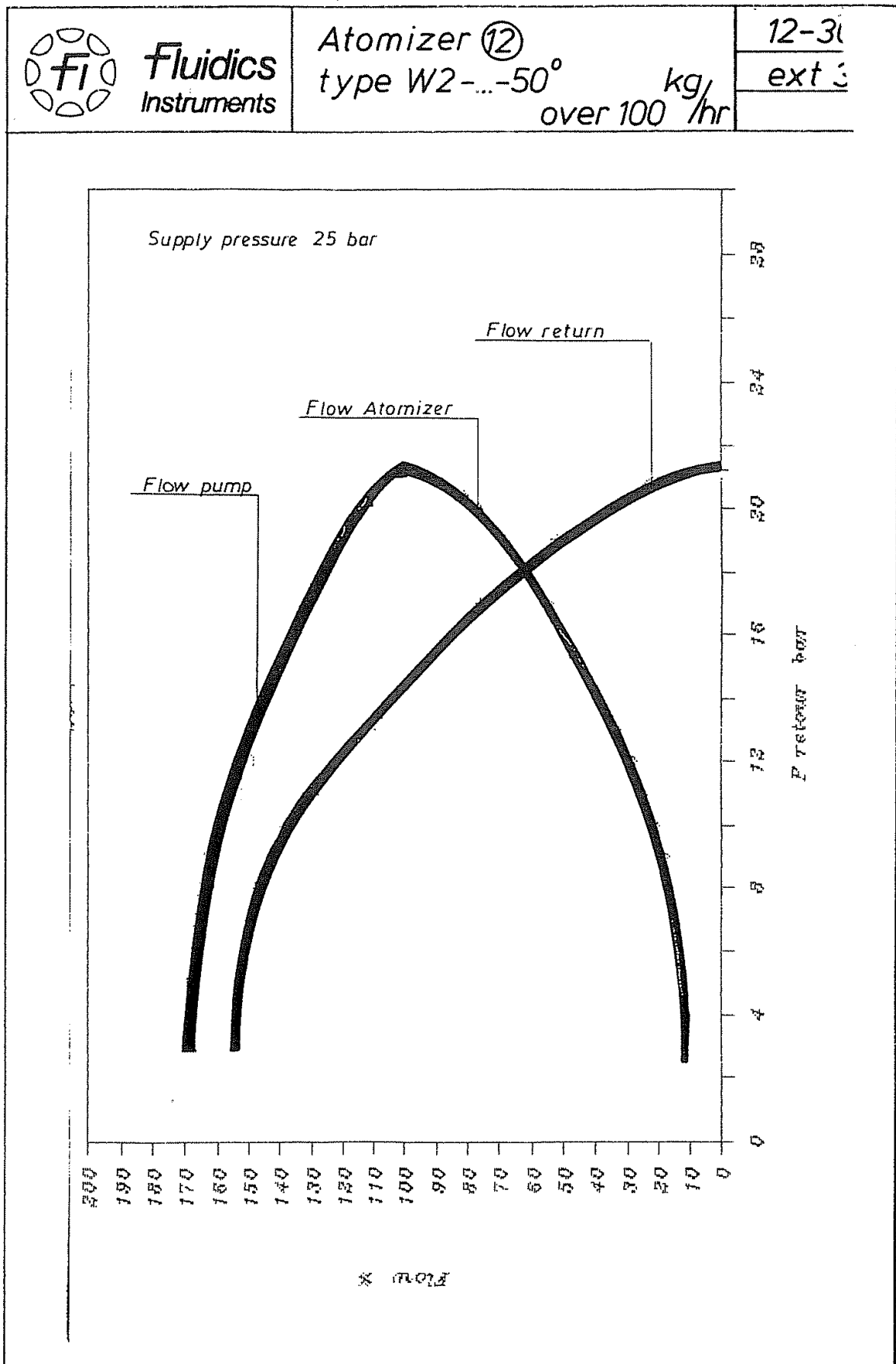
APPENDIX

Fluidics nozzle chart



APPENDIX

Fluidics nozzle chart



APPENDIX

Bergonzo nozzle tables

Return pressure [bar]

Nozzle kg/h	Bar	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
125	A	20	38	39	40	41	42	43	44	45	49	53	57	61	65	69	73	95	100										
125	B	20	300	300	300	295	285	275	275	265	245	230	215	200	185	174	153	140	120										
125	A	25	41	42	43	44	45	46	47	48	49	51	53	55	58	60	64	68	72	80	88	105	120						
125	B	25	330	330	330	325	320	315	310	305	295	290	285	280	265	240	230	220	200	190	170	150	130						
125	A	30	43	43	43	44	44	45	45	46	47	48	50	52	54	54	58	62	64	67	70	75	78	81	90	98	110	130	
125	B	30	360	360	359	358	357	356	355	355	350	345	340	335	330	320	310	300	290	280	270	255	240	220	205	190	175	155	135
150	A	20	47	48	50	52	54	56	58	61	64	68	72	78	85	92	100	110											
150	B	20	280	279	278	277	276	276	275	268	260	240	230	215	190	175	160	145	125										
150	A	25	52	52	53	54	55	56	57	58	60	64	68	72	76	80	85	90	97	105	118	128	142						
150	B	25	325	325	310	300	300	290	285	280	275	270	265	260	255	250	240	230	220	210	190	170	160						
150	A	30	57	56	55	54	54	55	57	58	59	60	62	65	68	72	75	80	84	88	93	99	105	112	120	130	145	145	
150	B	30	340	340	340	338	336	334	332	330	328	324	320	315	310	300	290	280	270	260	250	240	230	220	210	190	180	160	
175	A	20	55	57	59	62	64	66	68	72	75	80	82	90	95	102	115	130	150										
175	B	20	285	280	275	270	270	265	265	260	255	250	245	240	230	200	185	170	150										
175	A	25	60	61	62	63	64	65	66	68	70	72	78	80	82	85	92	98	105	110	120	140	160						
175	B	25	330	330	330	330	325	325	325	320	315	310	300	295	280	270	260	252	245	235	225	200	180						
175	A	30	67	68	69	70	71	72	73	74	75	76	77	79	80	82	85	90	92	95	100	105	110	118	125	140	160	180	
175	B	30	360	360	360	355	355	350	350	345	345	340	340	335	330	330	325	320	310	300	290	280	270	260	250	240	225	200	
200	A	20	57	58	59	60	62	65	68	72	78	82	92	100	110	125	140	160	180										
200	B	20	350	350	350	350	345	345	340	330	325	300	285	275	260	245	220	200	190										
200	A	25	65	66	67	68	70	71	73	75	78	81	86	90	95	100	108	115	122	135	150	170	190						
200	B	25	400	400	400	400	390	385	380	375	370	365	360	350	340	330	320	300	285	270	260	245	220						
200	A	30	66	67	68	68	69	70	70	71	72	75	78	80	82	88	92	98	102	108	113	118	125	130	140	155	175	225	
200	B	30	460	460	460	460	458	456	452	448	440	430	420	405	390	380	370	360	350	342	335	325	315	300	290	275	260	245	
225	A	20	65	68	70	72	76	79	84	88	91	94	102	110	118	125	140	160	200										
225	B	20	420	410	405	400	390	382	376	370	350	345	335	320	300	280	265	250											
225	A	25	72	73	74	75	75	76	79	82	85	88	91	95	100	105	115	120	130	145	160	180	225						
225	B	25	475	468	460	460	460	455	455	450	440	430	420	410	400	380	365	345	325	315	300	275	260						
225	A	30	78	78	78	79	79	80	82	84	86	88	90	91	94	98	100	110	115	118	125	130	135	145	155	175	200	240	
225	B	30	510	510	505	505	503	500	495	490	485	480	475	470	465	455	445	435	425	410	392	380	370	360	350	325	300	275	
250	A	20	76	78	80	84	88	90	94	105	110	118	125	135	145	160	180	220											
250	B	20	425	415	408	403	400	380	375	365	355	345	330	315	300	285	275	250											
250	A	25	87	88	88	89	91	94	96	100	104	108	112	122	132	142	155	162	175	180	210	225	250						
250	B	25	480	475	475	470	465	465	460	455	445	435	425	415	405	382	365	350	345	330	320	300	280						
250	A	30	89	90	90	92	94	95	96	98	102	106	109	112	118	124	136	144	155	160	170	180	190	210	225	235	265		
250	B	30	520	518	518	515	512	512	510	508	504	500	490	480	470	460	450	440	430	420	410	390	375	360	340	320			
275	A	20	80	84	88	92	96	98	104	112	118	125	135	142	152	170	190	230											
275	B	20	475	475	470	466	460	445	430	420	405	390	370	360	350	330	310	285											
275	A	25	92	93	94	95	96	98	100	105	110	118	120	130	138	145	155	164	178	195	210	240	265						
275	B	25	525	525	525	520	515	510	505	500	495	490	470	460	450	440	425	400	375	350	325	300							
275	A	30	105	106	107	108	109	110	112	116	118	120	125	130	135	138	142	148	154	160	170	180	190	210	225	250	280	330	
275	B	30	600	600	600	600	600	600	595	590	585	580	570	565	543	530	515	500	490	475	465	450	440	425	400	380	360		

A = nozzle output

B = pump output

Supply: 25 bar

APPENDIX

Bergonzo nozzle tables

Return pressure [bar]

Nozzle kg/h	Bar	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
300 A	20	85	88	90	94	98	100	105	110	115	125	135	145	155	170	190	225	275										
300 B	20	480	480	480	476	470	465	460	450	435	415	400	375	365	350	325	300	280										
300 A	25	100	100	100	102	104	106	108	110	113	116	120	125	135	145	155	165	180	200	225	255	310						
300 B	25	550	550	545	540	535	530	520	510	500	490	482	475	463	450	440	430	415	390	370	350	310						
300 A	30	105	106	107	108	110	112	114	116	118	120	124	128	132	136	140	146	152	162	175	182	195	210	230	260	290	340	
300 B	30	625	625	625	620	615	610	605	600	590	580	570	560	550	540	530	520	510	495	480	465	450	430	410	390	375	350	
325 A	20	95	96	97	98	100	103	106	110	120	130	140	150	165	200	240	260											
325 B	20	550	545	540	535	530	520	510	500	480	460	440	420	400	375	355	325											
325 A	25	108	107	108	109	110	112	114	116	118	125	132	141	150	160	170	180	200	225	250	280	330						
325 B	25	630	630	630	625	620	615	610	605	600	585	570	565	535	520	500	480	460	440	410	385	360						
325 A	30	115	115	116	117	118	119	120	122	126	130	135	140	147	152	160	170	180	190	200	210	225	242	260	280	310	330	
325 B	30	720	715	710	705	702	700	700	690	680	670	655	620	610	600	580	570	550	520	500	480	460	440	420	400	380		
350 A	20	105	107	108	109	110	115	118	125	135	145	155	170	190	215	240	275											
350 B	20	590	580	570	560	550	540	530	500	480	465	450	440	400	375	360	340											
350 A	25	120	122	124	126	128	132	134	136	138	140	145	150	155	165	175	185	200	225	255	275	350						
350 B	25	620	620	620	615	614	612	610	605	600	595	575	565	550	530	510	490	470	450	410	380	360						
350 A	30	125	125	127	129	131	133	135	138	141	143	145	150	155	160	168	174	184	195	210	225	245	265	280	325	370		
350 B	30	710	710	708	704	703	702	700	690	680	670	660	650	640	630	615	600	580	560	540	520	500	475	440	425	400		
375 A	20	110	114	118	127	134	137	140	145	152	162	170	180	195	210	250	290											
375 B	20	600	590	580	575	560	550	540	530	515	500	485	465	450	425	400	370											
375 A	25	130	130	130	132	134	136	138	140	146	150	155	160	170	180	195	210	230	250	275	320	375						
375 B	25	690	690	680	680	670	660	650	630	620	610	600	580	560	540	520	500	485	465	450	425	400						
375 A	30	135	136	137	138	139	140	142	144	148	151	155	160	166	172	180	190	200	210	225	235	250	270	300	340	370		
375 B	30	790	780	770	760	750	740	730	720	710	700	690	682	674	666	658	650	632	615	600	575	545	530	525	480			
400 A	20	130	135	140	145	150	155	160	170	180	190	205	220	240	263	330	370											
400 B	20	650	650	650	640	630	620	610	600	580	560	540	500	475	420	420	380											
400 A	25	130	135	140	145	150	155	160	170	178	185	195	202	212	225	250	270	290	320	340	375	400						
400 B	25	725	725	720	720	715	710	705	700	690	670	640	630	600	580	565	550	525	480	470	450	425						
400 A	30	152	153	154	155	157	162	165	170	176	180	190	200	210	220	230	245	260	270	285	300	325	365	400	425	450		
400 B	30	845	840	835	830	825	820	815	810	805	800	790	780	760	740	715	690	660	650	620	600	580	560	540	520	500		
425 A	20	120	125	130	135	140	145	150	165	175	185	210	230	250	275	300	350											
425 B	20	700	690	680	670	660	650	635	615	600	575	550	525	505	465	435	400											
425 A	25	145	146	147	148	149	150	154	157	160	170	180	190	210	225	245	265	280	320	360	400							
425 B	25	800	800	800	790	780	770	760	750	725	700	685	670	650	625	600	575	550	510	480	450							
425 A	30	150	150	149	148	147	146	145	148	154	160	168	177	185	195	205	225	238	250	270	290	310	325	360	380	450		
425 B	30	880	875	870	865	860	855	850	840	830	820	810	800	780	760	740	720	700	685	670	650	610	590	570	550	510		
450 A	20	130	135	140	145	150	158	165	175	185	200	210	230	255	280	320	375											
450 B	20	700	690	680	670	660	650	630	615	600	580	550	520	490	460	425	400											
450 A	25	145	145	148	151	154	158	162	165	170	180	190	200	220	240	255	280	310	350	390	450							
450 B	25	810	808	806	803	800	785	767	750	730	710	690	670	650	625	600	580	560	530	500	475							
450 A	30	155	156	157	158	160	162	165	170	175	180	187	194	200	210	220	230	240	260	275	290	310	340	375	420			
450 B	30	890	885	880	875	870	865	860	850	840	830	820	810	800	790	780	770	740	710	690	670	630	610	560	520	500		

Supply: 25 bar

Output [kg/h]

A = nozzle output

B = pump output

APPENDIX

Bergonzo nozzle tables

Return pressure [bar]

Nozzle kg/h	Bar	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
475	A	20	145	148	152	158	165	170	180	195	200	210	230	250	275	300	340	410											
475	B	20	740	735	730	720	710	700	680	660	640	620	490	560	530	500	475	450											
475	A	25	140	162	164	166	168	170	175	180	188	195	205	215	225	245	265	280	305	340	380	480							
475	B	25	850	845	840	835	830	820	810	800	790	780	760	740	720	700	675	650	620	580	540	510							
475	A	30	170	171	172	173	174	176	177	178	180	186	194	200	210	225	235	245	255	275	285	305	365	400	460	540			
475	B	30	910	909	908	907	906	904	902	900	890	880	865	850	835	820	800	785	765	750	725	700	675	660	635	600			
500	A	20	150	155	160	167	174	180	190	205	220	235	250	275	300	350	400												
500	B	20	740	730	720	710	700	685	665	650	630	610	590	570	550	520	490												
500	A	25	174	175	178	180	185	190	195	200	210	220	230	245	250	265	285	315	350	380	435	510							
500	B	25	845	840	835	830	825	820	815	810	800	780	765	750	725	700	675	650	625	600	580	550							
500	A	30	180	185	190	195	200	206	212	218	225	238	242	250	262	275	288	300	316	332	350	375	400	425	475	520			
500	B	30	945	940	935	930	925	920	915	910	905	900	880	865	850	835	815	800	775	750	725	700	685	650	630	610			
575	A	20	105	110	115	125	135	150	160	180	200	230	265	300	350	425	500												
575	B	20	910	900	890	870	830	800	780	750	720	690	670	640	600	580	530												
575	A	25	110	113	115	125	130	140	150	160	170	190	210	230	260	300	340	375	425	500	550								
575	B	25	1000	990	975	960	950	930	910	890	870	850	830	800	780	750	720	700	670	630	600								
575	A	30	120	122	125	127	130	135	140	145	155	165	180	195	210	230	255	280	310	340	375	420	475	530	600				
575	B	30	1190	1170	1150	1120	1100	1080	1050	1020	1000	990	975	965	950	920	900	880	850	820	800	770	740	700	670				
600	A	20	115	120	130	140	150	165	180	200	225	250	280	325	375	440	520												
600	B	20	920	900	890	850	820	800	780	760	740	710	690	670	650	610	580												
600	A	25	120	125	130	140	150	160	170	180	190	220	240	260	280	330	370	410	460	530	600								
600	B	25	1050	1030	1010	1000	990	980	960	940	920	900	880	840	810	790	760	730	700	680	650								
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600	B	30	1120	1115	1110	1105	1100	1095	1090	1085	1075	1050	1020	1000	980	960	940	920	900	880	850	825	800	780	720				
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650	B	20	990	950	920	900	890	870	850	800	780	760	710	680	660	620													
650	A	25	130	135	140	145	155	165	175	185	200	225	250	270	300	330	370	420	475	580									
650	B	25	1100	1090	1080	1060	1040	1000	990	970	945	920	900	880	850	820	800	780	750	720									
650	A	30	145	150	155	160	165	170	175	185	200	210	230	250	270	290	310	340	370	400	450	500	580	650					
650	B	30	1200	1195	1190	1185	1175	1150	1120	1100	1085	1065	1045	1020	1000	980	960	940	920	900	880	845	815	770					
700	A	20	130	140	155	170	180	200	230	250	280	325	375	425	500	630													
700	B	20	1000	980	960	940	920	900	880	850	830	800	780	740	700	680													
700	A	25	140	145	150	160	170	190	200	225	250	275	300	325	360	400	450	525	600	700									
700	B	25	1150	1130	1110	1100	1080	1060	1040	1020	1000	980	960	940	920	900	870	840	810	780									
700	A	30	150	155	160	170	180	190	200	215	230	250	270	290	320	345	370	400	440	480	540	600	680	780					
700	B	30	1250	1240	1230	1220	1210	1200	1180	1160	1140	1120	1100	1080	1060	1040	1020	1000	970	940	910	890	870	850					
750	A	25	150	155	160	170	175	185	195	200	225	240	260	280	320	350	375	400	500	600	750								
750	B	25	1200	1180	1160	1140	1120	1100	1080	1060	1040	1020	1000	980	965	950	930	900	880	850	820								
800	A	25	160	165	170	175	185	190	210	225	250	270	290	325	350	400	480	580	680	800									
800	B	25	1230	1215	1200	1180	1140	1120	1100	1080	1050	1020	1000	980	960	940	920	900	890	870									
900	A	25	300	325	350	375	400	430	470	500	550	600	650	700	750	800	850	900	890	870									
900	B	25	1350	1330	1310	1300	1285	1275	1260	1245	1230	1215	1200	1180	1160	1140	100	970											

A = nozzle output
B = pump output

Output [kg/h]

Supply: 25 bar

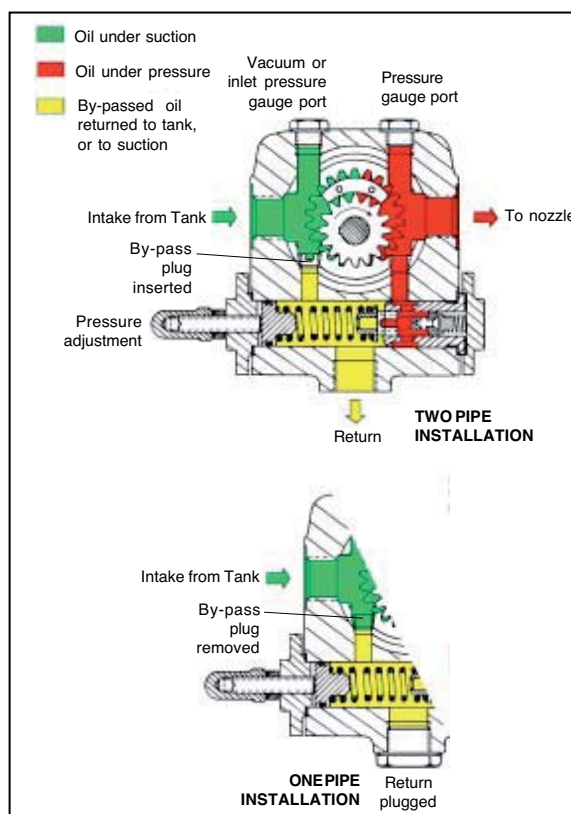
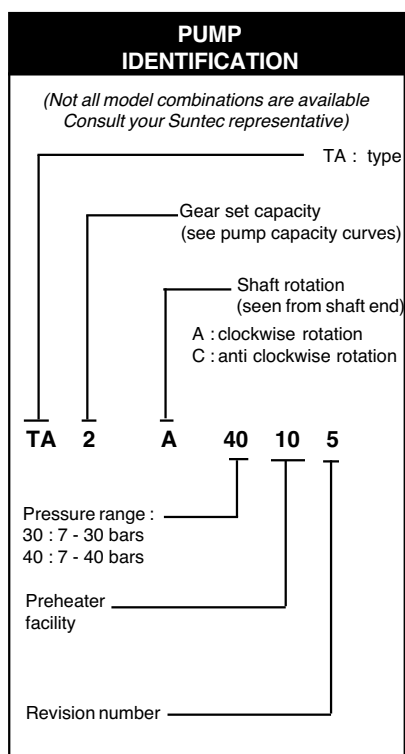
APPENDIX

Pumps and pressure regulators

PUMP SUNTEC TA TECHNICAL DATA

Note: All TA models are delivered for two-pipe system (by-pass plug fitted in vacuum gauge port).

For one-pipe system, the by-pass plug must be removed and the return port sealed by steel plug and washer.



General

Mounting	Flange mounting	
Connection threads	Cylindrical according to ISO 228/1	
Inlet end return	G 1/2"	
To nozzle	G 1/2"	
Pressure gauge port	G 1/4"	
Vacuum gauge port	G 1/4"	
Shaft	Ø 12 mm	
By-pass plug	Inserted in vacuum gauge port for 2 pipe system; to be removed with a 3/16" Allen key for 1 pipe system	
Weight	5,4 kg (TA2) 6 kg (TA4)	5,7 kg (TA3) 6,4 kg (TA5)

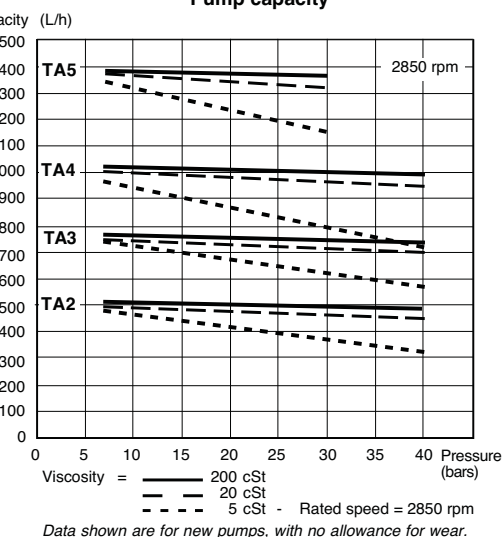
Hydraulic data

Nozzle pressure ranges	30 : 7 - 30 bars 40 : 7 - 40 bars
Delivery pressure setting	30 bars
Operating viscosity	4 - 450 cSt
Oil temperature	0 - 140°C max. in the pump
Inlet pressure	light oil : 0,45 bars max. vacuum to prevent air separation from oil heavy oil : 5 bars max.
Return pressure	light oil : 5 bars max. heavy oil : 5 bars max.
Rated speed	3600 rpm max.
Starting torque	0,3 N.m

Choice of heater

Cartridge	Ø 12 mm
Fitting	according to DIN 40430, NFC 68190 (N°9 elec.)
Rating	80-100 W

Pump capacity



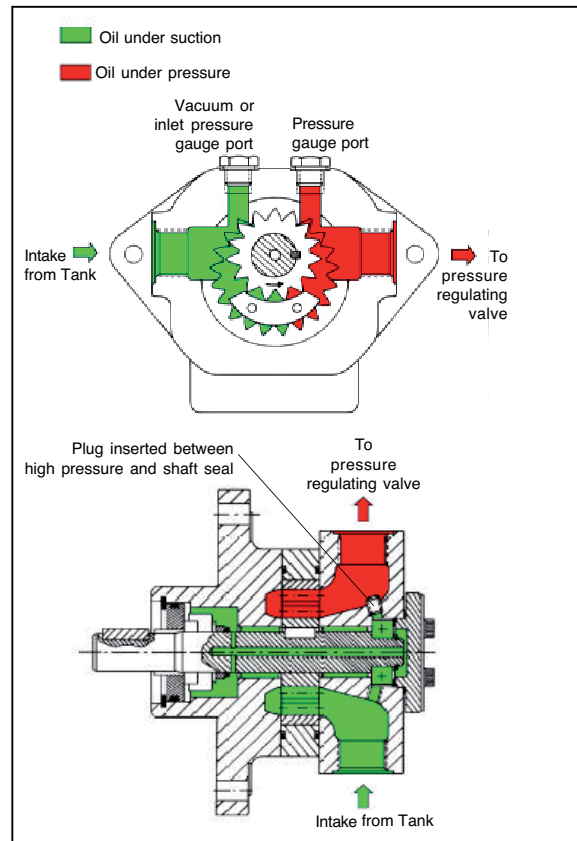
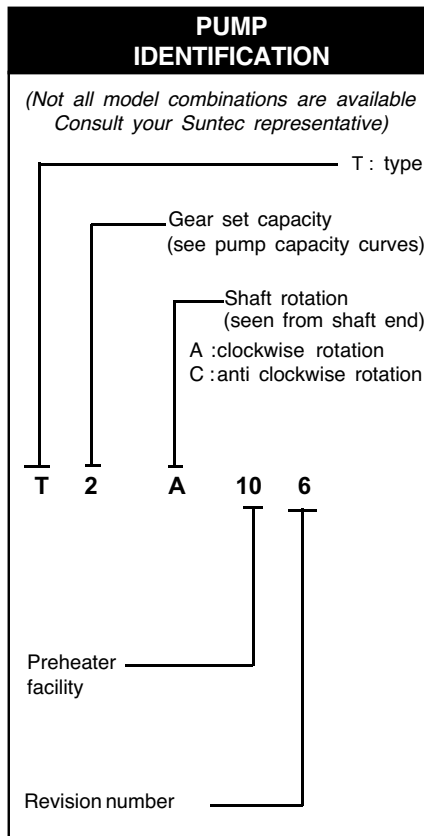
APPENDIX

Pumps and pressure regulators

PUMP SUNTEC T TECHNICAL DATA

Note: The bypass plug inserted between high pressure and shaft seal is only intended to change the pump rotation, check the presence of this plug with a 4 mm Allen key in the pressure outlet of the pump.

Caution : changing the direction of pump rotation involves changing of all pump connections.



General

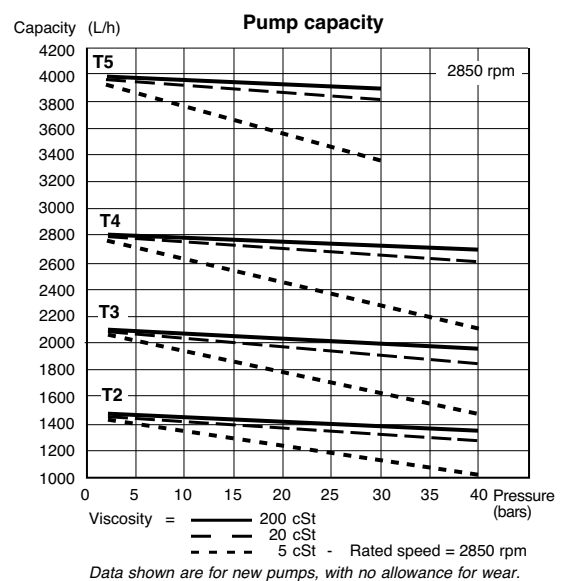
Mounting	Flange mounting		
Connection threads	Cylindrical according to ISO 228/1		
Inlet end return	G 1/2"		
To nozzle	G 1/2"		
Pressure gauge port	G 1/4"		
Vacuum gauge port	G 1/4"		
Shaft	Ø 20 mm		
Weight	7,8 kg (T2)	-	8,1 kg (T3)
	8,7 kg (T4)	-	9,4 kg (T5)

Hydraulic data

Nozzle pressure range	40 bars max. (T2, T3, T4)
	30 bars max. (T5)
Operating viscosity	4 - 450 cSt
Oil temperature	0 - 150°C max. in the pump
Inlet pressure	light oil : 0,45 bars max. vacuum to prevent air separation from oil
	heavy oil : 5 bars max.
Rated speed	3600 rpm max.
Starting torque	0,4 N.m

Choice of heater

Cartridge	Ø 12 mm
Fitting	according to DIN 40430, NFC 68190 (N°9 elec.)
Rating	80-100 W



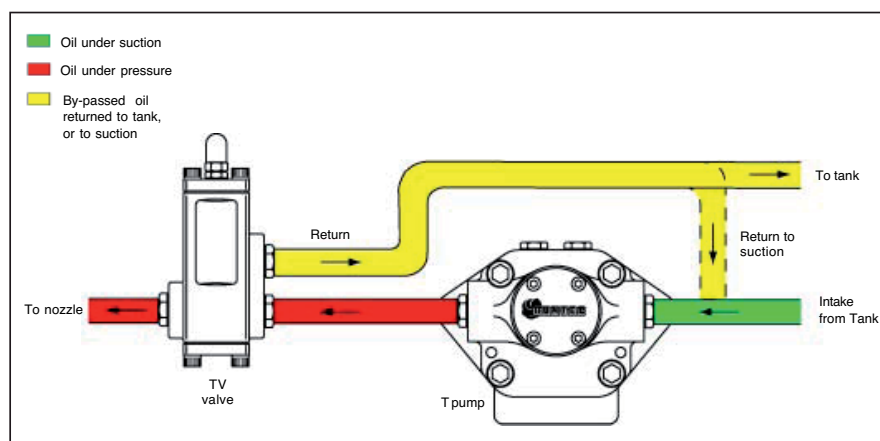
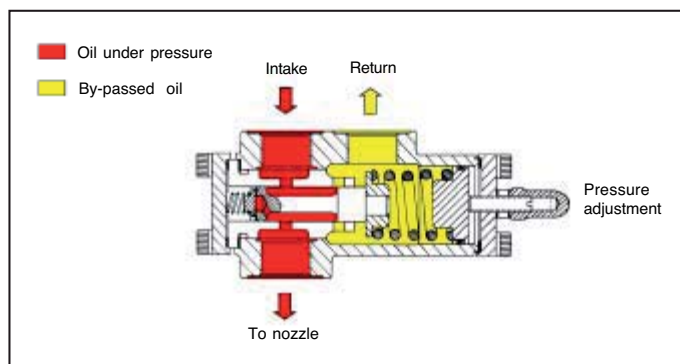
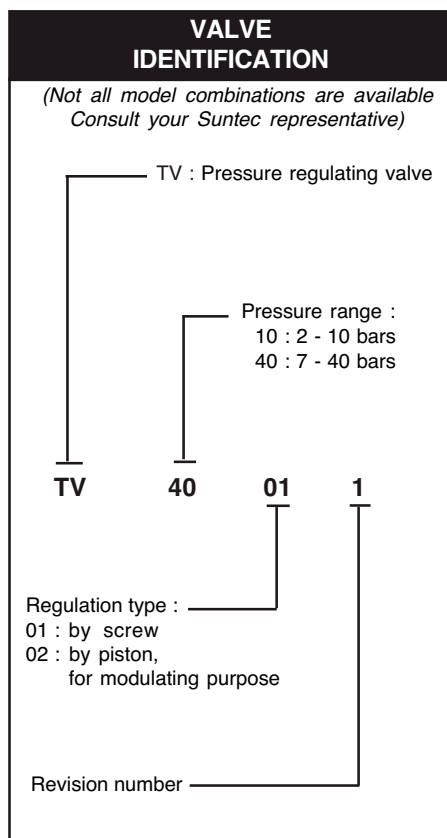
Power consumption

APPENDIX

Pumps and pressure regulators

VALVE SUNTEC TV TECHNICAL DATA

The pressure of the nozzle line is adjusted with the adjusting screw of the TV valve. The oil in excess to nozzle requirement is dumped to the return. Two pipe system : oil in excess is returned to tank. One pipe system : oil in excess is returned to pump suction.



General

Connection threads	Cylindrical according to ISO 228/1
Inlet	G 3/4"
To nozzle	G 3/4"
Return	G 3/4"
Weight	3 kg

Hydraulic data

Pressure ranges	10 : 2 - 10 bars (delivery pressure setting : 7 bars)
	40 : 7 - 40 bars (delivery pressure setting : 20 bars)
Operating viscosity	4 - 450 cSt
Oil temperature	0 - 150°C max. in the valve.

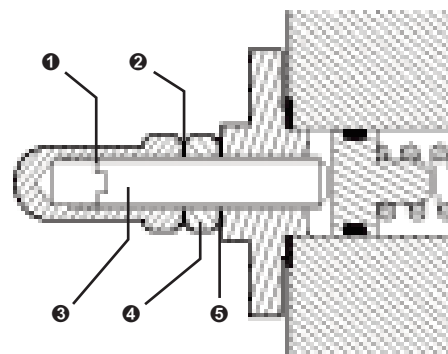
MOUNTING POSITION

TV valve may be mounted in any position.

PRESSURE ADJUSTMENT

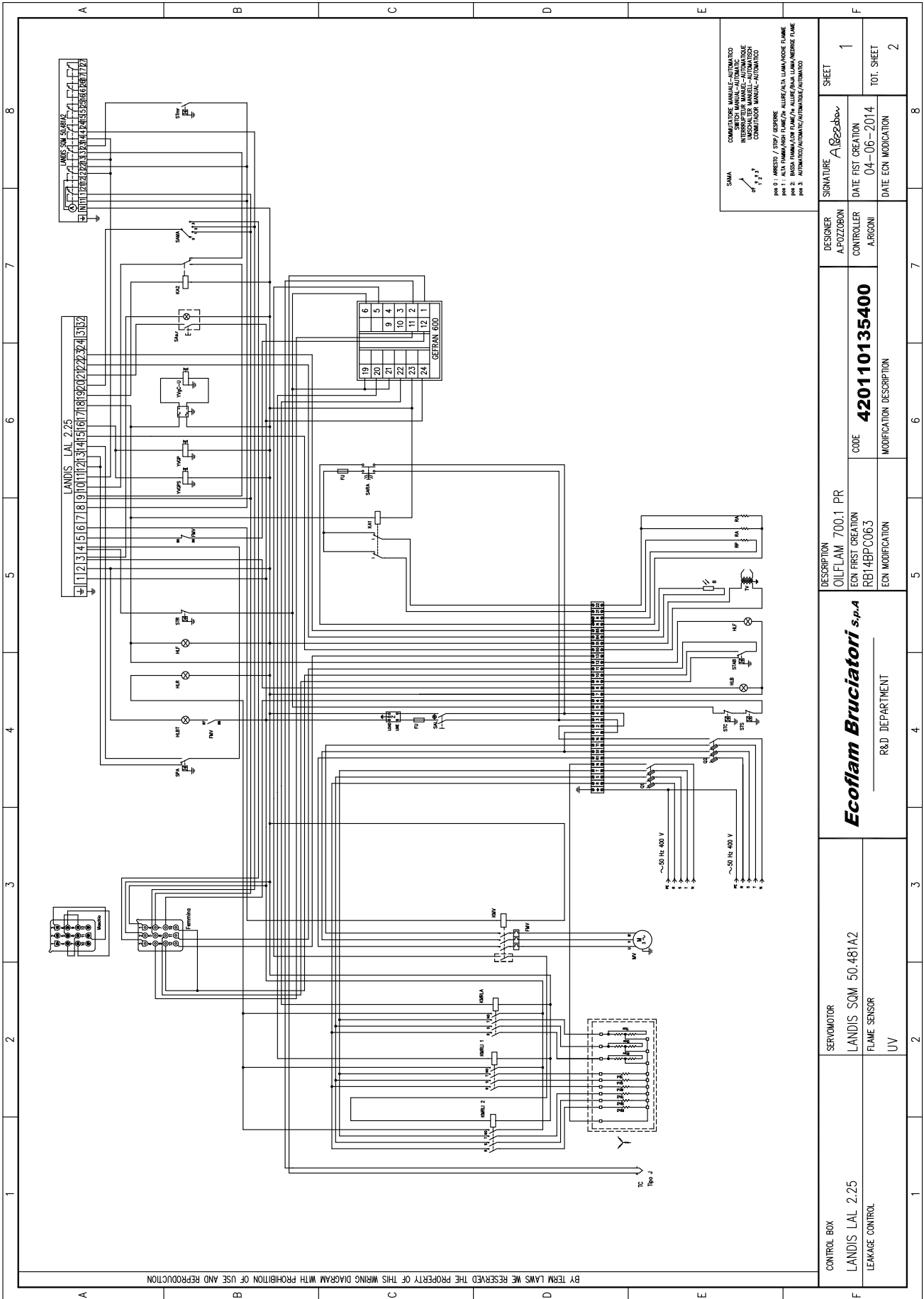
Remove cap-nut ❶ and washer ❷, unscrew lock-nut ❸.
To increase pressure, turn adjusting screw ❹ clockwise.
To decrease the pressure, turn screw anticlockwise.
Block lock-nut ❸, refasten washer ❷ and cap-nut ❶.

- ❶ cap-nut
- ❷ adjusting screw
- ❸ washer
- ❹ lock-nut
- ❺ washer



APPENDIX

Electrical diagrams



APPENDIX

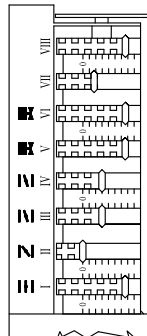
Electrical diagrams

1	2	3	4	5	6	7	8		
01	INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE	SAL	INTERRUTTORE DI LINEA WORKING SWITCH INTERRUPTEUR DE LIGNE						
02	INTERRUTTORE GENERALE CON FUSIBILE INTERRUTTORE GENERALE CON FUSIBILE INTERRUPTEUR GENERAL AVEC FUSIBLE	STC	TERMOSTATO CALDAIA HEATING THERMOSTAT THERMOSTAT CHAUDIERE						
Z	FILTRO ANTIDISTURBO ANTI-FLAMMING FILTER FILTRE ANTIPARASITES	STR	TERMOSTATO DI SICUREZZA - RESISTENZE RESTOR SAFETY THERMOSTAT THERMOSTAT DE SECURITE - RESISTANCES						
FU	FUSIBILE FUSE FUSIBLE	STS	TERMOSTATO DI SICUREZZA SAFETY THERMOSTAT THERMOSTAT DE SECURIDAD						
MV	MOTORE VENTILATORE MOTOR MOTEUR VENTILATEUR	KMRLA	CONTATTORE RESISTENZE DI LAVORO WORKING RESISTOR SWITCH INTERRUPTEUR DES RESISTANCES DE TRAVAIL						
RA	RESISTENZA AUSILIARIA AUXILIARY RESISTOR RESISTANCE AUXILIAIRE	KMRL1	CONTATTORE RESISTENZE DI LIVELLAMENTO LEVELING RESISTOR SWITCH INTERRUPTEUR DES RESISTANCES DE NIVELLEMENT						
RP	RESISTENZA POMPA PUMP RESISTOR RESISTENCIA BOMBA	KMRL2	CONTATTORE RESISTENZE DI LIVELLAMENTO LEVELING RESISTOR SWITCH INTERRUPTEUR DES RESISTANCES DE NIVELLEMENT						
TV	TRASFORMATORE POMPA PUMP TRANSFORMER TRANSFORMADOR	SAMA	COMUTATORE MANUALE-AUTOMATICO MANUAL-AUTOMATIC SWITCH INTERRUPTEUR MANUEL-AUTOMATIQUE						
B	FOTOCELLULA UV CELL CELLE UV	Y00-u	SOLENOIDE CHIUSURA LUCELLO OIL SHUT-OFF SOLENOID						
FNV	RELE' TERMICO MOTORE VENTILATORE MOTOR THERMAL RELAY (FAN MOTOR) RELAYS THERMIQUE MOTEUR VENTILATEUR	HLBT	LAMPADA DI BLOCCO TERMICO THERMAL LOCK-OUT LAMP LAMPE DE THERMAL DE SECURITE						
HLF	LAMPADA DI FUNZIONAMENTO WORKING LAMP LAMPE DE FONCTIONNEMENT	Stmr	TERMOSTATO DI RICIRCOLO CIRCULATION THERMOSTAT THERMOSTAT DE LA BOMBE DE RECIRCULATION						
HLB	LAMPADA DI BLOCCO LOCK-OUT LAMP LAMPE DE SECURITE	Sa&t	PULSANTE DI SBLOCCO APPARECCHIATURA RESET LOCK-OUT BUTTON BOUTON DE DEBLOCAGE DU COFFRE DE SECURITE						
HLR	LAMPADA RESISTENZE RESISTOR LAMP TENDON RESISTENCES	SPA	PRESSOSTATO ARIA AIR PRESSURE SWITCH PRESSOSTAT AIRE						
KA1	RELE' ARIA AIR PRESSURE RELAY RELE'	SARA	INTERRUTTORE RESISTENZE AUSILIARE AUXILIARY RESISTOR SWITCH INTERRUPTEUR RESISTANCE AUXILIAIRE						
KA2	RELE' ARIA AIR PRESSURE RELAY RELE'	Y0P	ELETTROVALVOLA GAS PILOTA PILOT GAS SOLENOID VALVE ELECTROVANNE GAZ PILOTE						
KAV	CONTATTORE MOTORE VENTILATORE REMOTE CONTROL SWITCH (FAN MOTOR) CONTACTEUR MOTEUR VENTILATEUR	Y0P&S	ELETTROVALVOLA GAS PILOTA DI SICUREZZA EXTRA SAFETY PILOT SOLENOID GAS VALVE ELECTROVANNE GAZ PILOTE DE SECURITE						
BY TERM LAWS WE RESERVED THE PROPERTY OF THIS WIRING DIAGRAM WITH PROHIBITION OF USE AND REPRODUCTION									
CONTROL BOX LANDIS LAL 2.25 LEAKAGE CONTROL		SERVOMOTOR LANDIS SQM 50.481A2 FLAME SENSOR UV	Ecoflam Bruciatori s.p.a R&D DEPARTMENT		DESCRIPTION OILFLAM 700.1 PR EON FIRST CREATION RB14BPC06.3 EON MODIFICATION		DESIGNER A-POZZOBON CONTROLLER A-RIGNI	SIGNATURE A. Bezzabov DATE FIST CREATION 04-06-2014 DATE EON MODIFICATION	SHEET 2 TOT. SHEET 2

USCITE RELE DEL REGOLATORE

OUT 1: KMRLA
OUT 2: KMRL1
OUT 3: KMRL2
OUT 4: TERMOSTATO DI ACCENSIONE

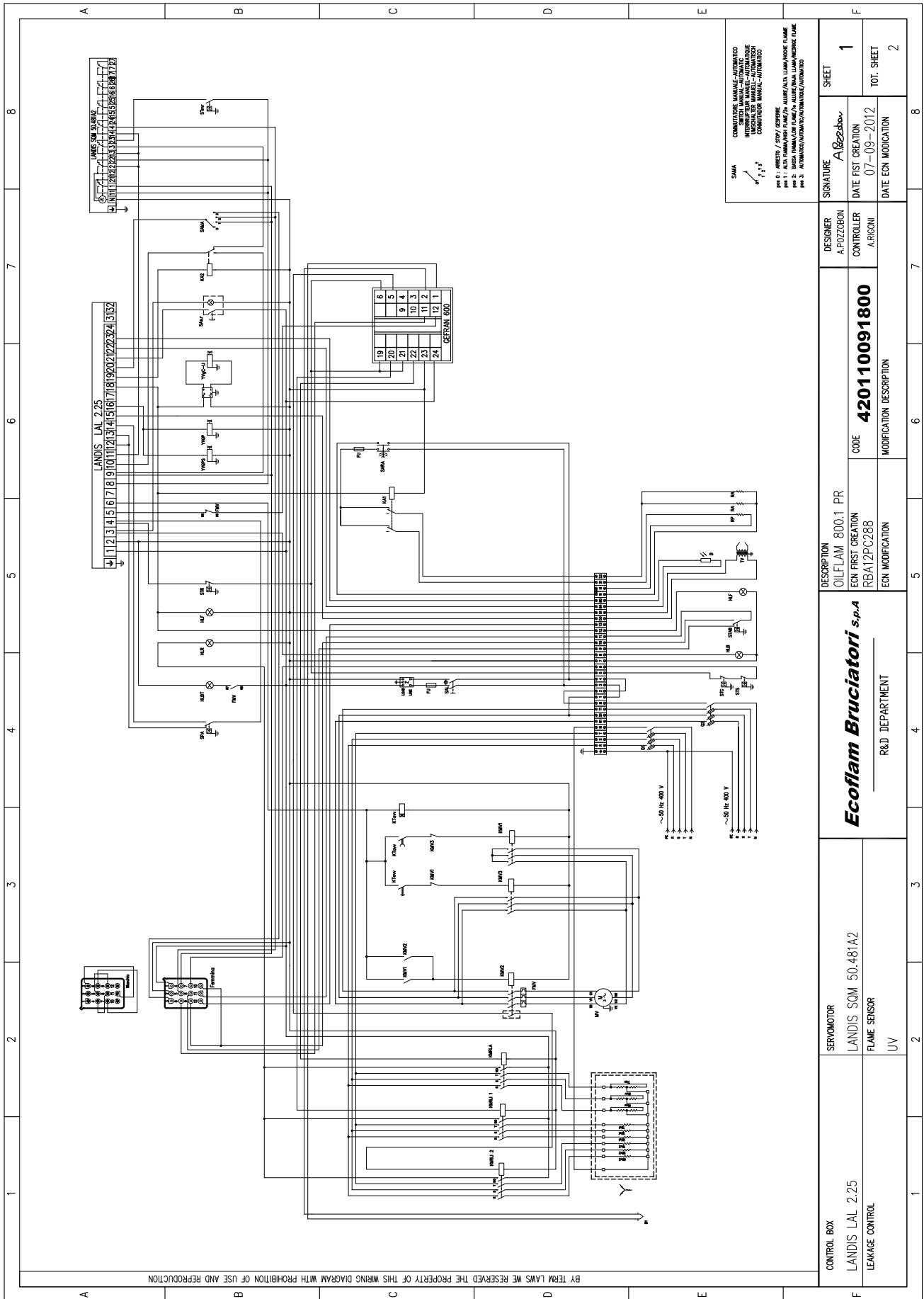
REGOLAZIONE CAMME PER OILFLAM 700.1 PR



(06°) I: CAMMA DI REGOLAZIONE ARIA MASSIMA FIAMMA
(07°) II: CAMMA DI REGOLAZIONE CHIUSURA TOTALE
ARIA MASSIMA FIAMMA
(40°) III: CAMMA DI REGOLAZIONE ARIA BASSA FIAMMA
(07°) V: CAMMA NON UTILIZZATA
(05°) VI: CAMMA NON UTILIZZATA
(05°) VII: CAMMA NON UTILIZZATA
(05°) VIII: CAMMA NON UTILIZZATA

APPENDIX

Electrical diagrams



SMA
 COMPLETARE NOME ALTERNATIVO
 NOME NOME ALTERNATIVO
 INDICARE NOME ALTERNATIVO
 INDICARE NOME ALTERNATIVO
 CONTROLLO MANUALE - AUTOMATICO
 CONTROLLO MANUALE - AUTOMATICO

pag. 0 - ARRETO / STOP / STOP
 pag. 1 - ALTA FUMATA / HIGH FLAME / ALTA FUMATA / HIGH FLAME
 pag. 2 - BASSA FUMATA / LOW FLAME / BASSA FUMATA / LOW FLAME
 pag. 3 - AUTOMATICO / MANUAL / AUTOMATICO / MANUAL

SIGNATURE	A. Bezzi	SHEET	1
DATE FIRST CREATION	07-09-2012	TOT. SHEET	2
DATE ECN MODIFICATION			

DESIGNER	A. POZZOBON	DESCRIPTION	OILFLAM 800.1 PR
CONTROLLER	A. RIGONI	ECN FIRST CREATION	RBAL2PC288
CODE	420110091800	ECN MODIFICATION	
MODIFICATION DESCRIPTION			

DESCRIPTION	OILFLAM 800.1 PR
ECN FIRST CREATION	RBAL2PC288
ECN MODIFICATION	

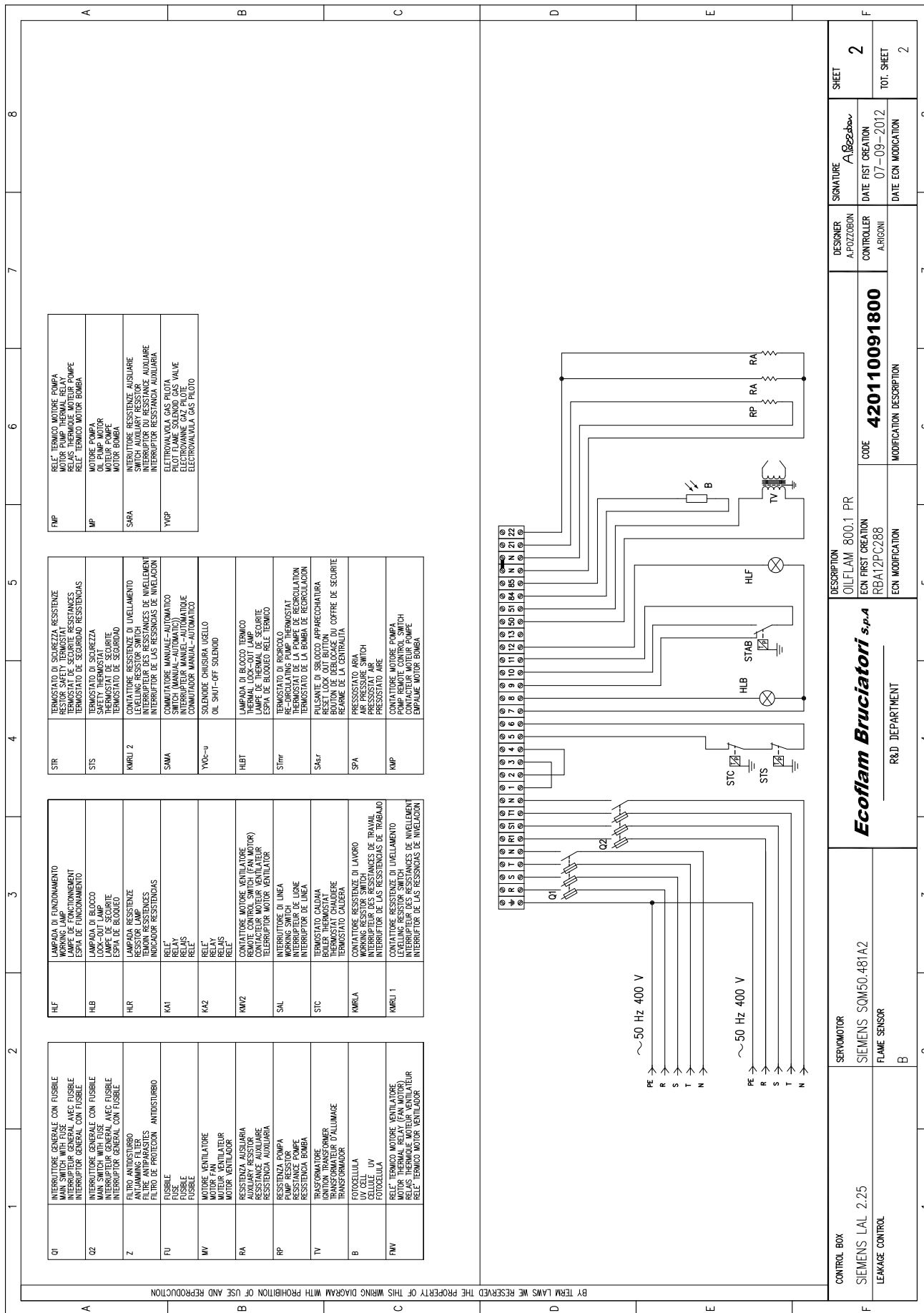
Ecoflam Bruciatori s.p.a	R&D DEPARTMENT
---------------------------------	----------------

SERVOMOTOR	LANDIS SQM 50.481A2
FLAME SENSOR	UV

CONTROL BOX	LANDIS LAL 2.25
LEAKAGE CONTROL	UV

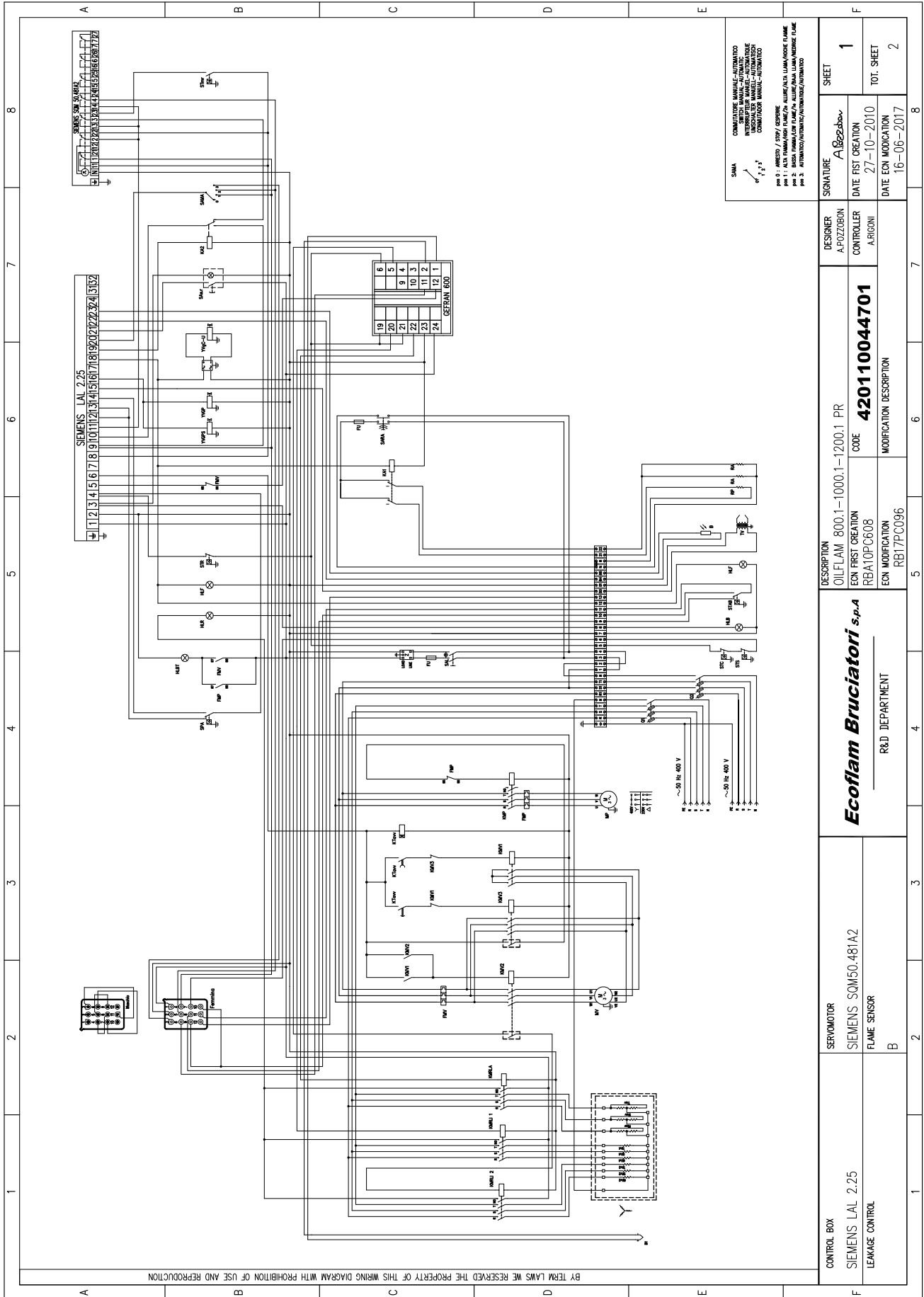
APPENDIX

Electrical diagrams



APPENDIX

Electrical diagrams



SMA
 COMBUSTIONE MANUALE - AUTOMATICO
 STARTER MANUALE - AUTOMATICO
 INTERRUPTORE MANUALE - AUTOMATICO
 CONTROLLO MANUALE - AUTOMATICO

pag. 0: ARRETO / STOP / ESPERARE
 pag. 1: ALTA FUMATA / HIGH FLAME / ALTE FUMEN / HIGH FLAME / ALTE FUMEN / HIGH FLAME
 pag. 2: BASSA FUMATA / LOW FLAME / BASSA FUMATA / LOW FLAME / BASSA FUMATA / LOW FLAME
 pag. 3: AUTOMATICO / MANUAL / AUTOMATICO / MANUAL / AUTOMATICO / MANUAL

SIGNATURE	A. Bezzi	SHEET	1
DATE FIRST CREATION	27-10-2010	TOT. SHEET	2
DATE ECN MODIFICATION	16-06-2017		

DESIGNER	A. POZZOBON
CONTROLLER	A. RIGONI

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ECON FIRST CREATION	CODE 420110044701
ECON MODIFICATION	MODIFICATION DESCRIPTION

DESCRIPTION	OIL/LAM 800.1-1000.1-1200.1 PR
ECON FIRST CREATION	CODE 420110044701
ECON MODIFICATION	MODIFICATION DESCRIPTION

DESCRIPTION	OIL/LAM 800.1-1000.1-1200.1 PR
ECON FIRST CREATION	CODE 420110044701
ECON MODIFICATION	MODIFICATION DESCRIPTION

DESCRIPTION	OIL/LAM 800.1-1000.1-1200.1 PR
ECON FIRST CREATION	CODE 420110044701
ECON MODIFICATION	MODIFICATION DESCRIPTION

CONTROL BOX	SERVOMOTOR
SIEMENS LAL 2.25	SIEMENS SOM50.481A2
LEAKAGE CONTROL	FLAME SENSOR
	B

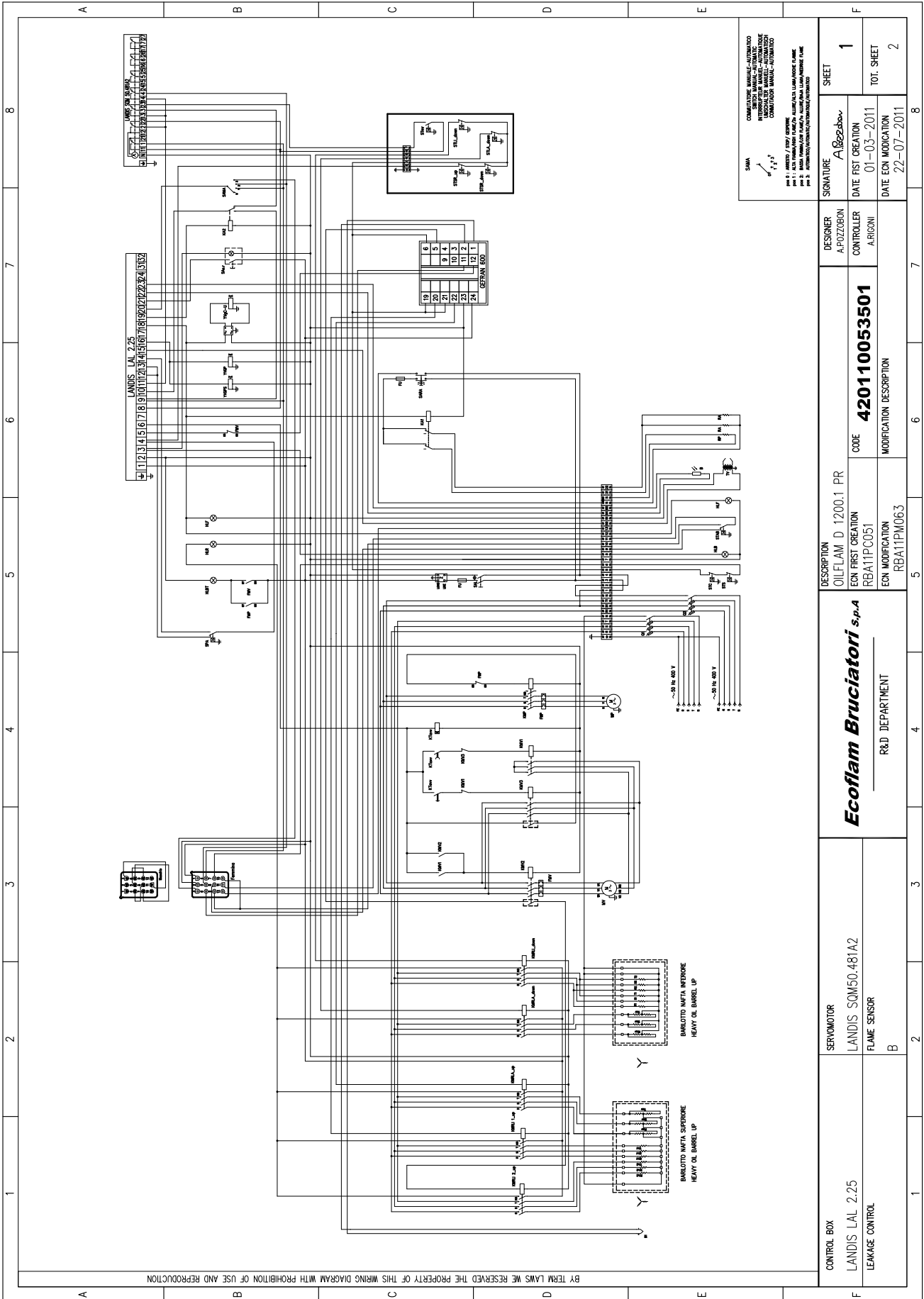
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Electrical diagrams

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<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Q1</td> <td style="width: 50%;">INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE</td> </tr> <tr> <td>Q2</td> <td>INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE</td> </tr> <tr> <td>Z</td> <td>FILTRO ANTISTURBO TURBO FILTER FILTRO ANTIPARABOLAS TURBO FILTER</td> </tr> <tr> <td>FU</td> <td>FUSIBILE FUSE FUSIBLE</td> </tr> <tr> <td>MV</td> <td>MOTORE VENTILATORE MOTOR FAN MOTEUR VENTILADOR</td> </tr> <tr> <td>RA</td> <td>RESISTENZA AUSILIARIA RESISTANCE AUXILIARY RESISTENCIA AUXILIARIA</td> </tr> <tr> <td>RP</td> <td>RESISTENZA POMPA PUMP RESISTOR RESISTENCIA BOMBA</td> </tr> <tr> <td>TV</td> <td>TRASFORMATORE IGNITION TRANSFORMER TRANSFORMATEUR D'ALLUMAGE</td> </tr> <tr> <td>B</td> <td>FOTOCELLA CELLULE UV FOTOCELULA</td> </tr> <tr> <td>FAV</td> <td>RELE' TERMICO MOTORE VENTILATORE MOTOR THERMAL RELAY (FAN MOTOR) MOTEUR THERMIQUE (VENTILATEUR) RELE' TERMICO MOTORE BOMBA</td> </tr> </table> </td> <td style="vertical-align: top;"> <table border="1" style="width:100%; 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Q1	INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE																																																																																																																
Q2	INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE																																																																																																																
Z	FILTRO ANTISTURBO TURBO FILTER FILTRO ANTIPARABOLAS TURBO FILTER																																																																																																																
FU	FUSIBILE FUSE FUSIBLE																																																																																																																
MV	MOTORE VENTILATORE MOTOR FAN MOTEUR VENTILADOR																																																																																																																
RA	RESISTENZA AUSILIARIA RESISTANCE AUXILIARY RESISTENCIA AUXILIARIA																																																																																																																
RP	RESISTENZA POMPA PUMP RESISTOR RESISTENCIA BOMBA																																																																																																																
TV	TRASFORMATORE IGNITION TRANSFORMER TRANSFORMATEUR D'ALLUMAGE																																																																																																																
B	FOTOCELLA CELLULE UV FOTOCELULA																																																																																																																
FAV	RELE' TERMICO MOTORE VENTILATORE MOTOR THERMAL RELAY (FAN MOTOR) MOTEUR THERMIQUE (VENTILATEUR) RELE' TERMICO MOTORE BOMBA																																																																																																																
HFB	LAMPADA DI FUNZIONAMENTO WORKING LAMP ESPIJA DE FUNCIONAMIENTO																																																																																																																
HLB	LAMPADA DI BLOCCO LOCK-OUT LAMP LAMPE DE SECURITE																																																																																																																
HLR	LAMPADA RESISTENZE RESISTANCE LAMP INDICADOR RESISTENCIAS																																																																																																																
K41	RELE' RELAY RELAIS																																																																																																																
K42	RELE' RELAY RELAIS																																																																																																																
MV2	CONTATTORE MOTORE VENTILATORE MOTOR CONTACTOR (MOTOR) CONTACTEUR MOTEUR VENTILATEUR																																																																																																																
SAL	INTERRUTTORE DI LINEA WORKING SWITCH RELAIS DE LIGNE																																																																																																																
STC	TERMOSTATO CALDAIA BOILER THERMOSTAT THERMOSTAT CHAUDIERE																																																																																																																
M4RLA	CONTATTORE RESISTENZE DI LAVORO WORKING RESISTOR SWITCH CONTACTEUR RESISTANCES DE TRAVAIL																																																																																																																
M4RL1	CONTATTORE RESISTENZE DI LIVELLAMENTO LEVELING RESISTOR SWITCH CONTACTEUR RESISTANCES DE NIVELLEMENT																																																																																																																
STR	TERMOSTATO DI SICUREZZA RESISTENZE RESTOR SAFETY THERMOSTAT THERMOSTAT DE SECURIDAD RESISTENCIAS																																																																																																																
SIS	SAFETY THERMOSTAT THERMOSTAT DE SECURITE THERMOSTATO DE SEGURIDAD																																																																																																																
M4RL2	CONTATTORE RESISTENZE DI LIVELLAMENTO LEVELING RESISTOR SWITCH CONTACTEUR RESISTANCES DE NIVELLEMENT																																																																																																																
S4WA	COMMUTATORE MANUALE-AUTOMATICO SWITCH (MANUAL-AUTOMATIC) COMMUTADOR MANUEL-AUTOMATICO																																																																																																																
YOG-u	SOLENOIDE CILINDRO GHIACCIO OIL SHUT-OFF SOLENOID																																																																																																																
HLBT	LAMPADA DI BLOCCO TERMICO LOCK-OUT LAMP ESPIJA DE BLOQUEO RELE TERMICO																																																																																																																
STirr	TERMOSTATO DI RICICCOLO RE-CIRCULATING PUMP THERMOSTAT THERMOSTAT DE RECIRCULATION																																																																																																																
S4ar	PIUSANTE DI SBLOCCO APPARECCHIATURA RESET LOCK OUT BUTTON BOITON DE DEROGAGE DU COFFRE DE SECURITE																																																																																																																
SPA	PRESSOSTATO ARIA AIR PRESSURE SWITCH PRESOSTAT AIRE																																																																																																																
MMP	CONTATTORE MOTORE POMPA PUMP REMOTE CONTROL SWITCH CONTACTEUR MOTEUR BOMBE																																																																																																																
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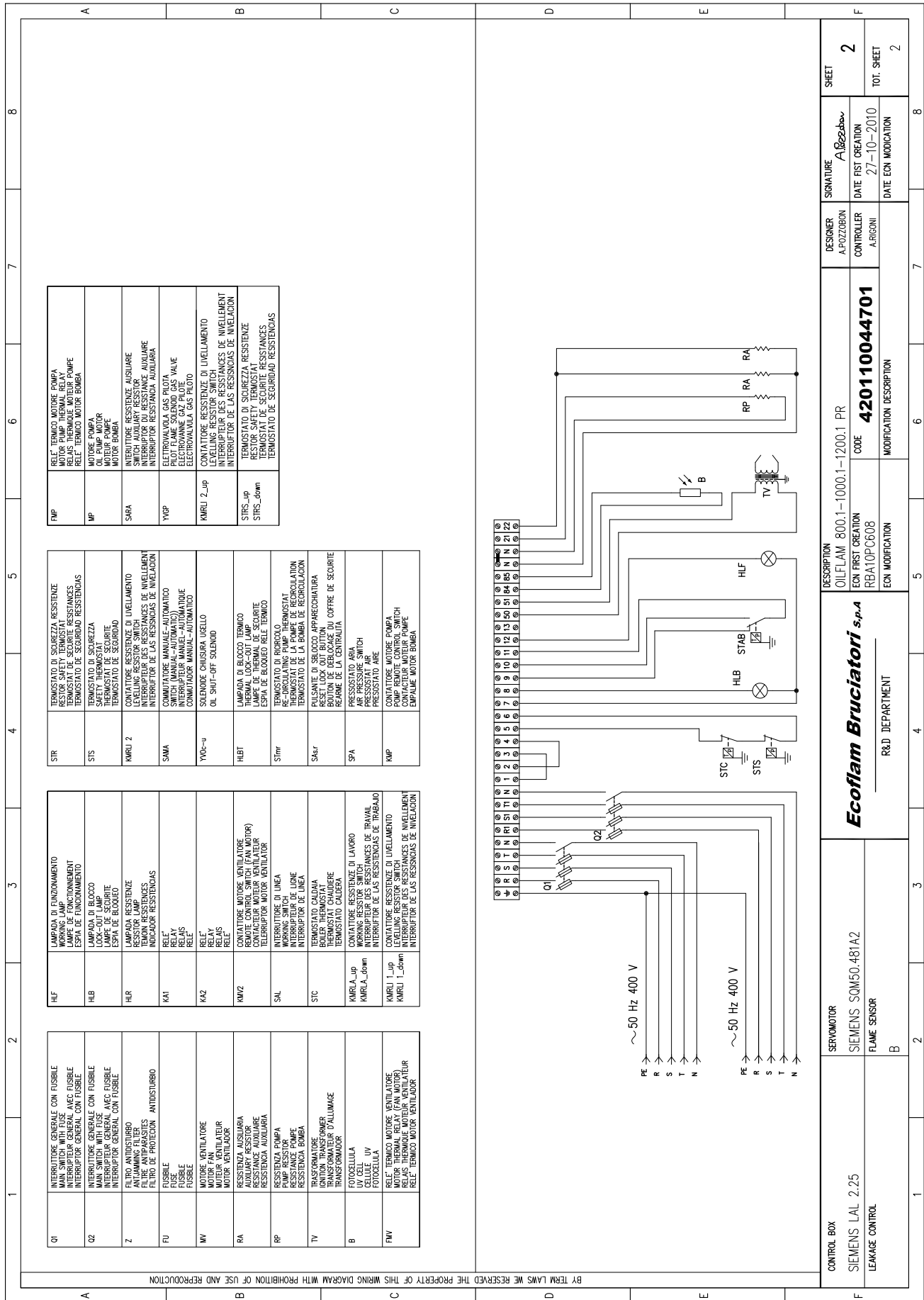
APPENDIX

Electrical diagrams



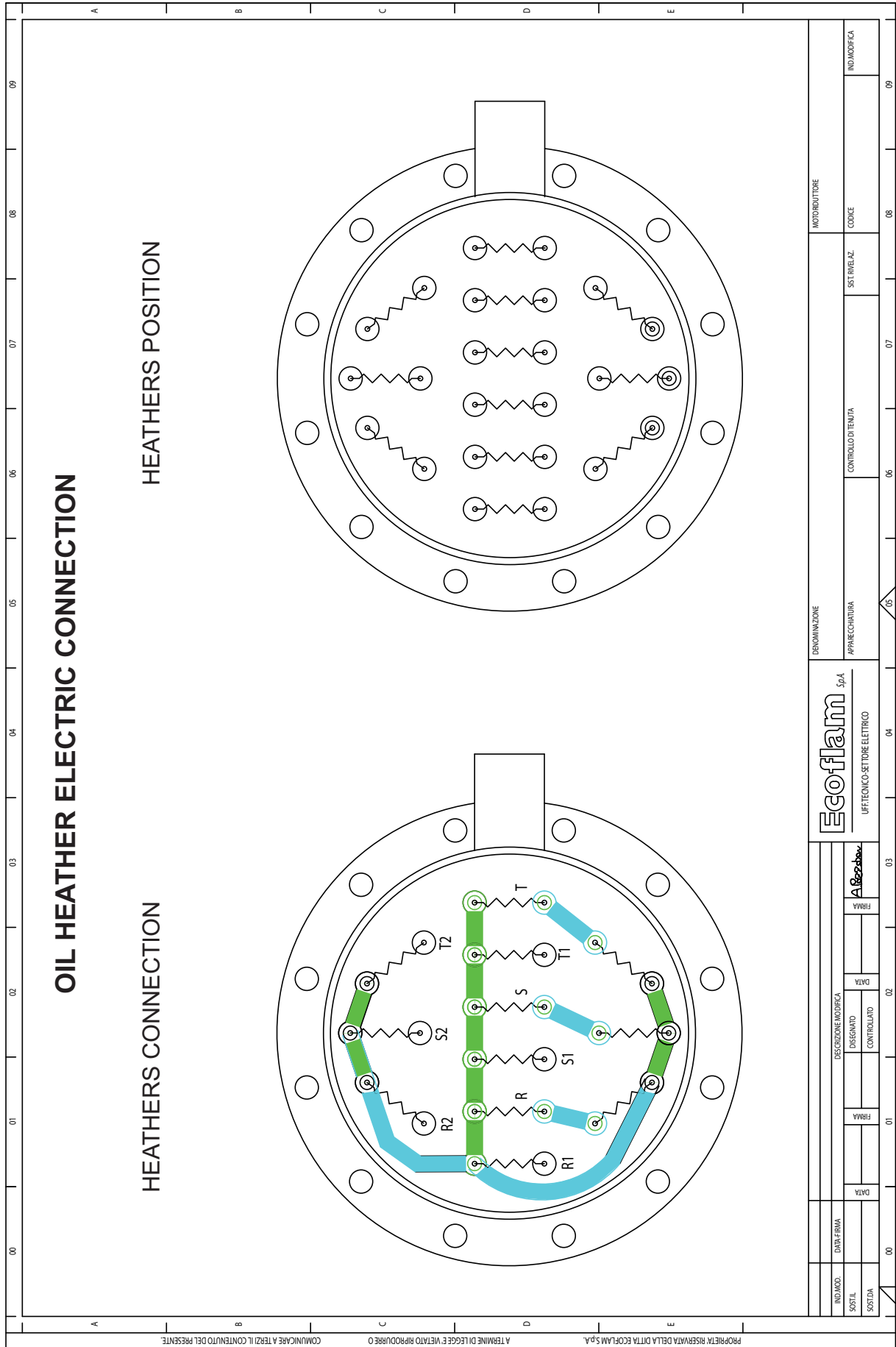
APPENDIX

Electrical diagrams



APPENDIX

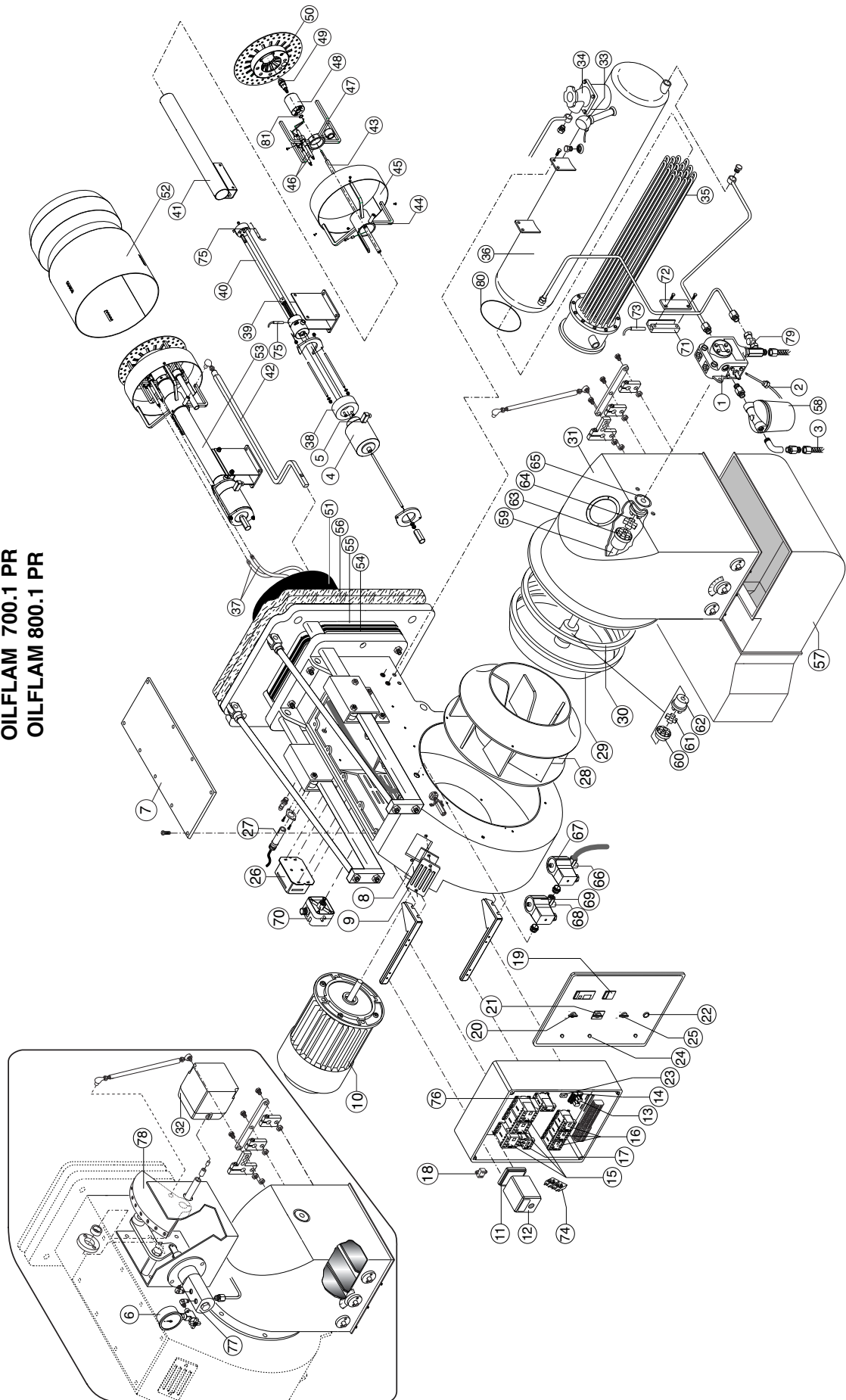
Electrical diagrams



APPENDIX

Spare parts

OILFLAM 700.1 PR
OILFLAM 800.1 PR



APPENDIX

Spare parts list

N°	DESCRIPTION		OILFLAM 700.1 PR	OILFLAM 800.1 PR code
1	PUMP	SUNTEC TA5C30106	65322993	65322993
2	HEATING ELEMENT PUMP	50 W	65323072	65323072
3	HOSES	25 x1500	65323181	65323181
4	COIL	EL011	65323809	65323809
5	CONNECTOR WITH RECTIFIER	EL011	65323571	65323571
6	MANOMETER	CEWAL R1/4 D50	65324105	65324105
7	COVER		65324059	65324059
8	GLASS		65320487	65320487
9	PEEP WINDOW FRAME		65320488	65320488
10	MOTOR	15000 W	65326334	-
		18500 W	-	65325248
11	CONTROL BOX BASE	SIEMENS LAL2.25	65320097	65320097
12	CONTROL BOX	SIEMENS LAL2.25 CB	13009187	-
		SIEMENS LAL2.25 Tv22"	-	65320063
13	RELAY	FINDER 5532 8	65323139	65323139
14	RELAY BASE	FINDER 5532 8	65323149	65323149
15	REMOTE CONTROL SWITCH	BF1810A230(1)	-	65073928
		BF3800A230 (1)	65075273	-
		BF2600A230 (2)	-	65327818
16	REMOTE CONTROL SWITCH	AEG LS4K.00(3)	-	65323133
		BF1210A230(2)	65324814	-
		AEG LS7K.10(1)	-	65324097
		BF1810A230(1)	65073928	-
17	MOTOR THERMAL RELAY	AEG B18K-320 25-32A	65324428	-
		AEG RF825000 35-50A	-	65327819
18	ANTI-JAMMING FILTER		65323170	65323170
19	ADJUSTMENT OF FUEL TEMPERATURE	GEFRAN 600	65322045	65322045
20	MAIN SWITCH	cod.4010011509	65324098	65324098
21	MANUAL / AUTOMATIC Selector		65326257	65323063
22	RESET SWITCH		65324101	65324101
23	FUSE HOLDER		65324279	65324279
24	LAMP	LYVIA 10X28 BA9S	65324100	65324100
		RED LED	65325033	65325033
		GREEN LED	65325034	65325034
		YELLOW LED	65325044	65325044
25	AUXILIARY SWITCH HEATER	ECX4350	65324278	65324278
26	IGNITION TRANSFORMER	BRAHMA T8	65323222	65323222
27	PHOTORESISTOR	SIEMENS	65320076	65320076
28	FAN	GF560R Ø530	65325905	-
		RU-560 M d.42	-	65324063
29	AIR CONVEYOR		65320648	65320648
30	RING		65320646	65320646
31	COVER AIR INLET		65324065	65324065
32	AIR DAMPER MOTOR	SQM50.481A2	65322902	65322902
33	THERMOCOUPLE	TC6MD2JBC	65322046	65322046
34	FILTER	U21008/01	65323158	65323158
35	HEATER	30 kW	65323091	65323091
36	OIL TANK		65324481	65324481
37	CABLE		65073892	65320947
38	RING		65321721	65321721
39	HOLDER SPRING		65321720	65321720
40	FIRING HEAD		65321722	65321722
41	PIPE		65324267	65324267
42	ROD FIRING HEAD	TC		65324579
43	ROD NOZZLE HOLDER	TC	65324269	65324269
44	HOLDER WAISTBAND		65324577	65324577
45	WAISTBAND		65324579	65324578
46	ELECTRODES		65325004	65325004
47	SUPPORT NOZZLE HOLDER		65320697	65320697
48	NOZZLE HOLDER		65320709	65320709
49	NOZZLE			
50	DIFFUSER		65320788	65320788

TC = SHORT HEAD TL = LONG HEAD

APPENDIX

Spare parts list

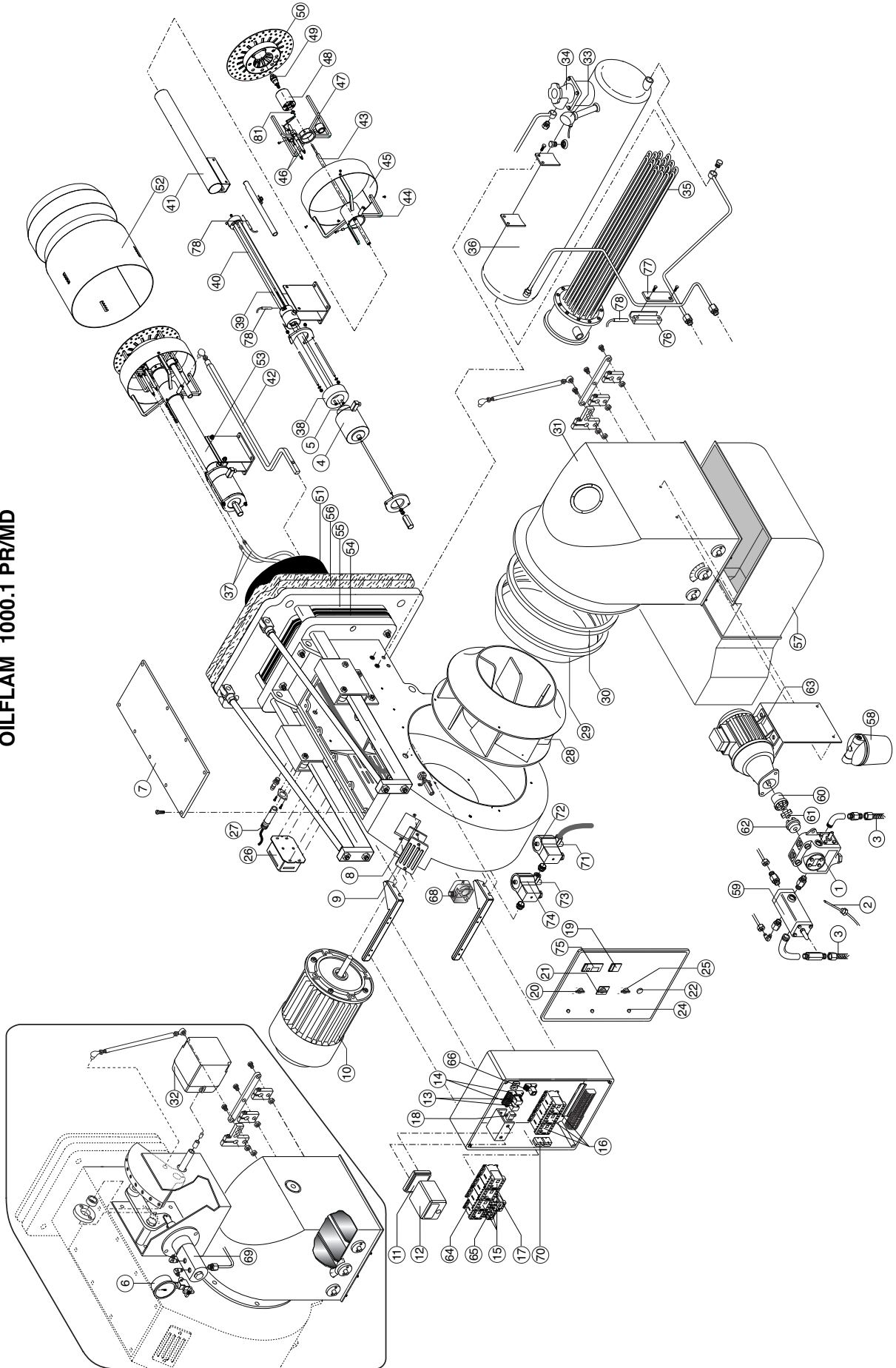
N°	DESCRIPTION		OILFLAM 700.1 PR	OILFLAM 800.1 PR code
51	BLAST TUBE		65320458	65324981
52	BLAST TUBE END		65320462	65325129
53	ASSEMBLY FIRING HEAD	TC		65322499
54	GASKET		65321137	65321137
55	GASKET		65321138	65321138
56	GASKET		65321139	65321139
57	SILENCER		65324071	65324071
58	FILTER	70501/03	65324103	65324103
59	ROD		65321468	65321468
60	COUPLING (FAN)		65321792	65321792
61	UNION (FAN)		65321791	65321791
62	COUPLING		65321790	65321790
63	COUPLING		65321782	65321782
64	UNION (PUMP)		65321786	65321786
65	COUPLING (PUMP)		65325219	65325219
66	GAS VALVE	BRAHMA EG12SRGMO	65323595	65323595
67	COIL	BRAHMA EG12S	65323709	65323709
68	GAS VALVE	BRAHMA EG12SRGMO	65323595	65323595
69	COIL	BRAHMA EG12S	65323709	65323709
70	AIR PRESSURE SWITCH	LGW 10 A4 (1-10mbar)	65323033	65323033
71	PREHEATED'S AUX. RESISTOR HOLDER		65321716	65321716
72	FIXING PLATE		65321717	65321717
73	HEATING ELEMENT	50 W	65323072	65323072
74	THERMOSTAT	IMIT TR2 40/200	65323147	65323147
75	HEATING ELEMENT	30 W	65324207	65324207
76	TIMER		-	65324073
77	ADJUSTMENT OIL PRESSURE	B-G-PRO-2 a.070H0138	65323166	-
		B-P-PRO-2 a.070H0115	-	65323167
78	OIL CAM GROUP		65322356	65322356
79	CHECK VALVE	ART. FZVR13 1-2	65325173	65325173
80	OIL TANK GASKET		65324001	65324001
81	NOZZLE HOLDER SEAL		65325363	65325363

TC = SHORT HEAD TL = LONG HEAD

APPENDIX

Spare parts

OILFLAM 1000.1 PR/MD



APPENDIX

Spare parts

N°	DESCRIPTION	OILFLAM 1000.1 PR	
			code
1	PUMP	SUNTEC T5C105	65322998
2	HEATING ELEMENT PUMP	50 W	65323072
3	HOSES	25 x1500	65323181
4	COIL	EL011	65323809
5	CONETTORE BOBINA	EL011	65323571
6	MANOMETER		65324105
7	COVER		65324059
8	GLASS		65320487
9	PEEP WINDOW FRAME		65320488
10	MOTOR	22 kW	65326336
11	CONTROL BOX BASE	SIEMENS	65320097
12	CONTROL BOX	SIEMENS LAL2.25	65320063
13	RELAY	FINDER 5532	65323139
14	RELAY BASE	94.72 SMA (R.5532)	65323149
15	REMOTE CONTROL SWITCH(motor)	AEG LS15K.00(2)	65323136
		AEG LS11K.00	65323135
16	REMOTE CONTROL SWITCH(heater)	AEG LS4K.00(1)	65323133
		AEG LS7K.10	65324097
17	MOTOR THERMAL RELAY	AEG B18K-320	65324428
18	ANTIJAMMING FILTER		65323170
19	ADJUSTMENT OF FUEL TEMPERATURE	GEFRAN 600	65322045
20	MAIN SWITCH	COMEPI art.EC	65324098
21	MANUAL / AUTOMATIC SELECTOR	LOVATO	740160022000
22	RESET SWITCH	COMEPI art.ECX1201	65324101
23	FUSE HOLDER	HK 520 04/1 10A	65324279
24	LAMP	10X28 BA9S 240V-3W	65324100
		RED LED	65325033
		GREEN LED	65325034
		YELLOW LED	65325044
25	AUXILIARY SWITCH HEATER		65324278
26	IGNITION TRANSFORMER	BRAHMA T8	65323222
27	PHOTORESISTOR	SIEMENS	65320076
28	FAN	RG-630 M.d.48	65321803
29	AIR CONVEYOR		65320647
30	RING		65320646
31	COVER AIR INLET		65324065
32	AIR DAMPER MOTOR	SQM50.481A2	65322902
33	THERMOCOUPLE	TC6MD2JBC	65322046
34	FILTER	U21008/01	65323158
35	HEATER	44 kW	65323092
36	OIL TANK		65324506
37	CABLE		65320947
38	RING		65321721
39	HOLDER SPRING		65321720
40	FIRING HEAD		65324673
41	PIPE		65324267
42	ROD FIRING HEAD		65324579
43	ROD NOZZLE HOLDER		65324269
44	HOLDER WAISTBAND		65324577
45	WAISTBAND		65324578
46	ELECTRODES		65325004
47	SUPPORT NOZZLE HOLDER		65320697
48	NOZZLE HOLDER		65324890
49	NOZZLE		
50	DIFFUSER		65320788
51	BLAST TUBE		65324788
52	BLAST TUBE END		65320461
53	ASSEMBLY FIRING HEAD		
54	GASKET		65321139
55	GASKET		65321137
56	GASKET		65324983

TC = SHORT HEAD TL = LONG HEAD

APPENDIX

Spare parts

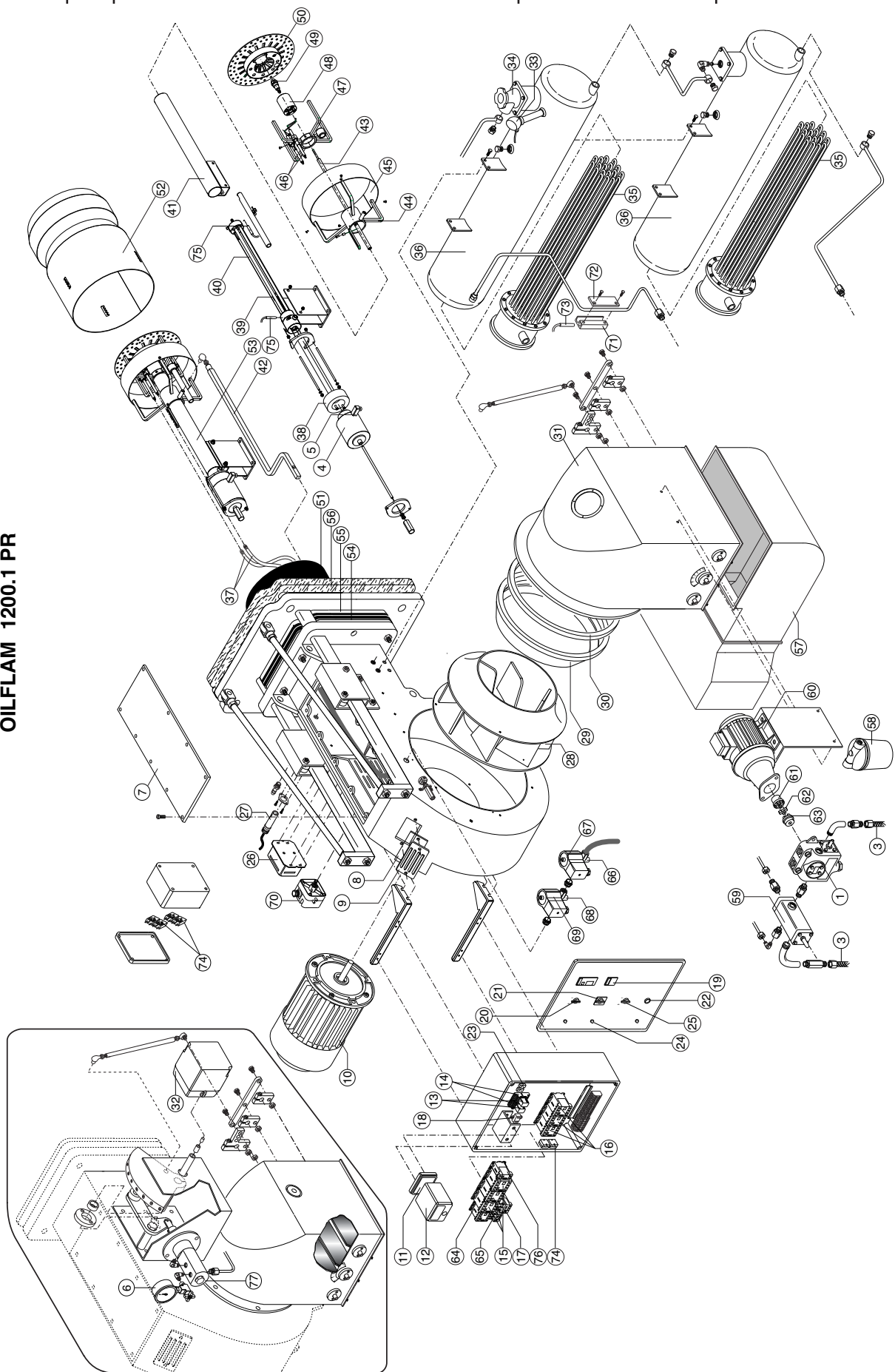
			OILFLAM 1000.1 PR
N°	DESCRIPTION		code
57	SILENCER		65324071
58	FILTER	70501/03	65324103
59	PUMP VALVE	SUNTEC TV40011	65322995
60	MOTOR COUPLING		65324479
61	UNION		65321791
62	PUMP COUPLING		65324364
63	PUMP MOTOR	5,5 kW	65325344
64	REMOTE CONTROL SWITCH	AEG LS4K.00	65323133
65	MOTOR THERMAL RELAY	AEG 8-12A	65323119
66	TIMER	AEG SDE	65324073
67	TIMER BASE		-
68	AIR PRESSURE SWITCH	LGW 3 A4	65323039
69	ADJUSTMENT OF OIL PRESSURE	B-GH-PRO-2	65323167
70	THERMOSTAT	IMIT TR2 40/200	65323147
71	GAS VALVE	BRAHMA EG12SR GFD	65323595
72	COIL	BRAHMA EG12SR	65323709
73	GAS VALVE	BRAHMA EG12SR GFD	65323595
74	COIL	BRAHMA EG12SR	65323709
75	MODULATING UNIT	RWF 40.000A97	65322044
76	PREHEATED'S AUX. RESISTOR HOLDER		65324418
77	FIXING PLATE		65321719
78	HEATING ELEMENT	30 W	65324207
		200 W	65324208
78	OIL CAM GROUP		65322356
79	CHECK VALVE	ART. FZVR13 1-2	65325173
80	OIL TANK GASKET		65324001
81	NOZZLE HOLDER SEAL		65325363

TC = SHORT HEAD TL = LONG HEAD

APPENDIX

Spare parts

OILFLAM 1200.1 PR



APPENDIX

Spare parts list

N°	DESCRIPTION	OILFLAM 1200.1 PR S	
			code
1	PUMP	SUNTEC T5C107	65322998
2	HEATING ELEMENT PUMP	50 W	65323072
3	HOSES	25 x1500	65323181
4	COIL	EL011	65323809
5	CONETTORE BOBINA	EL011	65323571
6	MANOMETER	CEWAL R1/4 D50	65324105
7	COVER		65324059
8	GLASS		65320487
9	PEEP WINDOW FRAME		65320488
10	MOTOR	37 kW	65325341
11	CONTROL BOX BASE	SIEMENS	65320097
12	CONTROL BOX	SIEMENS LAL2.25	13009187
13	RELAY	FINDER 5532 8	65323139
14	RELAY BASE	FINDER 5532 8	65323149
15	REMOTE CONTROL SWITCH	AEG LS15K.00(1)	65323136
		AEG LS22K.00(2)	65323134
16	REMOTE CONTROL SWITCH	AEG LS4K.00(2)	65323133
		AEG LS7K.10(1)	65324097
17	MOTOR THERMAL RELAY	AEG B55K-055 42-55A	65324067
18	ANTI JAMMING FILTER		65323170
19	ADJUSTMENT OF FUEL TEMPERATURE	GEFRAN 600	65322045
20	MAIN SWITCH	cod.4010011509	65324098
21	MANUAL / AUTOMATIC Selector		740160022000
22	RESET SWITCH		65324101
23	FUSE HOLDER		65324279
24	LAMP	LYVIA 10X28 BA9S	65324100
		RED LED	65325033
		GREEN LED	65325034
		YELLOW LED	65325044
25	AUXILIARY SWITCH HEATER		65324278
26	IGNITION TRANSFORMER	T8 13000/35 220-230/50	65323222
27	PHOTORESISTOR	QRB 1A A050	65320076
28	FAN	D633/410X251 d55	65325908
29	AIR CONVEYOR		65324064
30	RING		65320646
31	COVER AIR INLET		65324065
32	AIR DAMPER MOTOR	SQM50.481A2	65322902
33	THERMOCOUPLE	TC6MD2JBC	65322046
34	FILTER	U21008/01	65323158
35	HEATER	30 kW	65323091
36	OIL TANK		65324481
37	CABLE		65320947
38	RING		65321721
39	HOLDER SPRING		65321720
40	FIRING HEAD		65324673
41	PIPE		65324267
42	ROD FIRING HEAD	TC	65324579
43	ROD NOZZLE HOLDER	TC	65324269
44	HOLDER WAISTBAND		65324577
45	WAISTBAND		65324578
46	ELECTRODES		65325004
47	SUPPORT NOZZLE HOLDER		65320697
48	NOZZLE HOLDER		65324890
49	NOZZLE		
50	DIFFUSER		65320788

TC = SHORT HEAD TL = LONG HEAD

APPENDIX

Spare parts list

			OILFLAM 1200.1 PR
N°	DESCRIPTION		code
51	BLAST TUBE		65324788
52	BLAST TUBE END		65320461
53	ASSEMBLY FIRING HEAD	TC	
54	GASKET		65321137
55	GASKET		65324983
56	GASKET		65321139
57	SILENCER		65324071
58	FILTER	70501/03	65324103
59	PUMP VALVE	SUNTEC TV40011	65322995
60	PUMP MOTOR	5,5KW 400/50-T5-2P-IE2	65325344
61	COUPLING (MOTOR)		65324479
62	UNION		65321791
63	COUPLING (PUMP)		65324364
64	REMOTE CONTROL SWITCH(motor)	AEG LS7K.00(3)	65324097
65	MOTOR THERMAL RELAY(PUMP)	AEG 8-12A	65323119
66	GAS VALVE	BRAHMA EG12SR GFD	65323595
67	COIL	BRAHMA EG12SR	65323709
68	GAS VALVE	BRAHMA EG12SR GFD	65323595
69	COIL	BRAHMA EG12SR	65323709
70	AIR PRESSURE SWITCH	LGW 3 A4	65323039
71	PREHEATED'S AUX. RESISTOR HOLDER		65324418
72	FIXING PLATE		65321719
73	HEATING ELEMENT	50 W	65323072
74	THERMOSTAT	IMIT TR2 40/200	65323147
75	HEATING ELEMENT	30 W	65324207
76	TIMER		65324073
77	ADJUSTMENT OIL PRESSURE	B-P-PRO-2 a.070H0115	65323167
78	OIL CAM GROUP		65322356
79	CHECK VALVE	ART. FZVR13 1-2	65325173

TC = SHORT HEAD TL = LONG HEAD

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