GAS/HEAVY-OIL DUAL BURNERS

Ecoflam

techniques for energy saving

Multiflam 500.1
Multiflam 600.1

PR/PR - MD/MD

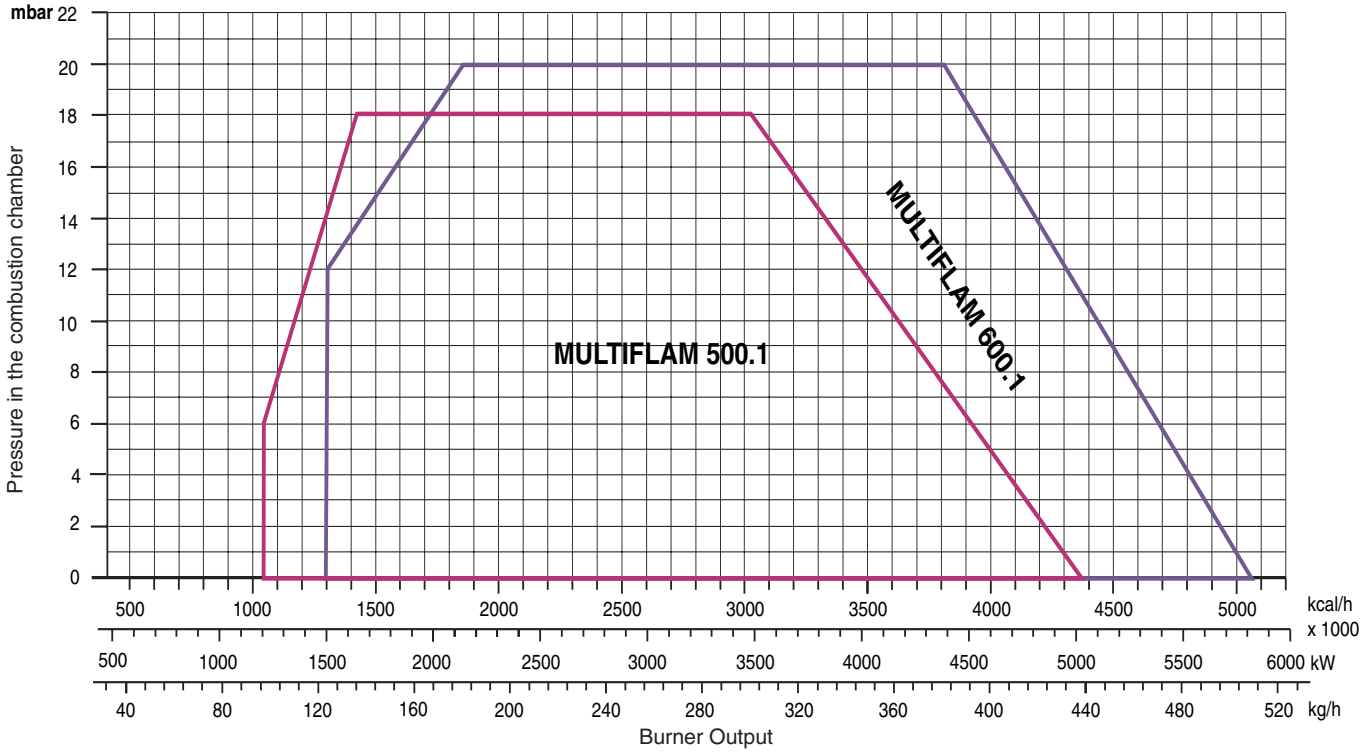
Heavy oil / Natural gas 40÷300 mbar

LB 1472
28.09.2006

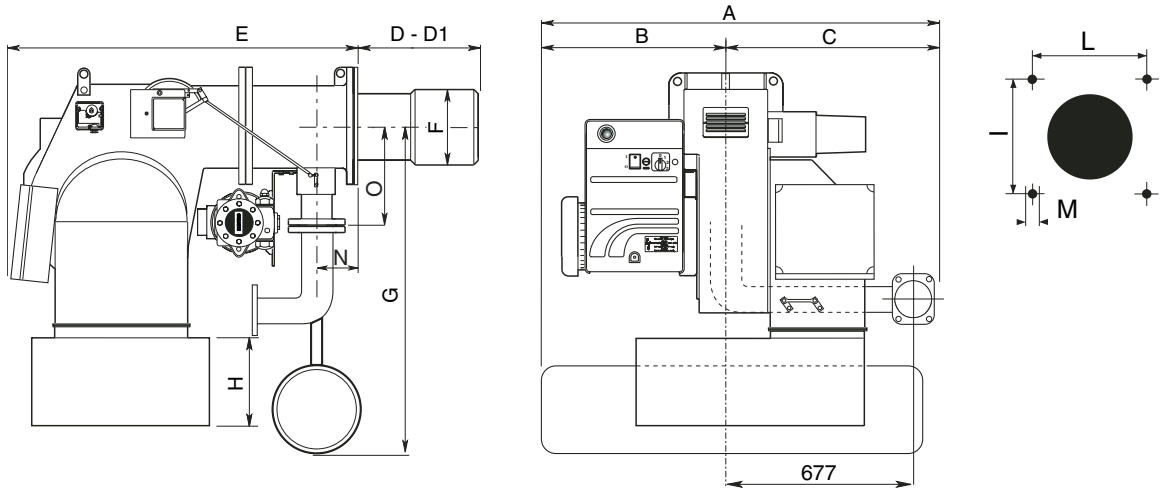
TECHNICAL DATA

MODELS		500.1	600.1
Thermal power max.	kW	5.000	5.800
	kcal/h	4.310.000	5.000.000
Thermal power min.	kW	1.200	1.500
	kcal/h	1.034.500	1.290.000
Natural gas pressure	mbar	40÷300	40÷300
Voltage 50 Hz	V	230/400	230/400
Motor	kW	11	15
Rpm	N°	2800	2800
Fuel :		Natural Gas (L.C.V. 8.570 kcal/Nm³)	
		Heavy oil (L.C.V. 9.800 kcal/kg max. visc 50°E at 50°C)	

WORKING FIELDS



DIMENSIONS D'ENCOMBREMENT



Models	A	B	C	D	D1	E	F	G	H	I	L	M	N	O
Multiflam 500.1	1395	643	752	350	600	1118	320	778	400	330	330	M16	195	250
Multiflam 600.1	1395	643	752	350	600	1215	320	778	400	330	330	M16	195	250

ELECTRICAL CONNECTIONS

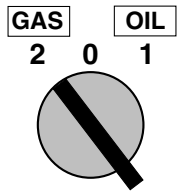
All burners factory tested at 400 V 50 Hz three-phase for motors and 230 V 50 Hz monophase with neutral for auxiliary equipment. If mains supply is 230 V 50 Hz threephase withuot neutral, change position of connectors on burner as in fig. Protect burner supply line with safety fuses and any other devices required by safety standards obtaining in the country in question.

CONNECTION TO THE GAS PIPELINE

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

OPERATION OF BURNER WITH GAS

Before starting the burner, make sure it is mounted correctly. Then check connections are correct according to the diagram and piping is appropriate to the system. Before connecting the burner to the electricity supply, make sure voltage corresponds to burner plate data. The connection diagram and start-up cycle are shown separately. For wiring from control box to burner, see the enclosed connection diagram. Pay particular attention to neutral and phase connections : never exchange them!. Vent air and impurities of gas pipe. Check gas pressure conforms to the limits stated on the burner plate when connecting a master gauge to the test port provided on the burner. Blower motor starts and pre-purging begins. Since pre-purging has to be carried out with the max. air delivery, the burner control circuit turns the air damper to the max. delivery position by the air servocontrol in approximately 30 seconds time. When the servocontrol is fully open, a signal to the electronic control unit starts the 36 seconds pre-purge cycle. At the end of the prepurging time, the air servocontrol gets to the Low Flame position so that burner ignition is ensured at min. output. Simultaneously the ignition transformer receives voltage and after 3 seconds (pre-ignition) opens the pilot gas valve. Fuel flows to the combustion head and ignites. Two seconds after pilot gas valves have opened, the ignition transformer is excluded from the circuit. In case of no ignition the burner goes to lock-out within two seconds. After 6 sec. open the working gas valve, governed by the gas firing butterfly valve.Now the burner is operating at the min. firing rate (about 30% of the max. firing rate). The air servocontrol runs at the Low Flame position and in case the temperature control has to be set at the max. output it goes to a fully open position of air damper and butterfly valve. During the burner-off periods the air damper closes up fully.

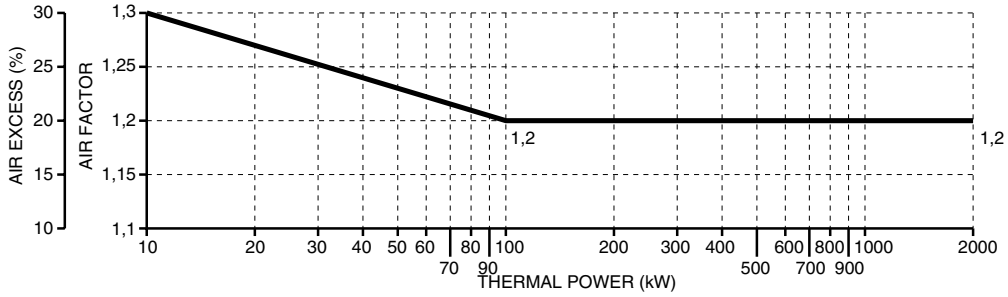


ADJUSTING THE COMBUSTION PROCESS

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

	Metano
CO_2	9,6%
CO	<100 ppm

	GPL
CO_2	11,7%
CO	<50 ppm

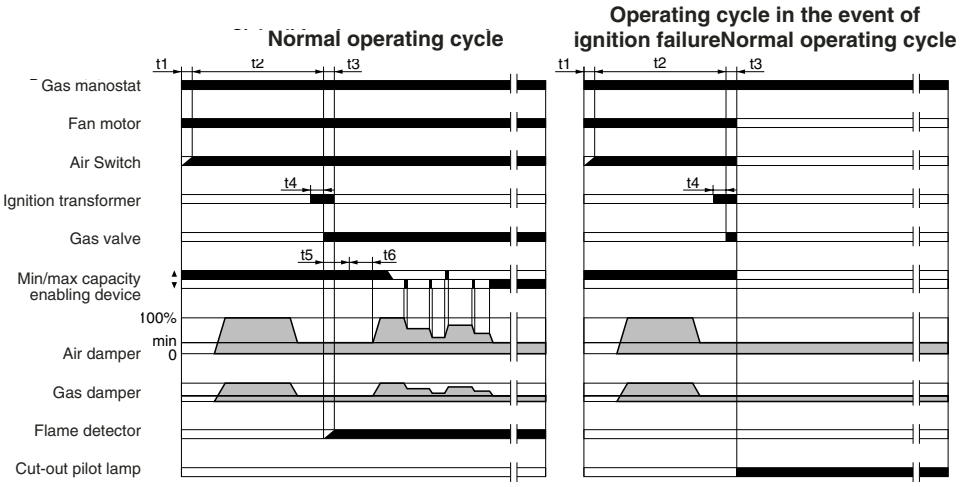


COMBUSTION ADJUSTMENT

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

LANDIS & STAEFA, Model LFL1.333 OPERATING CYCLE

Ref.	Description	Duration
t1	Duration Waiting time for confirmation	
t2	of air pressure	8”
t3	Preventilation time	36”
t4	Safety time	2”
t5	Pressurizing time	4”
	Time for enabling operation of the main gas valve on minimum capacity	10”
t6	Time for enabling operation of the main gas valve on maximum capacity	10”



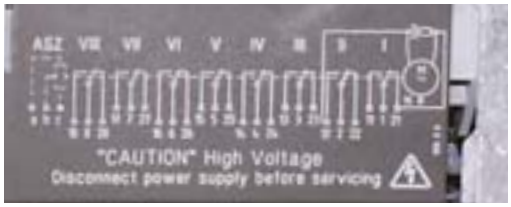
The control box starts the burner fan, to carry out the prepurging of the combustion chamber, and cheks the vent air pressure through the air pressure switch. At the end of prepurging, the ignition transformer cuts-in and generates a spark between the electrodes. At the same time the two gas valves open (Vs safety valve and Vl working valve). The total safety, in case of missed ignition or casual burner's flame-out, is granted by a ionisation probe which cuts-in and sets the burner shutdown within the safety time. In case of gas lack or a major pressure drop, the minimum air pressure switch shuts down the burner.

LANDIS & STAEFA SQM 50.481A2 AIR DAMPER MOTOR

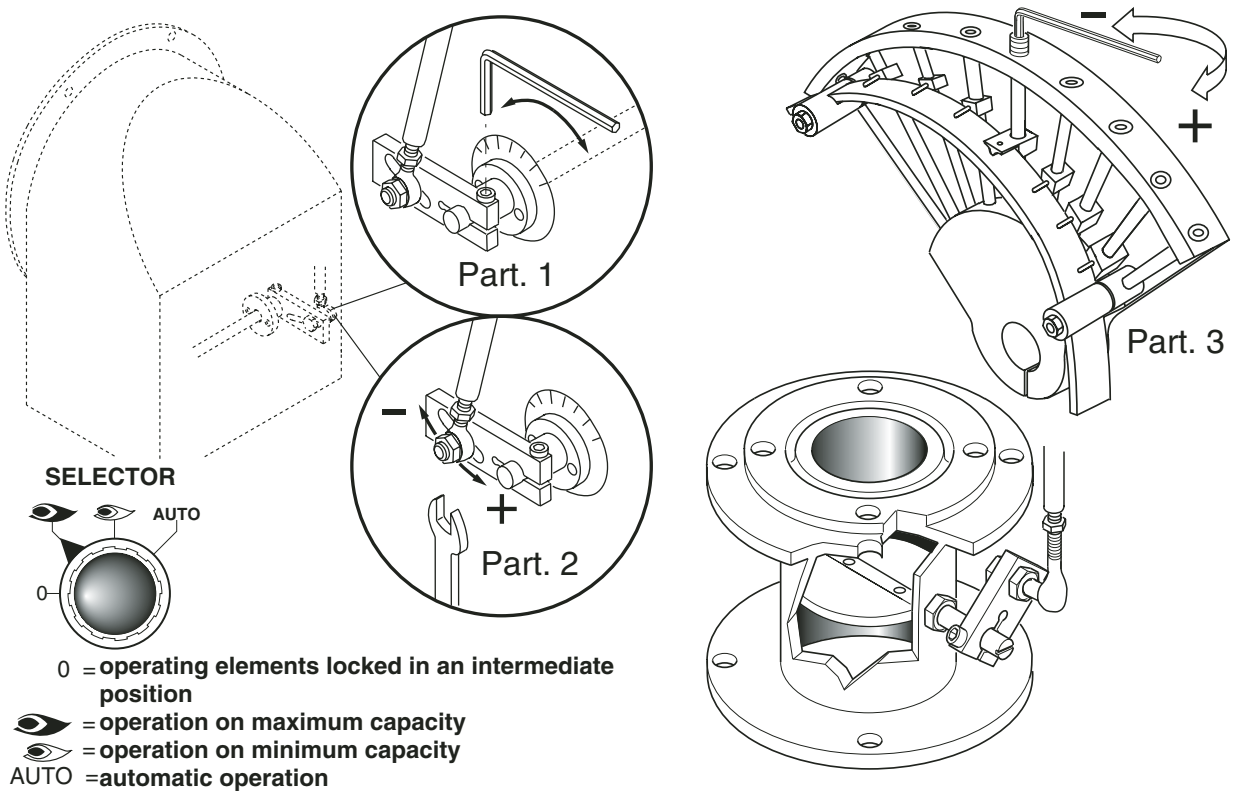
Remove cover to gain access to the adjusting cams.The cams are to be adjusted through the suitable key provided for.
Description:

Manual change

I - High flame operating opening position adjusting cam (Heavy-Oil /Gas).
II - Limit switch for the air damper position at burner’s shut down.
III - Ignition flame opening position adjusting cam (Gas).
IV - Ignition flame opening position adjusting cam(Heavy-Oil).
V - Low flame operating opening position adjusting cam (Gas).
VI - Low flame operating opening position adjusting cam (Heavy-Oil).
VII - Not used cam.
VIII - Not used cam.



AIR AND GAS ADJUSTMENT



ADJUSTING THE MINIMUM CAPACITY OF THE BURNER – AIR and GAS

Position the selector placed on the control panel on position 2 and proceed as follows:
Adjust the minimum gas flow rate using a suitable wrench, turn the butterfly valve until you reach the correct gas flow, as established by analyzing the combustion process.

ADJUSTING THE MAXIMUM CAPACITY OF THE GAS

Position the selector, situated on the control panel, on position 1 and proceed as follows:
Adjusting the maximum gas flow rate (see figure on solenoid valve adjustments) or adjust the gas pressure in the governor.

ADJUSTING THE MAXIMUM AIR FLOW RATE

Adjusting the maximum air flow rate (see figure, detail 2). Loosen the nut holding the air damper transmission rod;
The correct air flow as established by analyzing the combustion process.

ADJUSTING THE INTERMEDIATE BURNER CAPACITY

Using the selector, start the servomotor (closing or opening) and position on 0 to stop the stroke; the adjustment is made as outlined below. Repeat the operation for the other cam points.
Adjustment the intermediate gas flow rates (see figure, detail 3): - using a suitable Allen wrench, change the position of the cam guide blade; if you screw it down, the flow rate is reduced; if you unscrew it, the flow rate increases.

CALCULATING THE BURNER CAPACITY

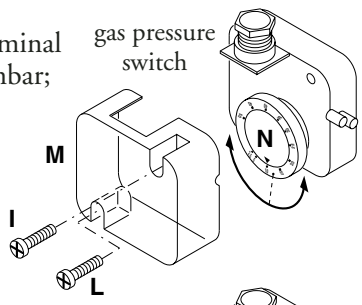
To calculate the burner's capacity in kW, proceed as follows: Check the gas flow rate (in liters) on the counter and the time of the reading in seconds.

Proceed with the calculation using the following : $\frac{e}{sec} \times f = kW$

e = Litres gas
sec = Time in second
f: G20 = 34,02; G30 = 116; G31 = 88

ADJUSTMENT OF GAS MINIMUM PRESSURE SWITCH

Unscrew off and remove cover M. - Set regulator N to a value equal to 60% of gas nominal feed pressure (i.e. for nat. gas nom. pressure = 20 mbar, set regulator to a value of 12 mbar; for L.P.G. nom. pressure of G30/G31- 30/37 mbar, set regulator to a value of 18 mbar).Screw up cover M

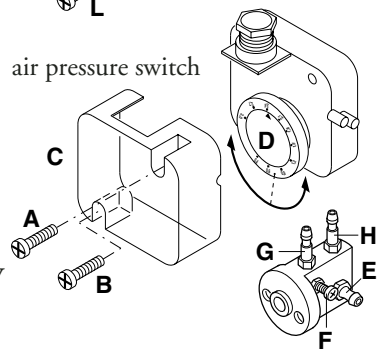


ADJUSTMENT OF THE AIR PRESSURE SWITCH

Unscrew screws A and B and remove cover C.- Set the pressure switch to the minimum by turning regulator D to position 1.

- Start the burner and keep in low flame running, while checking that combustion is correct. Through a small cardboard, progressively obstruct the air intake until to obtain a CO_2 increase of 0,5÷0,8% or else, if a pressure gauge is available, connected to pressure port E, until reaching a pressure drop of 1 mbar (10 mm of W.G.). - Slowly increase the adjustment value of the air pressure switch until to have the burner lockout. Remove the obstruction from the air intake, screw on the cover C and start the burner by pressing the control box rearm button.

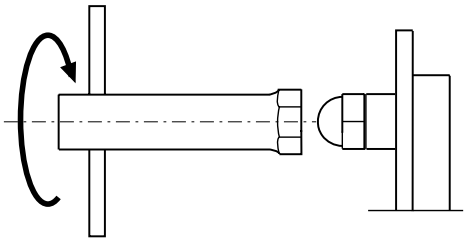
Note: The pressure measured at pressure port E must be within the limits of the pressure switch working range. If not, loose the locking nut of screw F and gradually turn the same: clockwise to reduce the pressure; counterclockwise to increase. At the end tighten the locking nut.



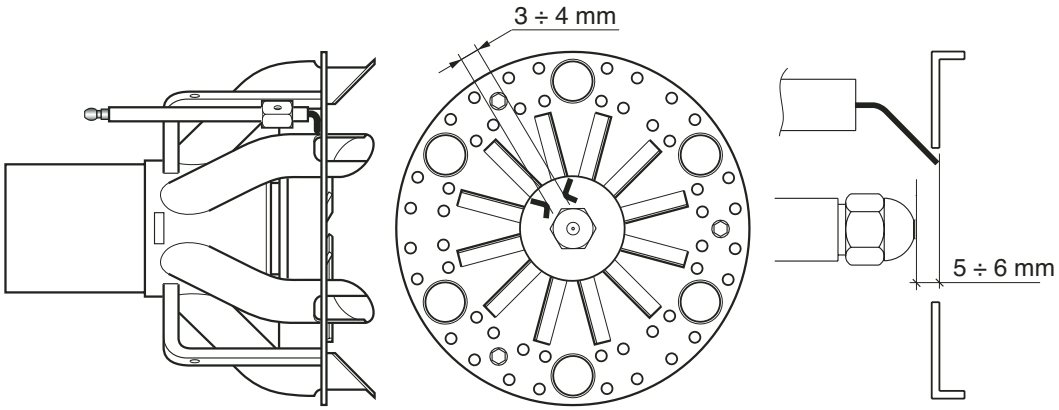
NOZZLE CLEANING AND REPLACEMENT

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

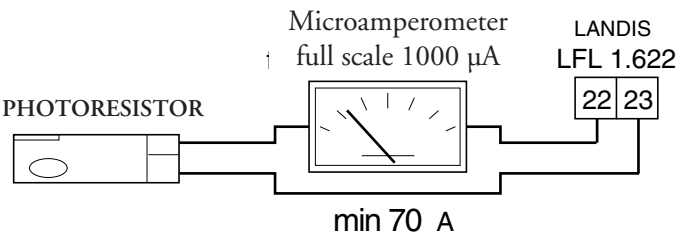
Note: Always check the position of electrodes after having replaced the nozzle (see illustration). A wrong position could cause ignition troubles.



POSITION OF IGNITION ELECTRODES



IONIZATION CURRENT

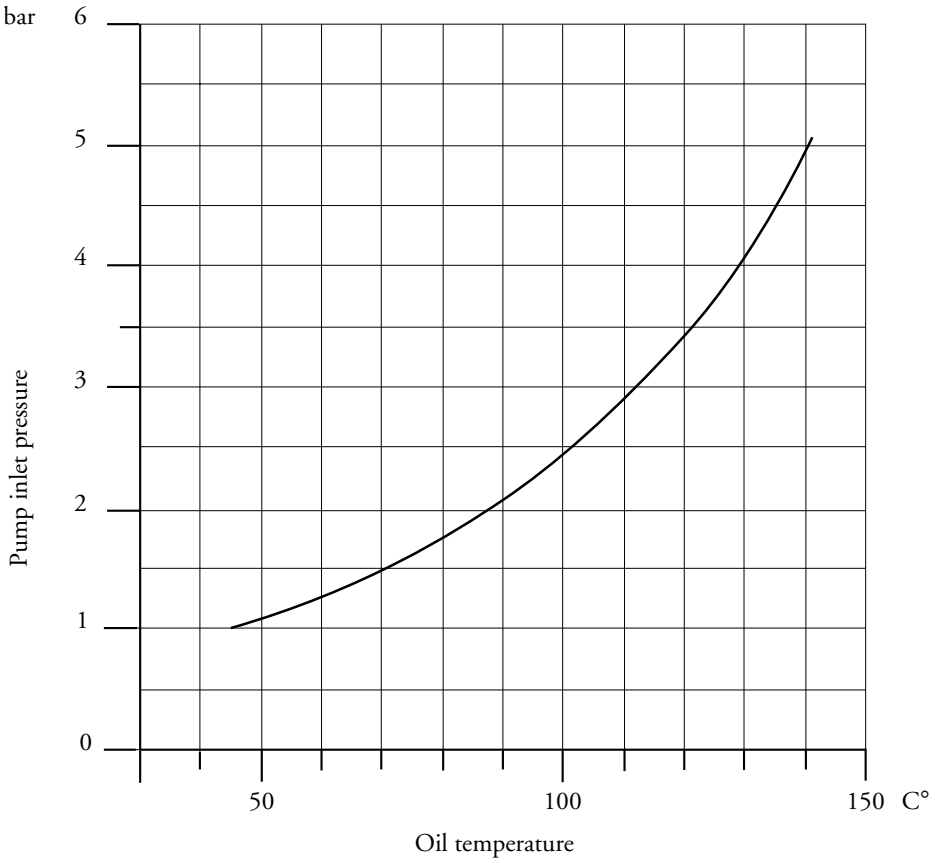


The ionization current is checked by inserting a microammeter with an end of scale of 50 µA (d.c.) in series with the ionization probe. A faulty position of the electrode can lead to a reduction in the ionization current and cause a safety cut-out of the burner due to a flame detection failure. In this case, check the position of the electrode, its electric connection and the earthing of the burner. The ionization current is normally > 20 µA.

REMOVING THE FIRING HEAD

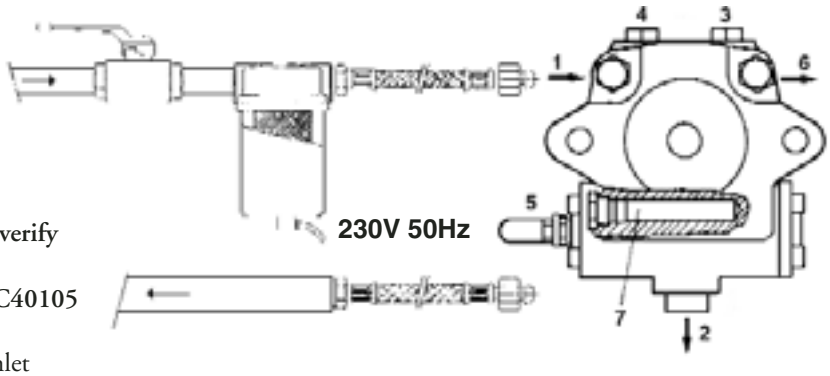
PUMP'S PRESSURE / OIL TEMPERATURE DIAGRAM

Pump inlet pressure:the vaporisation of light fraction of heated heavy oil causes premature pump wear, to avoid this, use the inlet pressures shown in the graph.



HEAVY OIL FEEDING

1 - Inlet
2 - Return
3 - Bleed and pressure gauge port
4 - Vacuum gauge port
5 - Pressure adjustment
6 - Nozzle outlet



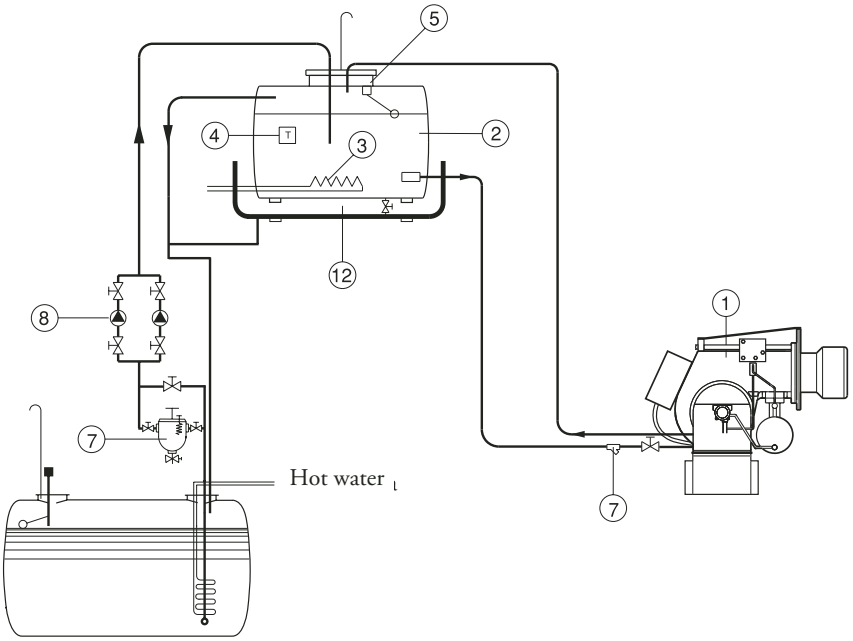
WARNING: For a correct working of the pump, verify what follows:

Pump :	**SUNTEC TA4C40105**
Oil temperature at the pump:	Max. 140 °C
Maximum allowable pressures:	Max. 5 bar on inlet

TYPE OF INSTALLATION

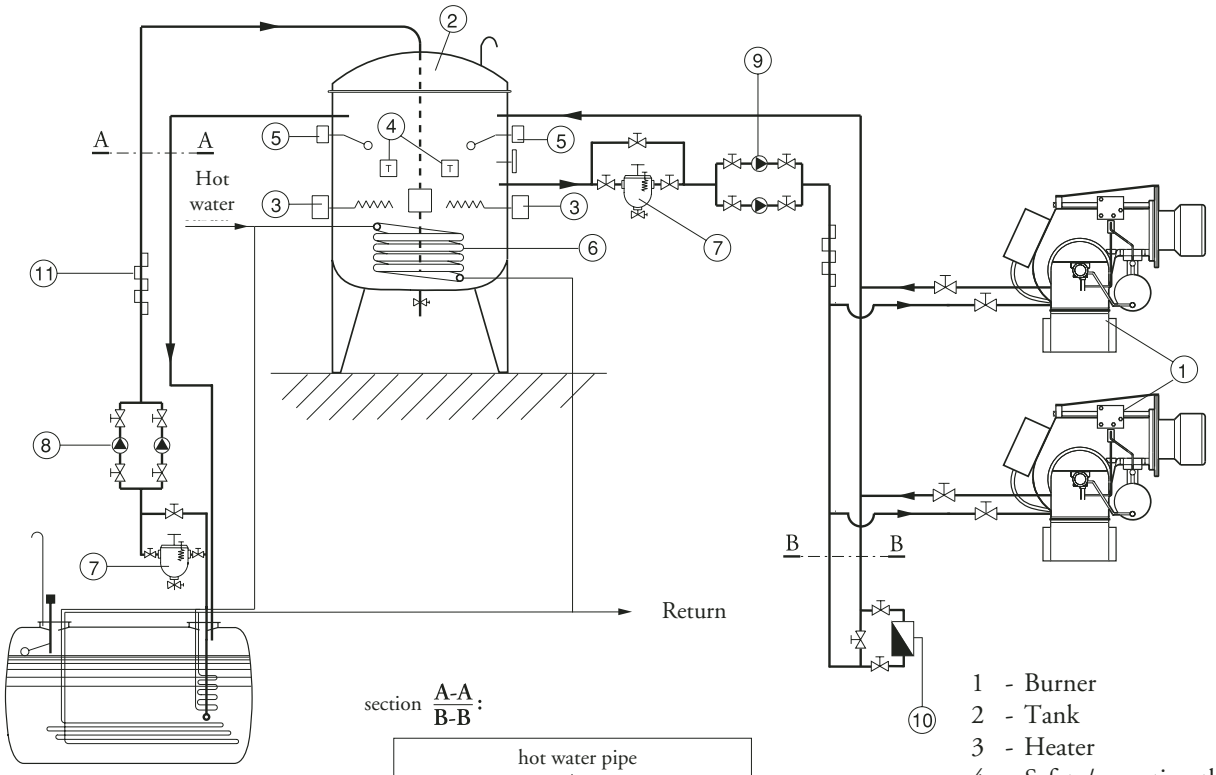
The burner must be supplied with oil heaving a min. temperature at the pump (50° C).

Drawing for fluid fuel oil up to 50°E at 50°C

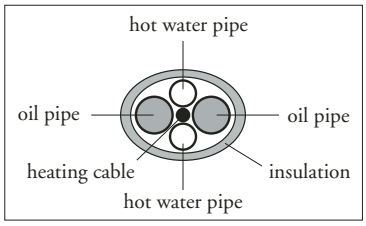


1 - Burner
2 - Tank
3 - Heater
4 - Safety/operation thermostat
5 - Level switch
6 -
7 - Filter
8 - Load pumps
9 - Holding basin

Drawing for heavy fuel oil up to 50°E at 50°C



section $\frac{\text{A-A}}{\text{B-B}}$:



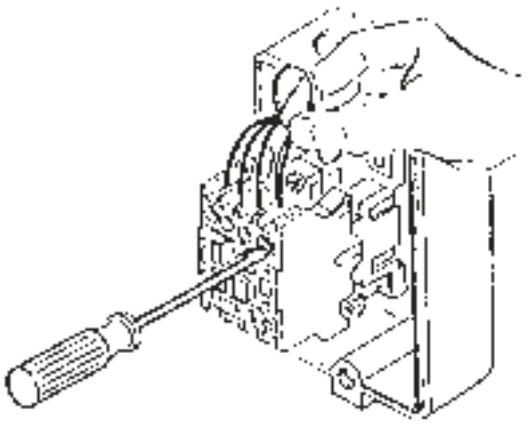
1 - Burner
2 - Tank
3 - Heater
4 - Safety/operation thermostat
5 - Level switch
6 - Self cleaning filter
7 - Heating coil
8 - Load pumps
9 - Ring pumps
10 - Regulator
11 - Heating cable

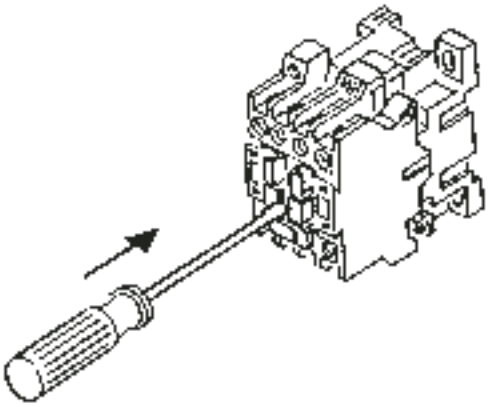
BEFORE PROCEEDING WITH THE FILLING OF THE OIL SYSTEM, CHECK THE FOLLOWING POINTS:

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

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

- Connect a fuel pressure gauge
- Set OUT1 - OUT1 - OUT3 - OUT 4 to 0°C on GEFRAN regulator
- Disconnect the resistors power cable from the motor's remote control switch, and insulate it temporarily
- Unplug the safety box
- Start the burner and manually operate the motor's remote control switch until the oil system is filled up. Note: the oil system can be considered filled when pressure gauge will show a constant reading of 16÷18 bar.





When done, shut off the burner, switch off power and restore initial conditions as follows:

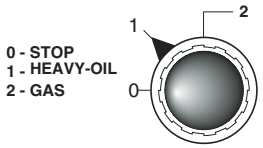
- Reconnect resistors power cable
- Set OUT1 - OUT1 - OUT3 - OUT 4 on GEFRAN regulator to the initial value.
- Plug in the control box

CHECKS TO BE MADE TO ENSURE A PROPER INSTALLATION:

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

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

MODULATING OPERATION



With the bumer in the start position and the appliance thermostats enabled, power is delivered to the resistances (G) of the preheater and heating cartridges for the pumps and the fuel supply line to the head (O). When the preheater thermostat reaches the set value, (usually a minimum of about 90°C is necessary to guarantee a good level of circulation) the pump start-up is enabled (set point on out 1, if using the GEFRAN 200 thermoregulating device). If the preheating system of the tank is also equipped for a fluid exchanger (hot water, steam, diathermic oil) the thermostat may enable a contact in the terminal block for any stop-start of the fluid electrovalve. This is not a standard solution as the heated fluid is normally always connected. The pump starts to send oil (the head has already been heated by its cartridge (O) and therefore has no residue of cold dense oil) which flows from the tank to the head and then to the return line of the ring. When the head thermostat reaches the set value (usually about 70-30°C the cycle starts properly and the control programmer enables start-up. The servomotor sets itself at minimum (see chapter on regulation) acting on the air and fùel via the pressure regulator on the return.
The electromagnet (A) opens the nozzle (Q) in the followmg condition :

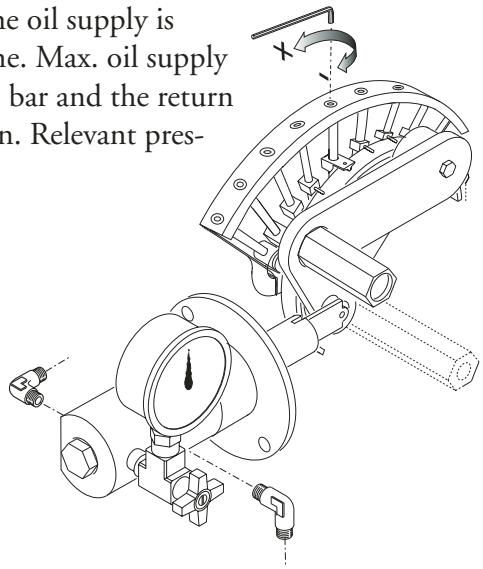
- sparks from the ignition electrodes are generated by the transformer also governed by the burner control device.

If the cell fails to detect the flame the burner shuts down (with the cyclic control programmer cutting in). Once ignition has taken place and after the flame stabilisation period, the system starts operating in modulating mode.

- Before start-up make sure that the pump and delivery pipes are completely filled with hot fuel oil; the absence of fuel oil can cause pump seizure.
- If there is a block, a specific waring light on the programmer and on the burner front control board lights up and this signal is usually sent to the main control board of the equipment using the burner, setting off a buzzer and warning light.
- A few blocks are normal on first starting up (up to about 4); to release press the button on the programmer (also found on the front of the bumer control board) for repeating the start cycle. Should they continue to occur seek the help of a specialised technician.

N.B. The position of the programmer at the time of the block is memorised to supply an indication of the cause of this block.

OIL DELIVERY ADJUSTMENT

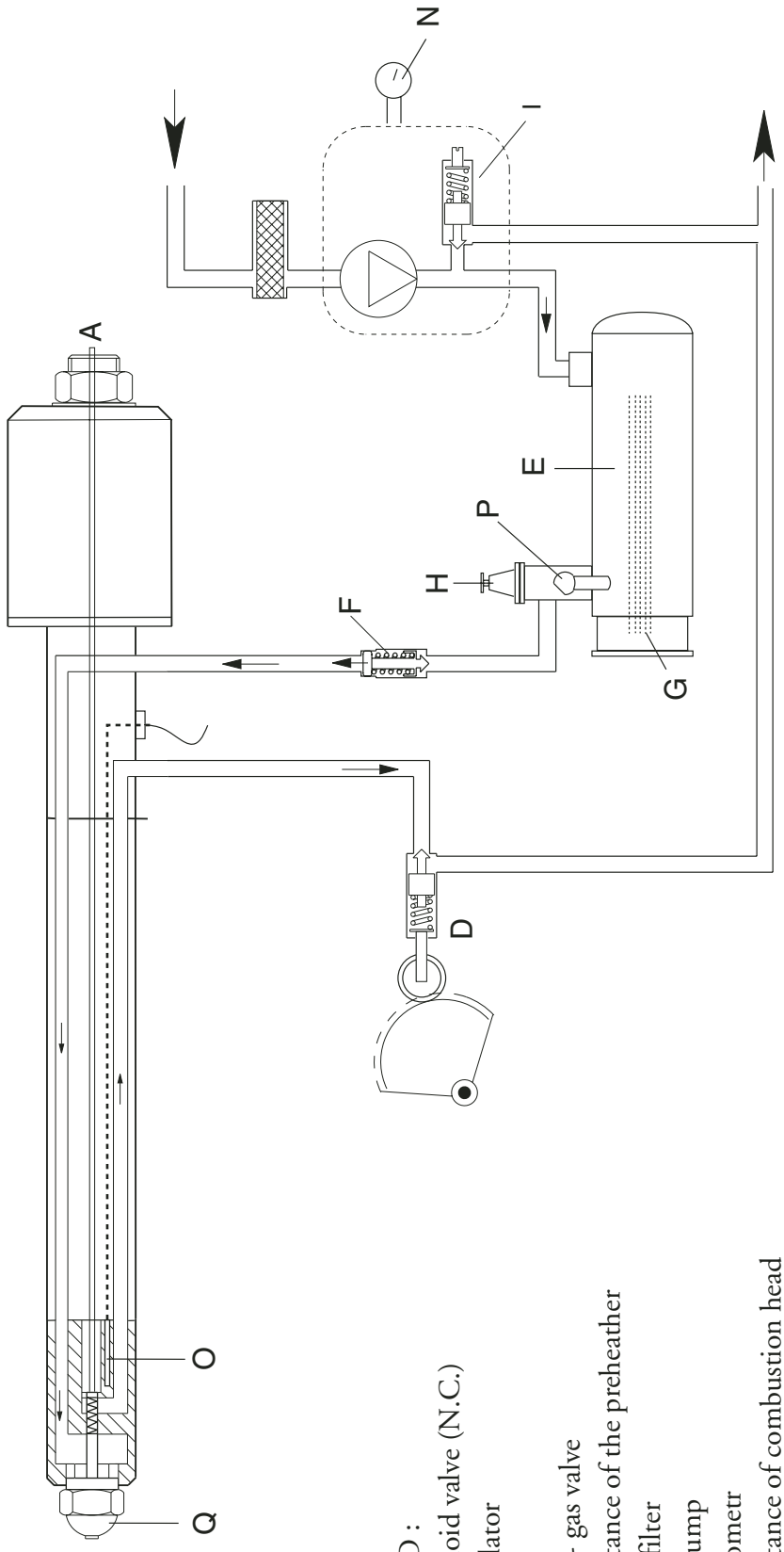


The diagram illustrates the fuel feeding system of these types of burners, which incorporates a by-pass nozzle with oil flow regulation on its return pipe. The oil supply is varied by acting on the nozzle through the pressure in the return line. Max. oil supply is therefore reached when the pressure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

Pump pressure 22-25 bar.
Max Burner output, return oil pressure:
FLUIDICS nozzle : 16 ÷19 bar.
BERGONZO nozzle : 20 ÷24 bar.

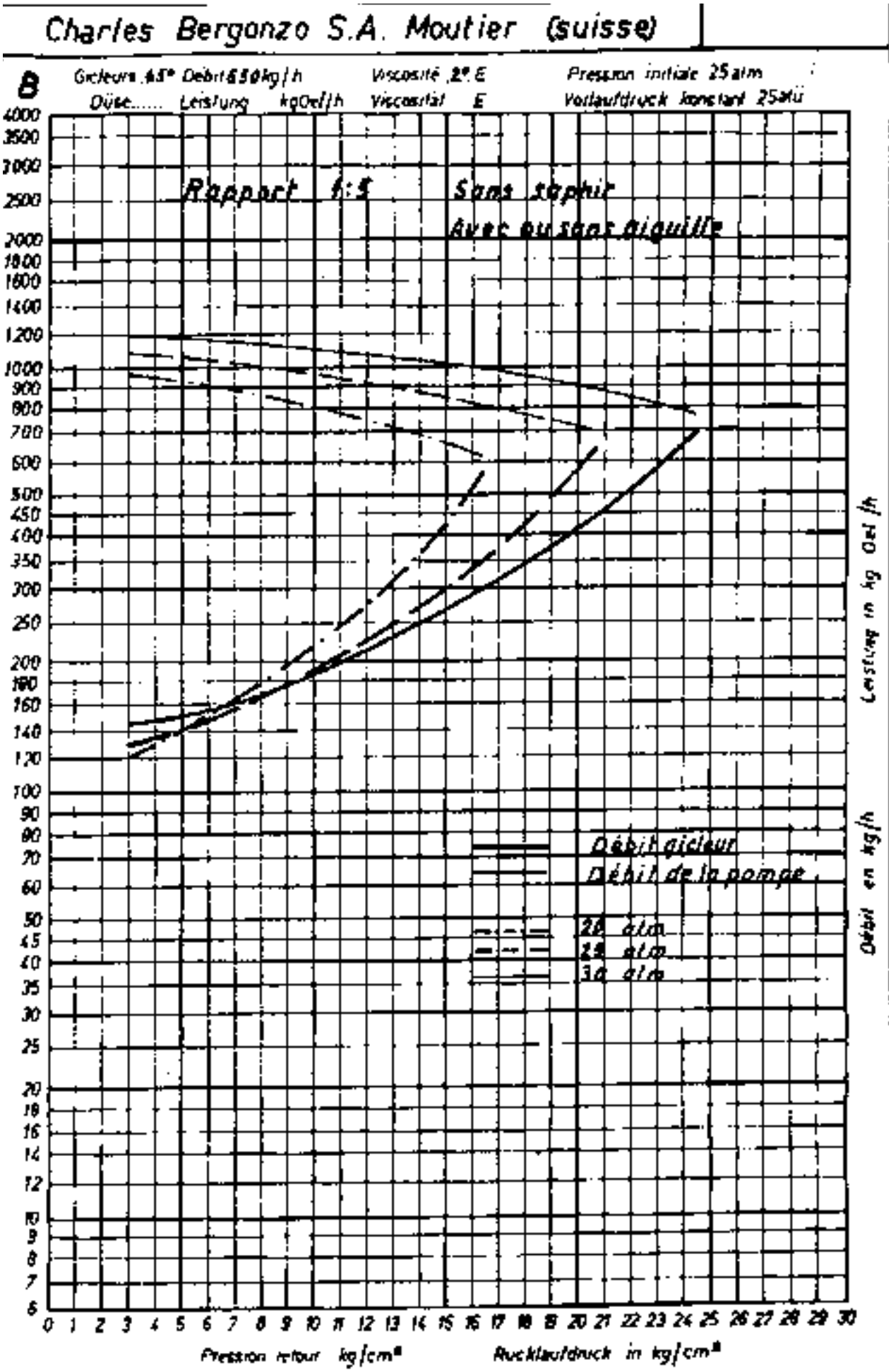
Min Burner output, return oil pressure:
FLUIDICS nozzle : 6 ÷9 bar
BERGONZO nozzle : 4 ÷8 bar

PRE - PURGING PHASE



LEGEND :

A Solenoid valve (N.C.)
D Regulator
E Tank
F Anti - gas valve
G Resistance of the preheather
H Pipe filter
I Oil pump
N Manometr
O Resistance of combustion head
P Oil temperature sensor
Q Oil nozzle


Charles Bergonzo S.A. Moutier (suisse)
B
Gicleurs 45° Debit 6.50 kg/h
Düse..... Leistung kgOel/h
Viscosité 2° E
Viscosität E
Pression initiale 25 atm
Vorlaufdruck konstant 25 atü
Rapport 1:5
Sans saphir
Avec ou sans aiguille
Débit gicleur
Débit de la pompe
20 atm
25 atm
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Leistung in kg Oel/h
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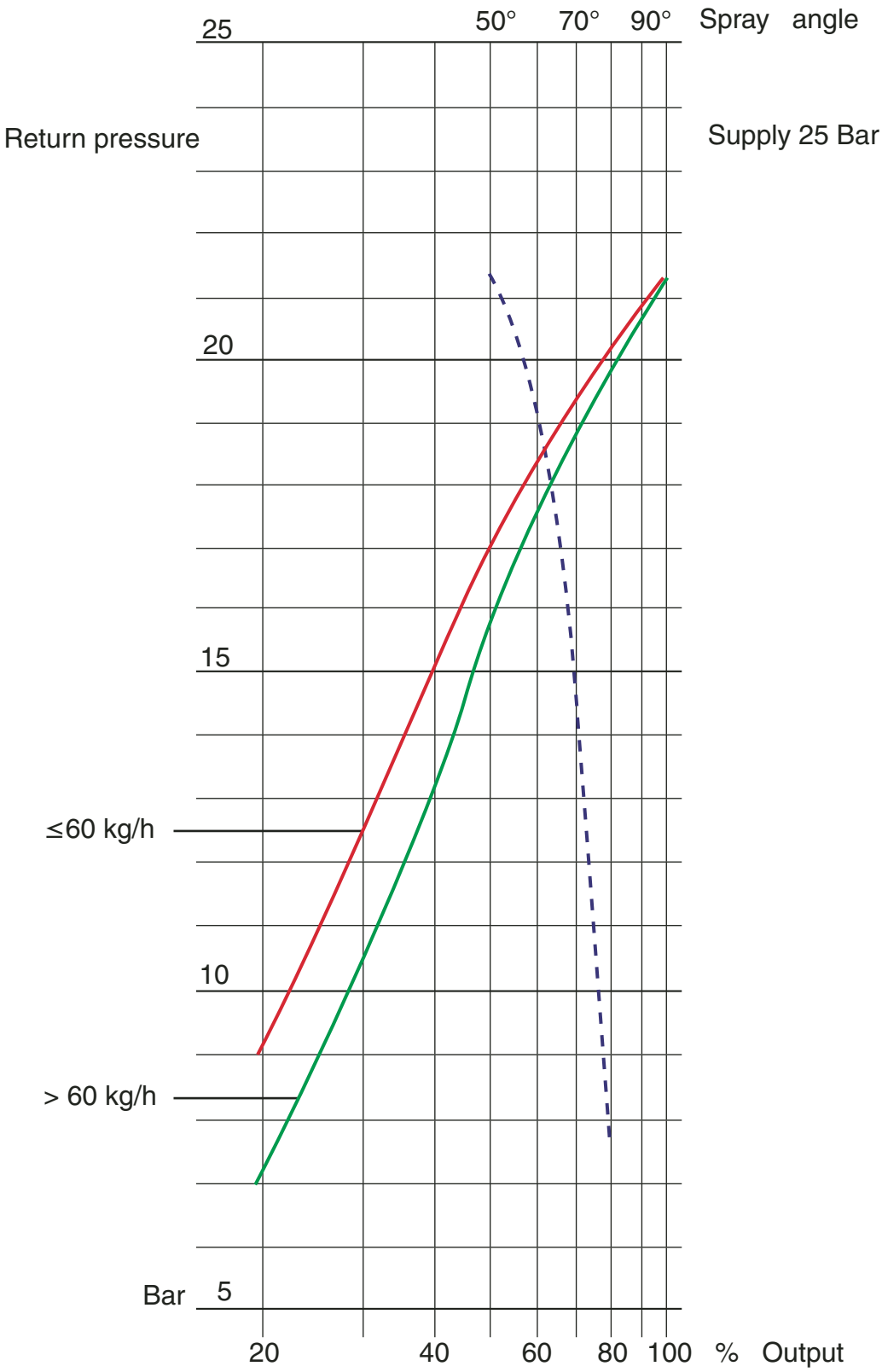
Pression retour kg/cm²
Rücklaufdruck in kg/cm²

FLUIDICS NOZZLE

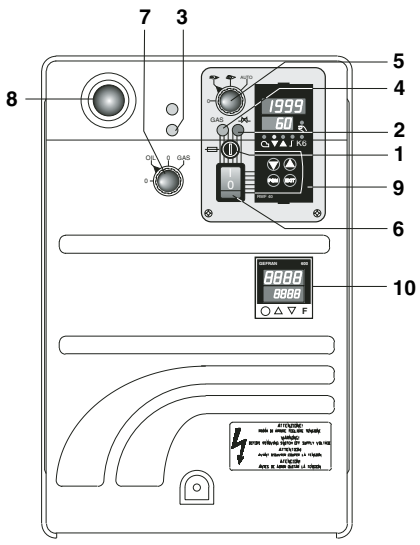


ADJUSTMENT OF FUEL TEMPERATURE

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°**).
- To modify factory temperature setting act as follows:
- press key "**F**"
- the led Out1 starts to flash, 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 flashes.

Please take care: if key "**F**" is pressed for a too long time, You enter in "configuration level" phase1, (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 flashing on the display – wait 10 seconds untill the regulator automatically goes out from "configuration level".

DESCRIPTION OF THE CONTROL PANEL OF THE BURNER

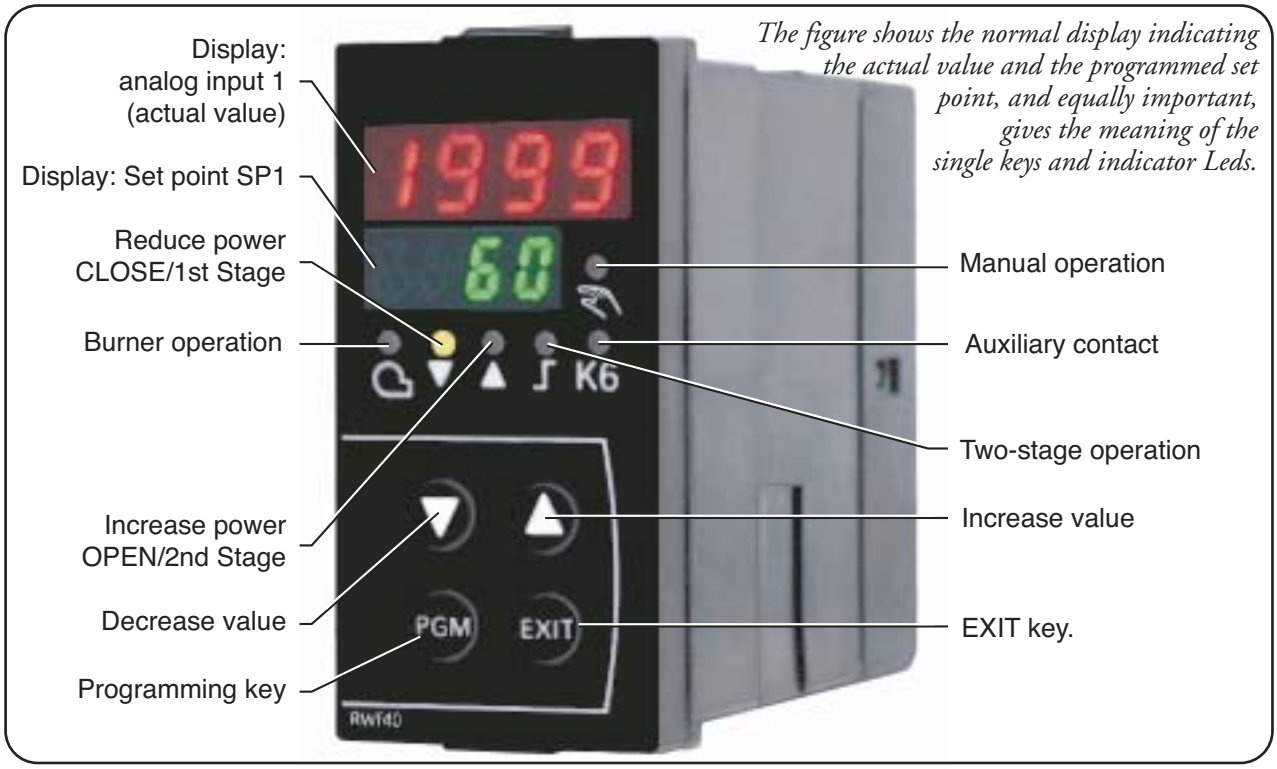


1 - Fuse
2 - Termal lock-out lamp
3 - working lamp
4 - Gas working lamp
5 - Selector :
- 0 Loking of devoices for operating at intermediate outputs
- Operation at max. output.
- Operation at min. output.
- **AUTO** Automatic operation.

6 - Main switch I / O
7 - Selector : 0 / Heavy Oil / 0 / Gas
8 - Lockout disable push button
9 - Modulating unit RWF 40
10- Thermostat unit GEFRAN 600

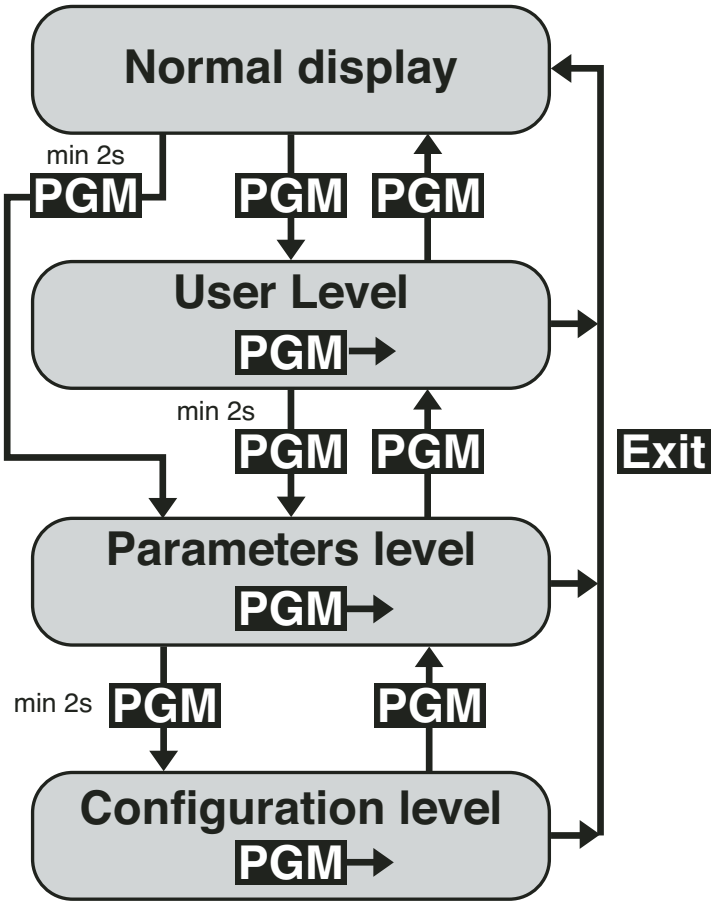
RWF 40 MICROPROCESSOR REGULATOR

Description of display and keys on the RWF 40 microprocessor regulator



The figure shows the normal display indicating the actual value and the programmed set point, and equally important, gives the meaning of the single keys and indicator Leds.

PROGRAMMING LEVELS



SETTING PARAMETERS

When the burner is ignited all displays of the regulator light up. The set point display will blink for about 10 seconds. The value in the upper field of the display (red) indicates the actual value. The value in the lower field of the display (green) indicates the set point currently programmed.

CHANGING THE SET POINT

To change the set point, proceed as follows: - Press the ***PGM*** button to access the user level. SP1* will appear in the lower display - Change the value of set point SP1 using the t and s keys.▼e ▲. - After a 2 second delay the value set is stored automatically – To return to normal display press ***EXIT***.

***** The value of SP1 depends on the value set previously in configuration level **C111**.

SETTING PID PARAMETERS

PID parameters are factory set to standard mean values. The operation of the regulator can be self-adapted to suit the system by activating the "tunE" function. The regulator will set the PID parameters automatically. To activate the "tunE" function proceed as follows: - With the burner in operation, press ***PGM*** + ▼. - the caption "tunE*" will blink in the display. – When "tunE" stops blinking, the self-adaptation routine has been completed. - Confirm the computed parameters by pressing the ▲ key for 2 seconds.

***** The "tunE" function cannot be activated in Manual mode, or when the burner is off.

The PID parameters can be corrected manually from the parameters level, working on the proportional band Pb1, the derivative action time dt and the integral action time rt.

To change parameters Pb1, dt and rt, proceeds as follows: - Press the ***PGM*** button to access the parameters level. - To move from one parameter to the next, press ***PGM*** . - When **Pb1** is displayed, the value can be increased or decreased using the s and t keys. - Confirm the changed parameters by pressing ***PGM***. - If confirmation is not given within 2 seconds the value will be stored automatically. - Press ***PGM*** to access the next parameter. - When dt is displayed, repeat the procedure described above. - Press PGM to access the next parameter. - When rt is displayed, repeat the procedure above. - To return to normal display press ***EXIT***.

DIFFERENTIAL SETTING FOR IGNITION AND SHUTOFF

The regulator allows the selection of an adjustable switching differential that establishes burner ignition and shutoff values. HYS1 indicates the lower ignition limit, below which the regulator switches the burner to maximum power. HYS3 indicates the upper shutoff limit, above which the regulator switches the burner off. To set HYS1 and HYS3 proceed as follows: - Press the ***PGM*** key to access the parameters level. - To move from one parameter to the next, press ***PGM*** . - When **HYS1** is displayed (burner ignition differential-stage II), increase or decrease the value using the ▼ and ▲ keys. - Confirm the changed parameters by pressing ***PGM***. - If confirmation is not given within 2 seconds the value will be stored automatically. - Press ***PGM*** to access the next parameter. - When **HYS2** is displayed (burner shutoff differential-stage II), repeat the procedure described above. - Press ***PGM*** to access the next parameter. - When **HYS3** is displayed (upper shutoff differential) repeat the procedure described above. - To return to normal display press ***EXIT***.

MANUAL/AUTOMATIC MODE

To access "MANUAL" mode, press and hold ***EXIT*** for at least 5 seconds. Manual mode can only be selected when the burner is in operation. It is deactivated automatically when the burner shuts off. When the LED above the hand symbol is alight, the regulator is in manual mode and the position of the servocontrol can be changed using the ▼ and ▲ keys. The LEDS on the front of the regulator indicate whether the servocontrol OPEN or CLOSE command is currently active. Pressing the ▼ key the servocontrol OPENS. Pressing the ▲ key the servocontrol CLOSES. To select automatic mode press and hold ***EXIT*** for at least 5 seconds. The LED above the hand symbol goes out and the regulator reverts to automatic.

CLIMATIC COMPENSATION

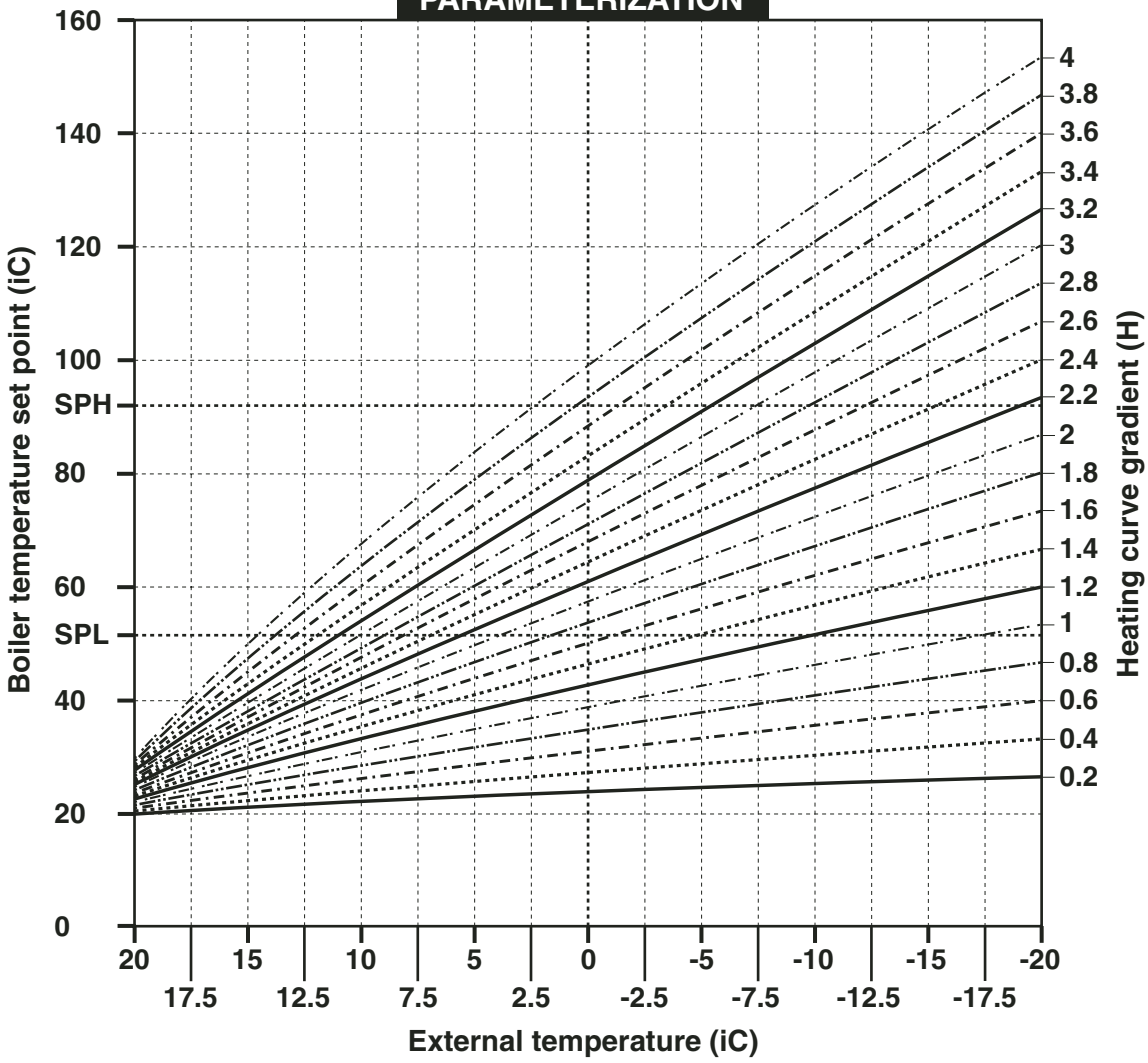
The RWF 40 regulator can be set with the set point interlocked to the external probe. To select this operating mode, proceed as follows: - Connect the required probe as in the wiring diagram. - Change the regulator settings. When using an external probe the regulator must be set as follows: - Press the ***PGM*** key to access the configuration level. When the caption **C111** (XXXX) is displayed, use the ▲ key to access the second figure (XXXX). Use the ▼ key to select the type of probe (XX3X). - Confirm the change of parameters by pressing ***PGM***. If this is not done within 2 seconds, the value is stored automatically - Press ***PGM*** to access the configuration level. When the display reads **C112** (XXXX), use the ▲ key to access the second figure (XXXX). Press the ▼ key to set the type of probe (XX3X). - Confirm the changed parameters by pressing ***PGM***. - If confirmation is not given within 2 seconds the value will be stored automatically.

- To return to normal display press ***EXIT***. To establish the heating curve, proceed as follows:

- Press ***PGM*** to access the parameters level. - Press ***PGM*** to move from one parameter to the next. - When the letter H is displayed (heating curve gradient), increase or decrease the value using the ▼ and ▲ keys. - Confirm the changed parameters by pressing ***PGM***. - If confirmation is not given within 2 seconds the value will be stored automatically.

- To return to normal display press ***EXIT***.

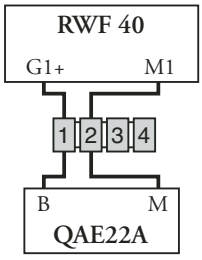
PARAMETERIZATION



PROBE CONNECTION DIAGRAMS

Cod. S721

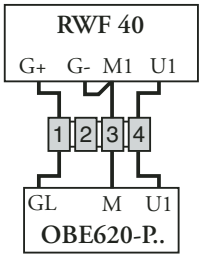
Connection for probe
QAE2..(passive probe)
Water probe
Configuration code
C111 = 9XXX



Cod. S704

Connection for probe
FT-TP/..(passive probe)
(Degusa probe)
Configuration code
C111 = 5XXX

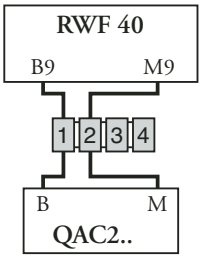
Cod.
S731
S731/1
S731/2
S731/3
S731/4



Connection for probe
QBE620-P..(active probes)
Configuration code
C111 = GXXX
S731 - 0…4 bar / 0…400 kPa
QBE620-P4
S731/1 - 0…10 bar / 0…1 MPa
QBE620-P10
S731/2 - 0…16 bar / 0…1.6 Mpa
QBE620-P16
S731/3 - 0…25 bar / 0…2.5 MPa
QBE620-P25
S731/4 - 0…40 bar / 0…4 MPa
QBE620-P40

Cod. S720/1

Connection for probe
QAC22 (passive probe)
Configuration code
C111 = XX3X
C112 = XX1X



C111 – C112 INPUT CONFIGURATION INDICATIONS

Analog input 1 (actual value)	
Pt1000, 2-wire, Landis & Staefa IEC 751 FT-TP/… (passive probe)	5
Ni1000, 2-wire, Landis & Staefa QAE2 … (passive probe - water probe)	9
Standard Signal DC 0…10 V QBE620P… (active probe - pressure probe)	G

Analog Input 3 (external temperature)	
No function (probe not active)	0
External probe Pt 1000, 2-wire, QAC22 (passive probe)	1

AUXILIARY CONTACT, TYPE OF REGULATOR, SET POINT *"SP1"* BLOCK *C112.* Parameter configuration

Set point "SP1"	
Set point SP1 - data input from keys	0
Set point SP1 - interlocked to external probe (configure)	1

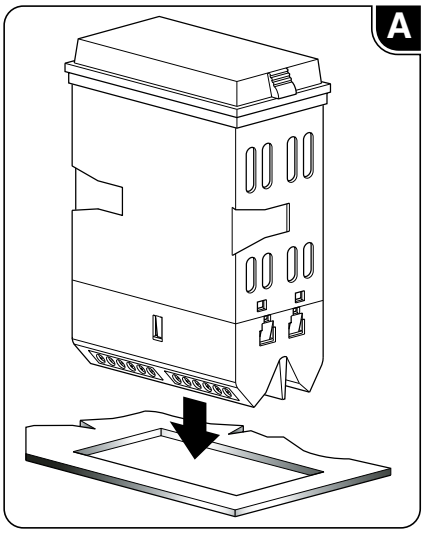
ERROR/FAULT INDICATION NUMBERS BLINKING IN DISPLAY

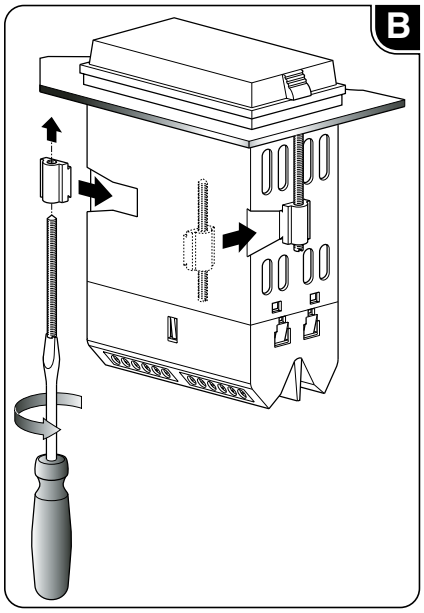
- ***Situation*** - The number ***1999 blinks*** in the display as the actual value, with the set point value displayed normally.
- ***Cause*** - The real value is not being measured. This means that the upper or lower limit of the measurement range on analog input 1 (real value) has been exceeded.
- ***Remedy*** - Check the electrical connections and the state of the probe. If the probe is faulty, the regulator will not indicate the real value of the physical quantity monitored. This will result in automatic shutdown (failsafe), **deactivation of the self-adapt function and inhibition of manual operation.** The response of the auxiliary contact will depend on the configuration of parameter C113.

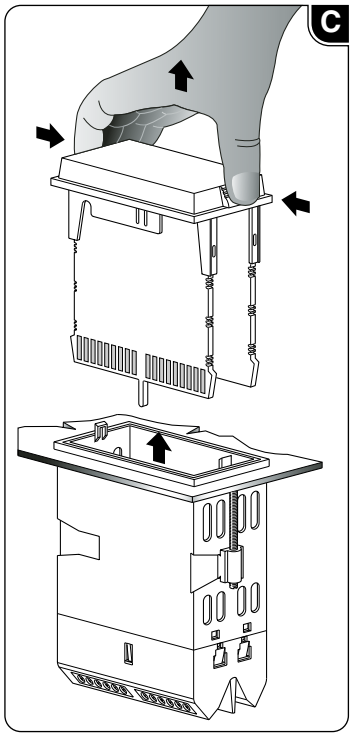
- ***Situation*** - The number ***1999 blinks*** in the display as the actual value, with **tA** showing in the set point field.
- ***Cause*** - The external temperature is not being measured. This means that the upper or lower limit of the measurement range on analog input 3 (real value) has been exceeded.
- ***Remedy*** - Check the electrical connections and the state of the probe. If the probe is faulty, the regulator will not indicate the real value.

- ***Situation*** - The number ***1999 blinks*** in the display as the actual value, with **SP .E** showing in the set point field.
- ***Cause*** - The external set point value is not being measured. This means that the upper or lower limit of the measurement range on analog input 2 (real value) has been exceeded.
- ***Remedy*** - Check the electrical connections and the external set point signal. If the probe is faulty, the regulator will not indicate the real value of the physical quantity monitored. **This will result in automatic shutdown (failsafe), deactivation of the self-adapt function and inhibition of manual operation.**

WHEN REPLACEMENT IS NECESSARY, PROCEED AS SHOWN IN FIGURES A-B-C BELOW







Insert the RWF 40 regulator through the relative opening in the electrical panel (**A**).
Insert the fixing anchors and screws into the slots, and secure the unit to the panel (**B**).
To open the regulator, squeeze the cover from the ends as shown, and lift out (**C**).

MAINTENANCE

ANNUAL CHECK

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

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

BEFORE TAKING ANY ACTION, CHECK:

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

IF THE BURNER FAILS TO START:

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

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

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

IF THE BURNER PROCEEDS WITH PREVENTILATION BUT DOES NOT LIGHT:

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

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

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

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

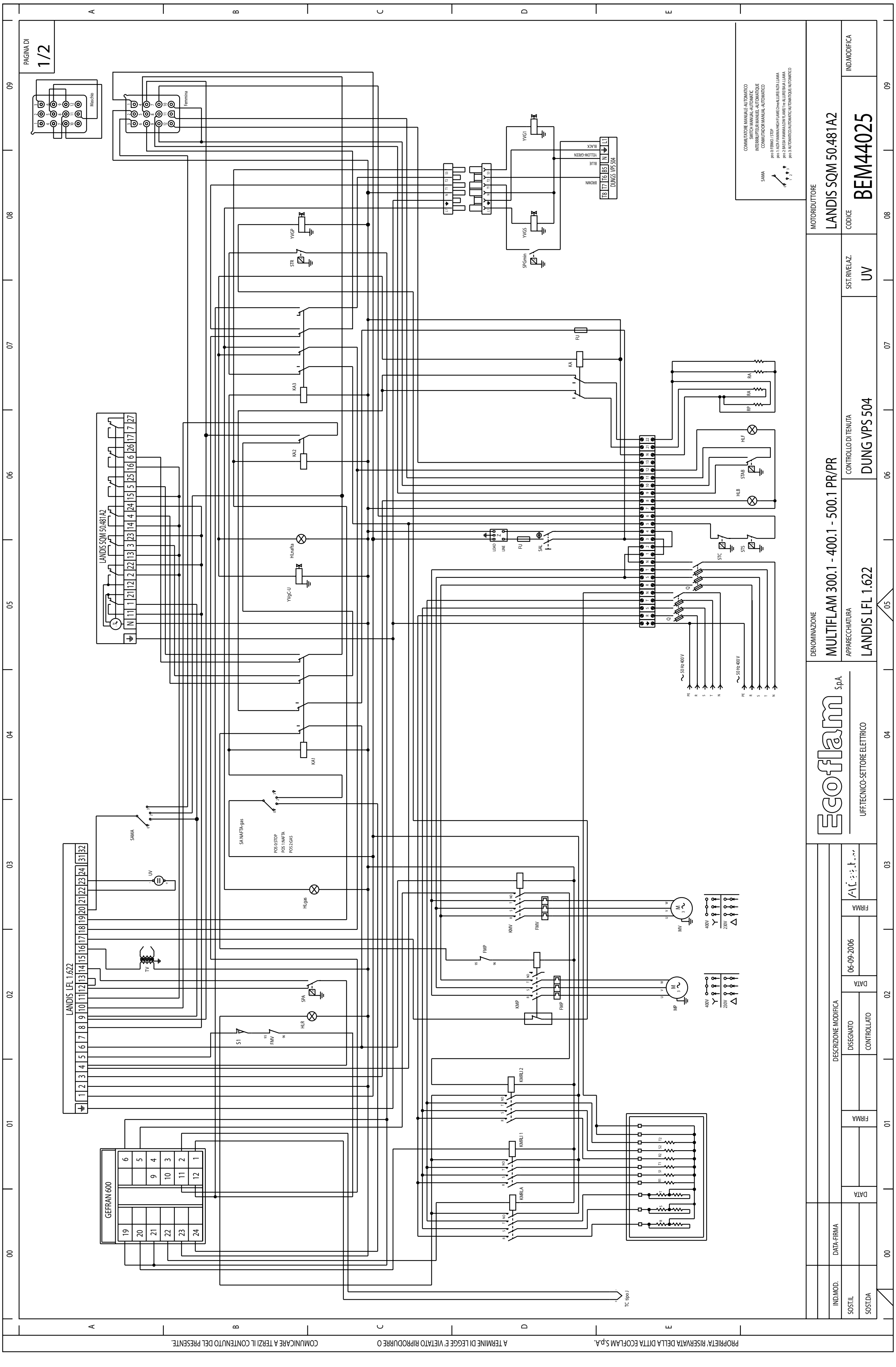
check the pressure regulator and gas filter. Check the gas pressure with a pressure gauge. Check the detector value (at least 70 µA).

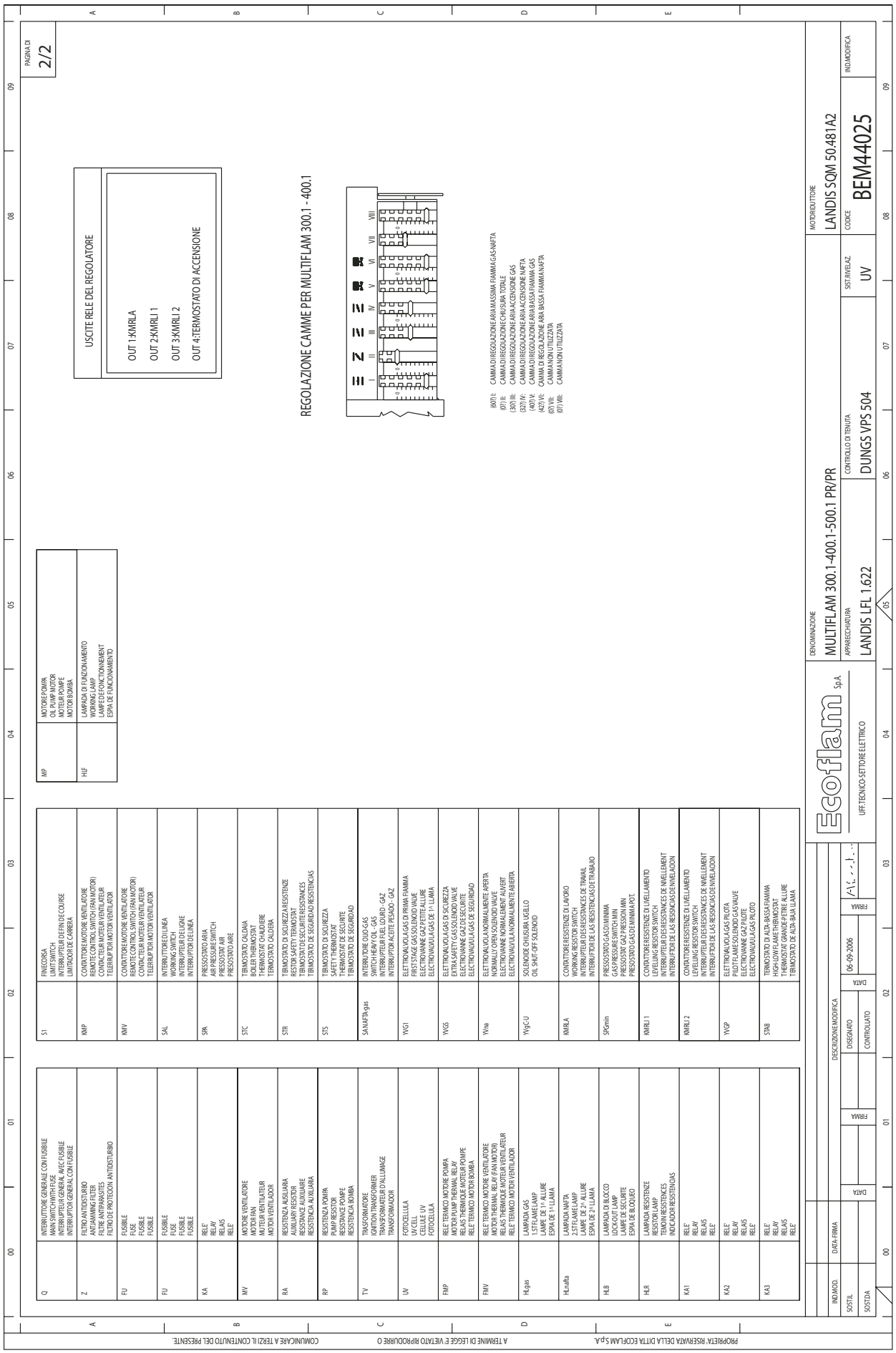
PARAMETERS

Parameter	Display	Ecoflam setting (passive probe) QAE22	Ecoflam setting (passive probe) FT-TP/1000	Ecoflam setting (active probe) QBE620-P...
Limit value of limit comparator	AL	0	0	0
Switching differential for limit comparator	HYSt	0	0	0
Proportional band	Pb.1	8	8	1
Derivative time	dt	20	20	3
Integral action time	rt	80	80	15
Dead band (neutral zone)	db	0.5	0.5	0.5
Actuator running time (sec.)	tt	25	25	25
Switch-on threshold burner / stage II	HYS1	-2	-2	-0.2
Switch-off level stage II	HYS2	0	0	0
Upper switch-off threshold	HYS3	5	5	0.5
Response threshold	q	0	0	0
Heating curve slope	H	2	2	2
Parallel displacement	P	0	0	0

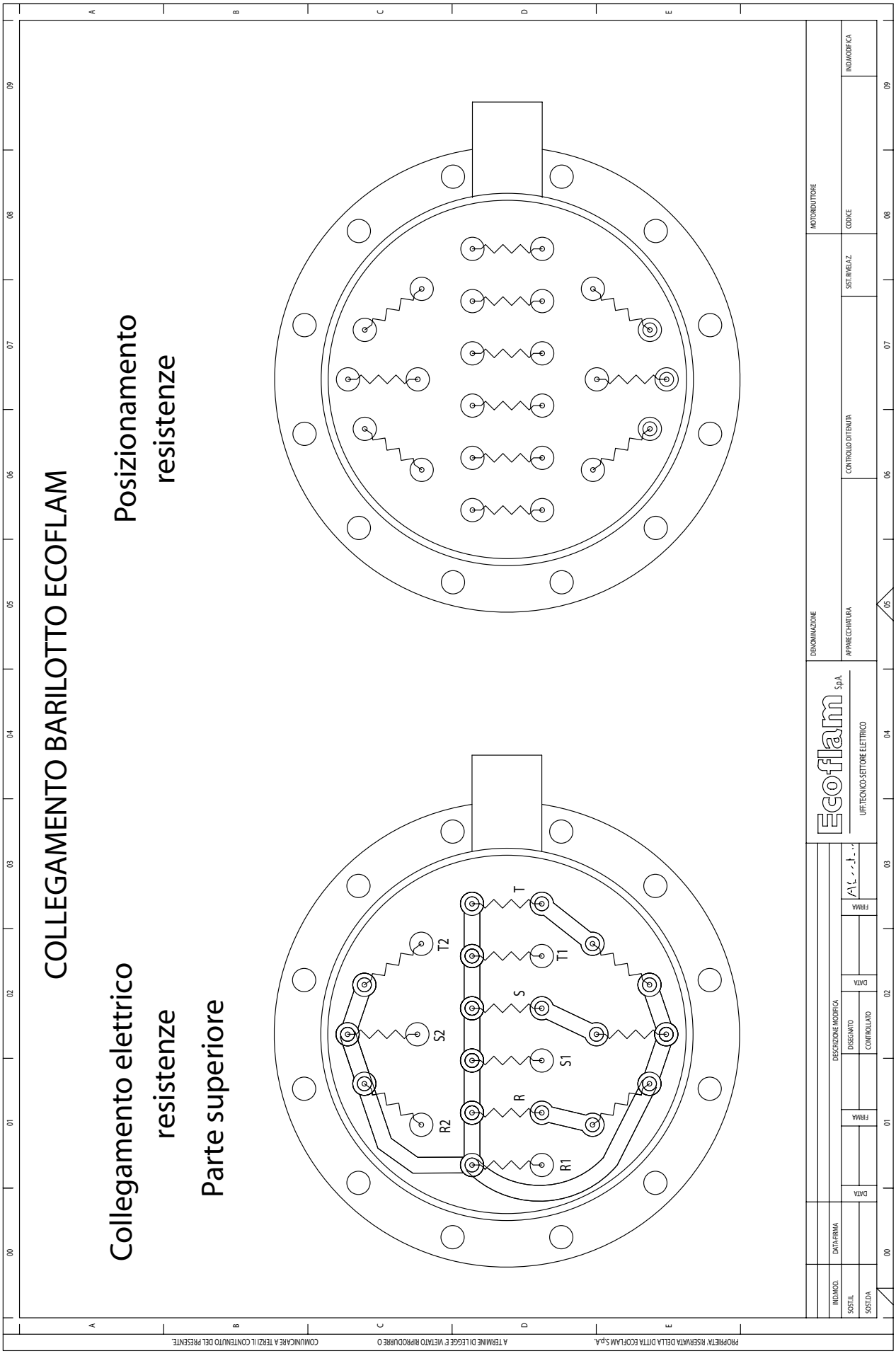
CONFIGURATION

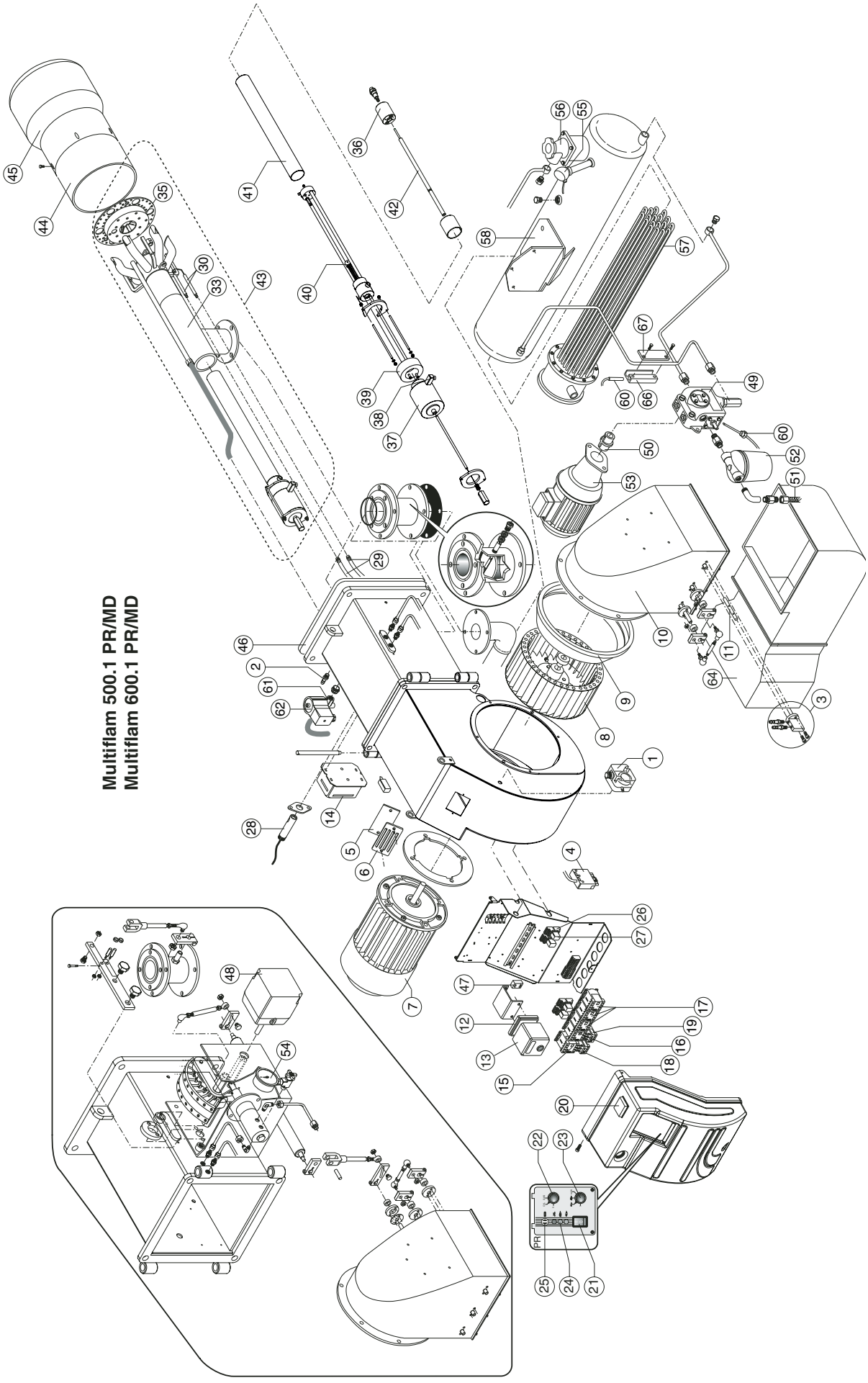
Parameter	Display	Ecoflam setting (passive probe)		(active probe) QBE620-P...				
		QAE22	FT-TP/1000	-P4	-P10	-P16	-P25	-P40
Analog input 1, 2 and 3; setpoint changeover / shift	C111	9030	5030	G000	G000	G000	G000	G000
Limit comparator; controller type; setpoint 1; locking	C112	0010	0010	0010	0010	0010	0010	0010
Unit address; decimal place / unit, signal for out-of-range	C113	0110	0110	0110	0110	0110	0110	0110
Measured value range start analog input 1	SCL	0	0	0	0	0	0	0
Measured value range analog input 1	SCH	100	100	4	10	16	25	40
Measured value range analog input 2	SCL2	0	0	0	0	0	0	0
Measured value range analog input 2	SCH2	0	0	0	0	0	0	0
Lower setpoint limit	SPL	60	60	0	0	0	0	0
Upper setpoint limit	SPH	88	88	4	10	16	25	40
Actual value correction,analog input 1	OFF1	0	0	0	0	0	0	0
Actual value correction,analog input 2	OFF2	0	0	0	0	0	0	0
Actual value correction,analog input 3	OFF3	0	0	0	0	0	0	0
Filter time constant for digital filter, analog input 1	dF1	1	1	0	0	0	0	0


PAGINA DI
1/2
Maschio
Femmina
LANDIS SQM 50.481A2
LANDIS LFL 1.622
GEFRAN 600
SAMA
UV
TV
S1
FMV
HLR
SPA
HLgas
KA1
KA2
KA3
STR
YVGP
YVG1
YVGS
SPGmin
DUNGS VPS 504
FU
KA
SAL
HLnafta
YVgC-U
HLF
STAB
HLB
STC
STS
RA
RP
~ 50 Hz 400 V
KMV
MV
KMP
FMP
MP
400V
230V
KMRL1
KMRL2
KMRLA
TC tipo J
COMMUTATORE MANUALE-AUTOMATICO
SWITCH MANUAL-AUTOMATIC
DENOMINAZIONE
MULTIFLAM 300.1 - 400.1 - 500.1 PR/PR
APPARECCHIATURA
LANDIS LFL 1.622
CONTROLLO DI TENUTA
DUNG VPS 504
SIST. RIVELAZ.
UV
MOTORIDUTTORE
LANDIS SQM 50.481A2
CODICE
BEM44025
IND.MODIFICA
Ecoflam S.p.A.
UFF.TECNICO-SETTORE ELETTRICO
DESCRIZIONE MODIFICA
DISEGNATO
CONTROLLATO
DATA
FIRMA
06-09-2006
IND.MOD.
DATA-FIRMA
SOST.IL
SOST.DA
PROPRIETA' RISERVATA DELLA DITTA ECOFLAM S.p.A. A TERMINE DI LEGGE E' VIETATO RIPRODURRE O COMUNICARE A TERZI IL CONTENUTO DEL PRESENTE.



Q	INTERRUTTORE GENERALE CON FUSIBILE MAIN SWITCH WITH FUSE INTERRUPTEUR GENERAL AVEC FUSIBLE INTERRUPTOR GENERAL CON FUSIBLE	S1	FINECORSA LIMIT SWITCH INTERRUPTEUR DE FIN DE COURSE LIMITADOR DE CARRERA	MP	MOTORE POMPA OIL PUMP MOTOR MOTEUR POMPE MOTOR BOMBA
Z	FILTRO ANTIDISTURBO ANTI JAMMING FILTER FILTRE ANTIPARASITES FILTRO DE PROTECCION ANTIDISTURBIO	KMP	CONTATTORE MOTORE VENTILATORE REMOTE CONTROL SWITCH (FAN MOTOR) CONTACTEUR MOTEUR VENTILATEUR TELERRUPTOR MOTOR VENTILATOR	HLP	LAMPADA DI FUNZIONAMENTO WORKING LAMP LAMP DE FONCTIONNEMENT ESPIA DE FUNCIONAMIENTO
FU	FUSIBILE FUSE FUSIBLE FUSIBLE	KMV	CONTATTORE MOTORE VENTILATORE REMOTE CONTROL SWITCH (FAN MOTOR) CONTACTEUR MOTEUR VENTILATEUR TELERRUPTOR MOTOR VENTILATOR		
FU	FUSIBILE FUSE FUSIBLE FUSIBLE	SAL	INTERRUTTORE DI LINEA WORKING SWITCH INTERRUPTEUR DE LIGNE INTERRUPTOR DE LINEA		
KA	RELE' RELAY RELAIS RELE'	SPA	PRESSOSTATO ARIA AIR PRESSURE SWITCH PRESSOSTAT AIR PRESOSTATO AIRE		
MV	MOTORE VENTILATORE MOTOR FAN MOTEUR VENTILATEUR MOTOR VENTILADOR	STC	TERMOSTATO CALDAIA BOILER THERMOSTAT THERMOSTAT CHAUDIERE TERMOSTATO CALDERA		
RA	RESISTENZA AUSILIARIA AUXILIARY RESISTOR RESISTANCE AUXILIAIRE RESISTENCIA AUXILIARA	STR	TERMOSTATO DI SICUREZZA RESISTENZE RESTOR SAFETY THERMOSTAT TERMOSTAT DE SECURITE RESISTANCES TERMOSTATO DE SEGURIDAD RESISTENCIAS		
RP	RESISTENZA POMPA PUMP RESISTOR RESISTANCE POMPE RESISTENCIA BOMBA	STS	TERMOSTATO DI SICUREZZA SAFETY THERMOSTAT THERMOSTAT DE SECURITE TERMOSTATO DE SEGURIDAD		
TV	TRASFORMATORE IGNITION TRANSFORMER TRANSFORMATEUR D'ALLUMAGE TRANSFORMADOR	SA1A/FPgas	INTERRUTTORE DUO-GAS SWITCH HEAP COIL - GAS INTERRUPTEUR FUEL LOURD - GAZ INTERRUPTOR ACEITE PESADO - GAZ		
UV	FOTOCELLULA UV CELL CELLULE UV FOTOCELULA	YVG1	ELETTROVALVOLA GAS DI PRIMA FIAMMA FIRST FLAME GAS SOLENOID VALVE ELECTROVANNE GAZ PETITE ALLURE ELECTROVALVULA GAS DE 1ª LLAMA		
FAMP	RELE' TERMICO MOTORE POMPA MOTOR PUMP THERMAL RELAY RELAIS THERMIQUE MOTEUR POMPE RELE' TERMICO MOTOR BOMBA	YVGS	ELETTROVALVOLA GAS DI SICUREZZA ESTABLISHED GAS SOLENOID VALVE ELECTROVANNE GAZ DE SECURITE ELECTROVALVULA GAS DE SEGURIDAD		
FAMV	RELE' TERMICO MOTORE VENTILATORE MOTOR THERMAL RELAY (FAN MOTOR) RELAIS THERMIQUE MOTEUR VENTILATEUR RELE' TERMICO MOTOR VENTILADOR	YVra	ELETTROVALVOLA NORMALMENTE APERTA NORMALLY OPEN SOLENOID VALVE ELECTROVANNE NORMALEMENT AUVERT ELECTROVALVULA NORMALMENTE ABIERTA		
HLgas	LAMPADA GAS STEP FLAME LAMP LAMPE DE 1ÈRE ALLURE ESPIA DE 1ª LLAMA	YVgC-U	SOLENOIDE CHIUSURA UGELLO OIL SHUT-OFF SOLENOID		
HLnafta	LAMPADA NAFTA STEP FLAME LAMP LAMPE DE 1ÈRE ALLURE ESPIA DE 1ª LLAMA	KMRLA	CONTATTORE RESISTENZE DI LAVORO WORKING RESISTOR CONTACTOR INTERRUPTEUR DES RESISTANCES DE TRAVAIL INTERRUPTOR DE LAS RESISTENCIAS DE TRABAJO		
HLB	LAMPADA DI BLOCCO LOCK-OUT LAMP LAMPE DE SECURITE ESPIA DE BLOQUEO	SPGmin	PRESSOSTATO GAS MINIMA GAS PRESSURE SWITCH MIN. PRESSOSTAT GAZ PRESSION MIN. PRESOSTATO GAS DE MINIMA POT.		
HLR	LAMPADA RESISTENZE RESISTOR LAMP TEMOIN RESISTANCES INDICADOR RESISTENCIAS	KMRLI 1	CONTATTORE RESISTENZE DI LIVELLAMENTO LEVELLING RESISTOR CONTACTOR INTERRUPTEUR DES RESISTANCES DE NIVELLEMENT INTERRUPTOR DE LAS RESSNCIAS DE NIVELACION		
KA1	RELE' RELAY RELAIS RELE'	KMRLI 2	CONTATTORE RESISTENZE DI LIVELLAMENTO LEVELLING RESISTOR CONTACTOR INTERRUPTEUR DES RESISTANCES DE NIVELLEMENT INTERRUPTOR DE LAS RESSNCIAS DE NIVELACION		
KA2	RELE' RELAY RELAIS RELE'	YVGP	ELETTROVALVOLA GAS PILOTA PILOT GAS SOLENOID VALVE ELECTROVANNE GAZ PILOTE ELECTROVALVULA GAS PILOTO		
KA3	RELE' RELAY RELAIS RELE'	STAB	TERMOSTATO DI ALTA-BASSA FIAMMA HIGH-LOW FLAME THERMOSTAT THERMOSTAT GRANDE-PETITE ALLURE TERMOSTATO DE ALTA-BAJA LLAMA		


COLLEGAMENTO BARILOTTO ECOFLAM
Posizionamento resistenze
Collegamento elettrico resistenze
Parte superiore
T
T2
T1
S
S2
S1
R
R2
R1
Ecoflam S.p.A.
UFF. TECNICO-SETTORE ELETTRICO
DENOMINAZIONE
APPARECCHIATURA
CONTROLLO DI TENUTA
MOTORIDUTTORE
SOST. RIVELAZ.
CODICE
IND. MODIFICA
DESCRIZIONE MODIFICA
DISEGNATO
CONTROLLATO
DATA
FIRMA
IND.MOD.
SOST.IL
SOST.DA
DATA-FIRMA
PROPRIETA' RISERVATA DELLA DITTA ECOFLAM S.p.A.
A TERMINE DI LEGGE E' VIETATO RIPRODURRE O
COMUNICARE A TERZI IL CONTENUTO DEL PRESENTE


Multiflam 500.1 PR/MD
Multiflam 600.1 PR/MD
PR

N° DESCRIPTION		MULTIFLAM 500.1 code	MULTIFLAM 600.1 code
1 - AIR PRESSURE SWITCH	DUNGS LGW10 A2P	Q120	Q120
2 - PRESSURE GAUGE		BFT01105/001	BFT01105/001
3 - AIR INTAKE SET		GRPA100	GRPA100
4 - WIELAND PLUG	6 pin	E226	
5 - GLASS		BFC02004	BFC02004
6 - PEED WINDOM FRAME		BFC02006	BFC02006
7 - MOTOR	11 k W	M176/1	-
	15 k W	-	M170/3
8 - FAN	360x135	BFV10305/001	-
	380x135	-	BFV10306/001
9 - AIR CONVEYOR		BFC08255	BFC08255
10 - AIR INTAKE		GRCA380	GRCA380
11 - AIR INTAKE PIPE		BFS02218/001	
12 - CONTROL BOX BASE	LANDIS	A401	A401
13 - CONTROL BOX	LANDIS LFL1.333	A124	A124
14 - IGNITION TRANSFORMER	BRAHMA T8	T101	T101
15 - REMOTE CONTROL SWITCH	AEG LS15K.00	R621/5	R621/5
16 - REMOTE CONTROL SWITCH (PUMP)	AEG LS05.10	R621	R621
17 - REMOTE CONTROL SWITCH	AEG LS7K.10	R621/3	R621/3
	AEG LS4K.10	R621/1	R621/1
18 - MOTOR THERMAL RELAY	AEG B18K-260 21-26A	R521/15	-
	AEG B77S 25-40A	-	R521/7
19 - MOTOR THERMAL RELAY (PUMP)	AEG 3-4,7A	R521/3	R521/3
20 - ADJUSTMENT OF FUEL TEMPERATURE	Gefran 600	E1216	E1216
21 - MAIN SWITCH	cod.40100I1509	R1020	
22 - GAS/HEAVY-OIL SELECTOR		R1020/5	R1020/5
23 - SELECTOR		R1020/5	R1020/5
24 - LAMP	Elettrospring EL/N-SC4	E1510	
25 - FUSE SUPPORT	FUSIT FH-B528	E802/2	
26 - RELÉ BASE	Finder 5532	R905	
	Finder 5534	R906	R906
27 - RELÉ	Finder 5532	R711	
	Finder 5534	R712	R712
28 - UV CELL	LANDIS QRA 2	A205	A205
29 - IGNITION CABLE	TC	BFE01403/2	BFE01403/2
	TL	BFE01403/3	
30 - IGNITION ELECTRODES SET		E612	E612
31 - PIPE	TC		
	TL		BFT14001/201
32 - ROD	TC		
	TL		
33 - GAS FIRING HEAD		BFT14004/001	BFT14004/001
34 - HEAVY OIL FIRING HEAD		BFT15226/001	
35 - FRONT DISC		BFD03020	BFD03020
36 - NOZZLE HOLDER		BFC11019	BFC11019
37 - COIL	EL011	V523	V523
38 - CONETTORE BOBINA	EL011	V1119/07	V1119/07
39 - RING		BFT15224/001	BFT15224/001
40 - SPRING HOLDER		BFT15222/001	BFT15222/001
41 - PIPE		BFT15221/001	BFT15221/001
42 - ROD NOZZLE HOLDER	TC	BFT15220/002	
43 - INNER ASSEMBLY	TC		
	TL		
44 - BLAST TUBE	TC	BFB08012/017	BFB08012/017
	TL		
45 - BLAST TUBE END		BFB07028/3	BFB07028/3
46 - GASKET ISOMART		BFG04051/1	BFG04052/1
47 - ANTIJAMMING FILTER		S132/4	S132/4
48 - AIR DAMPER MOTOR	LANDIS SQM50.481A2	M212/91	M212/91
49 - OIL PUMP	SUNTEC TA4C40105	P148/3	P148/3
50 - COUPLING		MP501/4	MP501/4
51 - HOSES	TN 25X1500 C/T	S901/2	S901/2

TC = SHORT HEAD TL = LONG HEAD

N° DESCRIPTION		MULTIFLAM 500.1 code	MULTIFLAM 600.1 code
52 - OIL FILTER	70501/03	S107/5	S107/5
53 - PUMP MOTOR	1100 W	M147/15	M147/15
54 - MANOMETER	CEWAL R1/4 D50-40BAR	S601/1	S601/1
55 - THERMOCOUPLE	TC6MD2JBC	E1216/1	E1216/1
56 - FILTER	U21008/01	S107/7	S107/7
57 - HEATER	24000 W	R126	R126
58 - OIL TANK		BFP01040/017	BFP01040/017
60 - HEATING ELEMENT	50 W	R110	R110
61 - PILOT GAS VALVE	DUNGS SV-DLE 507	V1994/21	V1994/21
62 - COIL	DUNGS SV-DLE 507		
63 - FAN SCOOP		-	-
64 - SILENCER		GRSIL07	GRSIL07
65 - MODULATING UNIT	LANDIS RWF 40	E1215	E1215
Version D			
66 - PREHEATED'S AUX. RESISTOR HOLDER		-	
67 - FIXING PLATE		-	

TC = SHORT HEAD TL = LONG HEAD

NOTE :

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

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