



# HEAVY OIL BURNERS AT TWO STAGES

MOD.: FNP 25/2-45/2-70/2

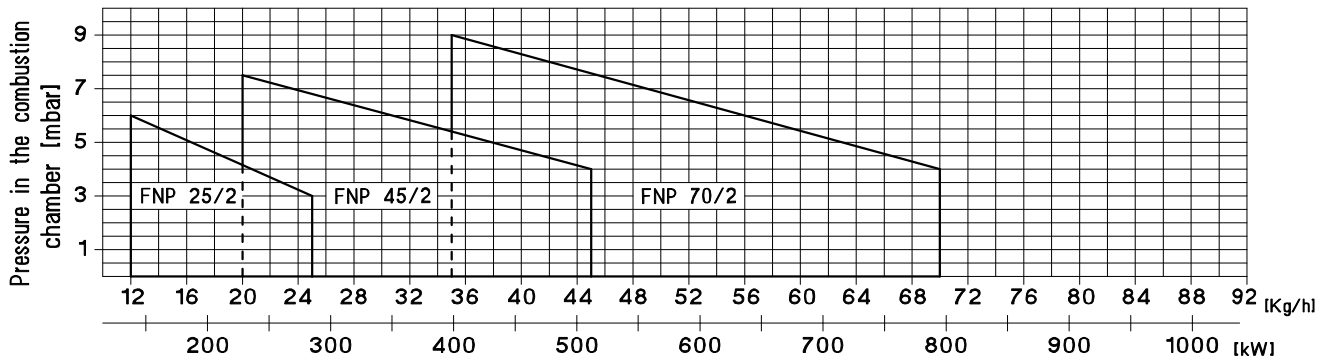
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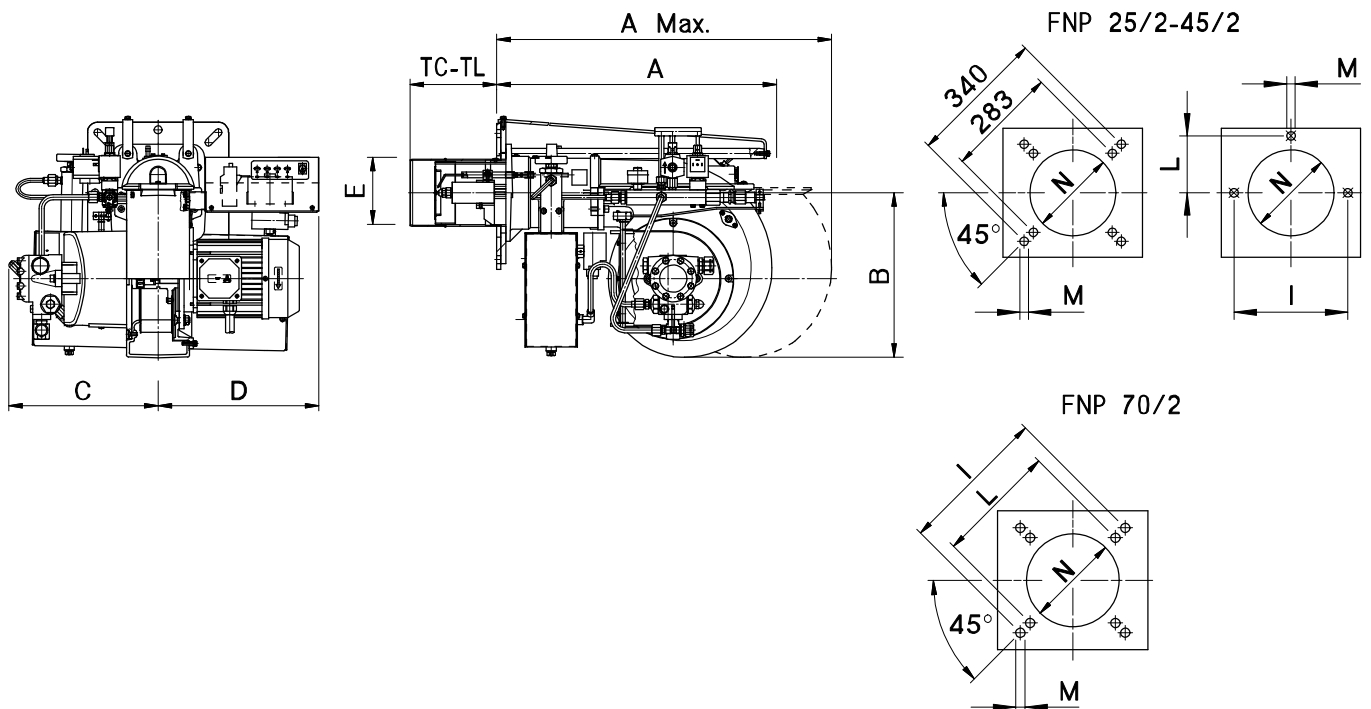
## TECHNICAL DATA

MODEL		FNP 25/2	FNP 45/2	FNP 70/2
Fuel delivery	(Kg/h)	12-25	20-45	35-70
Thermal power	(Mcal/h)	118-245	196-441	343-686
Thermal power	(kW)	137-284	227-512	398-796
Motor power	(kW)	0.73	1.1	1.5
Resistances power	(kW)	3	4	7.4
Electrical supply		230V-400V 50Hz-(+10%-15%)		
Fuel		Heavy oil 3°-7°E a 50°C		
Pump pressure		24bar (standard calibration)-28bar MAX		

## OPERATING RANGE DIAGRAM: Delivery-Pressure in the combustion chamber



## OVERALL DIMENSIONS [mm.]



MODEL	A	A Max.	B	C	D	E	TC	TL	I	L	M	N
FNP 25/2	540	950	325	295	319	135	170	350	250	125	M12	160
FNP 45/2	540	950	325	295	319	135	170	350	250	125	M12	160
FNP 70/2	660	1100	355	295	326	165	250	350	368	340	M12	180

ООО «Энергогаз Индустри»  
 143400, Московская область, г. Красногорск, ул. Успенская д.3, офис 304  
 тел./факс.: +7 (495) 9806177, www.energo-gaz.ru, energo-gaz@energo-gaz.ru



# HEAVY OIL BURNERS AT TWO STAGES

MOD.: FNDP 25/2-45/2-70/2

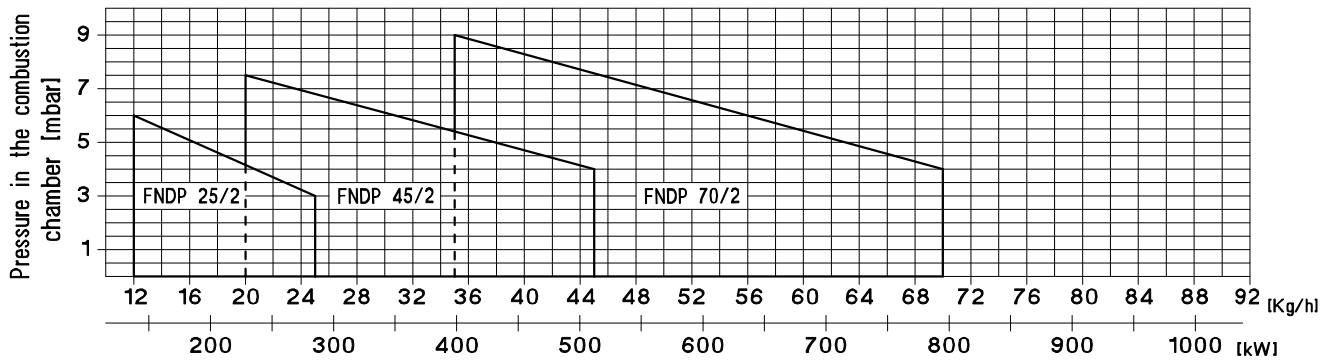
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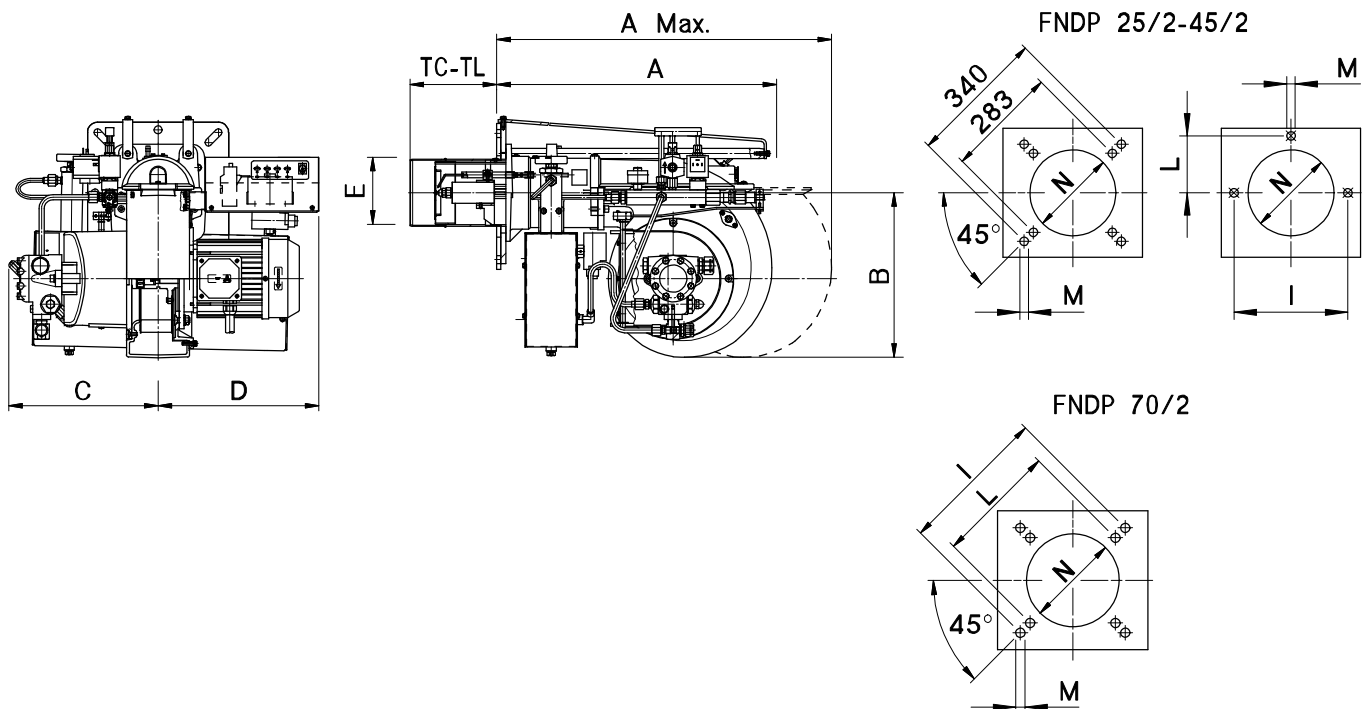
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Fuel		Heavy oil MAX 20°E a 50°C		
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## OPERATING RANGE DIAGRAM: Delivery-Pressure in the combustion chamber



## OVERALL DIMENSIONS [mm.]



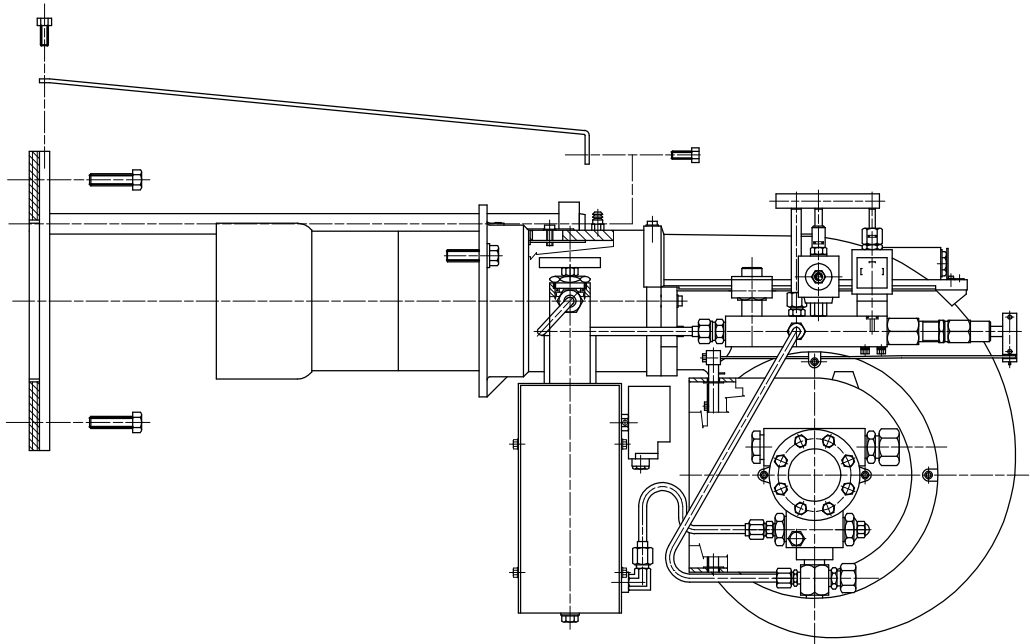
MODEL	A	A Max.	B	C	D	E	TC	TL	I	L	M	N
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143400, Московская область г. Красногорск, ул. Успенская д.3, офис 304  
 тел./факс.: +7 (495) 9806177, www.energogaz.ru, energogaz@energogaz.ru

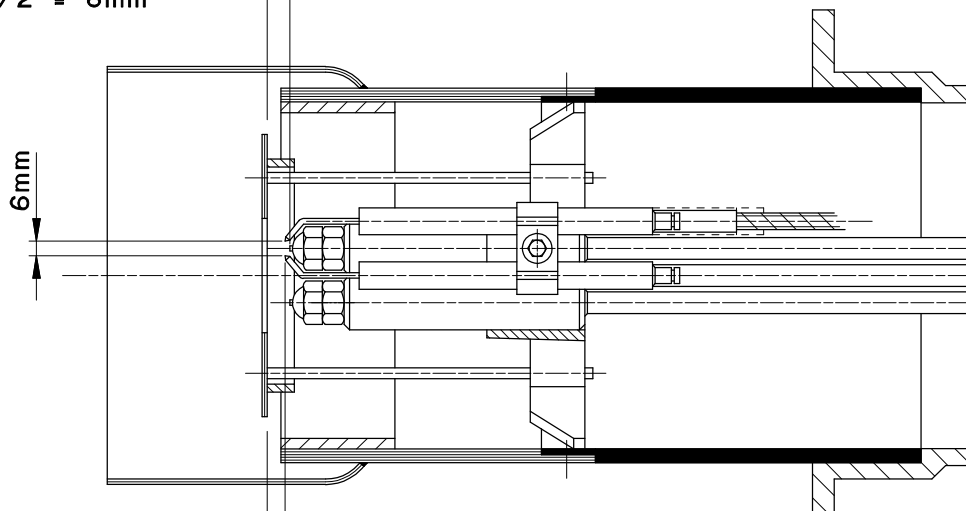


ASSEMBLY OF THE SLIDE ON THE BOILER DOOR

- 1° - Take off the slide from the burner and fit it to the boiler door.
- 2° - Insert the burner on the pivots up to the end of the stroke.
- NB.- Never hang up the burner on the pivots without the tie-rods.
- 3° - Mount immediatly the tie-rod on to the pivots.



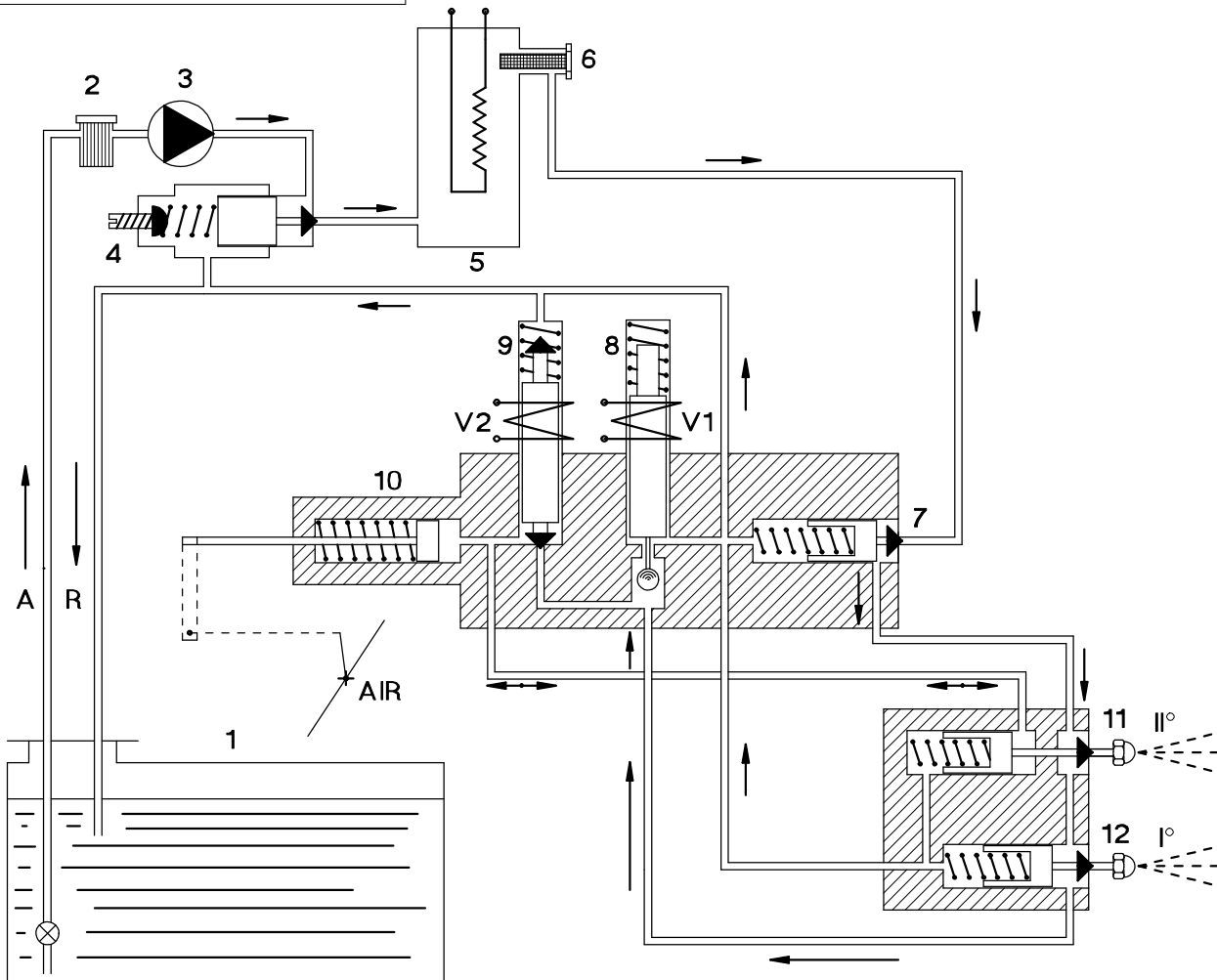
FNP-FNDP 25/2-45/2 = 6mm      DISC-NOZZLE distance  
FNP-FNDP 70/2 = 8mm



DISC-ELECTRODES distance      FNP-FNDP 25/2-45/2 = 4mm  
FNP-FNDP 70/2 = 6mm



## HYDRAULIC DIAGRAM



## PRE-WASHING

At each starting the fuel oil, which is inside the tank 1), is sucked in by the pump 3), depurated by the filter 2), and sent to the pressure regulator 4). Then it goes to the preheater tank 5), to the filter 6), to the antigas valve 7), to the plungers 11) and 12), to the valve 8), (usually open) and then it goes back to the tank trough the return pipe.

## IGNITION OF THE 1ST STAGE

After about 15 sec. of pre-washing, the control-box actuates the valve V1 and the oil under pressure lifts the plunger 12), and comes out atomized by the 1st nozzle. The voltaic arc, generated by the transformer, ignites the fuel: thus obtaining the 1st stage.

## IGNITION OF THE 2ND STAGE

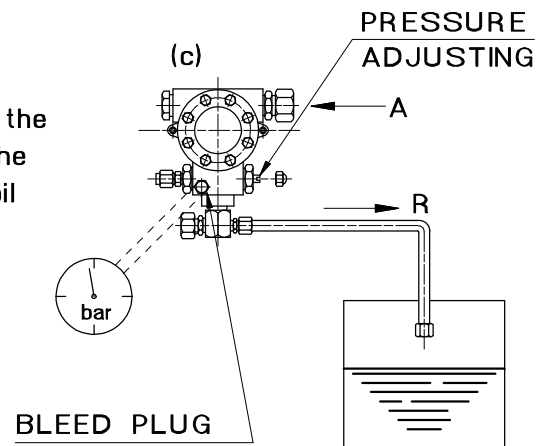
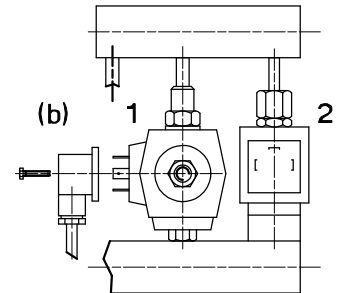
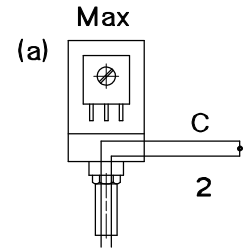
After about 15 sec. from the 1st stage, the control-box actuates the second valve V2 and the oil under pressure lifts the plunger 11) and comes out atomized from the 2nd nozzle and, at same time, the air shutter is opened by the cylinder 10).

Note:- By inserting a remote control to the burner terminals 10-11, it is possible to give or to relieve fuel to the 2nd nozzle, thus obtaining the flame modulation.

**TANK LOADING**

When the pre-heater tank is empty, it is necessary to refill it by cleaning the resistances; to do that act as per following routine:

- a) Disconnect the connecting cables (C and 2) from the thermostat of MAX and connect them each other.
- b) Take off the connector from the 1st valve.
- c) Take off the return pipe and insert it into a little bucket.
- d) Start up the motor and light-up the photoresistance until the fuel oil comes out from the return pipe; if the pump has got some difficulties in priming, take off the bleed plug and insert it again as soon as the fuel oil comes out.

**MAINTENANCE****1ST - DELIVERY FILTER CLEANING**

When the pressure of the manometer placed on the valve block gets lower than the advised calibration values, it is necessary to clean the deliver filter placed on the exit of the preheater tank.

Note: Before disassembling the filter, unload the tank pressure through the proper valve.

**2ND - PUMP FILTER AND LINE FILTERS CLEANING**

When the pump becomes noising and the delivery pressure becomes instable, this means that the fuel does not arrive to the pump: it is necessary to clean all the filters on the suction line and the pump filter.

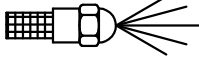



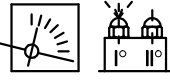
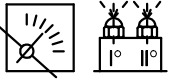
**3RD - RESISTANCES CLEANING**

When the burner is functioning and the exit temperature keeps on falling until causing the lock-out, it is necessary to dassemble the resistances and to clean them.

Note: Before disassembling the resistances, discharge the pressure of the tank.



TABLE OF ADVISABLE CALIBRATIONS

 NOZZLES G.P.H. I° - II° 45° - 45°	 PUMP PRESSURE bar	 NOZZLES DELIVERY kg/h	 COMBUSTION HEAD ADJUSTING NOTCH NO.	 AIR SHUTTER OPENING 1ST STAGE	 AIR-SHUTTER OPENING 2ND STAGE	* PRESSURE IN THE COMBUSTION CHAMBER mbar
1.00 - 1.00	22	12.4	MIN	MIN	2	0,5
1.00 - 1.25	24	14.2	1	0.5	2.5	1,1
1.25 - 1.25	24	15.6	2	1	3	1,6
1.50 - 1.50	24	19.4	3	1.5	4	2,6
1.75 - 1.75	24	22.6	5	2	4.5	3,3
2.00 - 2.00	24	25.8	7	2.5	5	3,9

It is suggested to employ nozzles "MONARCH" type "R" up to 2 GPH - type "P.L.P." >= 2.25 GPH

- As to furnace thermal power, consider 1 Kg of heavy oil = About 9.800 Kcal/h.
- To increase the heavy oil delivery, it is possible to adjust the pump up to a MAX of 28bar.
- The definite calibration must be done while the burner is functioning and up to obtain: CO<sub>2</sub> >= 12% - Bacharach <= 3 - Exhaust gas temperature of 220°C.

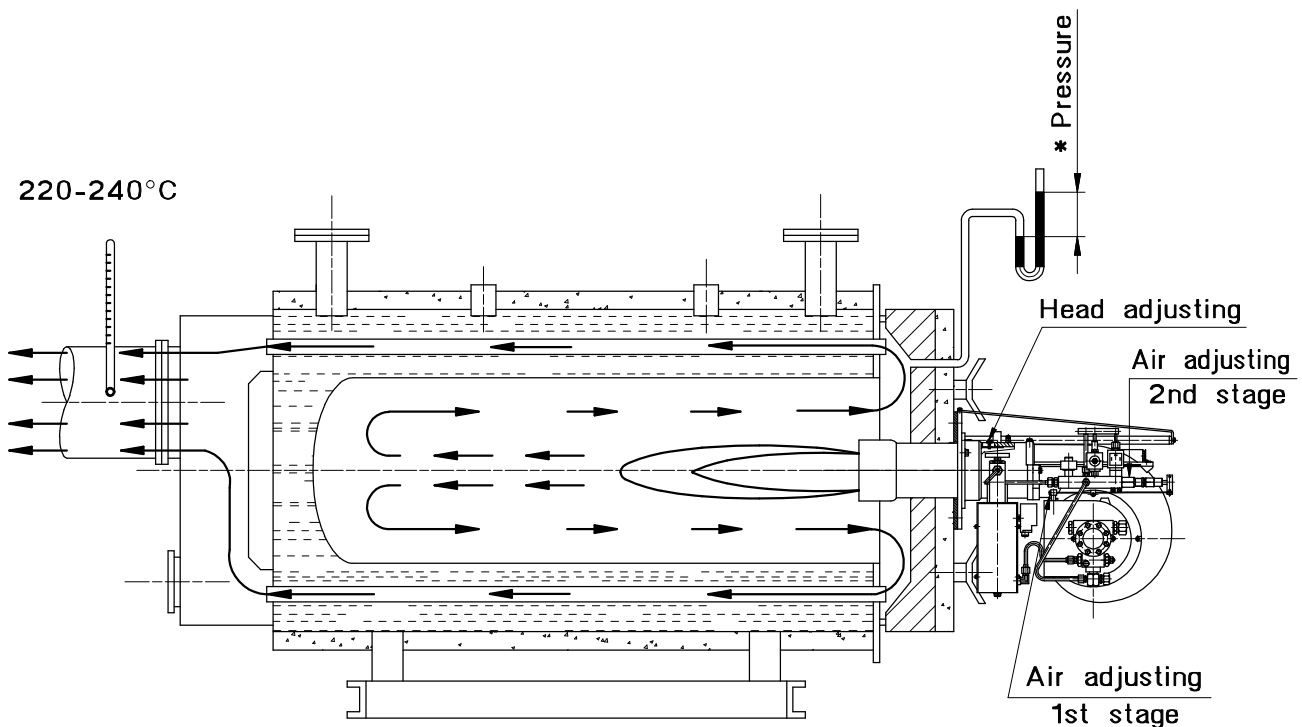
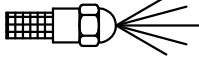









TABLE OF ADVISABLE CALIBRATIONS

 NOZZLES G.P.H. I° - II° 45° - 45°	 PUMP PRESSURE bar	 NOZZLES DELIVERY kg/h	 COMBUSTION HEAD ADJUSTING NOTCH NO.	 AIR SHUTTER OPENING 1ST STAGE	 AIR-SHUTTER OPENING 2ND STAGE	* PRESSURE IN THE COMBUSTION CHAMBER mbar
1.50 - 1.75	24	21	2	0.5	1.5	1.2
2.00 - 2.00	24	25.8	3	1	2.5	2
2.25 - 2.25	24	29	4	1.5	3.5	2.6
2.50 - 2.50	24	32.2	5	2	4.5	3.7
3.00 - 3.00	24	38.6	6	2.5	5.5	4.9
3.50 - 3.50	24	45	7	3	6.5	5.5

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- As to furnace thermal power, consider 1 Kg of heavy oil = About 9.800 Kcal/h.
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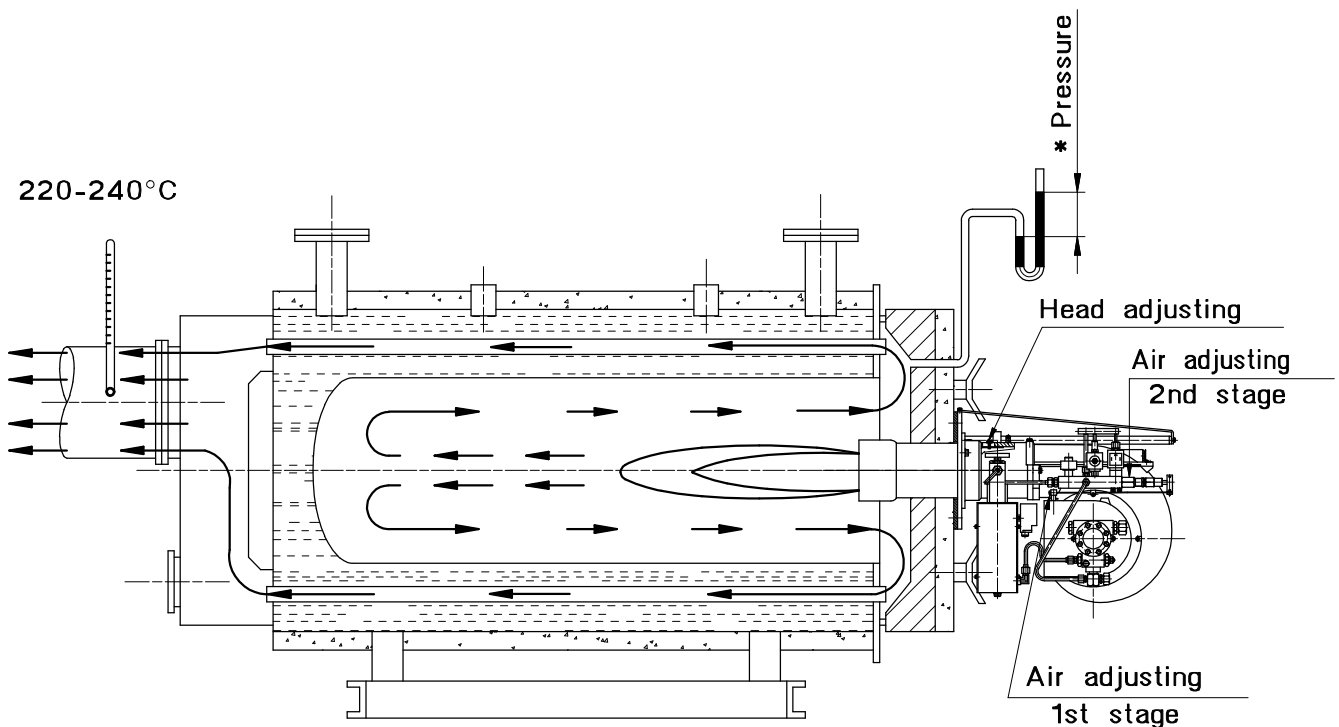
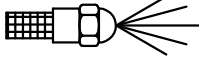









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 NOZZLES G.P.H. I° - II° 45° - 45°	 PUMP PRESSURE bar	 NOZZLES DELIVERY kg/h	 COMBUSTION HEAD ADJUSTING NOTCH NO.	 AIR SHUTTER OPENING 1ST STAGE	 AIR-SHUTTER OPENING 2ND STAGE	* PRESSURE IN THE COMBUSTION CHAMBER mbar
2.50 - 3.00	24	35.4	2	1.5	3.5	1.8
3.00 - 3.50	24	41.8	4	2	4.5	2.3
3.50 - 4.00	24	48.3	6	2.5	5.5	2.8
4.50 - 4.50	24	58	8	3	6.5	3.6
5.00 - 6.00	24	71	MAX	3.5	8	4

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- To increase the heavy oil delivery, it is possible to adjust the pump up to a MAX of 28bar.
- The definite calibration must be done while the burner is functioning and up to obtain:  
 $CO_2 \geq 12\%$  - Bacharach  $\leq 3$  - Exhaust gas temperature of 220°C.

