

HEYLO WARM AIR HEATER OPERATING INSTRUCTIONS

K25T

Models
K50

K120

GENERAL INFORMATION

The model K25T, K50 and K120 are oil-fired, compact, versatile, easily portable hot-air generators for heating and drying. They work equally well with or without a flue connection, and are lightweight and robust, considering they're substantial heating capacity. These hot-air generators may only be used commercially.

Hot-air generators are intended for heating specific areas designated for buildings under alteration, construction or repair, outdoors, defrosting or warming up machines, equipment, pipelines, drying rooms of hay and grain, or as auxiliary heaters in the event of an emergency.

{The manufacturer's instructions regarding the burner are necessary to complete these operating instructions.}

TECHNICAL DATA

	Model HL K25T	Model HL K50	Model HL K120
Part number	1101514	1101584	1101625
Rated thermal load (Btu/hr)	93,000	184,000	409,000
Rated heat output (Btu/hr)	85,000	170,000	375,000
Ventilator air output at 68°F (CFM)	1060	2100	4650
Hot-air output at Dt 73°F (CFM)	1200	2500	5200
Rise in temperature Dt (°F)	81	81	86
Static Pressure max. (in-w.c.)	0.2	0.4	0.6
Fuel consumption (gal/hr)	0.69	1.36	3.03
Efficiency loss thru exhaust gas (%)	6.7	8.0	7.0
Minimum flue draft (in-w.c.)	0.04	0.04	0.04
Exhaust-gas mass flow (lbs./sec)	0.03	0.05	0.08
Sound volume at 16 ft. (dB)	58	59	72
Electrical connection:			
Voltage (v / Hz)	115 / 60	115 / 60	115 / 60
Current load (amps)	3.5	6.7	12.4
Power input (W)	405	775	1430
Fuel	#1 or #2 Diesel	#1 or #2 Diesel	#1 or #2 Diesel
Tank capacity (gal)	9.3	-	-
Dimension:			
Overall height (in.)	28	40	53
Overall width (in.)	23	30	37
Overall length (in.)	40	55	73
Diameter of exhaust gas pipe (in.)	6	6	8
Diameter of hot-air connection (in.)	2x8.1	16.56	21.65
Weight, including burner (lbs.)	188	309	496
Settings for the thermostat:			
Fan thermostat (TR) (°F)	95 to 104	95 to 104	95 to 104
Temperature controller (TW) (°F)	158 to 194	158 to 194	158 to 104
Safety thermal relay (STB) (°F)	212	212	212

EQUIPMENT CONFIGURATION

Case, containing: fan and chrome-titanium steel combustion chamber with heat exchanger and exhaust connection. The oil burner is inside the paneling over the air intake connection (K120) or over the air blow-out connection (K50). The burner in the K25T is under the air blow-out connection. Since the flame inside the combustion chamber is inverted, it must be long and thin.

Capillary-tube thermostats are built into the heater. The temperature controller shortens the time needed for it to heat up and allows the fan to switch on after a delay. When the heater is switched off, the temperature controller allows the fan to continue running in order to get residual heat out of the heater. This protects the combustion chamber from overheating due to residual heat.

An efficient preheater is built in for operation at cold outside temperatures. It heats a certain amount of fuel oil to a point at which the burner can start up.

The built-in excess and insufficient voltage relay with an autotransformer (K120) ensures reliable burner operation even if the mains voltage is too low. This means that the burner always has the necessary operating voltage. The heater will run, even if the voltage is too low.

The room thermostat connection allows use of optional external thermostat to control the heater output to room temperature.

PROCEDURE

When the heater is running, the burner pump takes fuel oil from the tank (provided by the contractor for the K50 and K120) by way of the intake pipe or from a permanently installed supply of oil. The amount of oil required for heating is fed to the nozzle by way of the pressure line, sprayed into the combustion chamber and then ignited. A flame is produced which, together with its combustion gases, heats up the combustion chamber and the heat exchanger. Excess fuel oil pumped into the system flows back into the tank.

After a brief combustion chamber heating period, the temperature controller turns on the fan. This enables a very short warming up period. The fan draws in cold air and blows it over the combustion chamber and the heat exchanger, heating the air. The heated air exit through the exchanger port connection.

To heat, the "heat" switch on the control box must be switched on ("I"). First, the burner starts up, then the combustion chamber and heat exchanger warms up, finally the fan switches on to convey hot air.

If a room thermostat is connected to the system, it must be set to a temperature higher than the surroundings. Otherwise the heater will not start, because it will not recognize the need for heat.

To ventilate, switch the "ventilate" switch on ("I"). Now the heater will function as a ventilator.

To switch the heater off, set both switches to "0".

CONNECTIONS

Electrical power connection

The K25T, K50 and K120 models are designed for 115v alternating current, 60-Hz and use a 10ft. cord and safety plug.

The heater may only be connected to power supplies fused to 16 Amps maximum. Longer extension cords must be of sufficient size so as to not reduce the voltage to the heater, {see chart page 4}. The heater will still operate with voltages as low as 100v, so check the voltage at the heater in the event of malfunctions.

Operation with a room thermostat

If the heater is intended to keep closed rooms automatically at a specified temperature, then a room thermostat must be used. To do so, remove the cap from the heater socket located on the control panel. Now plug the thermostat into the socket.

Preheating the oil

At low temperatures the paraffin in fuel oil thickens. This clogs the oil filter, interferes with pumping action and keeps the heater from starting up. Preheating the oil makes it flow better. So the heaters have electric heating elements. The oil preheater is controlled by a thermostat independent of the appliance switch, although the heater must be hooked up to the power source.

Flue connection

The heaters will burn without a flue outdoors or in rooms that are not enclosed. We recommend a 3-foot pipe, 6-in. to 8-in. in diameter with a rain hood to keep out most of the rain and dirt, and create a weak draft.

When the heater is only run for a limited time in enclosed rooms, as in winter construction, its combustion gases must be able to escape into the fresh air outside the building. The exhaust pipe must be installed in such a way as to guarantee at least 0.004 w.c. of draft. By no means is there to be any counter-pressure in the pipe. This is why you must make sure that the exhaust gas pipe rises and its end points directly upward. It must be higher than the building eaves at the very least, although it is better to put it above the roof ridge to avoid counter-pressure from the wind which can carbonize the burner. The exhaust gas pipe must have a clearance of 1.75 feet from flammable materials and be secured from movement. The diameter may not be less than the exhaust connection of the combustion chamber.

When used constantly in closed rooms, you must provide the heater with a flue connection whose diameter is 6-in. to 8-in. and which is at least 1.5 feet above the ridge of the roof.

SETUP GUIDELINES

Apply to portable hot-air generators with enclosed combustion chambers and heat exchangers with exhaust connections for a flue.

WARNING: FIRE, BURN, INHALATION, AND EXPLOSION HAZARD. KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.

A. Utilization in the construction industry

If the heaters are used on construction sites, it is necessary to adhere to the OSHA safety guidelines.

B. Setup outdoors or in open, well ventilated rooms

The heaters may not be operated where combustible mixtures of gas and air, or dust and air, can occur (for examples, filling stations, paint shops, etc.) See warnings above.

C. Setup in closed rooms, with connection to flue

1. Place of setup. The heaters may not be operated where combustible mixtures of gas and air, or dust and air, can occur (for examples, filling stations, paint shops, etc.) See warnings above
2. The room's size must be such that its average heat requirement amounts to 7,000 Btu/hr/ft³.

Heating Power:	85,000 Btu/hr	Room size:	17,500 ft ³
	170,500 Btu/hr		35,300 ft ³
	275,000 Btu/hr		50,000 ft ³
	375,000 Btu/hr		67,000 ft ³
	475,000 Btu/hr		88,000 ft ³

3. Necessary addition of fresh air from outside for combustion:

Heating Power:	85,000 Btu/hr	Amount of fresh air:	1,400 ft ³ /hr
	170,500 Btu/hr		2,800 ft ³ /hr
	275,000 Btu/hr		4,500 ft ³ /hr
	375,000 Btu/hr		6,400 ft ³ /hr
	475,000 Btu/hr		7,700 ft ³ /hr

In order to ensure proper burning, the fresh air must be added to the room where the heater is located through windows and doors or other openings in the outside walls.

D. Setup in closed but well-ventilated rooms without connection to a flue

If, in exceptional cases, heaters are used temporarily under supervision in closed, well-ventilated rooms without a flue connection, then adhere to the following:

1. Place of setup: The heaters may not be operated where combustible mixtures of gas and air, or dust and air, can occur (for example, filling stations, paint shops, etc.). See warning above.

2. Minimum room size must have an average heat requirement in the setup area of 7,000 Btu/hr/ft³.

Heating Power:	85,000 Btu/hr	Room size:	17,500 ft ³
	170,500 Btu/hr		35,300 ft ³
	275,000 Btu/hr		50,000 ft ³
	375,000 Btu/hr		67,000 ft ³
	475,000 Btu/hr		88,000 ft ³

3. Replacement of ventilated air. For the minimum room size as stated in Section D2, and for larger rooms, as well, ventilated air amounting to at least 2.5 times the room volume listed in section D2 must be replaced in a natural way through doors and windows in order to eliminate the combustion gases and provide air for combustion.

		Natural replacement	
Heating Power:	85,000 Btu/hr	of ventilated air:	44,200 ft ³ /hr
	170,500 Btu/hr		88,300 ft ³ /hr
	275,000 Btu/hr		124,000 ft ³ /hr
	375,000 Btu/hr		168,000 ft ³ /hr
	475,000 Btu/hr		221,000 ft ³ /hr

If the natural replacement of ventilated air by means of doors and windows should be less and, owing to fewer or tightly closing doors and windows, be only equal to the room volume per hour listed in section D2, then additional fresh-air ventilation must be provided in at least the following amounts (fresh air near floor, and near the ceiling, otherwise toxic CO gas can be generated).

		Amount of	
Heating Power:	85,000 Btu/hr	fresh air:	18,000 ft ³ /hr
	170,500 Btu/hr		35,500 ft ³ /hr
	275,000 Btu/hr		50,000 ft ³ /hr
	375,000 Btu/hr		67,000 ft ³ /hr
	475,000 Btu/hr		88,000 ft ³ /hr

The following openings are required for this amount of fresh air and outgoing air:

Fresh air: 30 ft² Outgoing air: 30 ft²

E. Safety Clearances to combustible materials

1. To flammable materials, side clearance: 2 ft
2. To flammable materials, hot-air discharge side: 7 ft
3. To unimpeded air intake: 2 ft
4. Upward: 10 ft

MAINTENANCE

Maintenance work to be performed by qualified professionals only. A clean hot-air generator burns better, suffers fewer malfunctions and has a longer life, if well maintained.

WARNING!!! Be sure to disconnect the heater from all power sources before performing any maintenance work!

1. The oil filters must be cleaned after each heating season, or more often if use in dusty / dirty environment or fuel not clean.
2. Dust and dirt must be thoroughly cleaned off of internal components after each heating use, depending on how dirty the area is around the machine.
3. After each heating season, the soot must be removed from the combustion chamber and the burner adjustments checked. This should only be done by a qualified service person.

Note: The model K120 has three openings for cleaning the heat exchanger. One is behind the fan, which can be opened after the screws and the fan is removed. The second opening is located on the exhaust side behind the covering plate beneath the exhaust connection. The third opening is situated on the exhaust gas connection, which can be reached by taking the cover and the insulation sheeting off the case. The K50 has only the first two openings for cleaning purposes

STARTUP

Heating

1. Connect the draw and return lines to the oil supply (K50 and K120).
2. Connect the power cord to a well-grounded 115v, 60Hz, 10 source of power.
3. If called for by the building code, hook up combustion chamber exhaust to flue, otherwise connect to 3 feet exhaust pipe with rain hood.
4. If the heater and or oil are too cold, you must wait about 15-20 minutes, depending on the temperature, until the oil has been preheated. Not until then may you set the switch to heating mode and set the room thermostat (if there is one) to a temperature above that of the surroundings.

SHUT DOWN

1. Set heater toggle switch to off position – **do not unplug the heater** – the fan must continue to run after shut-down to cool the heater. The temperature controller switches the fan off automatically after a delay of 2-3 minutes. Hence you should not unplug from an electrical source to turn the heater off. If you turn the heater off unplugging or turning the mains switch off, the heater will not be able to cool down. This will lead to the safety thermal relay locking out, and the heater will not run until the safety thermal relay is reset.

VENTILATION

1. Set heater switch to ventilate.
2. To turn off ventilation: set heater switch to "0".

Cord Length in Feet				
Wire Gauge Chart A.W.G.				
Name plate amps	25	50	100	150
5-6	18	16	14	12
6-8	18	16	12	10
8-12	18	14	12	10
10-12	16	14	10	8
12-14	16	12	10	8

TROUBLESHOOTING GUIDE

PROBLEM: Burner does not start

POSSIBLE CAUSES AND REMEDY:

No electrical power (check with a voltage tester or lamp):

- Switch on the main power source, and check to be sure that the heater is plugged in.
- Replace the fuse or reset the circuit breaker.
- Check supply line for short circuit.

When running the heater without a room thermostat:

- Check that the cap on the thermostat receptacle is in place. The heater will not start without a thermostat receptacle cap.

Room thermostat (if there is one) is set too low:

- Set the room thermostat for a temperature higher than room ambient.

Room thermostat is defective:

- Check room thermostat, Only to be done by a qualified professional.
- If necessary, replace it or install the thermostat cap and operate heater manually.

Automatic oil ignition system indicates a malfunction (warning lamp lights):

- After waiting one minute press the illuminated anti-interference button. The emergency light must go off, and then the burner will try to start up again.
- When the heater is started for the first time, the anti-interference button may have to be pressed repeatedly before the burner intake is free of bubbles. Check the oil in the return line for bubbles. Bubbles in the oil make heater operation impossible.

Safety thermal relay has cut off electrical power supply. Exhaust temperature was too high, air intake or exhaust is too narrow, or the heater was not able to cool down sufficiently:

- Heater was shut down by pulling the plug instead of using the switch.
- Press the anti-interference button on the safety thermal relay and eliminate the cause of the over heating (intake or exhaust).

PROBLEM: Burner starts up, but then indicates malfunction, red lamp lights up.

POSSIBLE CAUSES AND REMEDY:

Oil tank is empty:

- Refill oil
- Oil pipeline not connected or main valve is closed.

Oil filters are dirty:

- Clean nozzle filters, pump filters, preliminary filters.
- Replace nozzle, if necessary.

Oil intake line leaks, pump takes in air:

- Seal the oil intake line; the oil in the return line must be free of bubbles.

Oil pump produces no pressure:

- Reset pressure properly, replace coupling or pump. Only to be done by a qualified professional.

PROBLEM: Burner starts up but does not ignite, indicates malfunction, red lamp lights up.

POSSIBLE CAUSES AND REMEDY:

No ignition spark. Ignition electrode improperly set or carbonized:

- Pull electrical plug or switch off electrical power and check blast connection.

Burner nozzle clogged:

- Unscrew and remove the burner nozzle. Replace with a new nozzle. Do not try to clean the nozzle, always replace! Nozzles which have been cleaned never run properly.

PROBLEM: Flame goes out after startup or burns unsteadily.

POSSIBLE CAUSES AND REMEDY:

Light-dependent resistor is dirty:

- Pull out light-dependent resistor and clean with a clean cloth. This should be done if heater is run in extremely dusty rooms.

Oil filters are dirty:

- Check and clean oil filters (preliminary filter, pump filter & nozzle filters)

Oil suction line leaks, pump takes in air:

- Air bubbles in the oil in the return pipe are observed, check by draining oil from return line into receptacle and checking for bubbles. Seal the oil suction pipe (tighten all screwed connection).
- Reset pump to correct pressure, only to be done by a qualified professional.

Burner nozzle clogged:

- Remove burner nozzle and replace.

Combustion air not properly set:

- Reset combustion air, only to be done by a qualified professional

PROBLEM: Burner does not switch off

POSSIBLE CAUSES AND REMEDY:

Room thermostat not mounted in the right place:

- Move the room thermostat. It is important to have the room thermostat located where it will not be exposed to cold airflow from windows, doors etc.

Room thermostat defective:

- Check room thermostat, only to be done by a qualified professional. If faulty replace.

PROBLEM: Room thermostat switches off burner before room temperature is reached.

POSSIBLE CAUSES AND REMEDY:

Room thermostat is exposed to warm air or heat radiation (such as direct sun light, machines, hot-water pipes or steam lines, etc.).

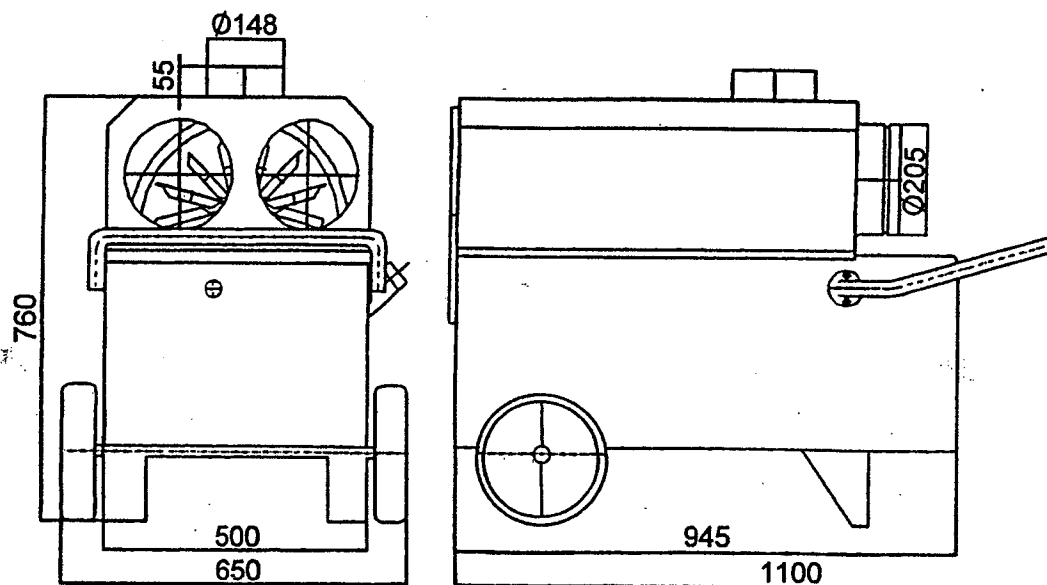
- Move the thermostat.

If after these steps you are unable to remedy the situation, contact customer service.

K25T

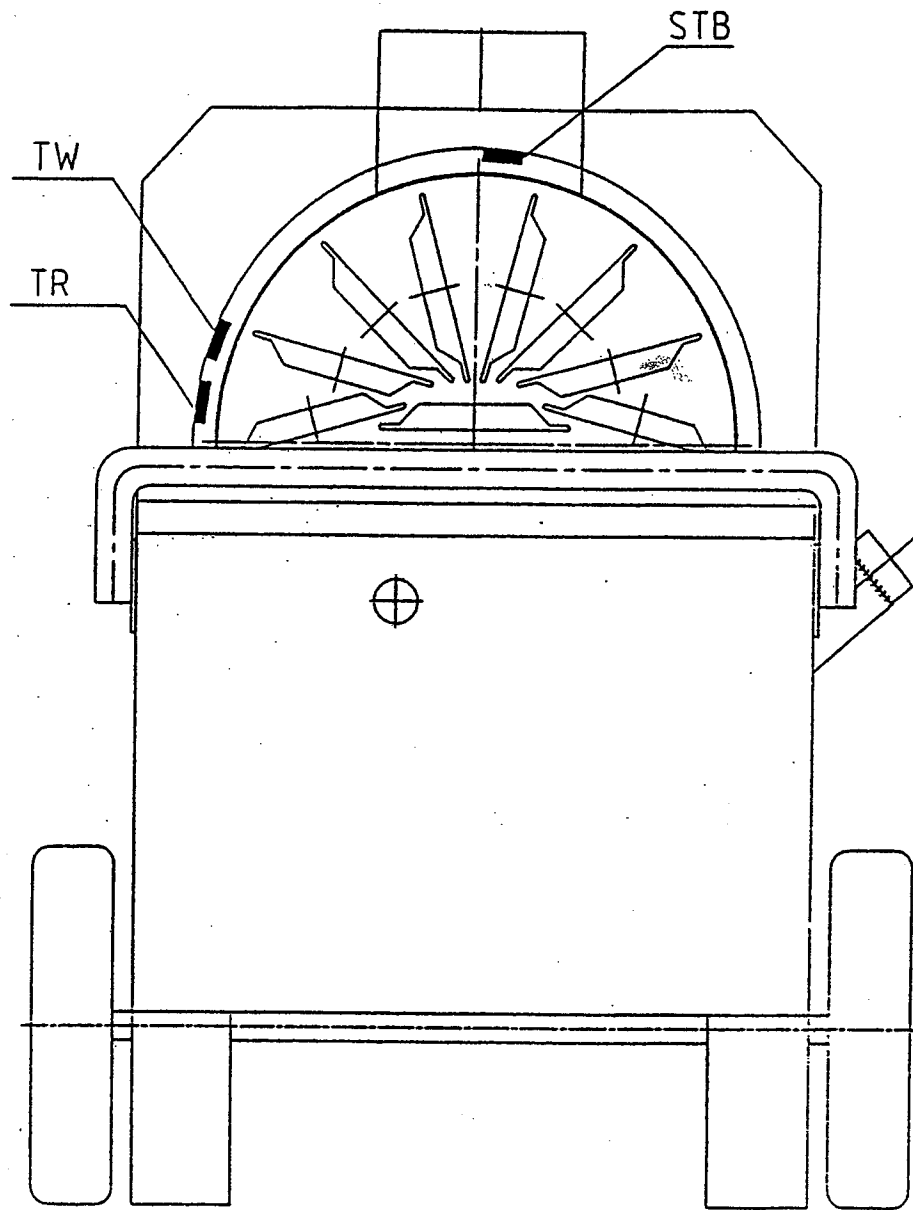
Supplementary Information

Dimensional Sketch



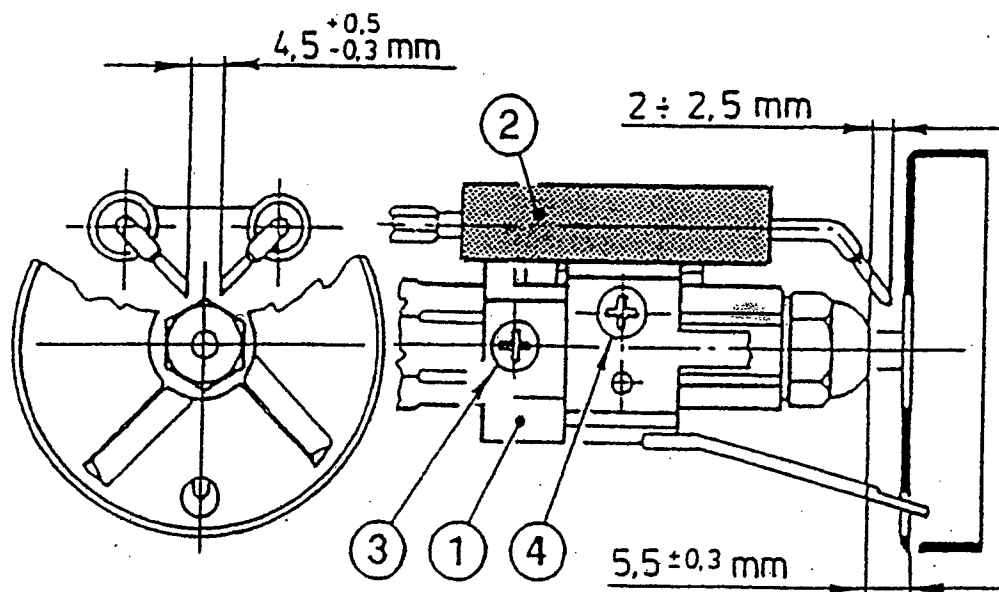
TECHNICAL DATA

Model	HL-K25T
Part No.	1101514
Rated thermal output (BTU/hr)	93,000
Rated heat output (BTU/hr)	85,000
Hot-air output at Δt 81°F (cfm)	1200
Ventilator air output at 68°F	1060
Static pressure (in. w.c.)	0.2
Temperature increase (°F)	81
Fuel consumption (gal/hr)	0.69
Minimum flue draft (in. w.c.)	0.04
Efficiency loss through exhaust gas (%)	6.7
Exhaust gas mass loss (lbs./sec)	0.03
Voltage/frequency (v/Hz)	115/60
Current load (amps)	3.5
Power draw (w)	405
Noise at 16 feet (dB)	58
Tank capacity (gal.)	9.3
Weight (lbs.)	188
Temperature controller (TR) (°F)	95 to 104
Temperature detector (TW) (°F)	158 to 194
Safety thermal relay (STB) (°F)	212



Thermostat Position K25T

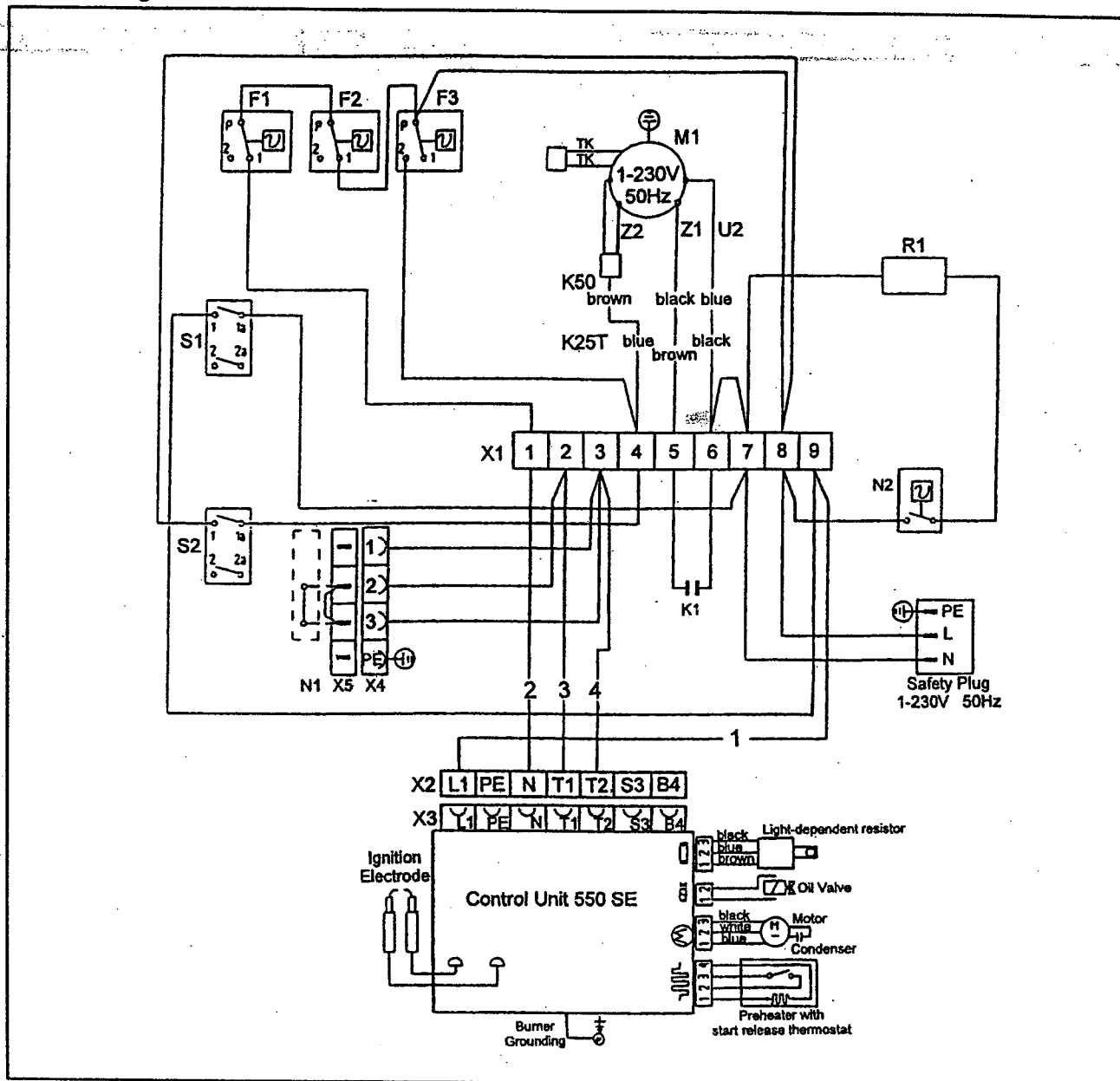
BURNER HEAD SETTING **K50/K25T**



Note: To set the baffle plate fastening system (1), loosen screw No.(3).
And to set the electrode system (2), loosen screw No.(4).

Appliance	Heating Power	Nozzle	Pump Pressure	Air Choke Setting	Burner Heat Setting	Burner Model
K25T	25kW	0.65 Gph 30° B Delavan Part No. 1630037	11b	2.0	2.0	RG 1 RK
K50	50kW	1.10 Gph 60° W Delavan Part No. 1630012	13b	4.5	4.5	RG 1 RK

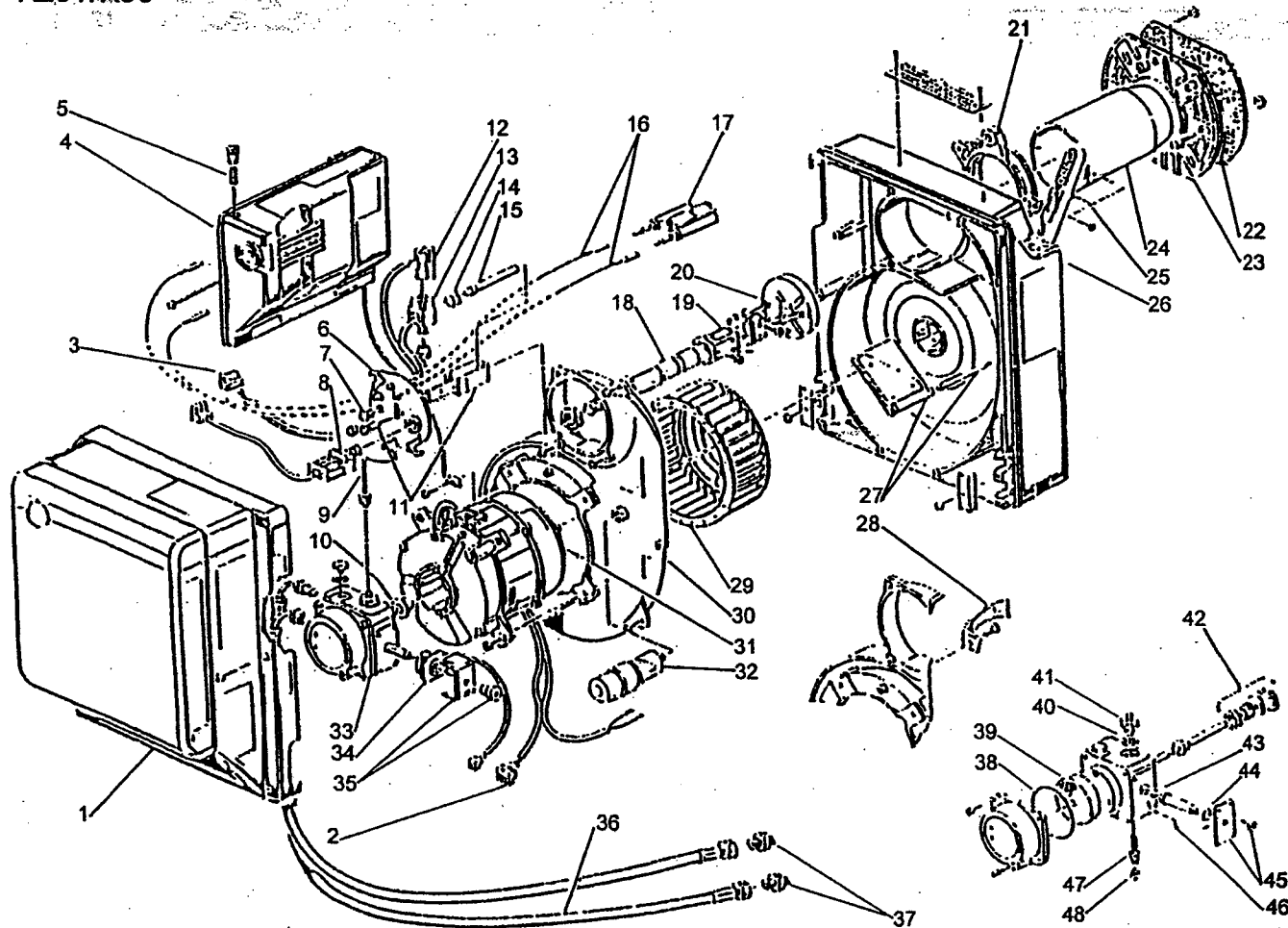
Circuit Diagram K25T/K50



- F1 Safety thermal relay
- F2 Temperature detector
- F3 Temperature controller
- M1 Fan motor
- R1 Immersion heater, oil preheater
- S1 "Heat" switch
- S2 "Ventilate" switch

- N1 Room thermostat RT
- N2 Thermostat, oil preheater
- X1 Terminal strip
- X2 7-pol plug, burner
- X3 7-pole plug, burner connection
- X4/X5 4-pole plug connection for RT
- K1 Condenser

K25T/K50



Item	Part No. K25T/K50	Description	Qty	Item	Part No. K25T/K50	Description	Qty.
1	—	Burner hood	1	25	—	Air regulator	1
2	1450946	Plug motor	1	26	—	Burner case	1
3	1450947	Plug preheater and thermostat	1	27	—	Air choke and air choke bolt	1
4	1420016	Control unit 550 SE	1	28	—	Air guide plate	1
5	1440409	Fuse, 3.15 A	1	29	1651747	Fan wheel	1
6	—	Blast connection flange	1	30	—	Front plate with air intake	1
7	—	Inspection plug	1	31	1400217	Motor	1
8	1420124	Light-dependent resistor	1	32	—	Condenser 4 μ F	1
9	1263006	Oil pipe, pump-blast connection	1	33	1630536	Pump	1
10	1650517	Pump coupling	1	34	1400654	Magnetic coil	1
11	—	Blast connection support	1	35	140655	Retaining clip w/screw for magnetic coil	1
12	1430106	Preheating thermostat	1	36	—	Oil hoses	1
13	—	Support preheating thermostat	1	37	—	Connecting nipple	1
14	1560209	O-ring seal	1	38	1560212	O-ring, pump cover	1
15	1430108	Preheating PTC resistance	1	39	1630654	Pump filter, R40	1
16	1630336	Cable ignition electrodes	1	40	—	Seal	1
17	1630337	Electrode block	1	41	—	Connecting nipple	1
18	1630417	Blast connection	1	42	1560213	Sealing insert, drive shaft-oil pump	1
19	1630418	Baffle plate mount	1	43	1560214	O-ring	1
20	1630419	Baffle plate	1	44	1560215	O-ring	1
21	—	Burner flange	1	45	—	Retaining flange w/screws & solenoid valve	1
22	—	Boiler flange seal	1	46	—	Solenoid valve body	1
23	—	Boiler flange	1	47	—	Pressure regulator screw	1
24	—	Flame tube	1	48	—	O-ring	1

Spare Parts List
K25T

Item No.	Part No.	Description
1	1220126	Heat exchanger, complete
2	1230605	Axial fan W2E-300-CP02-31
3	1260151	Tank, complete
4	1400312	Condenser 8uF, 400V
5	1400505	Cartridge heaters, model 503, D 24 x 200
6	1430015	Temperature controller 0-60°C
7	1430027	Bi-metal thermostat
8	1430030	Temperature detector 70-90°C
9	1430031	Safety thermal relay 100°C (permanent)
10	1450912	Attachment box for room thermostat connection, model C-146
11	1450916	Cap for room thermostat connection
12	1451002	Threaded terminal end/socket insert
13	1630037	Oil nozzle, 0.65 Gph 30° B, Delavan
14	1630650	Filter insert for Afriso oil filter
15	1630655	Afriso oil filter
16	1650014	Wheel, dimensions: 260 x 60, 65mm hub
17	1660227	Cap for wheel (Starlock cap) diameter: 20mm
18	1660237	Tank cover for K25T
19	1660886	Rocker switch
20	1660887	Cap for rocker switch



MODEL F3 & F5 INSTALLATION MANUAL

RIELLO 40
SERIES
RESIDENTIAL
OIL BURNERS

KSD
K25

FOR CANADA PRECAUTIONS

AIR FOR COMBUSTION

Do not install burner in room with insufficient air for combustion. Be sure there is an adequate air supply for combustion if the boiler/furnace room is enclosed. It may be necessary to create a window to permit sufficient air to enter the boiler/furnace room. The installer must follow local ordinances in this regard. Should local ordinances be lacking, it is suggested that the installer follow CSA standard B139.

CHIMNEY

Be sure chimney is sufficient to handle the exhaust gases. It is recommended that only the burner be connected to the chimney. Be sure that it is clean and clear of obstructions.

OIL FILTER

An external oil filter is ~~REQUIRED~~, even though there is an internal strainer in the pump. The filter should be replaced at least once a year, and the filter container should be thoroughly cleaned prior to installing a new filter cartridge.

DRAFT

Follow the instructions furnished with the heating appliance.

The pressure in the combustion area should be kept as close to zero as possible. The burner will operate with a slight draft or pressure in the chamber.

ELECTRICAL CONNECTIONS

All electrical connections should be done in accordance with the C.E.C. Part I, and all local codes. The system should be grounded.

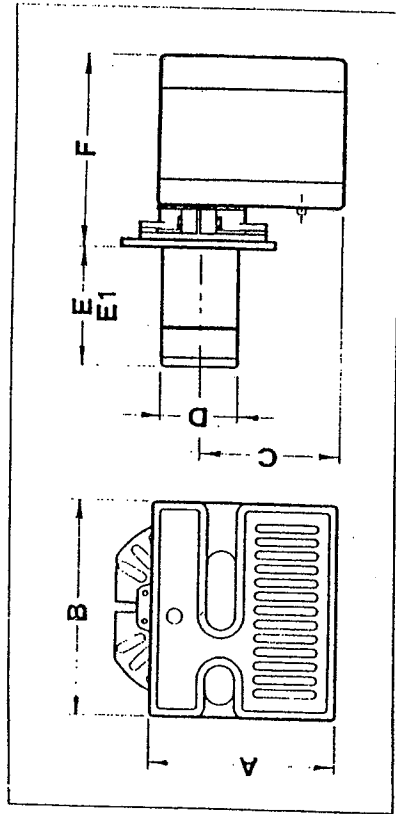
CONTROL BURNER OPERATION

Check out the burner and explain its operation to the homeowner. Be sure to leave the Owner's Instruction sheet with the homeowner.

FIRE EXTINGUISHER

If required by local codes, install an approved fire extinguisher.

RIELLO 40 F3 TECHNICAL DATA



DIMENSIONS

MODEL F3	A	B	C	D	E	F
Inches	8 15/32	9 59/64	6 15/32	3 1/2	6	8 29/32
mm	215	252	164	89	152	226

E1: 10 inch long (254mm) tubes are also available.

SPECIFICATIONS

FUEL: No. 2 Fuel Oil

FIRING RATE: 0.50 to 0.95 GPH 1.6 to 3.0 Kg/h

EFFECTIVE OUTPUT: 70,000 to 133,000 BTU/h 20.5 to 39 Kw

17,640 to 33,520 Kcal/h

VOLTAGE (Single Phase): 120V 60 Hz (+ 10% - 15%)

ABSORBED ELECTRICAL POWER: 155 Watts

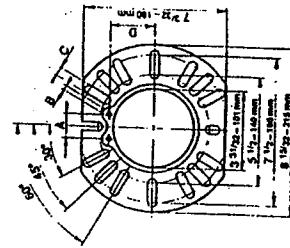
MOTOR (rated): 3250 rpm Run Current 1.6 AMP

CAPACITOR: 12.5 Microfarads 260V

PUMP PRESSURE: 130 to 200 psig

PRIMARY CONTROL: RIELLO 530 SE/C

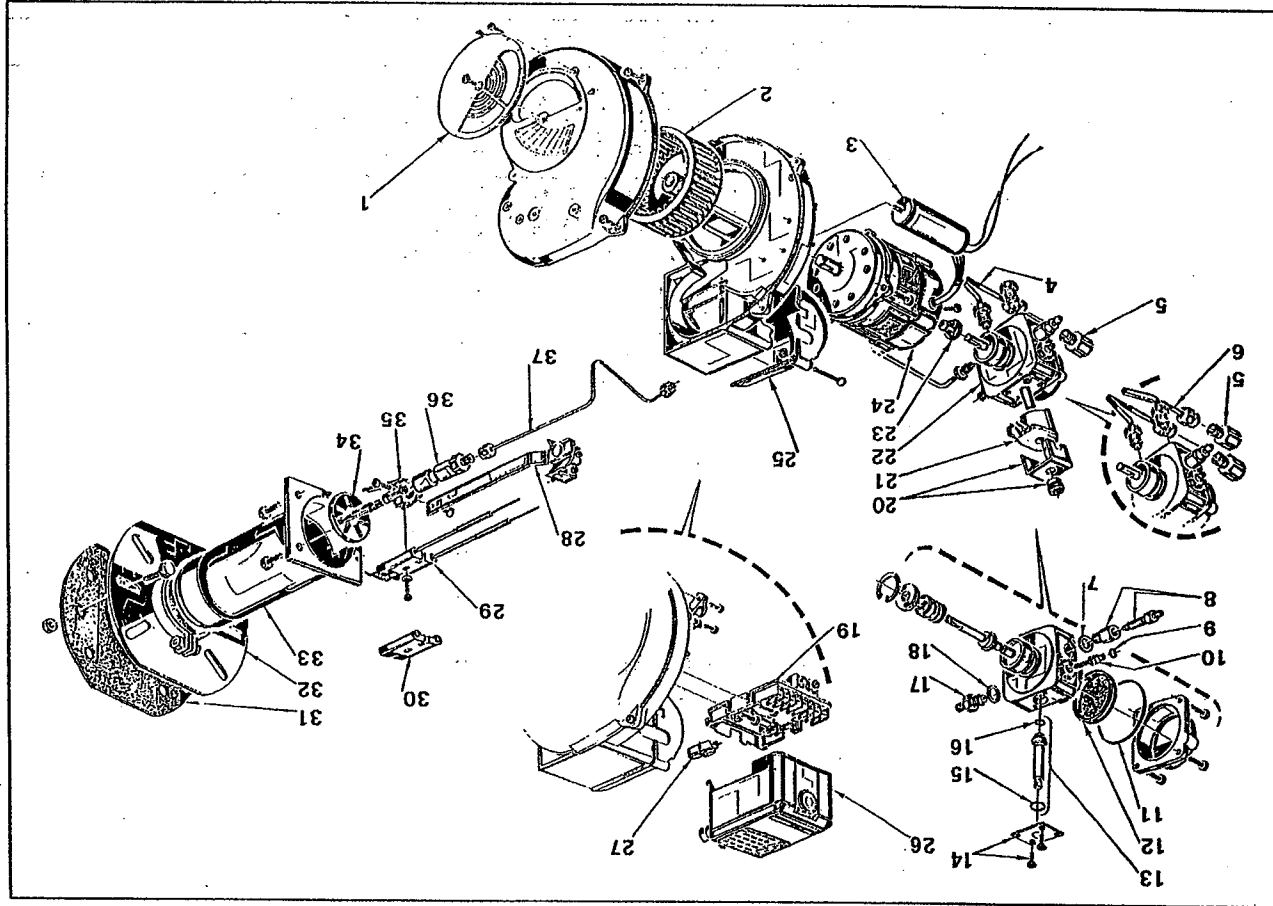
IGNITION TRANSFORMER: 8Kv 16 mA



MOUNTING FLANGE DIMENSIONS

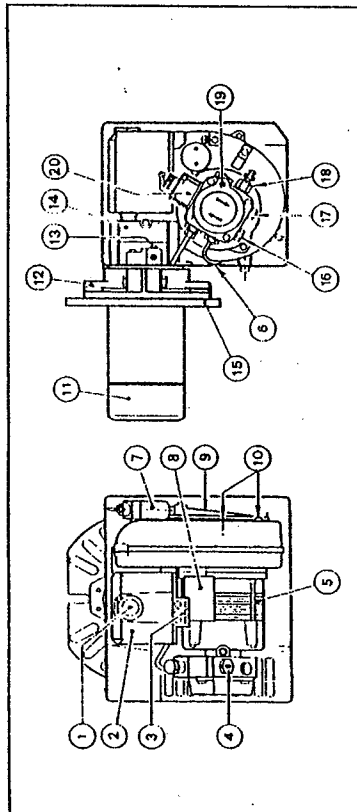
MODEL F3	A	B	C	D
Inch	1 1/4	1/4	7/16	2 3/16
mm	32	6	11	56

SPARE PARTS



F - 14

OIL BURNER COMPONENTS IDENTIFICATION RIELLO 40 SERIES



F3 & F5 BURNER COMPONENTS

- | | |
|---|-------------------------------------|
| 1. Lockout indicator lamp and reset button | 10. Air adjustment fixing screw |
| 2. Primary control | 11. Combustion Head |
| 3. Primary control sub-base | 12. Semi Flange |
| 4. Pump pressure regulator adjustment screw | 13. Turbulator adjustment screw |
| 5. Motor | 14. Air tube cover |
| 6. Capillary tube | 15. Mounting flange with gasket |
| 7. Hydraulic Jack | 16. Supply fuel line port |
| 8. Capacitor | 17. Return fuel line port |
| 9. Hydraulic air shutter | 18. Pressure gauge and bleeder port |
| | 19. Vacuum gauge port |
| | 20. Coil |

SERIAL NUMBER IDENTIFICATION

The Riello 15 character serial number, example, 97 A 8511111 00025, is identified as follows: 97 = last two digits of the year of manufacture; A = BI-week of manufacture; 8511111 = burner product code; 00025 = increment of 1 for each burner produced - specific to product code - reset to zero each January 1st.

Year of Manufacture	(97) (A) (8711111) (00025)	Sequence
BI-week of manufacture	burner product code	

INITIAL SET-UP

- Remove burner and air tube from cartons. Check parts list (inside cover) to ensure all parts are present.
- Remove burner cover by loosening the three screw securing it. Remove control box and air tube cover (see page 8).
- Remove drawer assembly from air tube, insert nozzle and set turbulator adjustment for

F - 3

WARNING: Omitting steps 2 and 3 will result in a collection of unburned oil in the combustion chamber creating a hazardous situation upon burner startup.

B) TWO LINE (LIFT SYSTEM)

Turn off the main power source to the burner and remove the air tube cover. Shine a light source on the photo cell (now visible where the air tube cover was removed), return power to the burner and activate the burner. With the light source in place, the burner will operate in prepurge only. When the pump is sufficiently purged, the hydraulic air shutter will open. Once the burner is purged, turn off the power source and replace the air tube cover. Return power to the burner. The burner is now ready to operate.

ATTENTION: It is important that the fuel line be completely sealed and free from air leaks or any internal blockages.

WARNING! WHEN THE BYPASS PLUG IS INSTALLED, A TWO PIPE SYSTEM MUST BE USED OR FAILURE OF THE PUMP SHAFT SEAL WILL OCCUR.

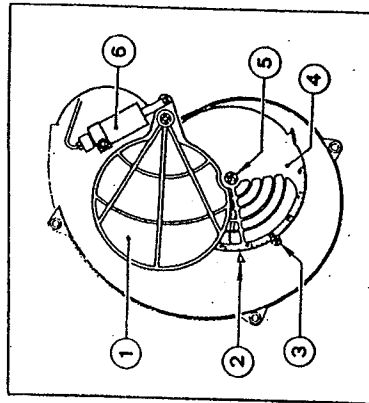
SETTING THE AIR ADJUSTMENT PLATE

A) The hydraulic AIR SHUTTER (1) is operated by the HYDRAULIC JACK (6), assuring complete opening of the combustion air intake. Regulation of the combustion air flow is made by adjustment of the manual AIR ADJUSTMENT PLATE (4) after loosening the FIXING SCREWS (3 & 5). The initial setting of the air adjustment plate should be made according to Column 5 in the Burner Setup Charts on page 13.

B) The proper number on the manual AIR ADJUSTMENT PLATE (4) should line up with the SETTING INDICATOR (2) on the fan housing cover. Once set, the air adjustment plate should be secured in place by tightening SCREWS 3 and 5. Manually open and release the hydraulic shutter to ensure it has free movement.

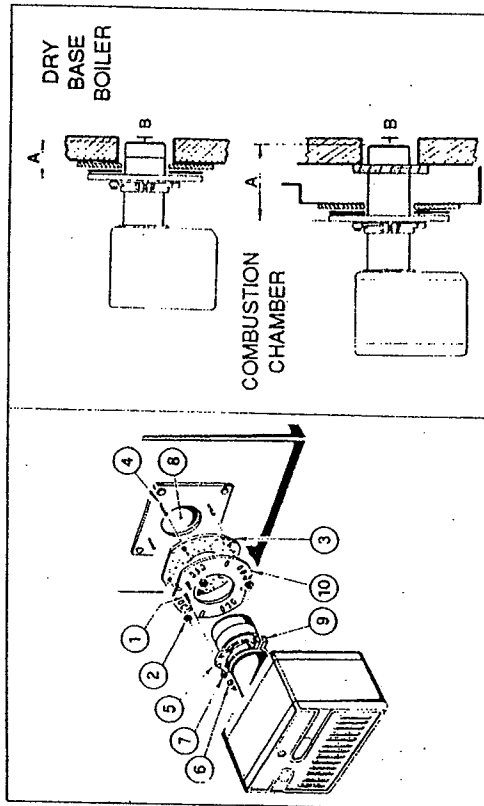
C) The final position of the air adjustment plate will vary on each installation. Use instruments to establish the proper setting for maximum CO₂ and a smoke reading of zero.

NOTE: Variations in flue gas, smoke, CO₂ and temperature readings may be experienced when burner cover is put in place. Therefore, the burner cover must be in place when making final combustion instrument readings, to ensure proper test results.



METHOD 1 - UNIVERSAL MOUNTING FLANGE

A) Insert the two BOLTS (1) into the UNIVERSAL MOUNTING FLANGE (10) from the flat side, ensuring the bolt heads are flush with the flat surface. Secure in place using two special CHROME NUTS (2) provided.



B) Position the MOUNTING GASKET (3) between the flat surface of the UNIVERSAL MOUNTING FLANGE (10) and the appliance. Line up the holes in the UNIVERSAL MOUNTING FLANGE with the STUDS (4) on the appliance mounting plate and securely bolt the UNIVERSAL MOUNTING FLANGE to the plate.

C) Secure the two semi-flanges of the ADJUSTABLE COLLAR (9) to the AIR TUBE using the two long BOLTS (6). Be sure that the ADJUSTABLE collar is properly positioned so the outside edge of the END CONE will be at least 1/4 inch (6.5 mm) back from the inside wall of the refractory of the combustion chamber (see dimension B above). The measured length (A), is to include MOUNTING GASKET and FLANGE, if used.

D) The burner may now be attached to the heating unit by inserting the AIR TUBE through the BURNER ACCESS HOLE (8) and into the appliance, making sure the BOLTS (1) line up with the two HOLES (5) in the ADJUSTABLE COLLAR. Secure the burner in place using two NUTS (7).

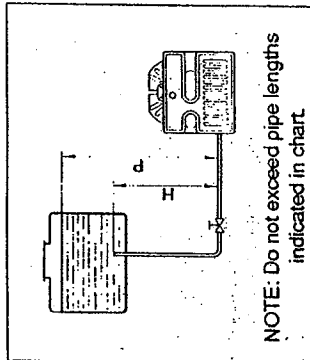
A visual verification of the air tube insertion into the combustion chamber of the heating unit is suggested. Dimension B should be at least 1/4" (see drawing).

NOTE: A suggested method for creating mounting bolt holes in the mounting gasket: Hold the gasket against the appliance mounting bolts using the mounting flange for proper positioning. Lightly tap the flange with a hammer to form the holes.

SINGLE LINE (GRAVITY FEED SYSTEM)

A) The burner is shipped configured for use in single line applications. No changes to the oil pump are required for use in single line applications.

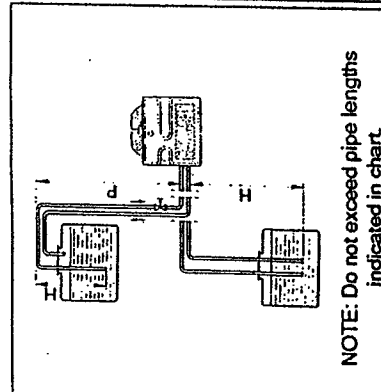
NOTE: If the pump cover (1) is removed for any reason, be sure the O-ring (2), is properly seated in the pump cover (1) before re-attaching the pump cover to the pump housing.



SINGLE LINE SYSTEM-PIPE LENGTHS				
H	3/8" OD		1/2" OD	
	FT	M	FT	M
1.5	0.5	33	10	65
3.0	1.0	65	20	130
5.0	1.5	130	40	260
6.5	2.0	195	60	325

B) Connect the pipe connector to the SUPPLY PORT (6) of the pump. Attach the required piping to this pipe connector. Be sure that the plug in the RETURN PORT (9) is tightened securely.

TWO LINE (LIFT SYSTEM)



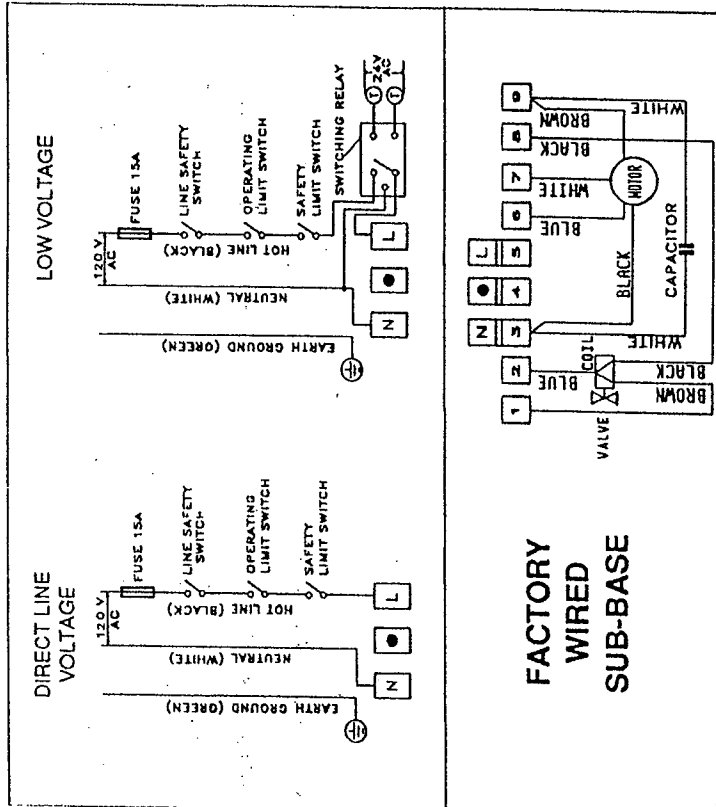
2 LINE (LIFT) SYSTEM-PIPE LENGTHS					
H	3/8" OD		1/2" OD		M
	FT	M	FT	M	
0.0	0.0	115	35	330	100
1.5	0.5	100	30	330	100
3.0	1.0	80	25	330	100
5.0	1.5	65	20	295	90
6.5	2.0	50	15	230	70
9.5	3.0	25	8	100	30
11	3.5	20	6	65	20

The burner may be controlled using either a DIRECT LINE VOLTAGE control circuit (120V AC 60 cycle) OR a LOW VOLTAGE control (24V AC 60 cycle) using a R8038A Honeywell switching relay or equivalent.

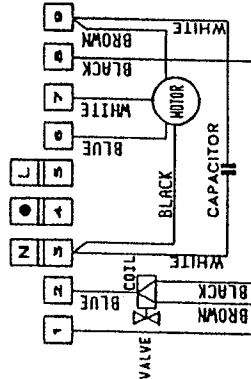
Using the appropriate diagram below, make electrical connections to burner. All wiring must be done in accordance with existing electrical codes, both national and local. When all electrical connections have been made, the control box may be put back in place on the sub-base.

WARNING: DO NOT activate burner until proper oil line connections have been made, or failure of the pump shaft seal may occur.

APPLICATION FIELD WIRING



FACTORY WIRED SUB-BASE



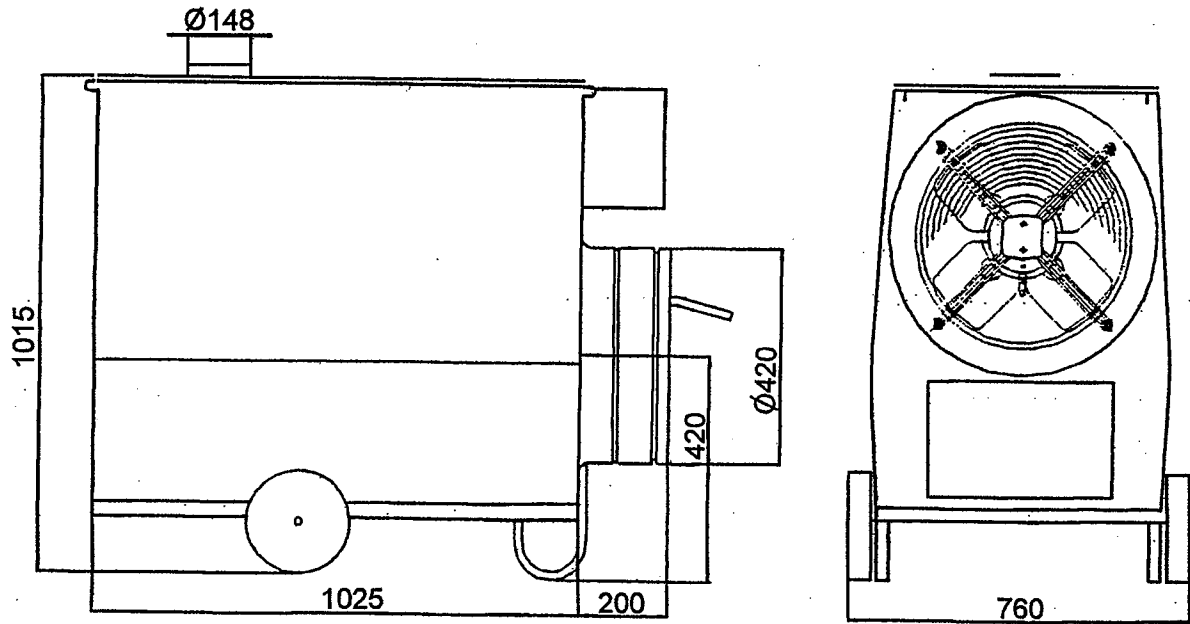
REMOTE SENSING OF SAFETY LOCKOUT: The SAFETY SWITCH in the 530SE CONTROL BOX is equipped with a contact allowing remote sensing of burner lockout. The electrical connection is made at terminal 4 (●) on the SUB-BASE. Should lockout occur the 530SE CONTROL BOX will supply a power source of 120Vac to the connection terminal. The maximum allowable current draw on this terminal (4) is 1 Amp.

WARNING: If a neutral or ground lead is attached to this terminal, the CONTROL BOX on the burner will be damaged should lockout occur.

K50

Supplementary Information

Dimensional Sketch

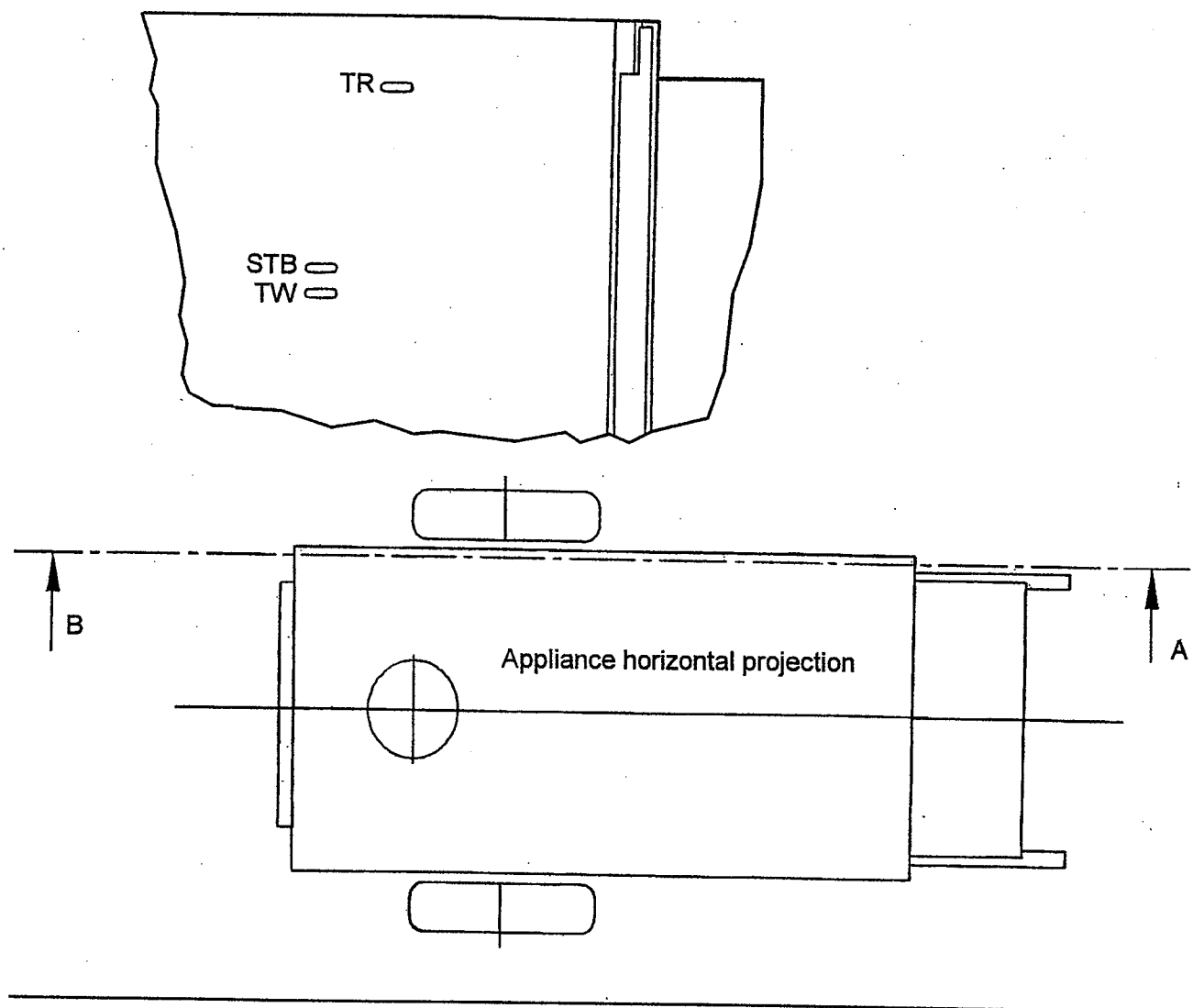


TECHNICAL DATA

Model	HL-K50
Part No.	1101584
Rated thermal output (BTU/hr)	184,000
Rated heat output (BTU/hr)	170,000
Hot-air output at Δt 81°F (cfm)	2500
Ventilator air output at 68°F	2100
Static pressure (in. w.c.)	0.4
Temperature increase (°F)	81
Fuel consumption (gal/hr)	1.36
Minimum flue draft (in. w.c.)	0.04
Efficiency loss through exhaust gas (%)	8
Exhaust gas mass loss (lbs./sec)	0.05
Voltage/frequency (v/Hz)	115/60
Current load (amps)	6.7
Power draw (w)	775
Noise at 16 feet (dB)	59
Tank capacity (gal.)	—
Weight (lbs.)	309
Temperature controller (TR) (°F)	95 to 104
Temperature detector (TW) (°F)	158 to 194
Safety thermal relay (STB) (°F)	212

Position of Installation for the Capillary Sensors in the Thermostat

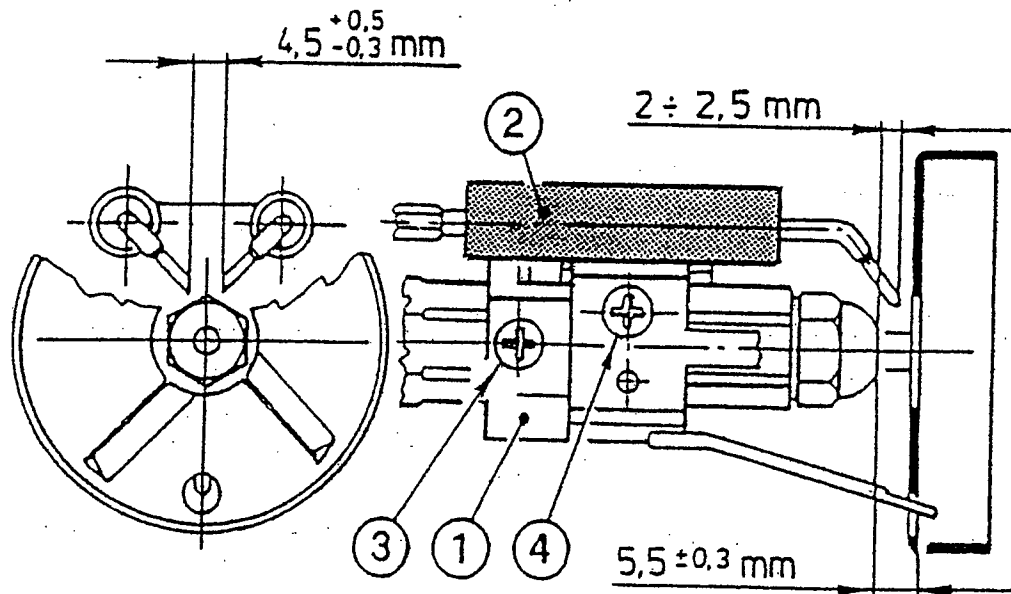
View Section A - B



Settings

Temperature Controller (TR)	40°C
Temperature Detector (TW)	90°C (permanent)
Safety Thermal Relay (STB)	100°C (permanent)

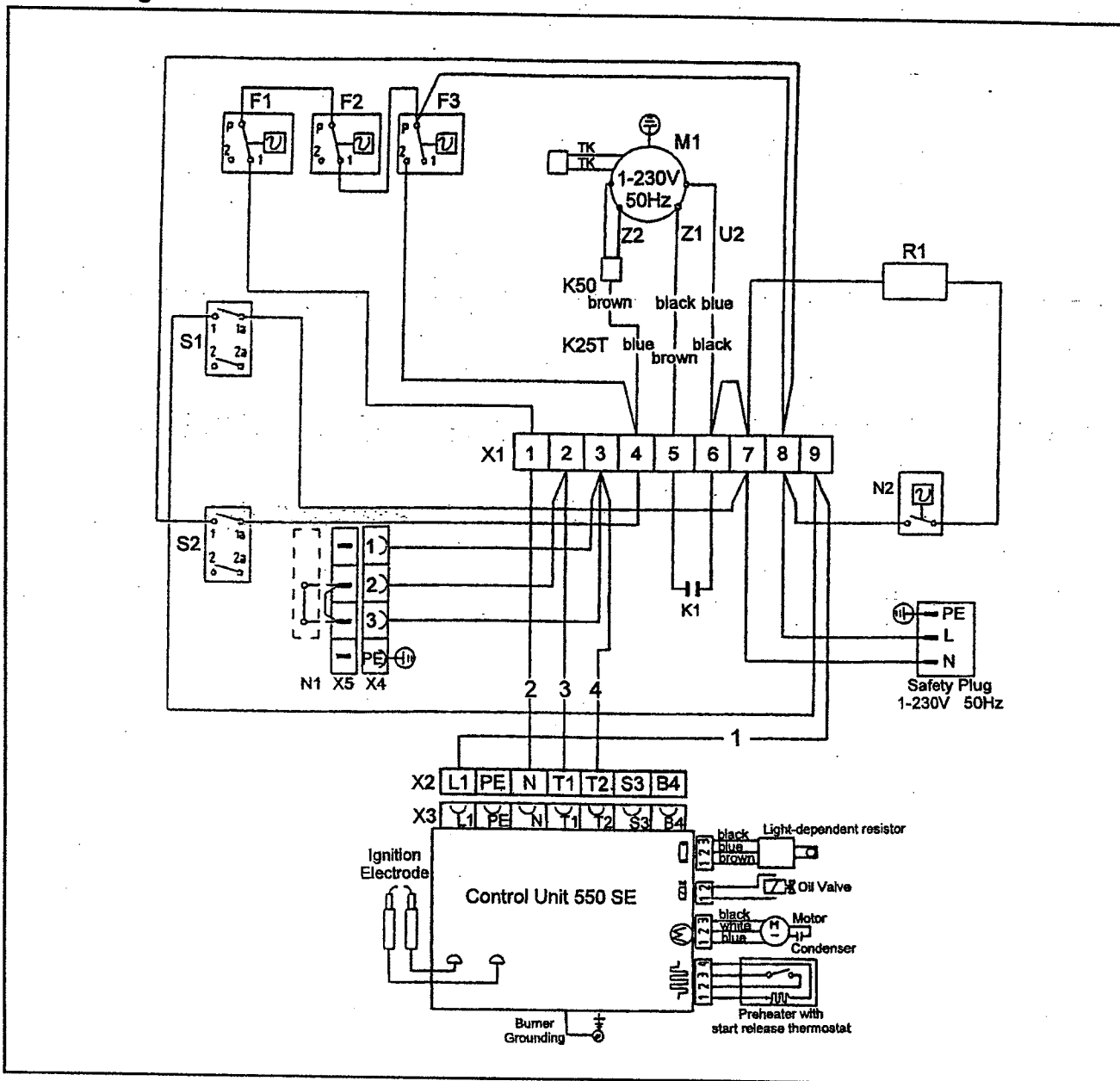
BURNER HEAD SETTING **K50/K25T**



Note: To set the baffle plate fastening system (1), loosen screw No.(3).
And to set the electrode system (2), loosen screw No.(4).

Appliance	Heating Power	Nozzle	Pump Pressure	Air Choke Setting	Burner Heat Setting	Burner Model
K25T	25kW	0.65 Gph 30° B Delavan Part No. 1630037	11b	2.0	2.0	RG 1 RK
K50	50kW	1.10 Gph 60° W Delavan Part No. 1630012	13b	4.5	4.5	RG 1 RK

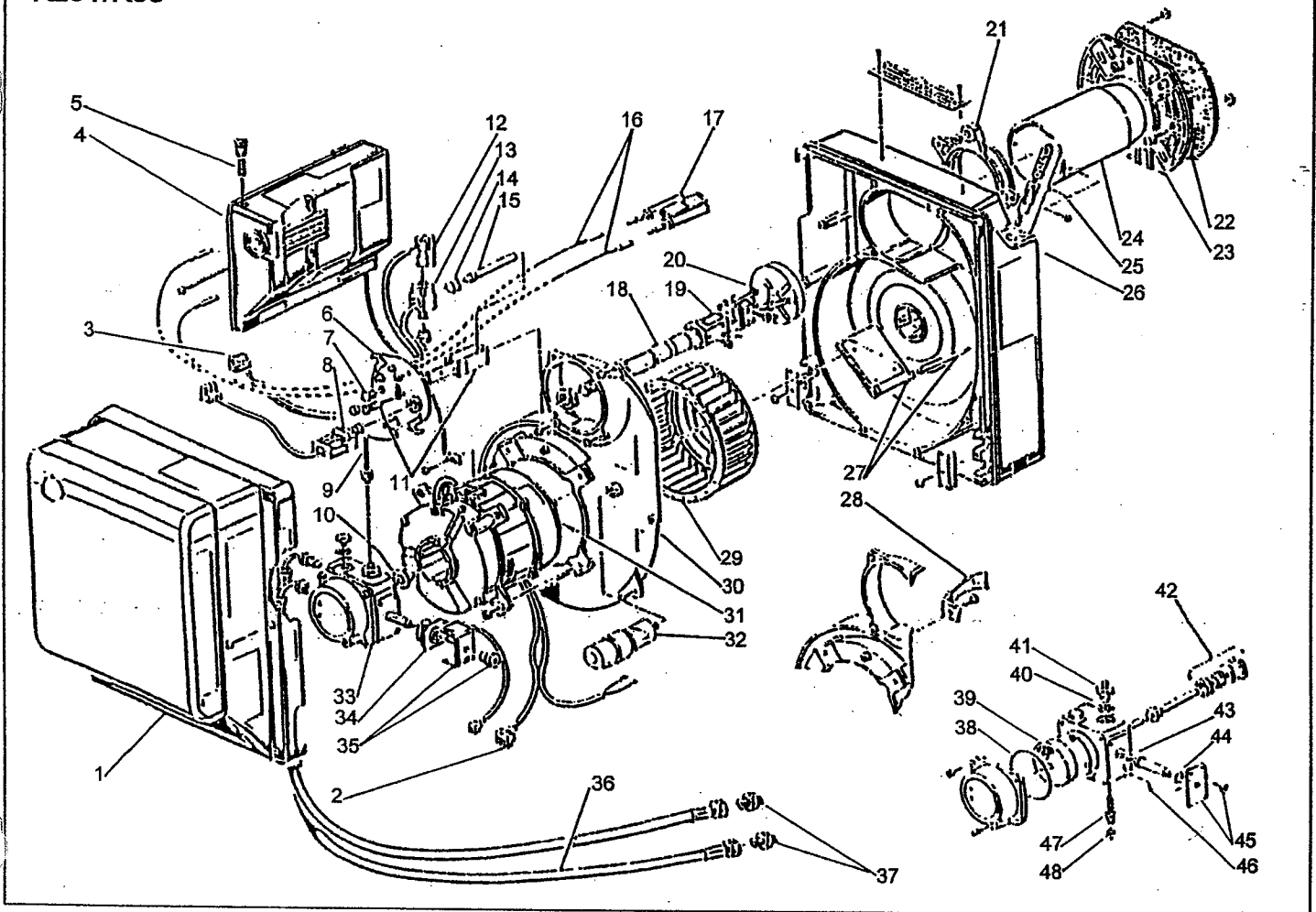
Circuit Diagram K25T/K50



- F1 Safety thermal relay
- F2 Temperature detector
- F3 Temperature controller
- M1 Fan motor
- R1 Immersion heater, oil preheater
- S1 "Heat" switch
- S2 "Ventilate" switch

- N1 Room thermostat RT
- N2 Thermostat, oil preheater
- X1 Terminal strip
- X2 7-pol plug, burner
- X3 7-pole plug, burner connection
- X4/X5 4-pole plug connection for RT
- K1 Condenser

K25T/K50



Item	Part No.	Description	Qty	Item	Part No.	Description	Qty.
K25T/K50				K25T/K50			
1	—	Burner hood	1	25	—	Air regulator	1
2	1450946	Plug motor	1	26	—	Burner case	1
3	1450947	Plug preheater and thermostat	1	27	—	Air choke and air choke bolt	1
4	1420016	Control unit 550 SE	1	28	—	Air guide plate	1
5	1440409	Fuse, 3.15 A	1	29	1651747	Fan wheel	1
6	—	Blast connection flange	1	30	—	Front plate with air intake	1
7	—	Inspection plug	1	31	1400217	Motor	1
8	1420124	Light-dependent resistor	1	32	—	Condenser 4 μ F	1
9	1263006	Oil pipe, pump-blast connection	1	33	1630536	Pump	1
10	1650517	Pump coupling	1	34	1400654	Magnetic coil	1
11	—	Blast connection support	1	35	140655	Retaining clip w/screw for magnetic coil	1
12	1430106	Preheating thermostat	1	36	—	Oil hoses	1
13	—	Support preheating thermostat	1	37	—	Connecting nipple	1
14	1560209	O-ring seal	1	38	1560212	O-ring, pump cover	1
15	1430108	Preheating PTC resistance	1	39	1630654	Pump filter, R40	1
16	1630336	Cable ignition electrodes	1	40	—	Seal	1
17	1630337	Electrode block	1	41	—	Connecting nipple	1
18	1630417	Blast connection	1	42	1560213	Sealing insert, drive shaft-oil pump	1
19	1630418	Baffle plate mount	1	43	1560214	O-ring	1
20	1630419	Baffle plate	1	44	1560215	O-ring	1
21	—	Burner flange	1	45	—	Retaining flange w/screws & solenoid valve	1
22	—	Boiler flange seal	1	46	—	Solenoid valve body	1
23	—	Boiler flange	1	47	—	Pressure regulator screw	1
24	—	Flame tube	1	48	—	O-ring	1

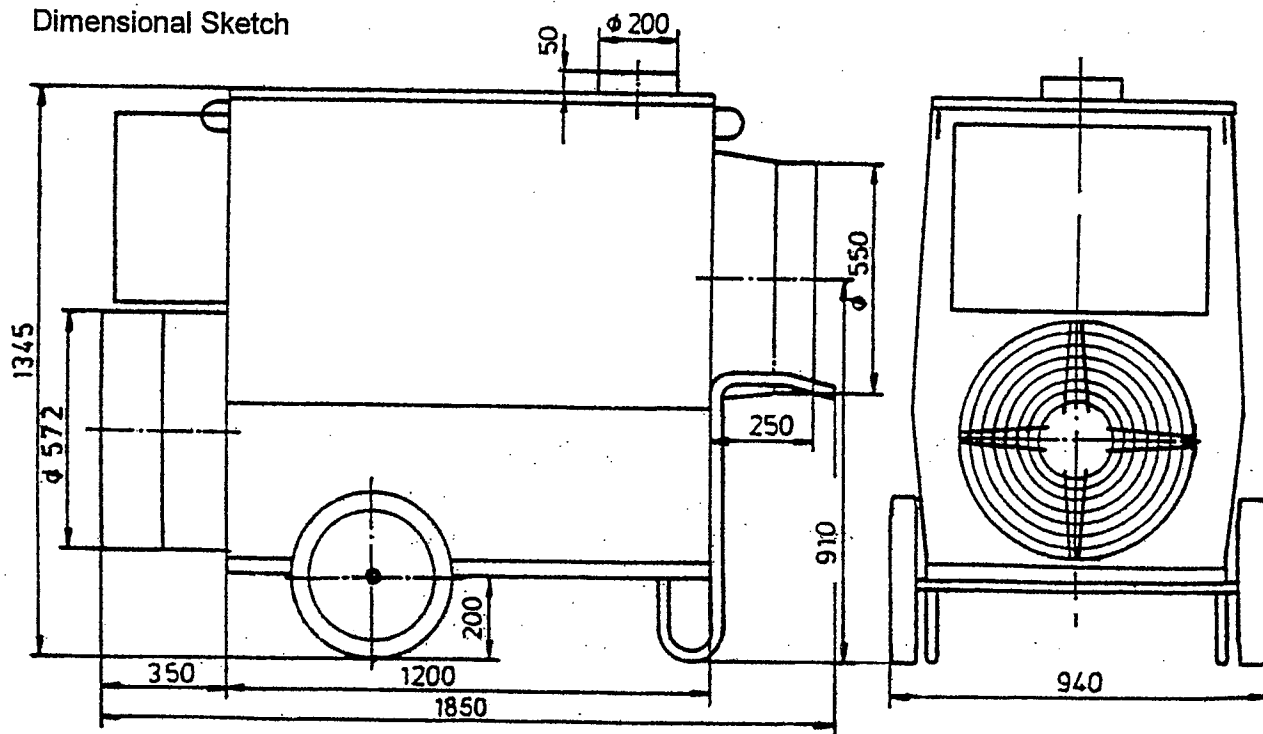
Spare Parts List
K50

Item No.	Part No.	Description
1	1220127	Heat exchanger, complete
2	1232792	Axial fan FB 045-4EL.3F.3P
3	1262080	Drum filter, complete
4	1301180	Bottom of drum filter case
5	1380694	Seal for cleaning cover, collector 1
6	1380695	Seal for cleaning cover, collector 2
7	1400312	Condenser, 8uF, 400V
8	1400505	Cartridge heater, model 503, D 24 x 200
9	1430015	Temperature controller 0-60°C
10	1430027	Bi-metal thermostat
11	1430030	Temperature detector 70-90°C
12	1430031	Safety thermal relay 100°C (permanent)
13	1450912	Attachment box for room thermostat connection, model C-146
14	1450916	Cap for room thermostat connection
15	1451002	Threaded terminal end/socket insert
16	1630012	Oil nozzle, 1.10 Gph 60° W, Delavan
17	1630638	Filter insert for drum filter
18	1630650	Filter insert for Afriso filter
19	1630655	Afriso oil filter
20	1650010	Wheel, dimensions: 275 x 70, 5mm hub
21	1660227	Cap for wheel (Starlock cap) diameter: 20mm
22	1660886	Rocker switch
20	1660887	Cap for rocker switch

K120

Supplementary Information

Dimensional Sketch



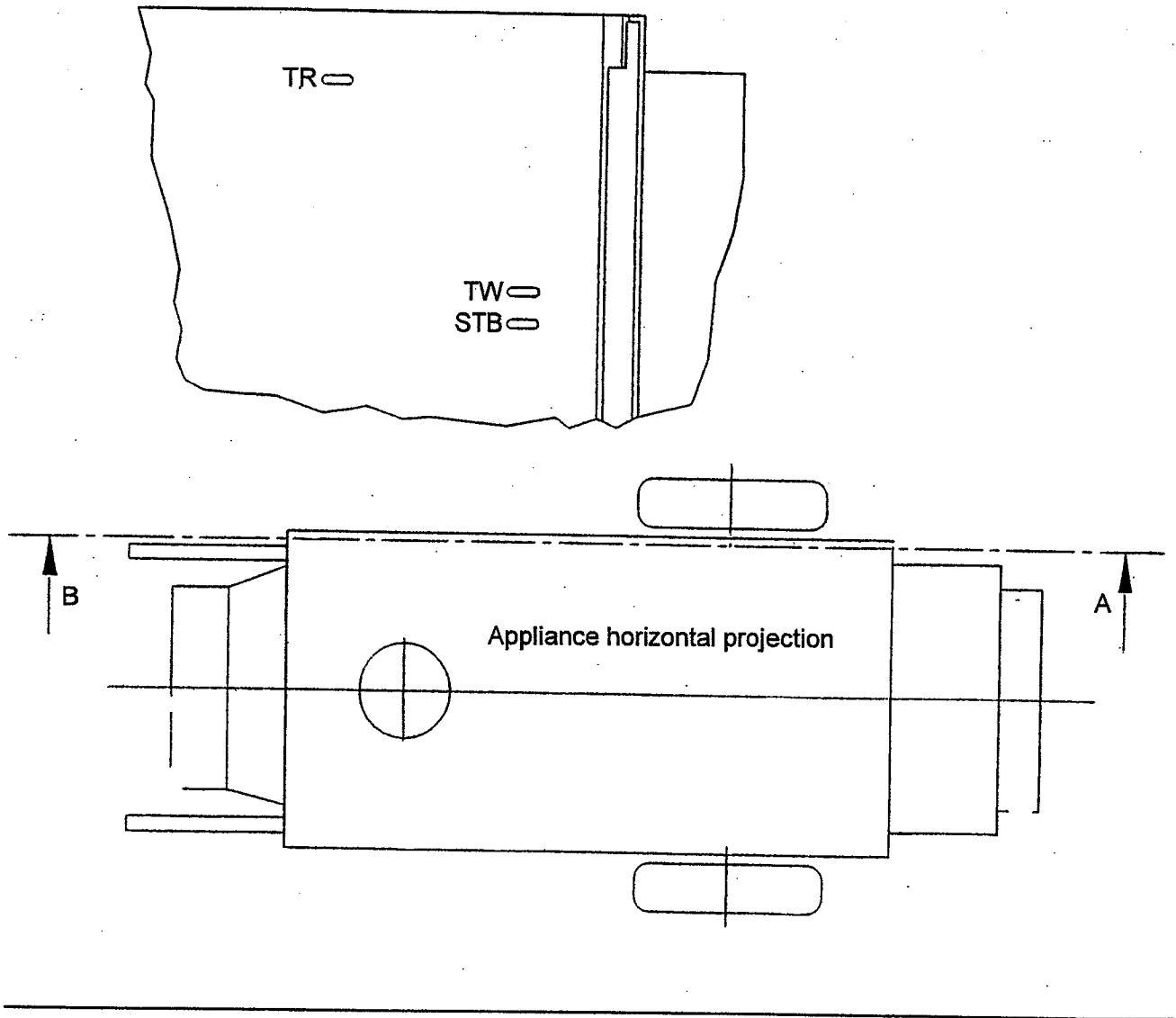
TECHNICAL DATA

Model	HL-K120
Part No.	1101626
Rated thermal output (BTU/hr)	409,000
Rated heat output (BTU/hr)	375,000
Hot-air output at Δt 81°F (cfm)	5200
Ventilator air output at 68°F	4650
Static pressure (in. w.c.)	0.6
Temperature increase (°F)	86.4
Fuel consumption (gal/hr)	3.03
Minimum flue draft (in. w.c.)	0.04
Efficiency loss through exhaust gas (%)	7
Exhaust gas mass loss (lbs./sec)	0.08
Voltage/frequency (v/Hz)	115/60
Current load (amps)	12.4
Power draw (w)	1430
Noise at 16 feet (dB)	72
Tank capacity (gal.)	—
Weight (lbs.)	496
Temperature controller (TR) (°F)	95 to 104
Temperature detector (TW) (°F)	158 to 194
Safety thermal relay (STB) (°F)	212

K120

Position of Installation for the Capillary Sensors in the Thermostat

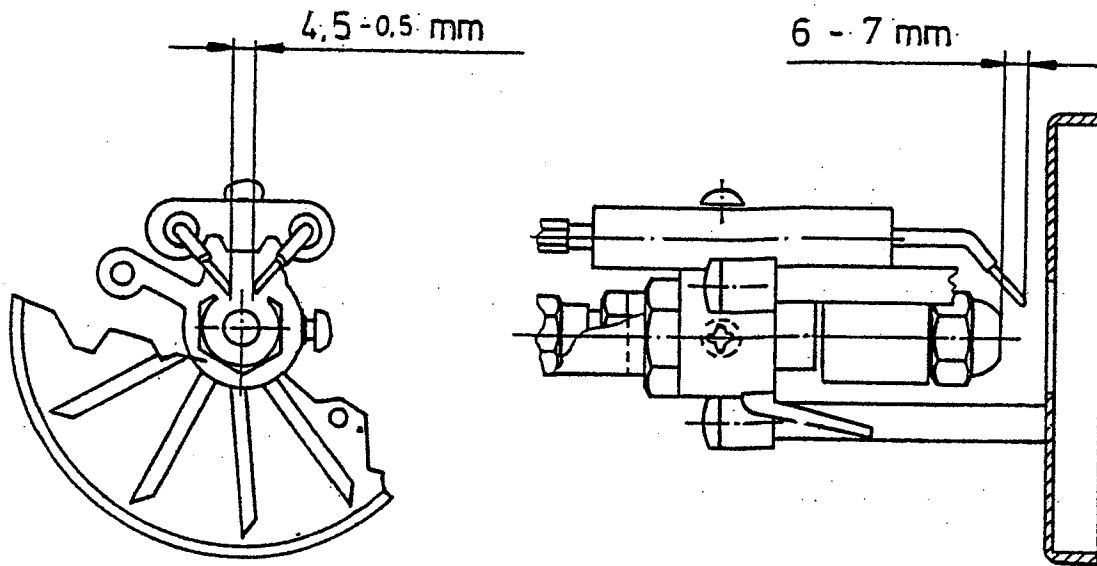
View Section A - B



Settings

Temperature Controller (TR)	40°C
Temperature Detector (TW)	90°C (permanent)
Safety Thermal Relay (STB)	100°C (permanent)

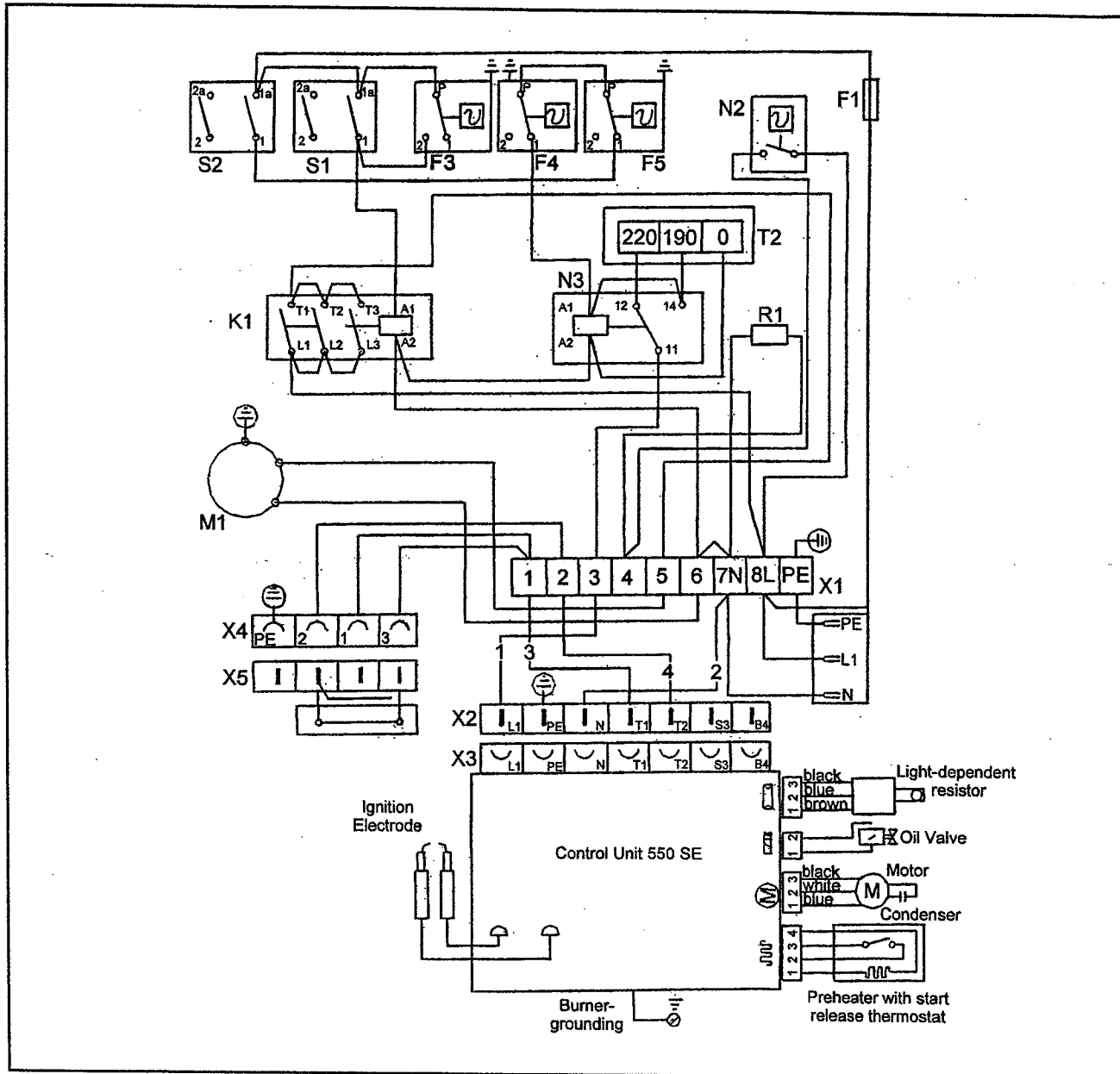
BURNER HEAD SETTING K120



Hot-air generator with ISK oil burner

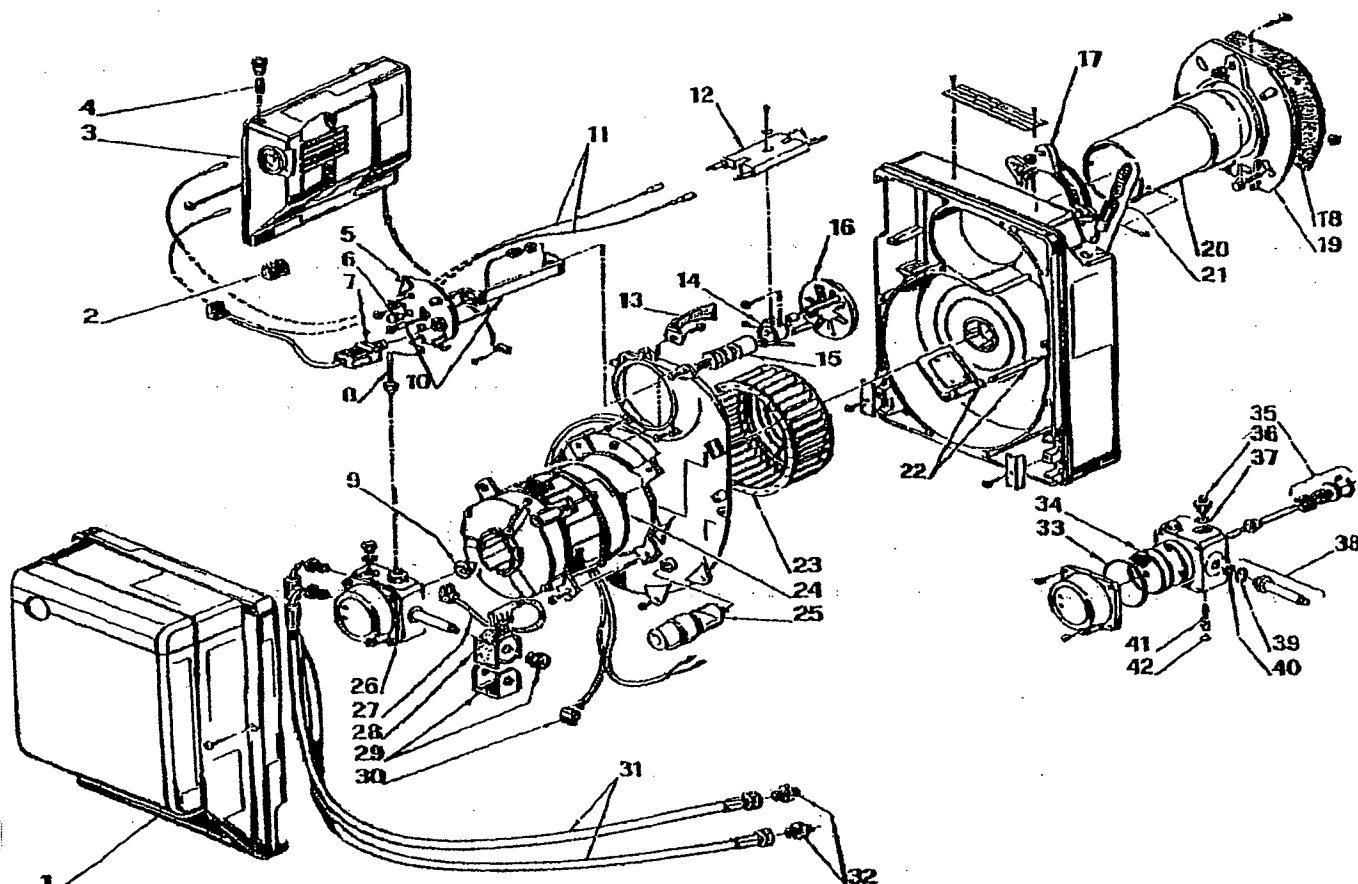
Appliance	Heating Power	Nozzle	Pump Pressure	Air Choke Setting	Burner Heat Setting
K120	103kW	2.50 Gph 60°B Delavan Part No. 1630252	11b	2.0 - 2.4	3.5

Circuit Diagram K120



- | | | | |
|----|---------------------------------------|----|---------------------------------|
| F1 | Control-circuit fuse | R1 | Immersion heater, oil preheater |
| F3 | Temperature controller | S1 | "Ventilate" switch |
| F4 | Temperature detector | S2 | "Heat" switch |
| F5 | Safety thermal relay | T2 | Autotransformer |
| K1 | power contactor | X1 | Terminal strip |
| M1 | Fan motor | X2 | 7-pol plug, hot-air generator |
| N1 | Room thermostat RT | X3 | 7-pole plug, burner |
| N2 | Thermostat, oil preheater | X4 | 4-pole plug connection for RT |
| N3 | Excess and insufficient voltage relay | X5 | 4-pole plug connection for RT |

K120



Item	Part No. K120	Description	Qty	Item	Part No. K120	Description	Qty.
1	-----	Burner hood	1	25	1630549	Pump	1
2	-----	Plug w/ bridge for preheater and thermostat	1	26	-----	Solenoid valve, coil cable	1
3	1420016	Control unit 550 SE	1	27	1400612	Solenoid valve coil	1
4	1440409	Fuse, 3.15 A	1	28	-----	Retaining clip w/screw for magnetic coil	1
5	-----	Blast connection flange	1	29	1450946	Plug motor	1
6	-----	Inspection plug	1	30	-----	Oil hose	1
7	1420124	Light-dependent resistor	1	31	-----	Nipple	1
8	1263007	Oil pipe, blast connection	1	32	1560212	Pump cover seal (O-ring)	1
9	1650517	Coupling	1	33	1630654	Pump filter R40	1
10	-----	Blast connection support	1	34	1560213	Seal insert - drive shaft, oil pump	1
11	1630336	Ignition cable, 1 STK	1	35	-----	Connecting nipple	1
12	1630340	Electrode block	1	36	-----	Seal	1
13	1630420	Baffle plate mount	1	37	-----	Solenoid valve body	1
14	1630421	Blast connection	1	38	-----	O-ring, solenoid valve	1
15	1630422	Baffle plate	1	39	1560214	O-ring	1
16	-----	Burner flange	1	40	-----	Pressure regulator screw	1
17	-----	Flange seal 20/2M	1	41	-----	O-ring	1
18	-----	Flange, boiler side 20/2M	1	42	1630252	Oil nozzle, 2.50 Gph 60° B, Delavan	1
19	-----	Flame tube	1	43	1630254	Oil nozzle, 3.00 Gph 60°B, Delavan	1
20	-----	Air regulator	1				
21	-----	Air choke and air choke bolt	1				
22	1651748	Fan wheel	1				
23	1400202	Motor	1				
24	1400325	Condenser 6.3 uF	1				

Spare Parts List K120

Item No.	Part No.	Description
1	1220135	Heat exchanger, complete
2	1262080	Drum filter, complete
3	1262405	Protective screen
4	1301180	Bottom of drum filter case
5	1380604	Seal for cleaning cover, collector 3
6	1380668	Seal for cleaning cover, collector 2
7	1380672	Seal for cleaning cover, collector 1
8	1400206	Alternate current motor, 0.75 kW
9	1400430	Autotransformer
10	1400505	Cartridge heater, model 503, D 24 x 200
11	1430015	Temperature controller 0-60°C
12	1430027	Bi-metal thermostat
13	1430030	Temperature detector 70-90°C
14	1430031	Safety thermal relay 100°C (permanent)
15	1430204	Excess and insufficient voltage relay, model C1US
16	1440014	Miniature contactor, model DIL EM-10
17	1440400	Control-circuit fuse, 6.3 A, 230V
18	1440408	Miniature appliance circuit-breaker
19	1450912	Attachment box for room thermostat connection, model C-146
20	1450916	Cap for room thermostat connection
21	1451002	Threaded terminal end/socket insert
22	1630252	Oil nozzle, 2.5 Gph 60° B, Delavan
23	1630638	Filter insert for drum filter
24	1630650	Filter insert for Afriso filter
25	1630655	Afriso oil filter
26	1650013	Wheel, dimensions: 400 x 70, 50mm hub
27	1651726	Axial running wheel K120
28	1660227	Cap for wheel (Starlock cap) diameter: 20mm
29	1660886	Rocker switch
30	1660887	Cap for rocker switch



MODEL F10 INSTALLATION MANUAL

RIELLO 40
SERIES
RESIDENTIAL
OIL BURNERS

FOR USA PRECAUTIONS

AIR FOR COMBUSTION

Do not install burner in room with insufficient air for combustion. Be sure there is an adequate air supply for combustion if the boiler/furnace room is enclosed. An opening of at least twice the area of the flue should be available, or one square foot of area for every gallon of firing rate. It is important to have one opening near the floor, and one near the ceiling. It may be necessary to create a window to permit a sufficient air to enter the boiler/furnace room. The installer must follow local ordinances in this regard. Should local ordinances be lacking, it is suggested that the installer follow NFPA manual # 31.

CHIMNEY

Be sure chimney is sufficient to handle the exhaust gases. It is recommended that only the burner be connected to the chimney. Be sure that it is clean and clear of obstructions.

OIL FILTER

An external oil filter is REQUIRED, even though there is an internal strainer in the pump. The filter should be replaced at least once a year, and the filter container should be thoroughly cleaned prior to installing a new filter cartridge.

DRAFT

Follow the instructions furnished with the heating appliance.
The pressure in the combustion area should be kept as close to zero as possible.
The burner will operate with a slight draft or pressure in the chamber.

ELECTRICAL CONNECTIONS

All electrical connections should be done in accordance with the National Electrical Code, and all local ordinances. In most localities, a number 14 wire should be used inside a metal conduit. The system should be grounded. A service switch should be placed close to the burner on a fireproof wall in an easily accessible location.

CONTROL BURNER OPERATION

Check out the burner and explain its operation to the homeowner. Be sure to leave the Owner's instruction sheet with the homeowner.

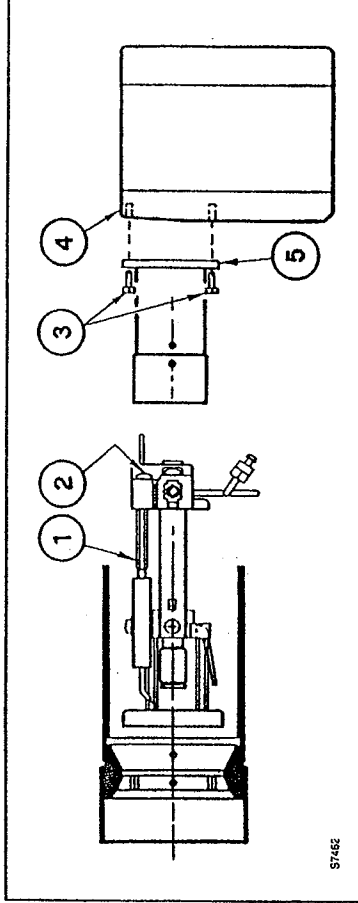
FIRE EXTINGUISHER

If required by local codes, install an approved fire extinguisher.

ASSEMBLY OF AIR TUBE TO BURNER CHASSIS

The air tube and drawer assembly are shipped in a carton separate from the burner chassis. Choose the proper air tube length to obtain the tube insertion for the specific installation.

- A) Remove the AIR TUBE and BURNER CHASSIS from their respective cartons.
- B) Remove the DRAWER ASSEMBLY (1) from inside the AIR TUBE by loosening the screw (2). Carefully pull the DRAWER ASSEMBLY out of the AIR TUBE, install the required nozzle (see page 7) and set aside.
- C) Remove the two BOLTS (3) from FRONT PLATE (4) of the BURNER CHASSIS. Align the two holes on the AIR TUBE HOLDING PLATE (5) with the two holes left open on the BURNER CHASSIS FRONT PLATE when the BOLTS (3) were removed. Replace the BOLTS and finger tighten only. Re-install DRAWER ASSEMBLY into AIR TUBE. Tighten SCREW (2) securely (see page 7).
- D) Tighten the two bolts (3) securely.



MOUNTING THE BURNER TO THE BOILER OR FURNACE

There are three possible methods to mount the burner, depending on the individual application. These are:

- 1) Universal flange bolted to Boiler/Furnace unit.
- 2) Semi-flange collar bolted to Boiler/Furnace unit.
- 3) Universal flange mounted to optional Pedestal mount, where flange-mounting direct to appliance is not possible. Pedestal kit must be ordered separately.

METHOD 1 - UNIVERSAL MOUNTING FLANGE

- A) Insert the two BOLTS (1) into the UNIVERSAL MOUNTING FLANGE (10) from the flat side, ensuring the bolt heads are flush with the flat surface. Secure in place using two special CHROME NUTS (2) provided.

BURNER SET-UP CHART

1	2		3		4	5
	ACTUAL FIRING RATE $\pm 5\%$	NOZZLE SIZE	PUMP PRESSURE		TURBULATOR SETTING	AIR DAMPER SETTING
	GPH	kg/h	GPH	PSI	BAR	
1.45	4.7		1.25 x 60°	145	10	2.7
1.80	5.8		1.50 x 60°	145	10	2.8
2.10	6.8		1.75 x 60°	145	10	3.1
2.40	7.8		2.00 x 60°	145	10	3.4
2.75	8.9		2.25 x 60°	150	10.4	4.2
2.95	9.5		2.50 x 60°	140	9.8	4.2

NOZZLES: Monarch R-PLP, Delavan W-B, Danfoss S-B, Steinen SS-S, Hago P.

NOTE: A 60° degree nozzle is suggested, however, a 80° degree nozzle may be used in cases where the flame is unstable at light-off when operated at low ambient temperatures.

COMBUSTION CHAMBER

Follow the instructions furnished by the boiler/furnace manufacturer. Size retrofit application according to the appropriate installation codes (eg. CSA B139 or NFPA #31).

NON-RETROFIT APPLICATIONS

If this burner is being installed in a packaged unit (ie. burner comes with a boiler or furnace), follow the installation and set-up instructions supplied with the heating unit, as settings will differ from those shown in this manual.

METHOD 2 - SEMI-FLANGE COLLAR

- Follow item C from METHOD 1.
- Align the air tube and attached adjustable collar so air tube is centered in the burner access hole of the boiler/furnace unit. Mark the center of the two holes in the ADJUSTABLE COLLAR on to the front plate of the heating unit. Then drill 1/4 inch (6.5 mm) holes through the front plate of the unit, using marks as a guide.
- Install two short BOLTS (1) through the front plate of the heating unit from the inside, and secure on the outside using the two special CHROME NUTS (2).
- Follow item D from METHOD 1.

METHOD 3 - PEDESTAL MOUNT

Secure the MOUNTING FLANGE to MOUNTING PEDESTAL using the hardware provided with the pedestal. Secure burner to MOUNTING FLANGE as in METHOD 1 items A, C and D.

NOTE: It is suggested that the pedestal be anchored in position on the floor by installing brackets over the pedestal tube and securing brackets to the floor.

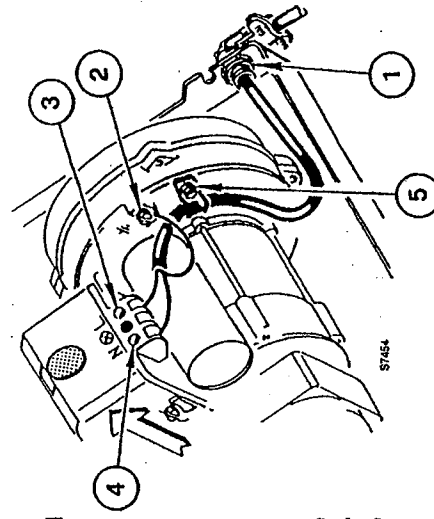
WARNING: WHEN THE COMBUSTION CHAMBER IS LINED WITH A REFRACTORY MATERIAL, IT IS IMPERATIVE THAT THE END CONE NOT PROTRUDE INTO THE CHAMBER AREA, AS EXCESSIVE HEAT AT BURNER SHUT-DOWN WILL DAMAGE THE END CONE.

ELECTRICAL CONNECTIONS

It is advisable to leave the control box off the sub-base while completing the electrical connections to the burner.

- Wire access hole
(Use BX electrical connector)
- Earth ground conductor terminal
(GREEN WIRE)
- Hot conductor terminal
(BLACK WIRE)
- Neutral conductor terminal
(WHITE WIRE)
- Strain relief clamp

WARNING: The hot (black) wire must be connected to the L terminal and the neutral (white) wire must be connected to the N terminal or the primary safety control will be damaged.



A) The burner is shipped with the pump set to operate on a two line system. Suction and return lines (7 & 11 in drawing on page 8) should be the same diameter and both should extend to the same depth inside the fuel tank. Be sure there are no air leaks or blockages in the piping system. Any obstructions in the return line will cause failure of the pump shaft seal. Do not exceed the pipe lengths indicated in the table.

B) Attach the two PIPE CONNECTORS (6) to the pump SUCTION and pump RETURN PORTS (7 and 11). Attach the required piping to these two pipe connectors using the NPT/METRIC ADAPTERS that are supplied with the burner.

WARNING: Pipe dope or Teflon tape are NOT to be used on any direct oil connection to the fuel pump.

WARNING: The height "P" in Pipe Length charts on page 9 should not exceed 13 feet (4 m).

WARNING: The vacuum should not exceed 11.44 inches of mercury.

IMPORTANT: An external, appropriately listed and certified oil filter must be placed in the fuel line between the fuel tank and the burner pump.

PUMP PURGE

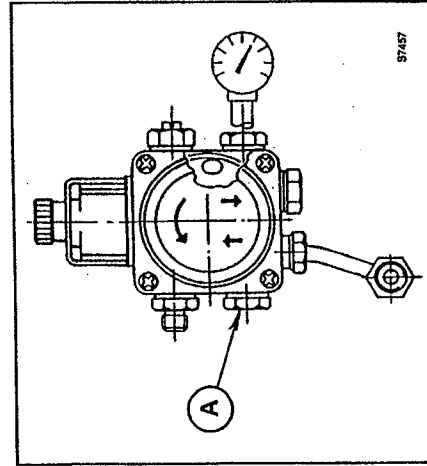
A) SINGLE LINE (GRAVITY SYSTEM)

Remove the plug in the VACUUM PORT (A) and wait for the fuel oil to flow out. The burner is now ready to operate.

B) TWO LINE (LIFT SYSTEM)

Turn off the main power source to the burner and remove the air tube cover. Shine a light source on the photo cell on the control box (now visible where the air tube cover was removed), re-turn power to the burner and activate the burner.

With the light source in place, the burner will operate in prepurge only. When the pump is sufficiently purged, the hydraulic air shutter will open. Once the burner is purged, turn off the power source and replace the air tube cover. Return power to the burner. The burner is now ready to operate.



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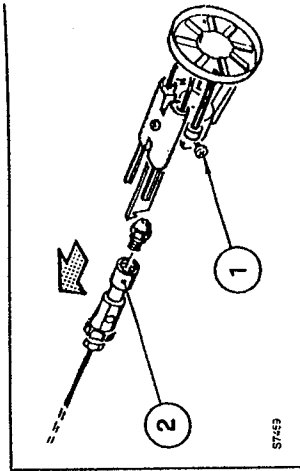
NOZZLE PLACEMENT

A) Determine the proper firing rate for the boiler or furnace unit, considering the specific application, then use the Burner Set-up chart on page 12 to select the proper nozzle and pump pressure to obtain the required input from the burner.

B) Remove the NOZZLE ADAPTER (2) from the DRAWER ASSEMBLY by loosening the SCREW (1).

C) Insert the proper NOZZLE into the NOZZLE ADAPTER and tighten securely (Do not overtighten).

D) Replace adapter, with nozzle installed, into drawer assembly and secure with screw (1).



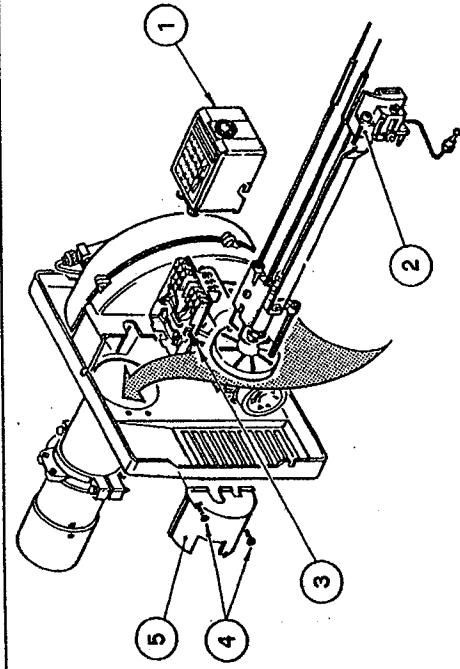
INSERTION/REMOVAL OF DRAWER ASSEMBLY

A) To remove drawer assembly, loosen SCREW (3), then unplug CONTROL BOX (4) by carefully pulling it back and then up.

B) Remove the AIR TUBE COVER PLATE (5) by loosening the two retaining SCREWS (4).

C) Loosen SCREW (2), then slide the complete drawer assembly out of the combustion head as shown.

D) To insert drawer assembly, reverse the procedure in items A to C above, then attach fuel line to the pump.



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ADDENDUM 40 F10 AND 40 F15 INSTALLATION MANUAL

NEW STYLE PUMP

The information in this sheet has been inserted in this manual to advise you that the RIELLO burner that you have selected has been equipped with a new design of fuel pump.

This pump comes equipped from the factory set for SINGLE LINE operation. No action is necessary on your part as the installer when fitting this burner to appliances set up with single fuel lines.

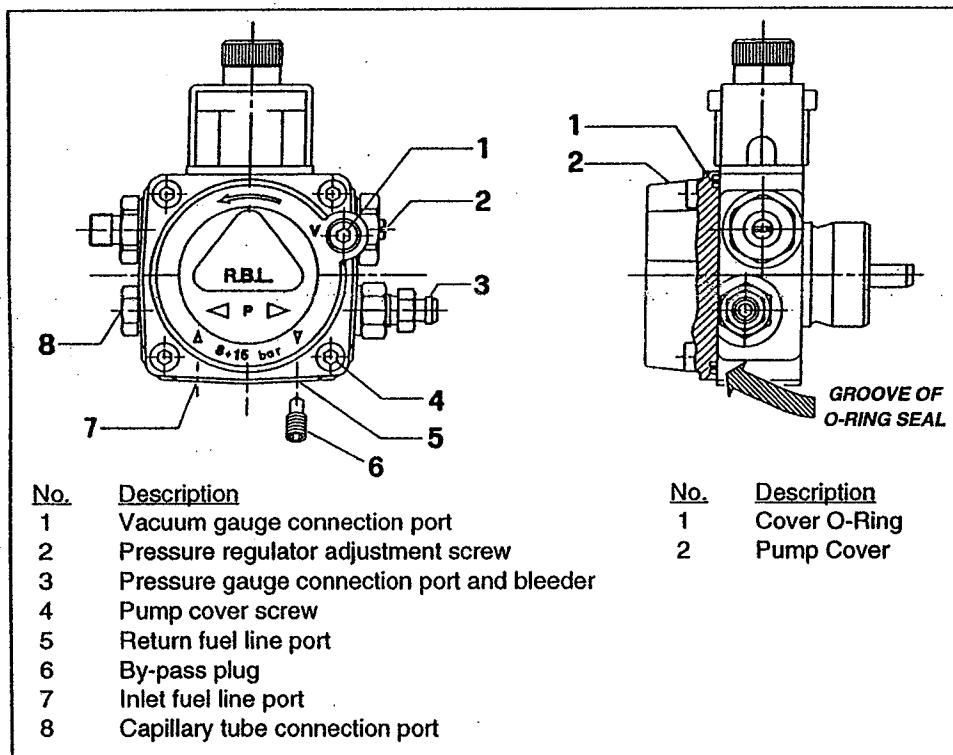
The drawing indicates the various features of this pump and their location on the pump. All other drawings found in the body of this manual are of the old style pump. Please refer only to this sheet for information specifically concerned with the new style pump.

If you require a TWO LINE setup, install the bypass plug as provided in the plastic bag. The bypass plug is installed in the return port of the pump as shown in the diagram below.

A 2.5 mm hexagonal key provided in the plastic bag with the bypass plug is to be used to install the plug. DO NOT use an inch size hexagonal key. Damage to the bypass plug may result.

To install the bypass plug:

1. remove the return plug (5) plug
2. install the bypass plug (6) using the 2.5 mm hexagonal key
3. install the return line pipe connector in the return port (5)



WARNING:

IF BYPASS PLUG IS INSTALLED, A TWO LINE SYSTEM MUST BE USED OR FAILURE OF THE FUEL PUMP SHAFT SEAL WILL OCCUR.

NOTE:

All pump part threads are British Parallel thread design. Direct connection of NPT threads to the pump will damage the pump. RIELLO manometers and vacuum gauges do not require any adapters, and can be safely connected directly to pump ports.

An NPT/Metric adapter must be used when connecting other gauge models.

Spare Parts are available as indicated below.

Note that these spare part numbers replace those found for the named parts in the spare parts listing on pages 14 and 15 of this manual.

burner model	part	spare part number
40 F10 and F15	single line pump	3007802
40 F10	capillary tube	3008055
40 F15	capillary tube	3007816
40 F10 and 40 F15	pump valve stem	3006925

Further Installation Notes:

Oil line connections and purging of the new pump will be performed in the same way as instructed in this manual for the old pumps.

The vacuum port (1) is now located on the pump cover as shown in the diagram above.

Notice to All RIELLO Customers

RIELLO has introduced a new oil pump for the 40 Series Oil Burners. The burner you purchase starting in late 1996 will be equipped with this oil pump.

The improvements recognizable to the purchaser are:

- the standard setup as SINGLE OIL LINE and
- location of the vacuum port.

A bypass plug (supplied) must be installed to make this pump function as a TWO OIL system.

The identifying feature for the new pump is the vacuum port as shown on the drawing below.

