HANSA

INSTALLATION OPERATING INSTRUCTIONS

HVS-5.0
HVS-5. 1
HVS-5.2

Power range from
0.3 1 - 3.43 GPH

CONTENTS

CHAPTER 1 INTRODUCTION

Dear Homeowner,

Congratulations on your purchase of the HANSA HVS oil burner. Properly installed it will provide many years of efficient and trouble free operation. Please read this Instruction Manual carefully, and give special attention to the following points:

NEVER attempt to use gasoline in your heating appliance. Gasoline is more combustible than fuel oil and could result in a serious explosion.

NEVER burn garbage or refuse in your heating appliance or try to light oil by tossing burning material into the appliance.

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DO NOT store combustible materials on or around the heating appliance. NEVER attempt to use crankcase or waste oil in your heating appliance. Serious damage may result to the burner.

Installation and adjustment of the burner requires technical knowledge and the use of combustion test instruments. Do not tamper with the unit or controls. Call your serviceman.

ALWAYS keep the fuel valve shut off if the burner is shut down for an extended period of time.

TO THE INSTALLER

.Installation of the burner must be done by a qualified installer in accordance with regulations of the National Fire Protection Standard for Oil-Burning Equipment, NFPA No. 31, and in complete accordance with all local codes and authorities having jurisdiction. For recommended installation practice in Canada, reference should be made to CSA standard CAN/CSA B 139-M91. A qualified installer is an individual or agency who is responsible for the installation and adjustment of the equipment and who is properly licensed and experienced to install oil-burning equipment in accordance with all codes and ordinances.

CHAPTER 2 TECHNICAL DATA

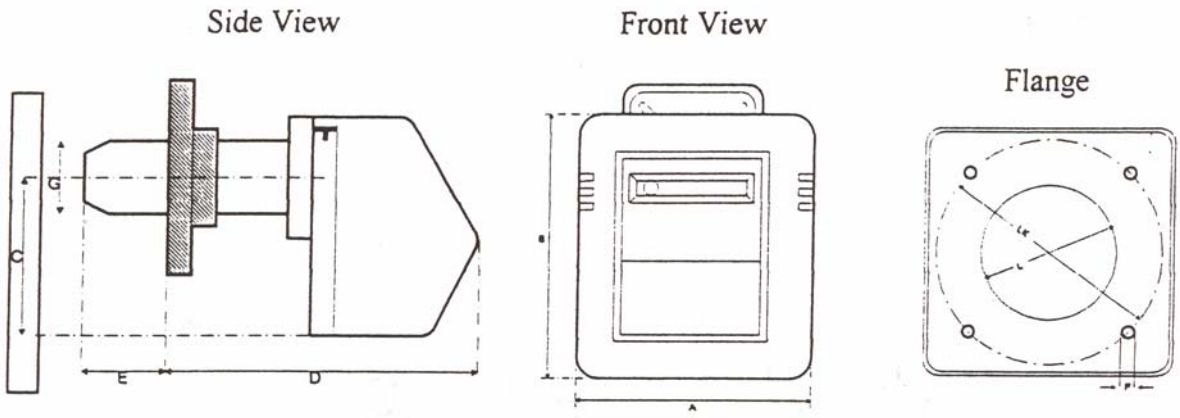


Figure 1: Oil burner mounting flange dimensions

HVS	A	B	C	D	E	F	G	L	LK
mm	240	270	216	280	60-130	8	80	85	140-165
In.	9 ½	10 5/8	8 ½	11	2 3/8 - 5 1/8	7/16	3 1/8	3 3/8	5 ½ - 6 ½

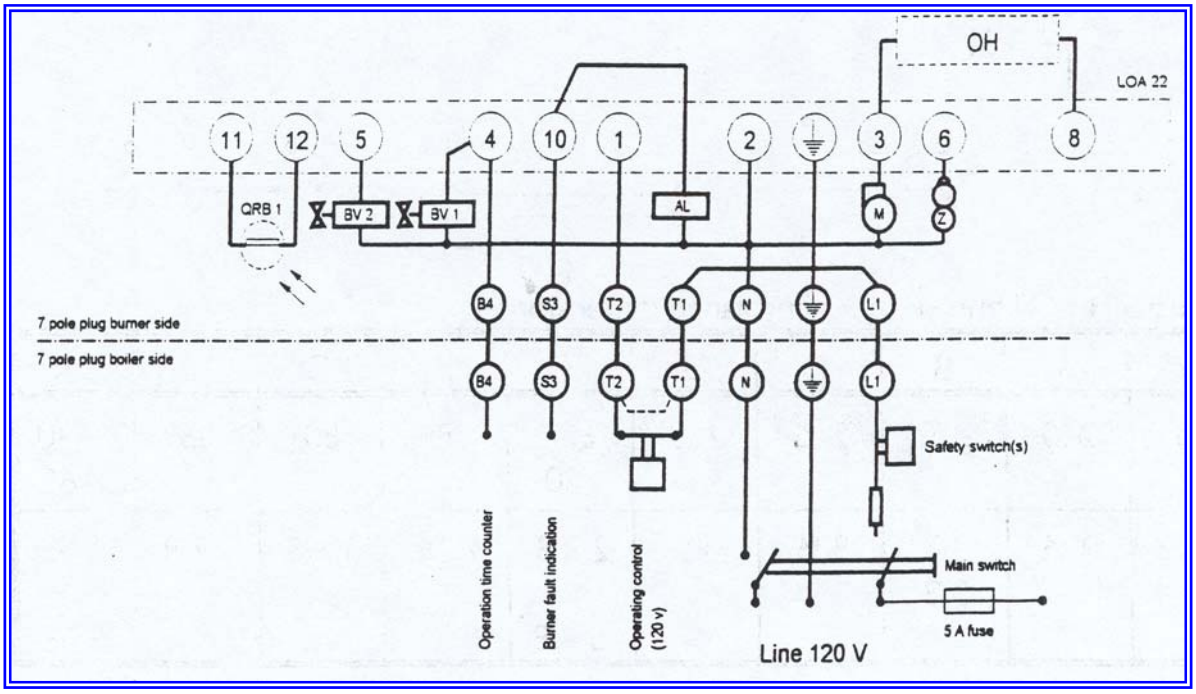
Specifications

Fuel: No.2 Fuel Oil
Firing Range: OJ I to 3.43 GPH
Voltage: 120V 60Hz (+ 10%-15%)
Power: I 50 watts
Primary Control: Landis & Gyr LOA 24.171 B 17; II OV; 60Hz
Ignition Transformer: Frda-Trevesco; Compact IIOV; 60Hz; 2.4A; Sec.2x5kV; 20mA
Motor: Hanning, OE6 W2B I, 120V; 60Hz; I .6A; 90W; 3400 RPM, with capacitor 12uF; Class /30B insulation system
Pump: Suntec; AS 47 7538. The pump is equipped with an integral automatic valve, rated at I 10V; 60Hz
Solenoid Valve: Suntec; 3713797, 120V, 60Hz, 5W, IP54
Fan Wheel: 120x40; 8mm shaft drill; Direct drive
Oil Preheater: Danfoss, L +C ROA 21; Viscostat V 81

WIRING DIAGRAM

All electrical components of the burner are factory prewired. The 7 pole plug connects the factory prewired burner with the burner wiring.

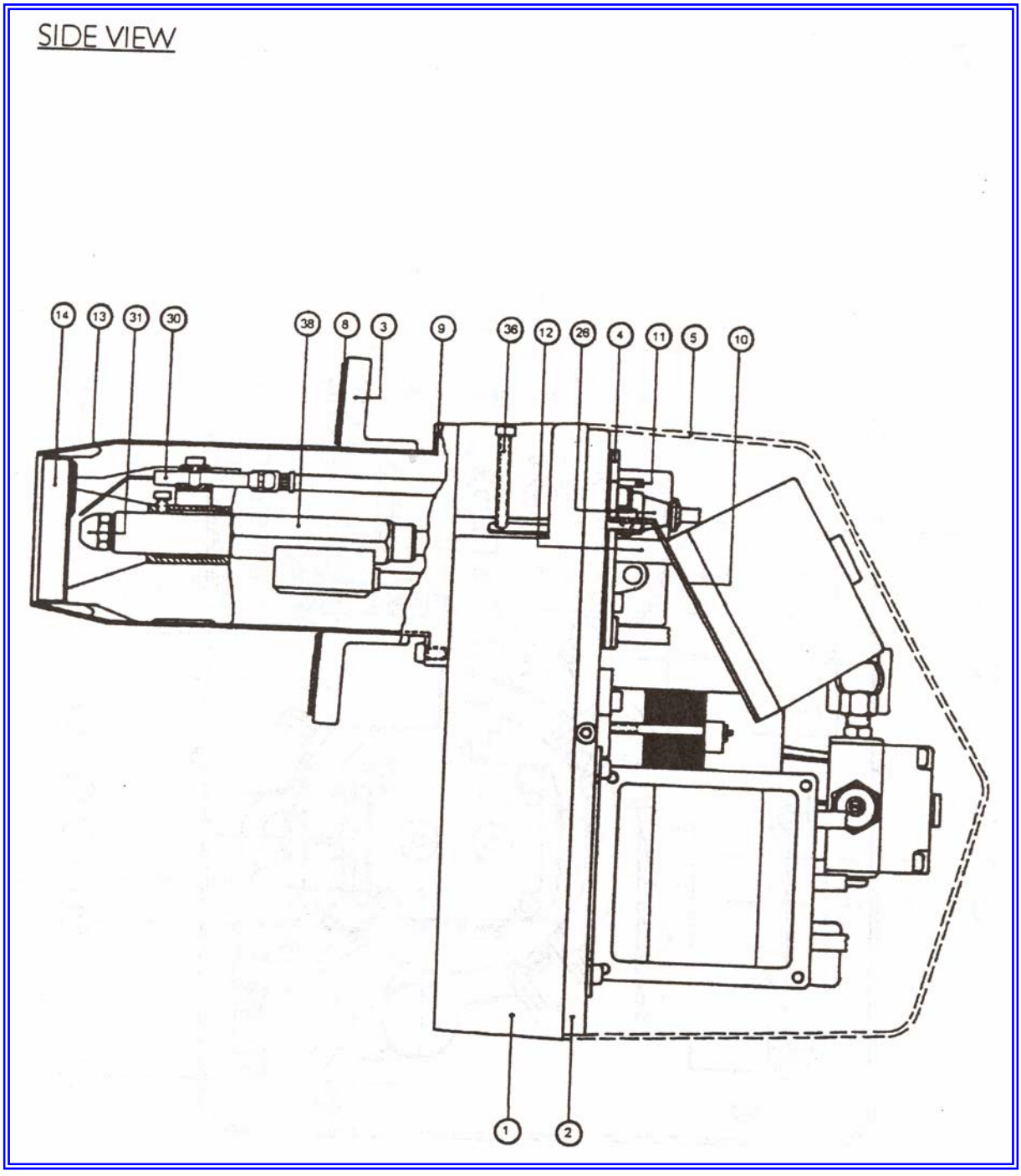
Figure 2



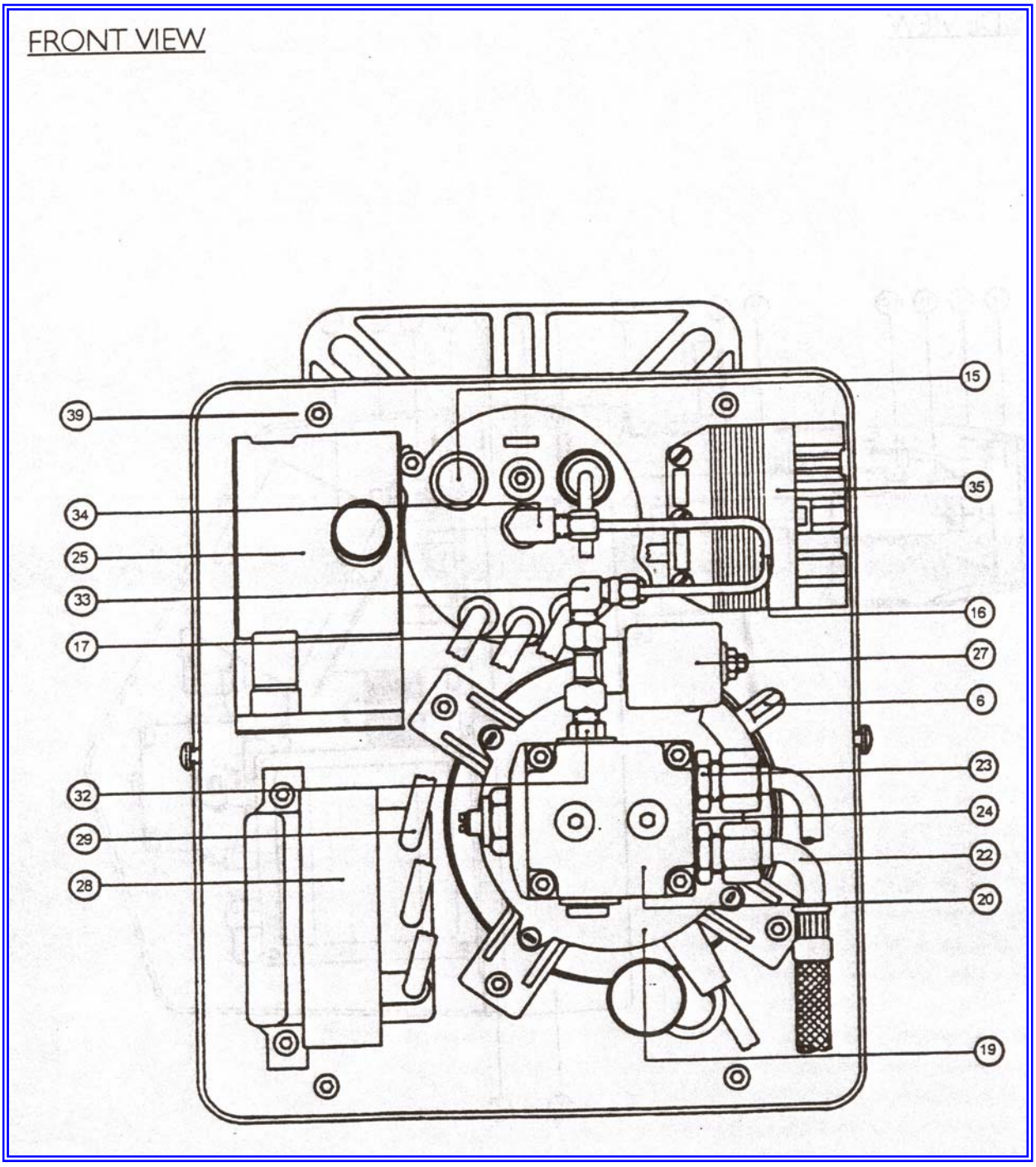
OH	Oil preheater	L1	Phase 120V
M	Burner motor	⏚	Ground
Z	Ignition transformer	N	Neutral
BV 1	Magnetic valve 1	T1	Operating control
BV 2	Magnetic valve 2	T2	Operating control
AL	Alarm unit	S3	Burner fault indicator
QRB	Photo resistance	B4	Operation time counter

Note: All electrical connections should be done in accordance with C 22.1 Canadian Electrical code and all local codes. This system should be grounded.

COMPONENT IDENTIFICATION



COMPONENT IDENTIFICATION



BURNER COMPONENTS

1	1	Burner Housing
2	1	Base Plate
3	1	Burner mounting flange
4	1	Electrode holder flange
5	1	Burner cover
6	1	Main air gate
7	1	Plastic air shutter
8	1	Flange gasket
9	1	Burner tube gasket
10	1	Control mounting plate
11	1	Adjustment Plate
12	1	Nuzzle pipe R 1/8
13	1	Burner tube
14	1	Turbolator
15	1	Blue sight glass
16	1	Pressure pipe
17	3	Cable protector
18	1	Blower wheel 120 degrees x 40 x 8
19	1	Motor with capacitor
20	1	Oil pump
21	1	Pump coupling
22	2	Oil hose
23	2	Oil hose adaptor
24	2	Gaskets
25	1	Primary control
26	1	Photo cell
27	1	Solenoid valve R 1/8
28	1	Transformer
29	2	Ignition cable
30	1	Double ignition electrode
31	1	Nozzle
32	1	Double nip R 1/8

BURNER COMPONENTS

33	1	FA - compression fitting R 1/8 x 4
34	1	MA - compression fitting R 1/8 x 4
35	1	Electric connection plug
36	1	Air adjustment bolt M5
37	1	Screwing nuts M5
38	1	Oil preheater

CHAPTER 3 INSTALLATION INSTRUCTIONS

Our burners are high quality products, when mounted, adjusted, and maintained by a specialist we provide that our burners work safe, reliable and economically for years.

Before mounting please consider the following points:

.Check that the flue is connected tight, if a leak is found seal before continuing.
If an older burner is being replaced the boiler must be cleaned before the new burner is installed.
Check the fuel filter and replace if necessary.

Initial Set Up

Step I
Remove the burner from the protective packaging. Check to see that you have the following items:

- ☑ 4mm Allen key
- ☑ Flex hose for oil supply line (red)
- ☑ Flex hose for oil return line (blue)
- ☑ Mounting flange
- ☑ Mounting flange gasket
- ☑ 7 pole electrical plug
- ☑ 4 bolts with washers (M8 x 4Omm) packaged underneath the electrical plug Hansa burner with cover

Step 2

Use the flange gasket to check alignment of predrilled holes to mount the flange. If no match can be found or the boiler does not have predrilled holes proceed with step 3. If predrilled holes do align skip to step 4.

Step 3.

Centre the flange gasket over the opening for the burner tube in the boiler. Use the gasket as a template to accurately mark the location for the bolt holes. Drill four 8mm holes and tap using a metric M8 thread. If metric drill or tap are not available an imperial equivalent can be used. (approximately 5/16 bolts will have to be field supplied)

Step 4

Place the gasket and the mounting flange on the boiler door aligning the holes with the slots on the flange. Four (4) M8 bolts have been provided to mount the burner flange. If holes in the boiler have a different thread, use appropriate bolt approximately I 1/2 inches in length. Important: When mounting the flange check that the mark "OBEN" is on the top side. The flange is inclined towards the combustion chamber to avoid oil running back into the burner.

Step 5

To mount the burner insert the burner tube into the flange. The burner head should be I /4" back from the inside wall of the combustion chamber. Unless boiler manufacturer specifies differently. Once adjusted tighten the bolt in the retaining collar.

Step 6

If your boiler is equipped with a prewired 7 pole electrical plug, you will not need the supplied 7 pole plug. The two plugs should then be fitted together, one from the boiler and one from the burner. Proceed to step 7.

If your boiler did not come. equipped with a 7 pole electrical plug you will need to wire the provided 7 pole plug according to the wiring diagram on page 4. After completing the wiring the two plugs should be frtted together. NOTE: Do not remove the prewired plug from the burner.

Step 7

If the burner has been factory preadjusted you are now ready to fire the burner. Minor adjustments may be necessary for safe operation of the burner. Use the appropriate instruments to verify the CO2 and smoke readings. For further settings see Chapter 4 Burner setup and adjustments, section primary/secondary air adjustments. Otherwise proceed with burner adjustment and setup.

CHAPTER 4

BURNER SETUP AND ADUSTMENTS

For proper operation of the burner, the following has to be set up appropriately.

- The oil nozzle
- The combustion head adjustment
- The primary air
- The secondary air
- The oil pressure
- The burner insertion

In this manual Hansa has included make and model specific set up information for boilers which have been tested in combination with the Hansa burner. For boilers that have not been specifically tested with the Hansa burner we provide generic set up information based on boiler size (These values are only recommendations and may vary depending on the boiler used). This information can be found in appendix A.

To facilitate the servicing of the burner, Hansa provides two service positions

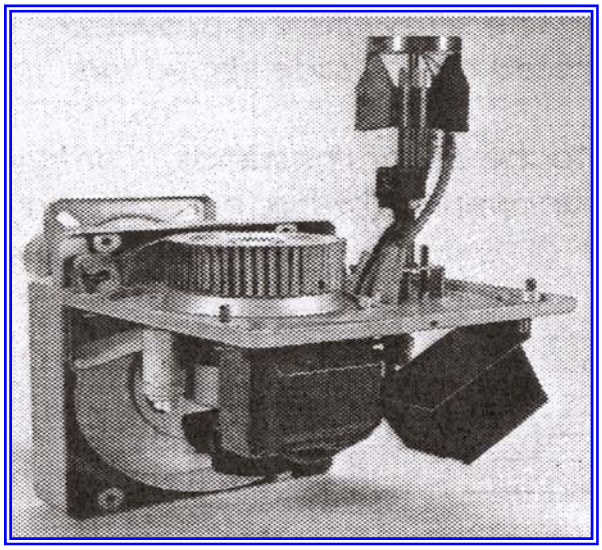


Figure 4.1 Horizontal service position

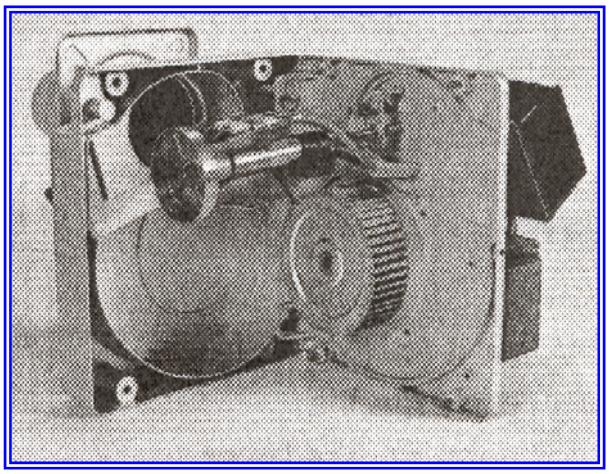


Figure 4.2 Vertical service position

To mount the burner in service position:

Loosen the screws located one on each side of the burner body to remove the cover. Open the four patent lock screws, located one on each of the four corners of the burner. Pull base plate complete with burner assembly straight out from the burner housing. Hang the pase plate in the desired service position using the holding brackets at the right side of the base plate and the screws near the top of the housing. For the vertical service position only one bracket is used. The screw might have to be backed out a bit. Do not forget to turn the screw back in when the service is finished.

To change the oil nozzle:

Mount burner in horizontal service position. Remove the two ignition cables from the ignition electrode. Loosen the turbolator retaining screw and pull the turbolator assembly off. Remove the protective plug or nozzle from the nozzle adaptor. Insert the new nozzle into the nozzle adaptor and tighten securely (for nozzle sizes see table 1.I and 1.2). Remount the turbolator assembly to the oil preheater (ignore the slots on the sides of the oil preheater). I M PORT ANT: The turbolator must be pushed all the way down until it sits flush on the base of the oil preheater.

The combustion head adjustment:

Adjustments to the combustion head are made at the screw immediately above where the oil line passes through the base plate (top center). The screw fits the provided 4mm allen key. The combustion head position is indicated on-the slide above the adjustment screw.

The combustion head adjustment is generally related to the boiler resistance. For high boiler resistances the combustion head is pulled back or opened (higher numbers on the indicator). At low resistances the head is pushed in or dosed (lower numbers on the indicator). For the HVS-5.2 the open/dose is reversed, at high boiler resistances the combustion head is pushed in or opened.

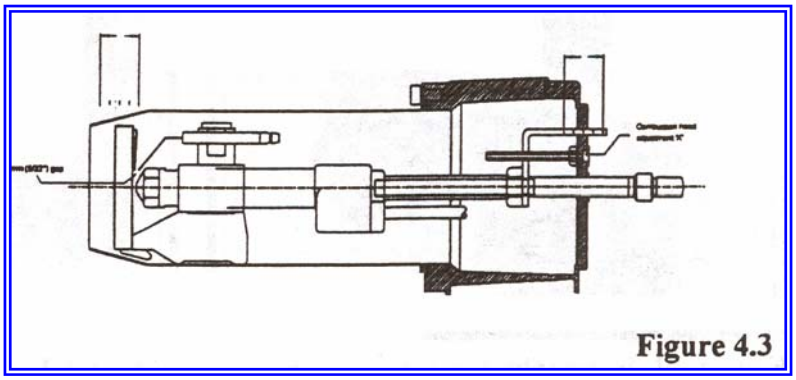


Figure 4.3

Primary /Secondary air adjustment:

The Hansa burner provides a coarse (primary) and fine (secondary) air adjustment.

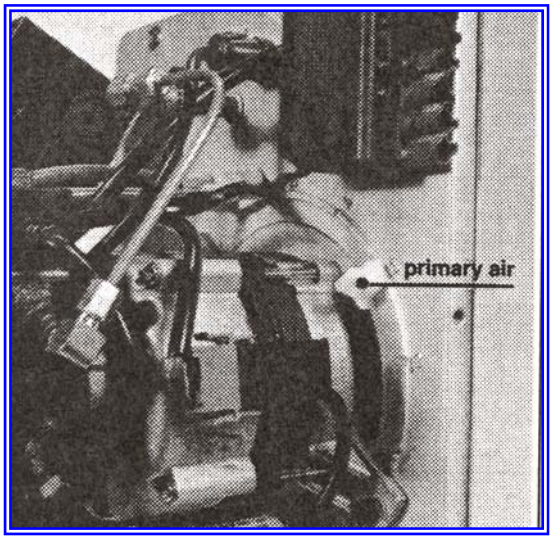


Figure 4.4 Primary air adjustment

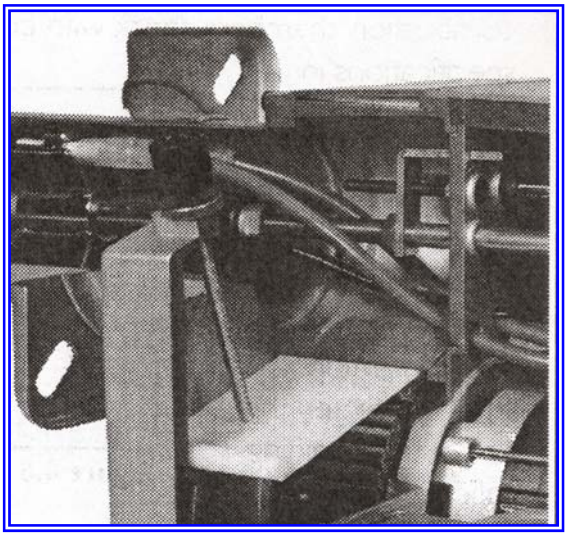


Figure 4.5 Secondary air adjustment

For consistent results, start with the secondary air adjustment about half way open and use it as fine adjustment only.

Tuning the burner *(all values are for #2 fuel oil only):*

For best efficiency CO_2 should be maximized. Although capable of more efficient operation, Hansa recommends an operating range of 12.5 to 14.0% CO_2 Use the combustion head adjustment to achieve the desired % CO2 level. Then use the air adjustment to obtain a zero smoke reading. Always make sure that you stop when you reach zero smoke, too much air can cause incomplete combustion.

Oil pressure adjustments:

The oil pressure is adjusted with the screw on the left side of the oil pump. The oil pump has two pressure ports. One marked '**P**' for pressure, the other marked '**V**' for vacuum. The vacuum pressure is a function of the oil connection to the tank, not the pressure adjustment of the oil pump.

Burner insertion:

On standard boilers with short combustion chambers the burner head should be flush or 1/411 back from the inside wall of the combustion chamber. For boilers with long combustion chambers check with boiler manufactures directions or for boiler specific specifications in the appendix of this manual. For non standard boilers the insertion dimension 'A' will ,be quoted, or 'Flush' for standard boiler insertion. Once adjusted tighten the bolt in the retaining collar.

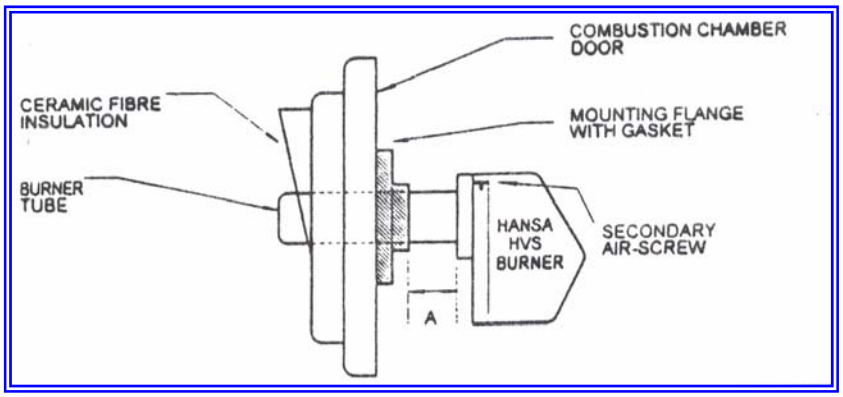
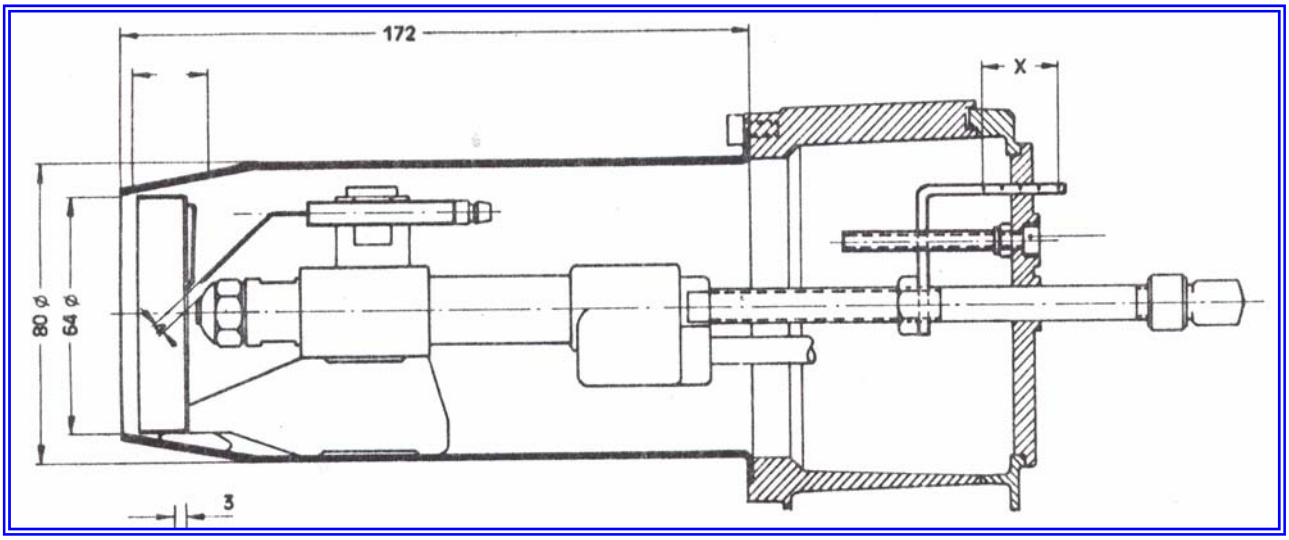
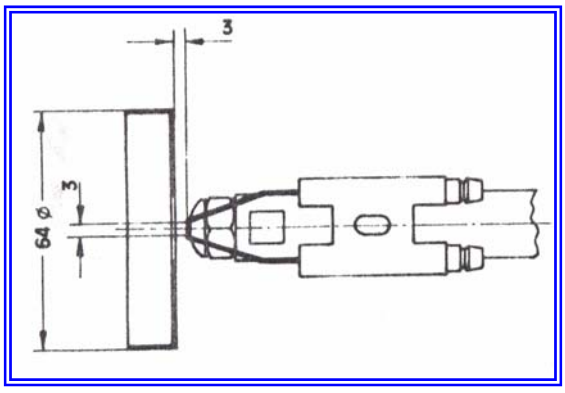


Figure 4.6 Insertion dimension "A"





CHAPTER 5
OIL LINE CONNECTION

SINGLE LINE (GRAVITY FEED)

PREFERRED METHOD

STEP I

Convert the pump for operation on a single line system by removing the by-pass plug.

To remove the by-pass plug:

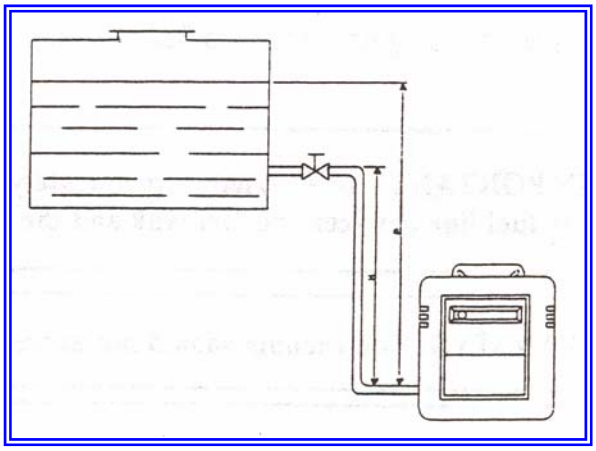
Step 1 Remove the pump cover by removing the four cover screws .

Step 2 - Remove the pump strainer, unscrew and remove the bypass plug.

Replace the strainer and pump cover. Tighten the four screws securely.

NOTE: Be sure the o-ring is properly seated in the pump housing before tightening the pump cover screws.

Step 2 Connect the flex hose to the suction port of the pump. Be sure that the plug in the return port is tightened securely.



SINGLE LINE SYSTEM-PIPE LENGTHS

H		3/8" OD		½" OD	
FT	M	FT	M	FT	M
1.5	0.5	33	10	65	20
3.0	1.0	65	20	130	40
5.0	1.5	130	40	260	80
605	2.0	195	60	325	100

Figure 5.1 **NOTE:** Do not exceed pipe Lengths indicated in chart.

ALTERNATE METHOD

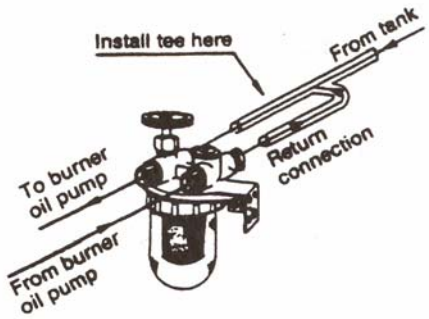
STEP 1

Convert the pump for operation on a single line system by installing a tee (which can be purchased from the manufacturer).

To install the tee in the pipe line:

STEP 1 - Follow as directed by Figure 5.2

Figure 5.2



TWO LINE (LIFT SYSTEM)

STEP 1

The burner is shipped with the pump set to operate on a two line system. Suction and return lines 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 to the pump shaft seal. Do not exceed the pipe lengths indicated in the tables on the previous page.

STEP 2

Attach the two flex hoses to the pump suction and pump return ports. Attach the required piping to these two flex hoses.

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

WARNING: The vacuum should not exceed 5.6 PSI

WARNING: The height 'P' in pipe length charts should not exceed 13 feet (4m).

WARNING: White teflon tape should not be used on any direct oil connection to the fuel pump. Instead yellow teflon tape may be used.

CHAPTER 6
PRECAUTIONS

PRECAUTIONS FOR CANADA

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 room is enclosed. It may be necessary to create a window to permit sufficient air to enter the boiler room. The installer must follow local ordinances in this regard. Should local ordinances be lacking, it is suggested that the installer follow CSA standard B I 39.

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

All 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 Canadian Electrical Code Part I, and all local codes. The system should be grounded.

BURNER OPERATION

Check out the burner after installation and explain its operation to the homeowner. Be sure to leave this manual in the mechanical room or with the home owner.

FIRE EXTINGUISHER

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

PRECAUTIONS FOR USA

AIR FOR COMBUSTION

Do not install the 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 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 the 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.

BURNER OPERATION

Check out the burner after installation and explain its operation to the homeowner. Be sure to leave this manual in the mechanical room or with the home owner.

FIRE EXTINGUISHER

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

APPENDIX

Table

RECOMMENDED HANSA BURNER SETUP

Table 1.1

Boiler size in 1000 Btu/h or (kW)	Burner model	Nozzle	Oil Pressure	Combustion head adjustment	Primary air
49- 84 (14-25)	HVS-5.0	0.35 - 0.50	102 - 145 psi 7 - 10 bar	1	1 - 2
75-132 (22-34)	HVS-5.0	0.50 - 0.75	116 - 160 psi 8 - 11bar	2	2 - 3
120-185 (35-54)	HVS-5.0	0.75 - 1.00	130 - 175 psi 9 - 12 bar	3	2 - 3
175-220 (51-64)	HVS-5.0	1.00 - 1.25	130 - 190 psi 9 - 13 bar	4 - 5	3 - 5
210-250 (62-73)	HVS-5.1	1.25	145 - 200 psi 10 - 14 bar	3 - 4	3 - 4
240-290 (70-85)	HVS-5.1	1.25 - 1.50	145 - 220 psi 10 - 15 bar	4 - 5	4 - 5
280-320 (82-94)	HVS-5.2	1.50 - 1.65	145 - 220 psi 10 - 14 bar	2 - 4	N/A

To determine nozzle size for a given boiler input and a chosen pump pressure:

$$\frac{Boiler\ Btu/h}{140{,}000\ Btu/h} \times \sqrt{\frac{100\ PSI}{desired\ PSI}} = Nozzle\ size\ in\ GPM$$

To determine the actual pump pressure for a given Nozzle size and Boiler input:

$$\left(\frac{Boiler\ Btu/h}{140{,}000\ Btu/h} \div Nozzle\ size \right)^2 \times 100\,PSI = pump\ pressure\ in\ PSI$$

RECOMMENDED HANSA BURNER SETUP
for Vitola SEA series boiler

Table 1.1

Boiler	Burner model	Nozzle	Oil Pressure	Combustion head * adjustment	Primary air *	Insertion (Dim 'A')
BEA-18	HVS 5.0	0.50x45°	9.7 bar 141 psi	1.5	2	25 mm 1 inch
BEA-22	HVS 5.0	0.65x45°	9.5 bar 138 psi	2.5	2.5	25 mm 1 inch
BEA-29	HVS 5.0	0.75x45°	11.4 bar 165 psi	2.5	2.5	25 mm 1 inch
BEA-35	HVS 5.0	1.00x45°	10.2 bar 147 psi	3	2.5	25 mm 1 inch
BEA-46	HVS-5.1	1.25x45°	10.8 bar 157 psi	3	3	25 mm 1 inch
BEA-58	HVS 5.2	1.65x45°	11.6 bar 168 psi	4.5 ÷ 6.0	5	25 mm 1 inch

* Low altitude
High altitude other diffuser

Aspen Gas & Oil Services Ltd.
2903 Edgewood Dr.
Cranbrook, BC V1C 6C9

Hansa Burner Part Numbers

Description				Part Number
4 slot turbolator		64/17		1013
12 slot turbolator		64/19		1061
Ignition cable w/ plug				1014
Plastic air shutter				1018
Alum air shutter				1018(A)
AEG plastic coupling			6.25	1022
AEG plastic coupling			7.25	1048
Blower wheel 120x40				1023
Flange Gasket				1026
Burner cover				1053
Nozzle holder				1060
Ignition Transformer				3514
Ignition electrode				4159
Ignition cable				725910
Ignition coupling electrode				726700
Ignition coupling transformer				726800
nozzle holder w/o oil preheater				1152
Landis & Gyr photo cell				3005
Landis & Gyr Primary control				3025
Primary control sub base				3050
Danfoss oil preheater w nozzle pipe				3624
Hanning Comb Fan motor				3408
Suntec Oil Pump 35 C 9528		up to 261psi		3954
Suntec Oil Pump Filtersiebe (screen)				674000
Oil Hose 1000 mm				4077
Oil Hose 3/8x1000mm c/w 90 deg end				603600
Hose connector 3/8 nptxflare				606600
Oil filter 2 strang				618000
Oil filter 1 strang				616000
Oil filter cart		oventrop		620000
Oil filter cart		Afriso		620100
Oil filter cup		oventrop		622000
Oil filter cup		Afriso		622100
O - ring		oventrop		622500
O-ring		Afriso		622700
Nozzle	.5x.45			656810
Nozzle	.65x45			656830-1
Nozzle	.75x45			656830-2
Nozzle	1.00x45			656830-3
Nozzle	1.25x45			656830-4
Nozzle	1.65x45			656830-5
Pump Gasket				667200
Baro Damper		5-6 inch		666800
Baro Damper		6-7 inch		666900
Baro Damper		7-8 inch		667400