Refleks

... a
world known name
in Oil Stoves
for Ships´ use

DIRECTIONS

CONTENTS

SECTION 1	CHOOSING AN OILSTOVE	SECTION 9	THE CENTRAL HEATION UNIT
SECTION 2	OILSTOVE TYPE F	SECTION 10	THE CONTROL REGULATOR
SECTION 3	OILSTOVE TYPE C	SECTION 11	THE CLEANING PIN
	FITTING INSTRUCTION	SECTION 12	LIGHTING THE STOVE
SECTION 4	THE OILSTOVE	SECTION 13	MAINTAINANCE
SECTION 5	THE FLUE PIPE UNDER THE DECK	SECTION 14	FITTING OF SPARE PARTS
SECTION 6	THE THROUGH DECK FLANGE	SECTION 15	MONTHLY MAINTAINANCE
SECTION 7	THE FLUE PIPE OVER THE DECK	SECTION 16	GUARANTEE
SECTION 8	THE FUEL OIL TANK AND FUEL PIPE CONNECTION		

1. CHOOSING THE APPROPRIATE OILSTOVE

Please see table next page.

Contribution/comparison 1,0 KW - 858 Kcal/h.

M = Model
K = Cooking plate
S = Heating coil connections for central heating unit
F = Air intake
V = Stainless steel boiler for connecting to central heating unit
W = Fitted with bulkhead fittings and built in regulator
C = Air intake duct

1 Kcal = 3,97 BTU
1 BTU = 0,25 Kcal

The heating capacity of an oil stove is calculated with an outside temperature of -20 degrees centigrade.

The heat required for a particular ship is calculated on the basis of the following:
An non insulated ship requires: 100 kcal./116 KW per m3.
An insulated ship requires : 60 kcal./ 70 KW per m3.

All oil stoves with the letters MF as part of the model number (e.g. 66MF), have a right angled (90 degrees) duct for fitting to the air intake, included in the price.

Model 66MF is also fitted with bulkhead fittings.
Models 2000K, 2000KV, 66MK, 71M, 71MS and 70M are made only with cast iron cooking plates.

The following stove types can be delivered with cast iron cooking plates if specially ordered: 62M, 62MS, 64M, 60M, 61MS and 67MS.

All stoves with cast iron cooking plates are fitted with a fiddle rail.

Type	66M	66MKS	66MW	66MK	66MV	62M	62MS	64M	60M	61MS	67MS	67MV	71M	71MS	70M	REFO	2000K	2000KV
Cap., kcal.air heating	1400	700	1400	1400		2100	700	5000	5000	1600	2000		1400	1000	1400	6000	3620	1293
Cap., kcal. radiator heating		700			1400		1400			3400	4200	7000		400				2327
Height, mm	420	450	370	450	550	440	440	630	620	715	900	760	250	250	345	810	590	590
Diameter, mm	165	165		165	240	260	260	320	320	320	365						260	260
Width, mm			170									400	250	250	325	390		
Depth, mm			280									400	250	250	495	320		
Ventilation, mm	70	70	70	70	70	90	90	90	90	90	114	114	70	70	70	120	90	90
Ventilation from floor, mm	420	345	370	345	490	345	345	525	420	525	760	715	205	205	345	710	425	425
Fresh air intake	70	70	70	70	70	90	90	90	90	90	114	114	70	70			90	90
Weight in kgs	4	7	6	4,5	8	7	8	10	10	14	18	30	8,5	9	18	48	10	11,5
Consumption, min. litre/hour	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,18	0,18	0,18	0,3	0,3	0,12	0,12	0,12	0,20	0,18	0,18
Consumption, max. litre/hour	0,3	0,3	0,3	0,3	0,36	0,36	0,36	0,8	0,8	0,8	1,0	1,5	0,3	0,3	0,36	0,90	0,54	0,54
Heat max.m3 without insulating	14	14	14	14	14	21	21	50	50	50	62	70	14	14	14	60	40	40
Heat max.m3 with insulating	23	23	23	23	23	35	35	83	83	83	103	117	23	23	23	100	70	70

2. TYPE F

Should the stove be mounted in an airtight room with poor ventilation, or in a wheelhouse that is airtight, the stove type F must be chosen, with an air intake connection to the fresh air. The air intake duct in the bottom of the stove is carried through deck or bulkhead to the free air with ducting of the same diameter.

Where the air intake is carried through the deck, it should be fitted with the special air intake top. (The top designed for the flue (exhaust) duct must not be used for the air intake, as it can create induction problems in the air flow through the stove.)

In a tightly closed wheelhouse the stove risks being extinguished when the wheelhouse door is opened, because of the negative air pressure created inside.

Oil stoves mounted in the engine room should always have their own outside air supply, because the motor takes air from the stove.

In Denmark the Ministry and Shipping has made an outside air supply obligatory for stoves mounted in the engine room.

The following stove types can only be obtained with a fresh air duct in the bottom:
66MF, 66MW, 66MV, 67MV, 71M and 71 MS.

The remainder of the stoves in our range can be ordered with this facility by giving them the F designation on ordering.

3. TYPE C

This type of stove is designed for mounting in caravans and has an extra long air intake duct in the bottom (80 mm approx. 3” in length for all stove models of type C so) that the stove can obtain its air for combustion from underneath the caravan.

All problems with draught are avoided, as it takes approx. 10 m3 of air to burn 1 litre of oil.

INSTRUCTIONS FOR INSTALLATION

4. OILSTOVES

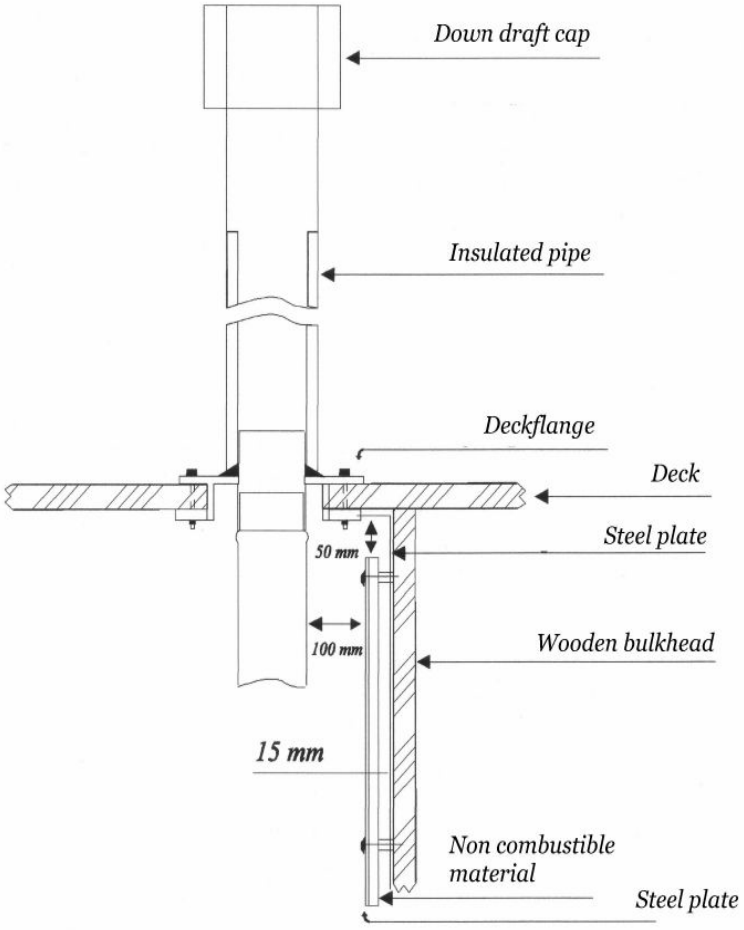
The stove should be mounted in a drip tray at least 50 mm (2”) deep.

The stove should be vertical with the long axis of the regulator seen from above parallel with the ships bow to stern axis. However in the event of a ship with a very powerful motor the stove should be turned so that the regulator is on the forward side of the stove.

The above precautions are because the stoves are gravity fed with fuel, and if the burner receives insufficient oil, the stove is extinguished. The stove will not burn e.g. in sailing boat with a constant heel of more than 10 degrees.

The stove should be installed a minimum of 300 mm (12”) from combustible material e.g. deck of bulkhead unless there is suitable insulation. We recommend that there should be insulation behind and over the stove, and that the relevant country Ministry of ship surveyor rules for insulating and covering of bulkheads, as shown in the drawing, are being followed.

The stove should be installed as low as possible in the ship. The stove takes its air in for combustion through the lowest row of slots in the stove body (not model F & C). The cold air in the bottom of the boat is then burnt, giving a more even heat through-out.



DECK FLANGE:
The deck flange is provided with an insulated ring.
To fit - turn the largest dimension ring downwards and cut the deckhouse/deck.

5. FLUE (CHIMNEY) UNDER THE DECK

The best up draught is obtained with a vertical flue.

Should the flue be fitted with a 90 degrees bend, we recommend it to be fitted with an inspection cover for ease of cleaning.

There should be a maximum of 2 90 degrees bends. Should further bends be necessary, 45 degrees bends must be used.

The flue should not have horizontal runs of more than 300 mm (12”).

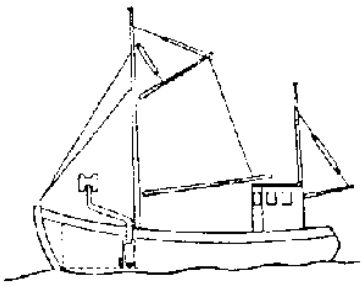
Single walled flue pipe gives a better use of the available heat. Where there exists a danger of touching the hot flue pipe, it can be screened off with a flue guard. The flue pipe can reach a temperature of 250 degrees centigrade on maximum out put. Use Refleks flue pipe and use always the same diameter flue pipe as the flue outlet on the stove.

6. DECK FLANGE (see drawing page 5)

The deck flange has an insulated ring which has a diameter 50 mm (2”) greater than the flue diameter. When fitting this insulation ring is on the bottom of the flange and goes through the deck. A water tight mastic should be used between deck and flange on fitting.

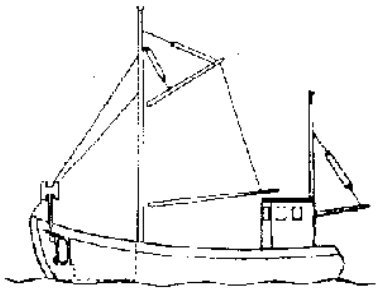
7. FLUE (CHIMNEY) ABOVE DECK LEVEL

To create the best up draught through the stove, an insulated flue pipe is recommended above deck level, together with a special Refleks cowl on top.



With a high flue the round cowl is used but with a low flue, the model “H” cowl is used to prevent down draft in the flue.

The best type of flue should be free of obstruction that can create turbulence round the cowl, as shown in drawing (2).If this cannot be achieved, there should be at least 400 mm (16”) from the bottom of the cowl to the wheelhouse roof.



A: If down draught occurs it may help to install the smoke pipe as shown in sketch. Be sure to mount the cap above the pilot house height.

B: If the stove is installed as shown in sketch – we recommend placing the regulator under the draught pipe i.e. towards the stem.

8. OILTANK AND FUEL SUPPLY PIPE

The fuel oil tank should be installed max. 2000 mm (78”) and min. 200 mm (8”) above the oil stoves regulator.

The tank is supplied with a brass compression ring and nut, so the 8 mm diameter copper fuel pipe can be easily fitted.

A heat sensitive safety fuel valve is fitted on the oil control. This functions as a stop cock, and at the same time shuts down the fuel supply in the event of fire or overheating, when the air temperature at the valve exceeds 70 degrees centigrade the fuel supply is shut off.

A heat sensitive safety fuel valve and a fuel oil filter improves the systems reliability.

9. CENTRAL HEATING UNIT

The instructions for installing a stove with a central heating coil are the same as for the basic unit. The central heating system should be installed as a two-line system. (see drawing).

SYSTEM WITHOUT CIRCULATION PUMP RUN
To obtain the necessary circulation of hot water, the hot water pipes should rise approx. 5 cm (2”) per 100 cm (39”) rum.

SYSTEM WITH CIRCULATION PUMP
The circulation pump is installed on the return pipe to the stove. (see drawing).

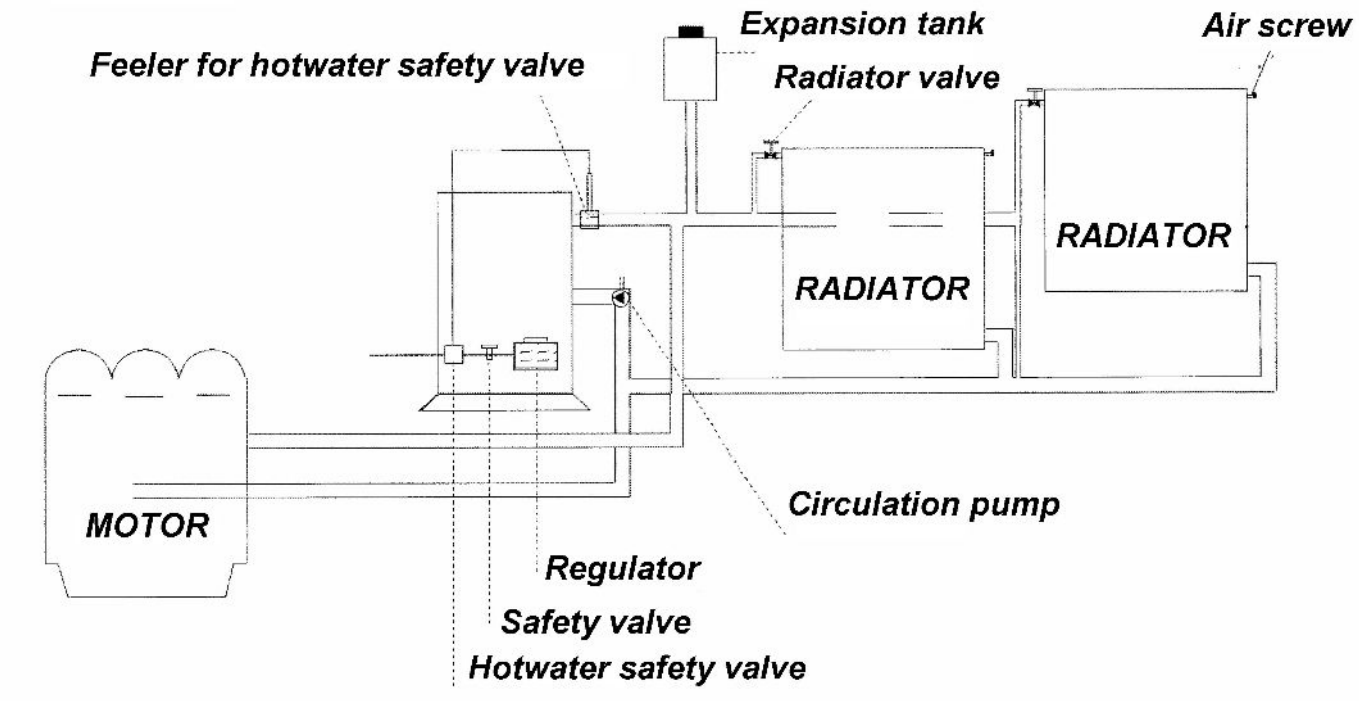
EXPANSION TANK
All systems should be installed with an expansion tank close to the stove on the hot water side of the system. The tank must be the highest part of the heating system. (see drawing).

HOT WATER SAFETY VALVE
The central heating system should be fitted with a hot water over heating safety valve, so that any over heating of the system will shut off fuel oil supply. (see drawing).

In the event of the hot water over heating safety valve being tripped, the system must first cool down, whereby the safety valve can be reset by pressing the reset button on the cut off unit on the fuel line.

THE CENTRAL HEATING SYSTEM SHOULD BE PROTECTED AGAINST FROST DAMAGE BY THE USE OF A SUITABLE ANTI-FREEZE.

A frozen system must never be ignited.



10. THE REGULATOR

The regulator is the heart of the oil stove. It controls the flow of fuel oil to the burner. There are 3 tapped connections in the bottom of the regulator for 8 mm copper pipe. (See sketch).

Overflow should be connected to a waste oil tank which should be placed at a lower level than the regulator. Under conditions of bad weather and heavy seas

the regulator can discharge approx. 1/2 litre over a period of 10 hours due to the violent motion of the float and float chamber. But only in heavy weather.

The overflow is also an important safety precaution. If the regulator float or valve mechanism should fail, the fuel oil will run through into the waste oil tank, and not into the stove, which could cause overheating, excessive oil use and possibly cause fire.

We at the factory have often received regulators for reconditioning where the overflow outlet has been blanked off.

We strongly advise against this practice.

By mounting the overflow pipe, you must hold reverse on the nut to prevent too much force and break the nipple. (The nipple can be replaced).

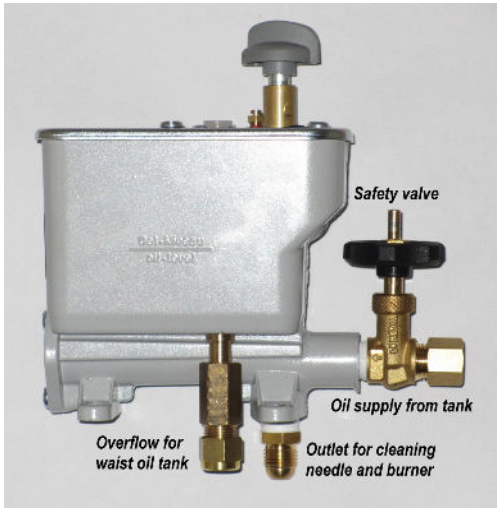
The regulator is very sensitive to dirt and water in the fuel supply. It is very important to clean the filter in the bottom of the regulator once every month.

The maximum and minimum supply capacity is noted on the oil control in cc/min.

The max. and min. for the various model of stove are as follows:
Model 62, 66, 71 and 70 = 2,0 - 6 cc/min.
Model 60, 61 and 64 = 3,0 - 14 cc/min.
Model 67 MS = 5,0 - 17 cc/min.
Model 67 MV = 5,0 - 20 cc/min.
Model 2000K and 2000KV = 3,5 - 9 cc/min.

All regulators are set by the factory for diesel oil with an oil viscosity of 4,0 at a temperature of 20 degrees centigrade. Diesel oil evaporates at approx. 77 degrees centigrade and becomes “waxy” at approx.
-10 degrees centigrade which can cause the stove to extinguish.

The stove can also burn paraffin which is a cleaner and more fluid fuel. The regulator would need to be adjusted.



Paraffin first becomes “waxy” at -35 degrees centigrade. Thus it can be a good idea to mix paraffin with diesel oil, with very low temperatures, in a rate of 1:1.

There are also several brands of diesel oil additive which can prevent problems because of frost.

11. CLEANING PIN

The cleaning pin is made of 6 mm dia. stainless steel, which slides in a brass T-piece, through a rubber O-ring, which can be changed in the event of leakage.

The cleaning pin is used to keep the fuel supply to the burner free from the products from combustion (soot etc.). Under constant use the cleaning pin should be pushed in and out a few times every 14 days to keep the fuel inlet free from obstruction.

It is important that the cleaning pin is not left pushed right in whilst the stove is in use, as in this position the end of the pin extends into the combustion chamber and the end of the pin can be coated in soot and slag thus

preventing its withdrawal. There can also occur heat transference through the pin which destroys the rubber O-ring.

The O-ring can only be changed when the brass T-piece is removed from the stove.

When the stove is not burning and the burner pot has oil in the bottom, it can easily be drained off by pulling the cleaning pin right out. The excess oil will then run out and the remainder can be easily wiped out with a piece of rag before the stove is relit.

12. LIGHTING THE STOVE

IMPORTANT! IMPORTANT! IMPORTANT!
Check that the burner pot is free of oil, see safety precautions.

Fill the fuel tank with oil and open the tank cock and the safety fuel valve.

A safety valve should always be mounted on the oil control or on the fuel supply line. It is very important always to shut of the safety valve when you shut off the stove. On this oil control there is only one shut-off valve on the outlet side to the burner in the stove. Therefore, there will still be oil pressure in the oil control itself even if you shut off the stove with the knob on the oil control.
Important: When the stove is not in use, the safety valve should be turned off and left in the closed position.

The control indicator off on the regulator should be set to 1. Open the top of the stove and drop a lit match down into the bottom of the burner pot.

If methylated spirit is used to light the stove, approx 5 cc should be poured directly into the burner pot and a lighted match thrown into the stove, allow the stove to burn for 2/3 minutes before switching the fuel oil supply (regulator) on. **Important Safety Advice. Do not look directly into the stove from above when using this start method.**

Close the top of the stove and wait 5-10 minutes, the time it takes for the stove to heat up and set light to the fuel oil. The control indicator can then be turned to the required from 1 to 6 on the scale.

Remember to start the circulating pump if the stove is coupled to a central heating unit.

SAFETY PRECAUTIONS BEFORE LIGHTING THE STOVE
NEVER LIGHT

1. A stove that has been extinguished and is still hot.
2. A stove with a frozen central heating unit.
3. A stove with any oil in the burner pot. If in doubt remove the cleaning pin and drain the burner pot before attempting to light the stove.

Carelessness with point 2 and 3 can cause explosion.

Before lighting the stove for the first time, check that the “turbo”, burner gauze or burner rings are correctly installed. (see drawing).

13. MAINTENANCE

A correctly installed oil stove requires a minimum of cleaning: 1-2 times per winter.

THE STOVE REQUIRES CLEANING WHEN:
1. The stove will not burn with a pure clean flame, and soot deposits occur in the burner.

2. The stove extinguishes itself without reason, possibly because of down draft in the flue or shortage of fuel oil.

CLEANING OF THE STOVE

Remove the burner rings from the top of the burner pot. This is possible on all models, but on model 62M and 62MS, the top ring should be bent a little oval so that it can pass through the opening.

The burner pot is cleaned with a wire brush. The top row of holes round the ring of the burner pot are clearly visible. Clean them carefully, but the many small holes in side wall of the burner pot should also be free from deposits.

All loose soot and slag should then be removed from the bottom of the burner pot, either with a vacuum cleaner or the special Refleks cleaning shovel. The burner pot should be removed from the stove every 2 years for a more thorough cleaning.

CLEANING THE FLUE PIPE

Remove the cowl from the top of the flue and clean the flue pipe thoroughly, back to the oil stoves exhaust outlet. Dismantle the flue pipe if there are many bends making the cleaning difficult.

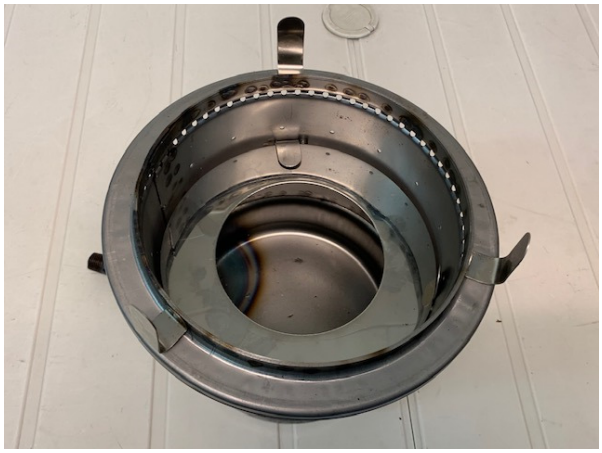
CLEANING THE FUEL OIL SUPPLY

Empty the fuel tank and clean it for removing any water or sediment.
Make sure the breather hole in the filler cap is not blocked. This causes the fuel supply to fail.

Clean the water trap filter. Change the filter gauze if badly fouled. Clean or change the filter in the bottom of the regulator. The filter can be cleaned in either clean diesel oil, paraffin or petrol, or blown clean with an air line.

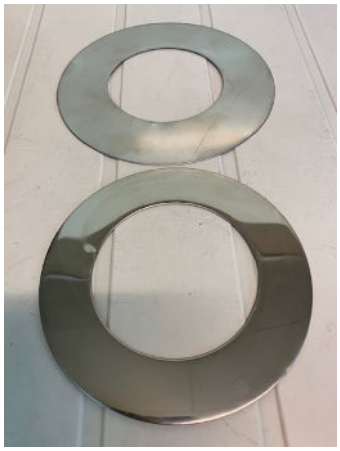
Remove the lid from the regulator body. Rinse the regulator body thoroughly with diesel oil or paraffin. Remove the outlet valve, and blow clean with an air line.

Clean the copper pipe from the regulator to the burner pot. This pipe can collect water from the fuel, and possibly dirt particles from the burner pot, due to its being the lowest point in the fuel supply line and the relatively small amount of oil that flows through it.



BURNER POT F. 62

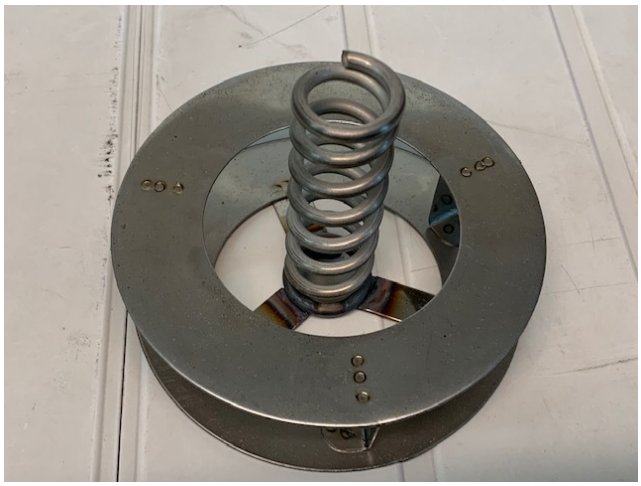
BURNER NET F.62



BURNER RINGS F.62

THE RING WITH THE LARGEST DIAMETER SHOULD BE IN THE TOP OF THE BURNER POT.

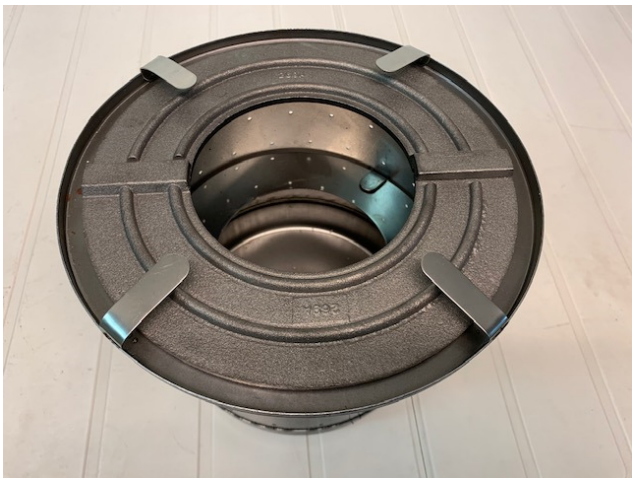
BURNER POT F. 66



BURNER RING / TURBO F. 66

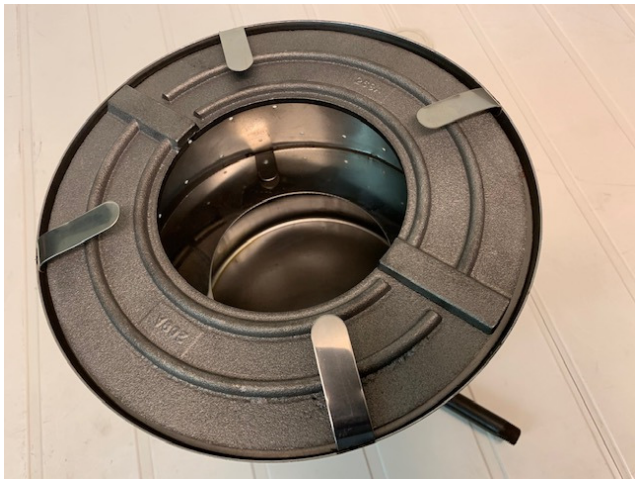
THE SPRING SHOULD ALWAYS BE UPWARDS.

BURNER POT F. 61

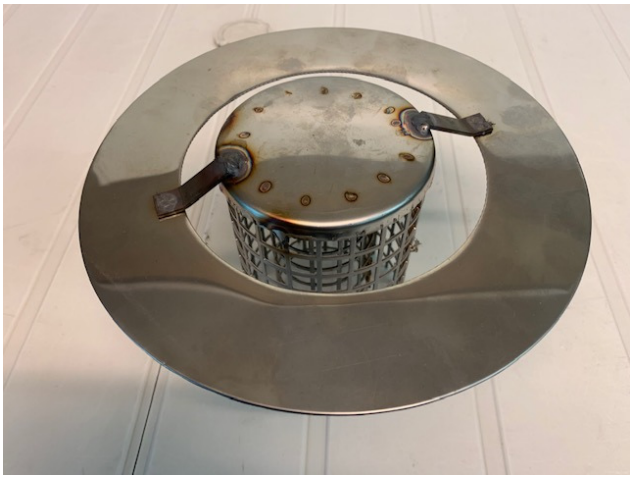


BURNER POT F.61

BURNER POT F. 60/64



BURNER POT F.60/64



BURNER NET F.60/61/64

BURNER POT F.60/61/64 MOUNTED WITH NET

THE BURNER NET IS NOT STANDARD IN THE STOVE, BUT CAN BE BOUGHT AS OPTION.

BURNER POT F. 2000K/KV, REFO 6000

BURNER POT F. 2000K/KV, REFO 6000

Diesel Stove Cleaning Powder

All flames produce burnt carbon particles, even with an effective flue and downdraft cap system, therefore stove burner pots and flues need regular maintenance to stop these carbon deposits adhering (burning on) to the internal components of the system which, in turn, reduces the efficiency and fuel economy of the stove.

Stove systems can be cleaned manually, i.e., using tools such as flue brush, wire brush for burner pots, etc. to remove deposits but this method is messy and still leaves awkward places not fully clean.

The alternative is to use the cleaning powder which will clean the stove components thoroughly and keep the stove running at optimum performance.

Application

Turn the stove to a low setting, simply throw * in one bag of cleaning powder (each pack contains 8 bags) so that it falls into the internal base of the burner pot and leave in low heat for about 30 minutes. After this period, the stove may be turned up as required. So long as the flame within the stove shows a green-blue colour the powder is working cleaning the system, sometimes even days later.

Note *

The construction of some burner pots with burner net arrangements does not allow the powder bag to be placed in the stove while it is working. In these cases, turn off the stove, allow to cool down, remove burner net, place powder bag on internal floor of burner pot, replace net and light as per the stove manufacturers instructions.

Frequency of use

On a stove that is running continuously 24 hours/day we recommend that a cleaning powder bag is used every 14 days. Stoves used a) intermittently or b) continually on the low heat setting require cleaning when visible signs of carbon deposits can be seen on the burner pot surfaces or attached to the burner net.

14. SPARE PARTS

The stove type should be quoted on ordering any spare parts. This can be obtained from the name plate, mounted over the cleaning pin. In the event of this being unreadable, the stove diameter and total height should be quoted, together with any detail of a possible water heating coil.

FITTING OF SPARE PARTS

The burnerpot and copper water heating coil have an average life expectancy of 8-10 years.

The burnerpot is constructed such that defects first occur with the top air intake ring corroding, allowing to much air into the combustion chamber giving rise to soot deposits and poor heating effect. Should this occur the burnerpot should be changed.

An oilstove which stands unused with salt water in the burnerpot will corrode through in approx. 6 months. Precautions against this occurring should be taken.

Never light a stove with a central heating or hot water coil that is not filled with water. The copper coil will be burned through very quickly. Only models 66MS and 66MKS can be lit without the central heating system being connected, This is because the copper water coil is fitted round the outside of the combustion chamber.

CHANGING THE BURNERPOT AND COPPER COIL

The oilstove is held together with 3,3 mm pop rivets. These are drilled out, where after the stove can be totally stripped down. This is the only way the burnerpot and heating coil can be changed. The new burnerpot is tapped carefully in from the bottom of the combustion chamber and held in place with 3 pop rivets or self tapping screws.

The heating coil is forced in from the top of the combustion chamber which can become a little oval during the process. (This is why the total strip down is necessary).

After the heating coil is in place, the ends are shortened the same as the old coil, but the connections are not fitted before the stoves outer jacket is in place.

The regulator is easily changed. Disconnect the copper pipe connections and remove the two securing bolts from the bottom.

15. MONTHLY MAINTENANCE

We would also recommend that all heaters should be serviced at least every four weeks, this service to include the following:

1. Checking water filter and draining.
2. Checking fuel tank and draining off any water.
3. Checking for and eliminating any diesel leakage (i.e. from pipe work, heater, burnerpot, regulator, drip tray etc.).
4. Clean filter in bottom of regulator (immerse in hot water for a few minutes and then thoroughly dry off).
5. Clean burner of heater with wire brush and ensure that the air intake holes in their burnerpot are free from dirt.
6. Clear flue pipe of any soot.

IT IS ALSO VERY IMPORTANT THAT THE FOLLOWING IS STRICTLY ADHERED TO:
1. Never re-light a warm heater (Leave it to cool first).
2. Never light a heater with a surplus of oil in the burner.
3. Never leave the heater top lid open, it should only be opened to light the stove and then closed immediately.
4. Always ensure adequate ventilation is available to the heater.

DAILY CHECKS BY THE OPERATOR SHOULD INCLUDE:
1. Watching for signs of fuel leakage.
2. Emptying any waste oil from drip tray.
3. Emptying any build up of water from the filter.

16. GUARANTEE

1. 2 YEAR GUARANTEE AGAINST MATERIAL FAILURE AND MANUFACTURING FAULTS.
2. THE GUARANTEE COVERS ONLY SPARE PARTS UNLESS THE PRODUCT IS SENT POSTAGE PAID TO REFLEKS OLIEOVNE A/S (VALID ONLY IF THE PRODUCT IS PURCHASED IN DENMARK, IF NOT, SEE SECTION 4).
3. THE GUARANTEE DOES NOT COVER MISTREATMENT OF THE PRODUCT, AND THE GUARANTEE ON THE REGULATORS IS RENDERED VALID IF THE SEAL ON THE REGULATOR ADJUSTING SCREWS ARE BROKEN.
4. IF THE PRODUCT IS PURCHASED IN A LAND OTHER THAN DENMARK, DETAILS OF THE GUARANTEE SHOULD BE OBTAINED FROM THE SUPPLIER OR IMPORTER.

WARNING: IF IN ANY DOUBT CONTACT A COMPETENT ENGINEER.

REFLEKS OLIEOVNE A/S

LØRUPVEJ 17, DK-5750 RINGE
TLF: +45 62 67 12 68
FAX: +45 62 67 13 81
E-MAIL: INFO@REFLEKS-OLIEOVNE.DK
INTERNET: WWW.REFLEKS-OLIEOVNE.DK