PUMP HEATING UNIT PVT
Mounting, Operation,
and Maintenance

MGN 3K110

Enclosures:

Pump heating unit	36050-01-I
Pump heating unit	36050-01-II
Regulating valves	36050-01-III
Preheater	36050-01-IV
Tubing diagram	36051-01-V
Data sheet	36051-01-VI

In the text, reference is made to the following instructions:

Imo pumps	5431
Temperature-controlled 3-way valve	
Suction filter	
Pressure filter	
Pressure regulating valve	
Oil-firing plant, operation	

Contents:

N-PB

2.1.2

Preheaters. Sketch IV.

Each preheater consists of a casing (49) and a heating element (48). The heating element is a finned tube (Stanex tube) (50) closed with welded-on heads and provided with a flange which is adapted to the casing.
The central tube (51) is situated in the centre.

The casing is equipped with a plug (52) for venting.

Oil is supplied to the preheater at the flange (d) and flows alongside the heating element (48). A strong turbulence is thus set up and imparts an effective thermal convection to the oil.

The hot oil leaves the preheater at the flange (f).

Heat transmission oil is supplied at (a), is conducted through the central tube (51) towards the outlet flange (f) of the preheater, and returned between the central tube (51) and the finned tube (50) at a high velocity, to leave the preheater through (b).

2.1.3

Fittings for oil. Sketches I and II.

The fittings comprise the equipment necessary for shut-off of each section:

Stop cock for oil inlet (04)
Stop cock for oil outlet (24)
Safety valve for oil (26)
Thermometers (25) and (15) for oil.

2.1.6

Suction filter. Sketch I.

The suction filter (17) is mounted at the front of the bottom frame. It is a double filter with a change-over cock (45) and a mantle screen with 0,54 mm mesh width.
The filter is provided with a differential pressure gauge showing the pressure drop across the filter. Otherwise reference is made to separate instructions for suction filter.

2.1.7

Pressure filter. Sketch I.

The pressure filter (23) is also fitted at the front of the bottom frame. The filter has a change-over valve (22) and a mantle screen with 0,2 mm mesh width. A differential pressure gauge shows the pressure drop across the filter.
Otherwise reference is made to separate instructions for pressure filter.

2.1.8

The air-controlled pressure regulating valve (31) is fitted in connection with the pressure filter discharge tube. The pressure regulating valve regulates the return oil flow from the discharge side of the pumps to the fuel oil tank, and thus maintains a constant pressure of the hot oil. The oil pressure is regulated with reduction valves (12) and (13) on the instrument panel.

The pressure can be regulated manually with valve (44). See sketch III, Fig. 2.
Otherwise reference is made to separate instructions for the pressure regulating valve.

3.5

The electric switches for starting and stopping the unit must be placed as close to the instrument panel as possible.

3.6

All the bolts of the flanged joints must be retightened 24 hours after the unit has been put in service for the first time or after repair. It must be done without pressure in the tubes.

4. OPERATION

4.1

Start-up

4.1.1

Admit control air through valve (10).
Set valve (12) to approx. 3.5 bar.
Set valve (13) to approx. 1 bar lower than valve (12).
Read the pressures on pressure gauges (09), I and II.

4.1.2

Open valves (32), (47), and (46).
Cut in the electric compressed air control.
Open throttle valve (29) and check that air flows out. See separate instructions for pressure regulating valve.

4.1.3

See that valves (44) and (33) are open, and that change-over cock (45) for suction filter and change-over valve (22) for pressure filter are in their extreme positions.

4.2

Initial regulation at start-up

4.2.1

Close regulating valve (47) slowly.
Adjust air reduction valve (13) until the fuel oil pressure is approx. 25 bar. See pressure gauge (07).

4.2.2

See that valves and joints do not leak. Retighten if necessary.

NOTE: Always tighten flanges without pressure in the tubes.

4.2.3

Set the sensor (14) so that thermometer (15) reads an oil temperature resulting in a viscosity of 2,0-2,5 °E. See operating instructions for oil-firing plant.

4.2.4

Read thermometers (25) to see if the discharge temperatures from the single preheaters of the section are almost identical.

4.2.5

When the fuel oil temperature required is reached:
Read thermometer (05) to see if 3-way valve (39) guides the heat transmission oil through by-pass (01) past the preheaters.

4.2.6

Repeat sub-sections 4.1.4 - 4.2 and 4.2.2 - 4.2.5 for the other pumps and preheaters of the pump heating unit.

4.3.3

NOTE: Do not cut in more sections than are necessary in order to meet the demand. Too many preheaters will result in hunting of the oil temperature.

If the oil consumption is of a size which it is hard to combine with a number of sections, the inlet temperature of the heat transmission oil must be reduced so that the preheater capacity is changed and hunting is avoided.

4.3.4

Adjust the pressure drop of the heat transmission oil across the unit by means of valve (35) so that pressure gauge (42) reads approx. two thirds of the pressure on pressure gauge (41).

4.4

Normal operation

4.4.1

When the unit has reached normal operation, proceed as follows:

1. Check on pressure gauge (06) that the pressure on the suction side of the pumps is not below 0,3 bar.

2. Check on the pressure gauge of the suction filter that the pressure drop does not exceed 0,3 bar. If necessary, change over to a clean filter with cock (45) and clean the dirty filter immdiately. See separate instructions for suction filter.

3. Check the pressure drop across the pressure filter. If it is larger than 0,8 bar, change over to a clean filter with valve (22) and clean the dirty filter immediately. See separate instructions for pressure filter.

4. Interrupt the discharge of fuel oil with (24) and of heat transmission oil with (16).

NOTE: (24) and (16) must not be closed until temperature (25) has dropped to approx. 50°C. Otherwise safety valves (26) and (36) may open because of increased pressure in the preheaters.

5. When the pumps are cut out, close valves (19) and (21).

4.5.2

Shut-down of entire unit:

1. Close valves (44) and (33) for oil.
2. Cut out the electric compressed air control.
3. Close stop valve (10) for control air.
4. Close stop cocks (32) and (46) for pressure regulating valve.
5. Change suction and pressure filters if they have been in service for some time, using cock (45) and valve (22).
6. Clean the dirty filter elements while hot.