<table>
<thead>
<tr>
<th>Nr.</th>
<th>ITA 400 US</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.2 in</td>
</tr>
<tr>
<td>B</td>
<td>6</td>
</tr>
<tr>
<td>C</td>
<td>0.08 in</td>
</tr>
<tr>
<td>D</td>
<td>0.24 in</td>
</tr>
</tbody>
</table>
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Preface
This manual describes the use of the heaters as mentioned on the cover. The information in this manual is important for the correct and safe use of the heater.

Identification of the product (fig. 1)
The identification plate is attached to the side of the heater. The identification plate shows the following data:
A  Production code
B  Bruto capacity
C  Netto capacity
D  Pump pressure
E  Airflow
F  Electrical connection
G  Fuel consumption
H  Type of fuel
I  Air temperature at 65°F
J  Serial number
K  Year of manufacture

Service and technical support
For information about the heater, please contact your dealer or the manufacturer. Make sure you have the type and serial number of the heater.

Guarantee and liability
For the Guarantee and Liability see the terms and conditions.

Environment
Note
The heater is made of various metals and synthetic materials. The heater also contains electronic parts, which must be treated as electronic waste. Please contact your dealer for further information.
1 SAFETY INSTRUCTIONS

1.1 Pictograms in this manual

Caution
A caution shows a danger that can cause damage to the equipment.

Warning
A warning shows a hazard that can cause death or serious injury.

1.2 Pictograms on the heater (fig. 2)

A Pump pressure

1.3 Use in conformity with destination
The heater is designed for use on construction sites, in poultry houses, workshops, storage rooms, warehouses, greenhouses and polyurethane tunnels and to dry agricultural products and bulbs.

1.4 Use this product for the purpose it was intended for
The convector heater was designed for use indoors and outdoors. The heater can be used for the heating of tents, building sites, showrooms, sports halls, storage sheds, workshops, round-the-clock projects, warehouses, greenhouses, polytunnels, spray arrangements, and for the drying of agricultural produce and bulbs.

Caution
If the heater will be installed indoors, make sure that there is proper ventilation in the room. Make sure the flue gas can only flow to an outside source separate from the room.

1.5 General instructions

Warning
- For all service and adjustments contact qualified, competent and authorized persons.
- Make sure to always follow the local standards and guidelines as well as the local requirements.
- Make sure to read this manual carefully before using the convector heater.
- Keep this document near the convector heater.
- Follow the procedures described.
- Do not lean on the convector heater.
- Do not tamper with the heater. Adjustments may only be made by specially trained personnel.
- Do not operate the unit near combustibles.
- Keep at least 7 ft away from the exhaust opening of the convector heater.
- Make sure there is sufficient air for proper combustion.
- Make sure there is no highly flammable material near the convector heater.
1.6 Additional safety

**Warning**

- Make sure that the convector heater has cooled off sufficiently and that the plug has been removed from the socket before carrying out any repair or maintenance work.

- **Connect the heater only to a 1-phase 120 V / 60 Hz power supply.**
- **Replace fuses only with identical spares.**
- **The heater must be grounded.**

- **Use only No.1 fuel, No.2 fuel or Diesel.**
- **Do not use gasoline or crankcase oils.**
- **Place the separate fuel tank at least 7 ft from the heater.**
- **Do not fill the tank while the heater operates.**
- **When the static pressure is not within the limitation of the heater, this can cause damage to the fan motor or heat exchanger.**

- The maximum static pressure in the duct system is 10.44 lb/ft².
- The maximum air temperature of the ducts is 220 °F.
2 INTRODUCTION

2.1 Purpose
The heaters are indirectly fired heaters with photocell control and connections for a room thermostat and flue with raincover. The heaters are tested at sea level and at a temperature of 68 °F.

2.2 Working principle
An electric motor drives a fan and fuel pump. The pump draws the fuel from the tank to a magnetic valve. The fan blows air into and around the combustion chamber. The magnetic valve opens 12 seconds after switching on the heater and the fuel flows into the nozzle. A spark between the electrodes ignites the atomised fuel and starts a flame. The light from the flame activates a photocell. After the safety time the ignition switches off. The magnetic valve closes when you switch off the heater, or as a result of a fault, the flame stops. The fan runs until a thermostat switches the fan off: the cooling cycle is complete.

2.3 Main components (fig. 3)
A Fuel tank filter
B Grill
C Fan
D Electric motor
E Magnetic valve
F Electrode (2x)
G Burner head
H Air slide valve
I Photocell
J After cooling safety thermostat
K Combustion chamber/heat exchanger
L Flue connection
M Maximum thermostat
N Fuel tank (not for ITAS series)
O Drain plug
P On/Off switch
Q Reset button
R Identification plate
S Air inlet burner (only for ITA 45, ITAS 45)
T Fuel pump
U Connector for room thermostat
V Cable with plug
W Fuel filter
X Push bar frame

2.4 Accessories
- Flue with raincover
- Room thermostat
- Single outlet with duct
- Manifold with duct
- Wheels with tyres (only for ITA 45 and ITA 75).

3 GETTING STARTED

3.1 Remove packaging
Remove the packaging from the heater.

3.2 Installation
1. Make sure that the heater is placed horizontally.
2. Fill the tank with fuel.
3. Make sure there is sufficient distance between the wall and the air inlet. Minimum distance is 4 ft.
4. Make sure that the heated air can flow without obstruction. Minimum distance from outlet to an obstacle is 7 ft.

Caution
Use only No. 1 fuel, No. 2 fuel or Diesel.

Caution
- Be careful when you fill the tank. Remove any spilled oil from the heater and the ground.
- Gas oil tends to thicken at low temperatures. This can block the filters. Add a maximum of 15% paraffin to the fuel at temperatures below -20 °F, or keep the fuel frost-proof, or use tank heating (optional).
5. Check the ventilation surface area: for each 3500 BTU a surface of 270 ft² is needed.
6. Check the connection of the room thermostat.
   Do not remove the cap when you do not use a room thermostat.
   Remove the cap to connect a room thermostat.
7. Install the flue (4 ft and a raincover).
8. Make sure the On/Off switch is in the 0 position.
9. Check the supply voltage: see the identification plate.
10. Put the plug in the socket.
11. Press the reset switch.

3.3 Power up
1. Press the On/Off switch to switch on the heater.

   Caution
   Do not switch on the heater when the tank is empty!

2. Set the room thermostat.
   The heater supplies warm air after approximately 10 seconds.

   Caution
   The fuel system de-aerates through the nozzle. Close down may occur several times when starting with an empty filter. To rectify: press the reset switch.

4 OPERATION
4.1 During operation
Hot

   Caution
   Do not touch the flue with rain cover, nor the air outlet! The flue with rain cover and the air outlet become hot during operation!

4.2 Power down
1. Switch off the heater.
   The magnet valve closes and stops the fuel supply.

   Caution
   After you switch off the heater, the fan still rotates. The fan cools the heater to avoid damage caused by overheating. The fan stops automatically.
   Do not remove the plug from the socket until the heater fully stops!

   2. Disconnect the electric power.
5 MAINTENANCE

5.1 Maintenance table

Warning
For all service and adjustments contact qualified, competent and authorized persons.

After each winter season, record the maintenance in the table at the back of this book.

<table>
<thead>
<tr>
<th>Description</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empty the tank and rinse the tank with paraffin.</td>
<td>X</td>
</tr>
<tr>
<td>Clean the filter in the filter cap of the tank.</td>
<td>X</td>
</tr>
<tr>
<td>Check the photocell for damage. Make sure the photocell is free from dust and sediment.</td>
<td>X</td>
</tr>
<tr>
<td>Check the adjustment of the electrodes.</td>
<td>X</td>
</tr>
<tr>
<td>Replace the fuel filter.</td>
<td>X</td>
</tr>
<tr>
<td>Check the nozzle.</td>
<td>X</td>
</tr>
<tr>
<td>Clean the heat exchanger.</td>
<td>X</td>
</tr>
</tbody>
</table>

Hot
Do not touch the flue with raincover and air outlet! Wait until the flue with raincover and the air are cooled down before maintenance.

3. Let the heater burn for 3 minutes. This protects the pump against corrosion.
4. Keep the burner head free from dust and sediment. A dirty burner head causes bad combustion that makes soot and carbon and damage to the burner chamber.

5.2 General

Warning
Disconnect the electric power during maintenance.

If the heater is not used for a long period:
1. Empty the tank, rinse the tank with paraffin.
2. Fill the tank with diesel oil, to prevent corrosion in the tank.

5.3 Adjustment air inlet and electrodes (fig. 6)
A Distance nozzle-swivel disc
B Opening air inlet
C Distance nozzle-electrode
D Distance swivel disc-cone

5.4 Electrodes (fig. 7)
Check the electrodes:
1. Remove the cover of the heater.
2. Remove the oil pipe (B).
3. Loosen the electrode cables (A).
4. Remove the screws (G).
5. Remove the burner head.
6. Clean and re-adjust the electrodes (C).
   The electrodes must be free of dirt, grease, fuel etc.
   If the points of the electrodes are burned too much and adjustment is impossible: replace the electrodes.
7. Loosen the screw (F).
8. Re-adjust the electrodes.
Install the burner head in the reverse order.

Replace the electrodes:
1. Do the points 1 to 7 of “Check the electrodes”.
2. Replace the electrodes.
3. Adjust the electrodes.
Install the burner head in the reverse order.

5.5 Nozzle (fig. 7)

Warning
Do not touch the filter of the nozzle.
This will damage the nozzle.

Check the nozzle:
1. Remove the cover of the heater.
2. Remove the oil pipe (B).
3. Loosen the electrode cables (A).
4. Remove the screws (G).
5. Remove the burner head (H).
6. Check the nozzle (D).
   If the nozzle is black, because of soot or coke: replace the nozzle.
Install the burner head in the reverse order.

Replace the nozzle:
1. Do the points 1 to 6 of “Check the nozzle”.
2. Remove the electrodes (C).
3. Remove the swivel disc (E).
4. Remove the nozzle (D).
5. Replace the nozzle: use the correct type!
6. Install the swivel disc.
7. Readjust the electrodes, see fig. 6.
Install the burner head in the reverse order.

5.6 Photocell (fig. 5)

Check the photocell:
1. Remove the cover of the heater.
2. Remove the photocell out of the holder pipe (A).
3. Clean the photocell if the glass is black (B).
   If the glass is cracked: the photocell must be replaced by the dealer.
Install the photocell in the reverse order.
TROUBLESHOOTING

Before you trouble shoot, make sure that the electricity is connected and the fuel tank is full.

Warning
For all service and adjustments contact qualified, competent and authorized persons.

Warning
Disconnect the electric power during repair!

Table troubleshooting

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Solution</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The heater does not start.</td>
<td>1 No cap is present on the thermostat connection.</td>
<td>Fit the cap.</td>
<td>User</td>
</tr>
<tr>
<td>2 The thermostat setting is incorrect.</td>
<td></td>
<td>Correct the adjustment.</td>
<td>User</td>
</tr>
<tr>
<td>3 The burner relay has a fault.</td>
<td></td>
<td>Replace the burner relay.</td>
<td>Dealer</td>
</tr>
<tr>
<td>4 The fan rotates irregularly or is blocked.</td>
<td></td>
<td>Check the fuel pump. Check the motor.</td>
<td>User</td>
</tr>
<tr>
<td>5 The fuel pump is blocked.</td>
<td></td>
<td>Replace the fuel pump.</td>
<td>Dealer</td>
</tr>
<tr>
<td>The heater stops burning. The reset button is lit.</td>
<td>6 The fuel system has air present when starting.</td>
<td>Press reset switch. Repeat the start procedure if necessary.</td>
<td>User</td>
</tr>
<tr>
<td>7 The fuel filter is blocked.</td>
<td></td>
<td>Clean or replace the filter.</td>
<td>User</td>
</tr>
<tr>
<td>8 The air inlet of the burner has an incorrect adjustment.</td>
<td></td>
<td>Adjust the air inlet, see fig. 6</td>
<td>Dealer</td>
</tr>
<tr>
<td>9 The magnetic valve does not open.</td>
<td></td>
<td>Check the electrical connection. A “click” should be heard when you press the switch to “O” and “I”. Clean or replace the magnetic valve.</td>
<td>User Dealer</td>
</tr>
<tr>
<td>10 The pump pressure is not correct.</td>
<td></td>
<td>Adjust the pump pressure with a manometer.</td>
<td>Dealer</td>
</tr>
<tr>
<td>11 The pump coupling is defective.</td>
<td></td>
<td>Replace the pump coupling.</td>
<td>Dealer</td>
</tr>
<tr>
<td>Fault</td>
<td>Cause</td>
<td>Solution</td>
<td>Action</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>The heater stops burning. The reset button is lit.</td>
<td>12 The suction line or main filter has an air leak.</td>
<td>Check and replace if necessary.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td>13 The protection grill for the air intake is dirty or blocked.</td>
<td>Clean the grill.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td>14 The fresh air supply is not sufficient.</td>
<td>Open a door or a window.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td>15 The photocell dirty.</td>
<td>Clean the photocell, see fig. 5.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td>16 The heat exchanger is blocked.</td>
<td>Clean the heat exchanger.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td>17 The overheating thermostat is activated or defective.</td>
<td>Trace cause. Reset, or if necessary replace the thermostat. See faults 1 and 9.</td>
<td>User</td>
</tr>
<tr>
<td>The heater produces smoke.</td>
<td>18 The nozzle is blocked or worn.</td>
<td>Replace the nozzle.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td>19 The suction line or main filter has an air leak.</td>
<td>Check and replace if necessary. See faults 8, 10, 13 and 14.</td>
<td>User</td>
</tr>
<tr>
<td>The heater produces white smoke.</td>
<td>20 The fuel system has air.</td>
<td>See fault 6.</td>
<td>User</td>
</tr>
<tr>
<td>The heater uses too much fuel.</td>
<td>21 The nozzle is too big or the wrong type is used.</td>
<td>Replace the nozzle with the correct one.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the fuel pipes.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See faults 10 and 18.</td>
<td></td>
</tr>
<tr>
<td>Heater cannot be switched off.</td>
<td>22 The magnetic valve does not close.</td>
<td>Remove the fuel line from the filter to extinguish the flame.</td>
<td>User</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clean or replace the magnetic valve.</td>
<td>Dealer</td>
</tr>
<tr>
<td>The cooling thermostat does not switch on/off.</td>
<td>23 The automatic cooling does not work.</td>
<td>Remove the fuel line from the filter: the flame will extinguish.</td>
<td>Dealer</td>
</tr>
<tr>
<td>The automatic cooling does not work / does not stop.</td>
<td>24 The after cooling thermostat does not switch on/off.</td>
<td>Cooling is required for 4 minutes. Remove the plug from the socket.</td>
<td>Dealer</td>
</tr>
</tbody>
</table>
Record the maintenance details in table A in the appendix at the back of this book.

7 SPARE PARTS
For operation we advise you to have spare parts in store. See table B in the appendix.

8 TECHNICAL INFORMATION
• For the technical specifications, see table B in the appendix at the back of this book.

9 INSTALLATION OF ACCESSORIES

9.1 Flue with rain cover (fig. 4)
The heater is provided with a flue connection.
1. Fit a flue (B) to the flue connection (C).

Caution
The flue must point upwards. Never place the flue pipe horizontal. An angle of 45° is acceptable; minimum length flue 4 ft.

2. Fit a raincover (A) to the end of the flue.

9.2 Outlet hose
An outlet hose can be fitted to the outlet of the heater, in order to blow heated air to a remote space away from the heater.

Caution
Check the temperature resistance of the used hose.

<table>
<thead>
<tr>
<th>Single outlet</th>
<th>ITA 400 US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. length</td>
<td>L = 40 ft: Ø19.7 in</td>
</tr>
</tbody>
</table>

Please contact the dealer for information about maximum lengths of outlet hoses, bends, distribution pipes and hose clamps.

9.3 Room thermostat
See the instructions of the room thermostat.

10 STANDARDS AND GUIDELINES
For the standards and guidelines, go to www.thermobile.nl.

Caution
The flue must point upwards. Never place the flue pipe horizontal. An angle of 45° is acceptable; minimum length flue 4 ft.

Caution
Check the temperature resistance of the used hose.
<table>
<thead>
<tr>
<th>Date</th>
<th>Description: Maintenance or Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Description: Entretien ou Erreur</td>
</tr>
<tr>
<td></td>
<td>Descripción Mantenimiento o fallo</td>
</tr>
<tr>
<td></td>
<td>Action by</td>
</tr>
<tr>
<td></td>
<td>Action par</td>
</tr>
<tr>
<td></td>
<td>Acción por</td>
</tr>
<tr>
<td>Date</td>
<td>Description: Maintenance or Failure</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>Description: Entretien ou Erreur</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Descripción Mantenimiento o fallo</strong></td>
</tr>
</tbody>
</table>
### B

<table>
<thead>
<tr>
<th></th>
<th>ITA 400 US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity, gross</td>
<td>Btu 325,000</td>
</tr>
<tr>
<td>Capacité, brute</td>
<td></td>
</tr>
<tr>
<td>Capacidad, bruta</td>
<td></td>
</tr>
<tr>
<td>Capacity, net</td>
<td>Btu 297,000</td>
</tr>
<tr>
<td>Capacité, nette</td>
<td></td>
</tr>
<tr>
<td>Capacidad, neta</td>
<td></td>
</tr>
<tr>
<td>Fuel consumption</td>
<td>gal/h 2,4</td>
</tr>
<tr>
<td>Consommation de combustile</td>
<td></td>
</tr>
<tr>
<td>Consumo de combustible</td>
<td></td>
</tr>
<tr>
<td>Pump pressure</td>
<td>ps 152</td>
</tr>
<tr>
<td>Pression de pompe</td>
<td></td>
</tr>
<tr>
<td>Presión de bomba</td>
<td></td>
</tr>
<tr>
<td>Air capacity</td>
<td>ft³/min 3200</td>
</tr>
<tr>
<td>Capacité d’air</td>
<td></td>
</tr>
<tr>
<td>Capacidad de aire</td>
<td></td>
</tr>
<tr>
<td>Hot air</td>
<td>ΔT (°C) 122-50</td>
</tr>
<tr>
<td>Air chaud</td>
<td>°F-°C</td>
</tr>
<tr>
<td>Aire caliente</td>
<td></td>
</tr>
<tr>
<td>Diameter outlet</td>
<td>inch 19,7</td>
</tr>
<tr>
<td>Diamètre évacuation</td>
<td></td>
</tr>
<tr>
<td>Diámetro salida</td>
<td></td>
</tr>
<tr>
<td>Diameter flue</td>
<td>inch 7,9</td>
</tr>
<tr>
<td>Diamètre échappement</td>
<td></td>
</tr>
<tr>
<td>Diámetro chimenea</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>ITA 400 US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel tank</td>
<td>gal 61</td>
</tr>
<tr>
<td>Réservoir à combustible</td>
<td></td>
</tr>
<tr>
<td>Depósito de combustible</td>
<td></td>
</tr>
</tbody>
</table>

- ρ (15° C): 0.85 kg/dm³
- H_l = 42.689 MJ/kg
- H_s = 45.5 MJ/kg
- 1 kW = 860 kcal/h
- 1 kW = 3413 Btu/h
- 1 kW = 3.6 MJ/h