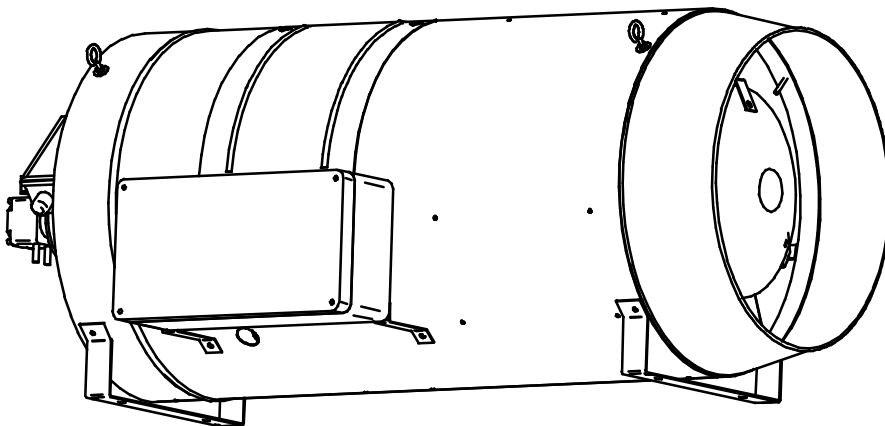


**Instruction manual**  
**DXB Heater**

**Ver GB 506h**



YOU MUST READ THIS DOCUMENT BEFORE COMMENCING INSTALLATION.  
INSTRUCT THE USER ONCE TAKEN INTO USE AND KEEP THIS DOCUMENT  
NEAR THE APPLIANCE

Date: 06-02-2013  
Version: GB 506h  
Heaters on Fuel: Diesel or kerosene

## Foreword

This installation and user manual is intended mainly for the gas, oil and electrical fitter. It also provides instructions for the user and for the maintenance of the air heater. To use this air heater in a safe and effective way, it is strictly essential that this manual is used correctly.

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## 1 About this manual

In this manual you will find information on the DX Heater. One section of this is intended to enable the user of the DX Heater to operate the appliance in a sensible and safe way. Another section is intended to enable the fitter or service technician to fit, set up and maintain the DX Heater, and to detect and resolve any malfunctions quickly and effectively.



This manual makes regular mention of a fitter or service technician. This refers to a qualified fitter or service technician who is trained in the fitting, malfunction-free operation and maintenance of the DX Heater. He is also competent to carry out work on a heater.

### 1.1 Guaranty

Guaranty is only valid when the appliances are used and or installed according to this manual.

## 2 Safety instructions and precautions

Always read the entire manual so that you are familiar with all the safety instructions and precautions.

### 2.1 Key to symbols



Safety warning: warning of danger of physical injury or (direct) damage to product, animals or the environment.



Warning



Information



Tip

### 2.2 Symbols on the appliance



Warning which refers to the manual for information on the component on or next to which the warning is positioned.



Warning of the potential hazard of electric shock.



Safety grounding

### 2.3 Warnings

Keep this manual in a safe place near the heater so that you can consult the manual whenever necessary



Incorrect use of the heater can result in physical injury. Therefore, follow the instruction below carefully:

- Avoid physical contact with the motor or other hot parts of the heater.
- Do not touch live parts of the heater.
- Keep body parts, loose items of clothing, jewellery or hair away from rotating fan blades or other moving parts of the heater.
- Do not place articles in front or nearby the heater because this can cause fire hazard.



The following conditions can lead to damage to the heater:

- Incorrect transportation or storage of the heater;
- Errors in the assembly of (parts of) the heater;
- Excessively high or low gas burner pressure;
- Excessively high or low ambient temperature;
- Wear, ageing and metal fatigue in components of the heater.
- Moisture: the heater has IPX4D protection grade.

## 2.4 Pre-check.



Before unpacking and installation, please check (i.e. on the data badges) if the heater corresponds to the order and if it is suitable for the local present provisions (Fuel type, electrical supply etc.)

The installation must comply with all applicable local and national standards.

The installation of the air heater must be in accordance with the relevant requirements of the Safety Regulations, Building Regulations and the IIE Regulations also incorporating the fuel safety (installation and use) regulations. Other national and/or local regulations may apply (the Local Authority, Fire Officer and Insurers)



The competent installer must make sure the heater operates correctly and must instruct the user about the safe operation of the heater.

This heater takes its combustion air from within the room in which it is located, the necessary ventilation requirements must be followed for safety regulations.

The heater should not be installed in areas containing corrosive or explosive vapours. Please consult your supplier; otherwise the guarantee will become invalidated.

Make sure that the warm air can be blown out freely. There should absolutely be no (possibility of) materials within 5m from the front of the heater.

The heater has been tested in detail on safety and correct operating settings before leaving the factory. It has been adjusted for the type of fuel that is stated on the data badge. Should there be any doubt, please contact your supplier.

## 2.5 Safety precautions

If the distance between hot flue gas coming from the outlet cover and people or animals is too short, this may pose a danger to them. In addition, the heater is started automatically, which may pose a risk to people or animals in the vicinity of the heater. Therefore, you should always observe the prescribed minimum distances between the heater and people, animals and crops (refer to Mounting the heater)



O<sub>2</sub> is used during combustion and converted, amongst others, to CO<sub>2</sub>. Too much CO<sub>2</sub> in the air may be harmful to people, animals and crops. Therefore, you should always ensure sufficient fresh air can enter the space where the heater has been placed, e.g. by way of open windows or a separate fresh air intake. When the CO<sub>2</sub> concentration is too high, the heater will not function properly. There may be incomplete combustion. (Danger of Carbon Monoxide CO) The CO<sub>2</sub> concentration may not exceed 1%. Minimal ventilation requirements 1000m<sup>3</sup>/h for each 100kW installed power.

Observe the following precautions when using the heater:

- Only start the heater if access panels and protective grill have been fitted.
- Have the heater checked and serviced once a year by a service technician.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- Children may only be present in the space where the heater has been placed if supervised by an adult.
- Ensure the socket outlet is located within a 2 m radius of the heater and that the plug can be removed easily and quickly from the socket outlet.
- Leave the plug in the socket outlet even if you are not using the heater. This prevents condensation of the print circuit board; this may lead to heater damage and/or malfunctions.
- Make sure the mains cable does not get damaged. Replace a damaged cable immediately.

- Do not connect the heater to an air duct, as this has a negative effect on the performance of the heater.
- Due to the presence of CO<sub>2</sub> and the noise levels produced, you must obtain permission from the safety and health service before taking a heater into use that is to be placed
- Minimal ventilation requirements 1000m<sup>3</sup>/h for each 100kW installed power.
- In case of a malfunction, ensure the heater is free of electricity by removing the plug from the socket outlet, in order to prevent damage to the heater.



## **2.6 Water and chemical substances**

Observe the following measures if water or chemical substances that could be dangerous to people, animals, and/or crops are used in the space where the heater has been placed:

- Switch off the heater.
- Make sure the heater cannot be started automatically by removing the plug from the socket outlet.
- Close the fuel tap.
- Cover the heater.

## **2.7 Use in a greenhouse**



Observe the following additional measures when using the heater in a greenhouse:

- The CO<sub>2</sub> level should not exceed 1% (10,000 ppm).
- In completely enclosed greenhouses there must be at least 1000m<sup>3</sup>/h for each 100kW installed power and external atmospheric protection.
- There must be at least two openings in the space to ensure adequate circulation of air if no artificial ventilation is present.
- Use the heater preferably in combination with one or more exhaust fans and a CO<sub>2</sub> meter
- Do not use any sulphurous fuels in the space where the heater has been placed, as these contain high amounts of sulphur that could be harmful.

## **2.8 Use in a poultry shed**



When cleaning and disinfecting a poultry shed in which a heater has been placed, or when spreading sawdust, the following precautions should be taken. Failure to take these precautions will give rise to a risk of explosion or fire.

Take the following into account when using the heater in a poultry shed:

- The CO<sub>2</sub> content must not exceed 0.3% (3,000 ppm).
- If no artificial ventilation is provided, there must be at least two openings in the space to ensure sufficient circulation of air.
- Cover or remove the heater when cleaning or disinfecting the poultry shed.
- When spreading sawdust the heater must be covered to prevent sawdust particles from entering the heater and creating a fire hazard. Also make sure that the heater cannot be started automatically by removing the plug from the socket outlet. Also close the fuel valve.
- Clean the heater after every poultry shed clean-out to prevent the heater from becoming dirty.
- Do not use water when cleaning the heater

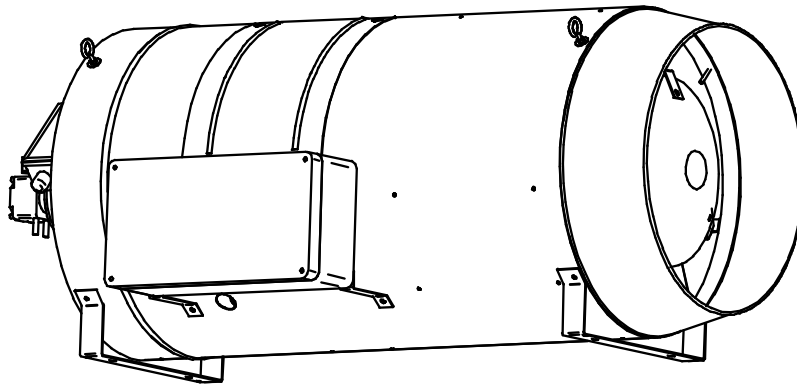
# **3 Introduction DXB heater**

The DX Heater is a direct fired heater designed specifically for greenhouses and poultry sheds. The device is placed in the enclosed space itself, which means that the heater displaces air only and uses a small amount of energy to warm and ventilate the space. The large air capacity and the unique shape of the heater also ensure that the device can distribute the air within the space in the best possible manner.

The heater's design is aimed at straightforward installation, maintenance and safe use. Ignition and combustion for example are controlled automatically and parts are easily accessible for cleaning and maintenance.

The heater can be ordered for different gas types and fuel settings:

- Natural gas, Propane, Butane and LPG
- Paraffin/kerosene and Diesel



## 4 Installation



Read the chapter on Safety instructions and precautions first and observe all warnings and precautions. Follow all instructions in this chapter explicitly.



Only skilled installers or service technicians are permitted to install the heater.

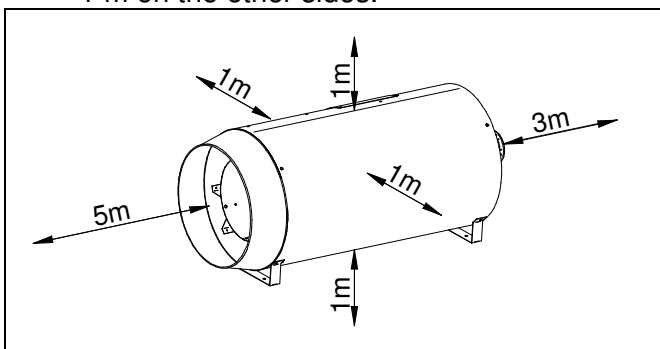
### 4.1 Mounting the heater



Mount the heater in a sturdy manner, taking into account the dynamic load and the weight of the appliance (refer to Specifications ).

Take the following into account when installing the heater:

- Attach chains to the four hook eyes and suspend the heater.
- Make sure the heater is positioned horizontally otherwise it will not operate (properly).
- Do not connect the heater to an air duct, as this has a negative effect on its performance.
- Take into account the minimal distances between the heater and people, animals and crops:
  - 5 m on the outlet side;
  - 3 m on the inlet side;
  - 1 m on the other sides.



The same minimum distances apply between the heater and walls, glass and other objects, with the exception of the outlet side. The minimum distance on this side must be equal to the throw that the heater is capable of producing. This depends on the type of heater (refer to Specifications ).

## 4.2 Connecting the Fuel supply

The oil connection must comply with national and regional installation regulations.

You can connect the oil heater to a single oil pipe (figure) or an oil pipe with return (figure). Fit return pipe E to the oil pump connection R (figure 12). Fit supply line D to oil pump connection S. There are two hose connectors on the outside of the heater, around the supply and return lines. Use hoses which are resistant to oil and any harmful substances which may be present locally (such as ammonia fumes). Make sure the return and supply lines are properly connected. An oil filter must be fitted to the heater's supply line. The return pipe can be used to feed air back to the ventilation pot/flow control.

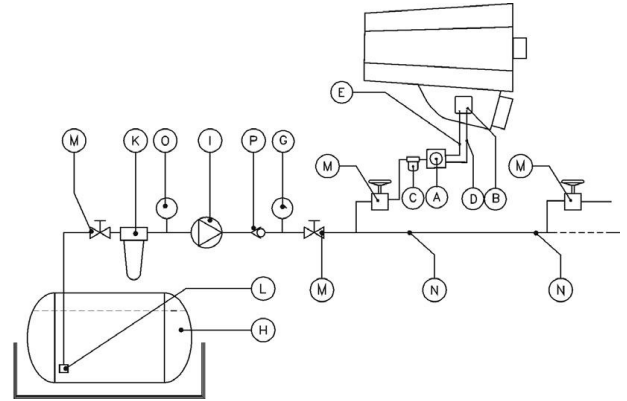
To guarantee a good supply of oil, all the parts in figures 6 or 7 must be included. This prevents malfunction in the oil heater.

The intake pressure of the oil pump must be between 0 and 2 bar. The suction height of the heater oil pump is a maximum 3 metres.

### Single oil pipe (figure)

If the oil heater is connected to a single oil pipe, a flow control (such as tigerloop) should be fitted.

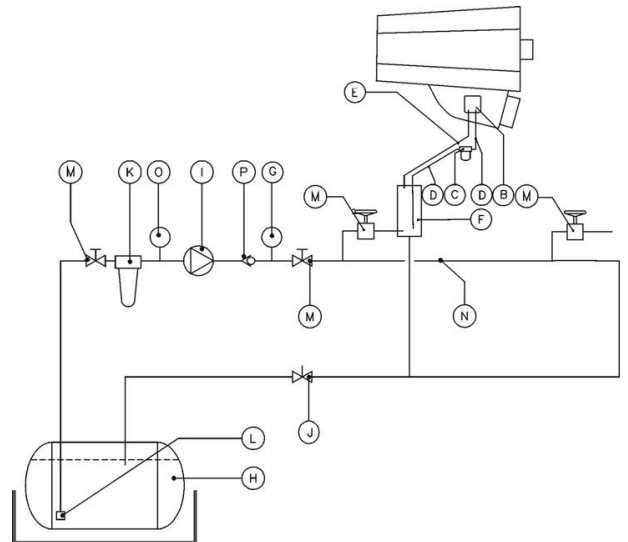
Position the flow control higher than the oil tank in relation to the tank running dry. Do not fit the supply and return lines higher than the flow control to the tank. This prevents the formation of air bubbles.



### Oil pipe with return (figure)

If the oil heater is connected to an oil pipe with return, an air ventilation pot must be fitted.

Position the ventilation pot higher than the oil tank in relation to the tank running dry.



Key to letters in figures:

A = Flow control (e.g. Tigerloop)  
 B = Oil pump  
 C = Oil filter  
 D = Supply line  
 E = Return line  
 F = Ventilation pot  
 G = Manometer  
 H = Oil

I = (Transfer) pump  
 J = Overflow valve  
 K = Filter/water separator  
 L = Dirt filter foot valve  
 M = Cut-off (manual)  
 N = Main pipe  
 O = Vacuum meter  
 P = Back pressure valve



The heater can be converted from one fuel to the other. This involves changing the nozzle and adjusting the pump burner pressure. Look into the specifications for the exact adjustments. Instructions can be found in this manual.

## 4.3 Electricity supply

### 4.3.1 230Vac supply



The installation must comply with local and national requirements, (as well as IEE regulations). The unit heater is delivered completely internally wired. Where controls of any type are to be added (e.g. room thermostat), the relevant wiring diagrams must be followed. Never use a room thermostat to interrupt the electrical supply to the heater!



The supply is 230Vac 50Hz with earth. When the supply voltage is lower than 195V and higher than 255V the correct functioning of the heater is not guaranteed.

A mains cable including plug is supplied with the heater. The wires of the cable must be connected to the clamps in the connection box. Make sure you do not damage the mains cable. Replace a damaged cable immediately. When the heater is connected without a plug, make provisions to completely isolate the heater for maintenance purposes. This can be an isolation switch (min. 3mm contact opening gap). The switch should not interrupt earth. Ensure the plug or switch is located within a 2 m radius of the heater and the plug can be removed easily and quickly from the socket

### 4.3.2 Thermostat connection

The heater can be controlled in various ways. It can be controlled by a simple ON / OFF signal, but it can also be controlled by an external print.

### 4.3.3 Thermostat cable

In all cases the communication between the heater and the thermostat is based on a two wire, low-voltage connection. (see also electrical wiring diagram).



Cable specification: signal cable, 1x2x0,8 (shielded and twisted)  
Maximum length 200m.

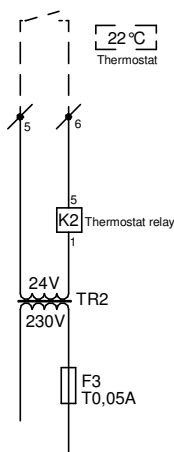
If the chosen cable is too thin, the signal will be too weak and heater will not work. If the cable is not shielded and twisted the signal might become disturbed in an EMC unfriendly environment. Keep the thermostat cable separated from mains cables. Connect the earth shield of the cable only to the earth terminal in the heater.

If these guidelines are not followed it may result in malfunction of the installation or worse, it could damage the thermostat or the electronics in the heater.

### 4.3.4 Simple ON / OFF contact with thermostat relay in heater

(standard configuration see schematic P002 version D)

The heater can optional be supplied with an 24V transformer in the thermostat circuit.



This transformer switches a relay for the on/off signal in the heater. This option is made when there are long leads to the main control panel. The heater will only react on the heat demand. Remote reset or the ventilation signal can only be made on the heater itself.

Every heater has to be switched by a **separate** low voltage ON/OFF contact in the control room

**Do not connect more than 1 heater to each other.**

The following (Standard) settings on the main board in the heater have to be actual.

- The S2 micro switches on the main board have to be set to OFF, see example.



- The switch S3 has to be set to 1.
- The thermostat has to be connected to the clamps 5 and 6 in the

heater.

(Any changes too these switches must be performed with the power off, otherwise any changes made will not take effect. )



### 4.3.5 Simple ON / OFF contact with NO thermostat relay in heater

#### **Not the standard configuration** (see schematic P002 version C)

The heater can be connected to a potential free ON/OFF contact.

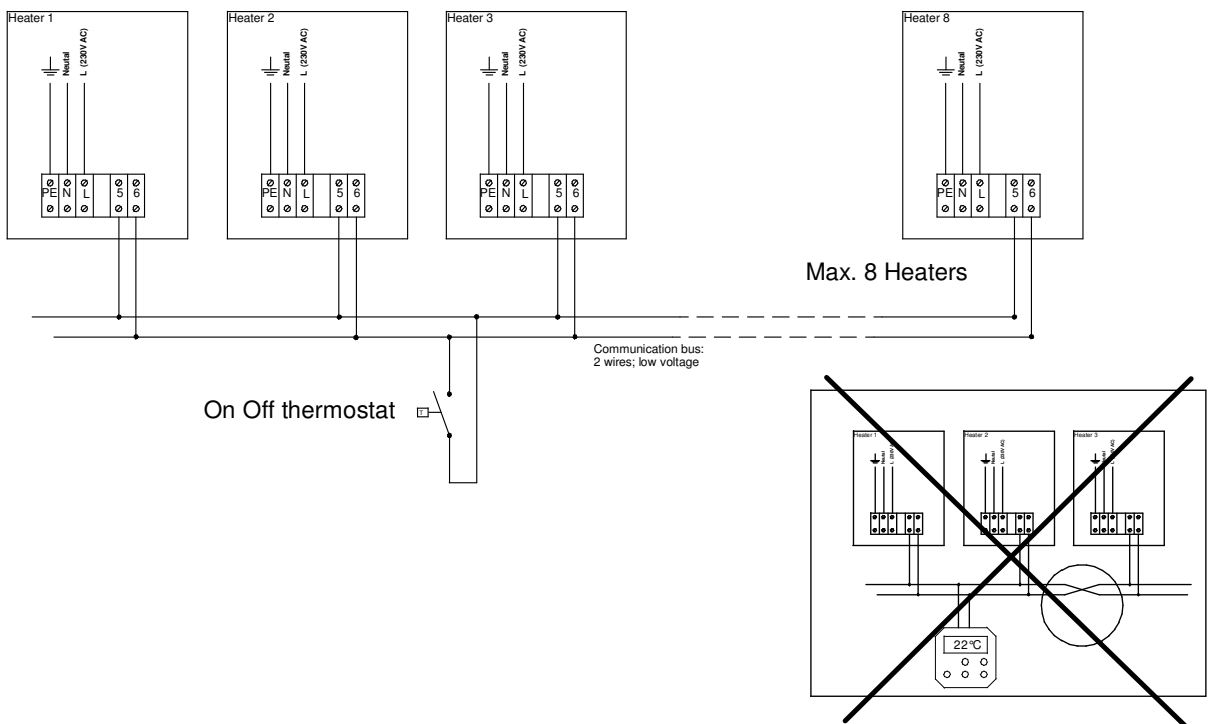
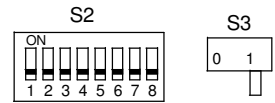
The thermostat wires need to free of EMC related issues.

The heater will only react on the heat demand. Remote reset or the ventilation signal can only be made on the heater itself.

The following (Standard) settings on the main board in the heater have to be actual.

- The S2 micro switches on the main board have to be set to OFF, see example.
- The switch S3 has to be set to 1.
- The thermostat has to be connected to the clamps 5 and 6 in the heater.
- In the case that more than 1 heater is connected to 1 thermostat, do not exchange clamp 5 with clamp 6 between the heaters. This will result in permanent burning of the heaters.

Any changes too these switches must be performed with the power off, otherwise any changes made will not take effect.



### 4.4 Interface Unit;

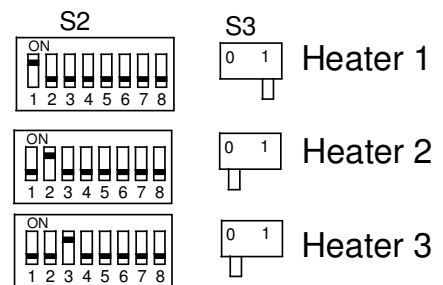
Special designed module to connect the heaters to external climate computers. This unit has connections for Burner ON / OFF, Ventilation, Reset function in case of faults and some outputs are available (faults for example) The unit can control up to 8 heaters.

When this unit is used the settings in the heater have to change.

Each heater needs its own unique number to recognise the heater by the room thermostat. The number of the heater can be set by the micro switch S2 on the heater control in the heater. The number at the upper position of the switch is the given number for that heater. Make sure that each heater has its own unique number. If more than one heater has the same number the system does not work.

Any changes too these switches must be performed with the power off, otherwise any changes made will not take effect.

The switch S3 has to be set to 0 (off)





It is possible you may have the incorrect settings with the system still working! However if this is the case, you will ultimately damage the equipment. So every care should be taken to ensure the switches are set correctly!

#### 4.5 Checks before taken into operation

Perform the following checks before taking the heater into operation.

- Wiring, Ensure the heater is free of electricity by removing the plug from the socket outlet. Now check that the connection is OK and that the wiring is connected properly.
- Fuel leaks, Check that the oil system is leak-free and does not contain air.
- Supply voltage; check if the supply voltage is sufficient.
- Transport and combustion air flow, Check if the transport and combustion air exhaust is free from any obstacles. In this way, you will prevent the heater from continuing to operate while the air exhaust is blocked.
- Burner pump pressure, The heater will not operate if the burner pressure is too high or too low; refer to Measuring the burner pressure
- Flame detection, Flame detection is by means of an LDS photocell. The LDS photocell measures the brightness of the flame that arise when there occurs a flame. When the measured brightness of the flame does not arise or is too low the heater will not function.
- CO-value and CO<sub>2</sub>-readings in the combustion air too high a level of CO and/or CO<sub>2</sub> in an enclosed space can be harmful to people, animals and crops. You should therefore always verify that the CO value and the CO<sub>2</sub> content in the flue gas comply with the requirements; refer to Measuring combustion values
- General heater operation.

## 5 Function of the heater

### 5.1 Function service/reset button on the heater



On the left side of the control box there is a external service/reset button situated. This service/reset button has several functions:

When the button is pushed for 5 seconds (b the display) the heater will start to burn. When the button is pushed again for 2 seconds the heater will stop. The heater will remain in the burn mode for maximal 24 hour. Every hour the heater will perform a safety shutdown and will automatically restart.

When the button is pushed for 7 seconds (F the display) the heater will start to ventilate (without burning). The heater will stop to ventilate when the button is pushed again for seconds.



in

in

2

When the heater is in error A(x), it can be reset by pushing this service/reset button once.

### 5.2 Heat demand



The heat demand can be generated by means of the room thermostat or manually by pushing the reset/service button on the heater.

If there is heat demand, the following cycle will start:

1. Internal checks: The heater performs several checks before there happens anything.
2. **Pre purge:** The electronic circuit board acknowledges the heat-demand and the fan will start running for 15 seconds. (Display print → 1)
3. **Ignition:** After 15 seconds of pre purge, the electrode will spark for max. 5 seconds, the fuel valve is opened and the fuel air mixture will ignite. (Display print → 2)

4. **Burn:** When the flame is detected (Display print → **b**) the unit will go into burn mode.
5. **End of heat demand:** When the heat demand ends, the burner will switch off and the system fan will continue to run for ca. 1 minute in order to cool the unit down (Display print → **P**).

The unit will try to ignite 1 times before lockout on flame fault.

In the case of flame failure during operation, the heater will attempt one restart.

When the heater is in lockout you see in the display intermittent A1. On the display of the room thermostat you see failure 1.

The heater error A(x) can be reset by pushing the service/reset button for 1 second.



Every hour the heater performs a safety shut down. After this shutdown the heater will restart automatically.

### **5.3 Delayed start**



Often more than one heater are connected to one control unit. When all the units are starting on at the same time, a pressure drop in the fuel supply and electrical power supply can occur. This may result in some heaters not starting. To prevent this there is a random waiting time before the heater starts.

### **5.4 Ventilation**



By means of the optional external interface board, the fan in the heater can start without the burning from the heater. The symbol F will be displayed on the heater.

The fan can also be operated manually by pushing the function button twice.

This manual ventilation setting will remain maximum 24 hour.

### **5.5 Air transport, vane switch**



In the air stream inside the heater a vane switch is mounted. When the fan is running this switch should be made. If not, Error E8. The heater will perform a retry for 5 times. When the vane switch is still not closed the heater will lock with error A8 and has to be reset manually.

When during one heat demand the vane switch opens more than 5 times the heater will also stop. Error A8.

When the heater is in standby and the vane switch is closed, the heater will give error E8 until the switch is open again.

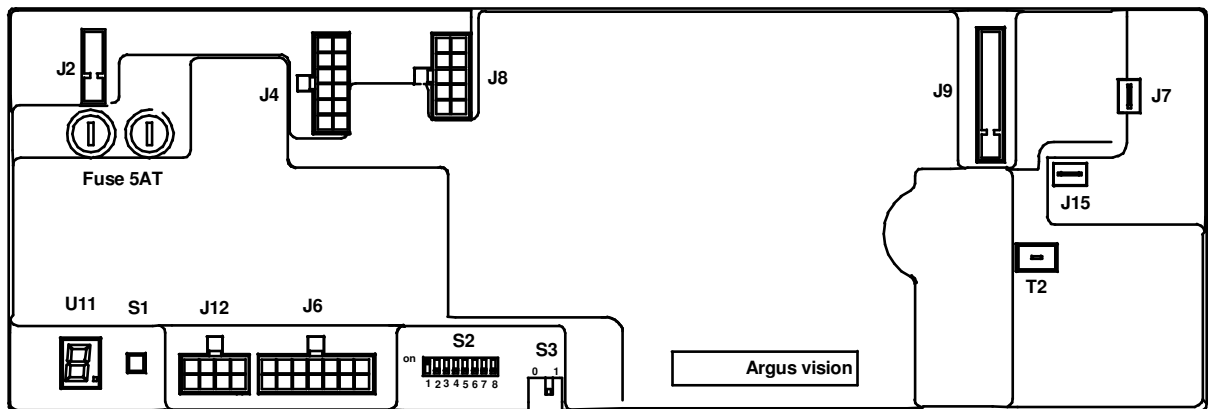
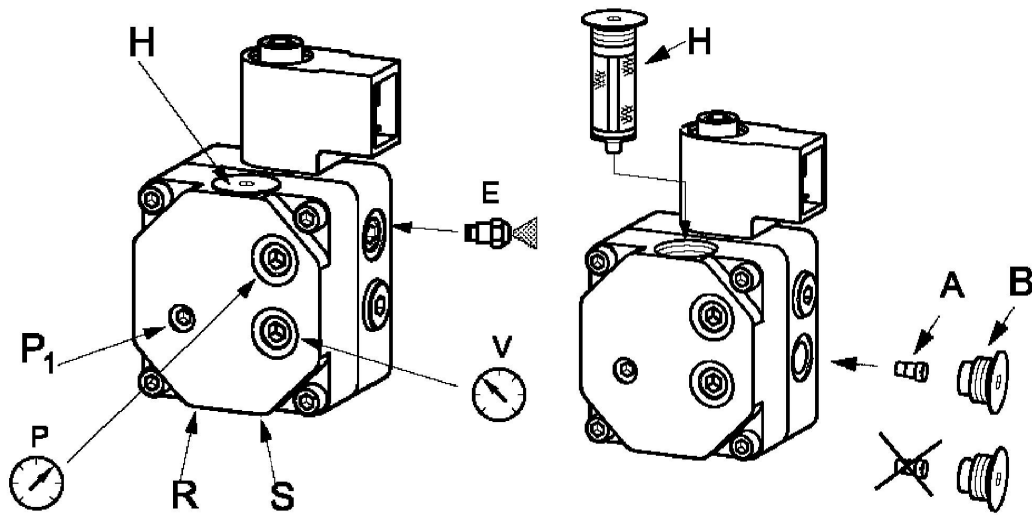
### **5.6 Description heater control HC**

The heater control HC controls the unit and communicates with the room thermostat.

Functions integrated in the heater control HC are:

- Two wire communication with room thermostat
- ionisation flame guard on burner
- controlling the fuel valve
- guarding the temperature of the heat exchanger
- LED signals status of heater, heat demand: green, failure: red
- Status of heater on 8 segment display on heater control HC
- reset of heater
- service mode function

### **Lay-out print board**



- J2** Main power connection 230V
- J4** Connection for fuel valve and the N for system fan relay
- J6** Connection for room thermostat, appliance recognition
- J7** LDS photocell / flame sensor
- J8** Fuse for system fan relay and ignition transformer
- J9** Not used
- J12** Connections for Temperature sensors, vane switch and gas pressure switch
- J15** LDS photocell / flame sensor
- F1 & F2** Fuses 2x 5AT
- U11** Status display
- S1** Reset service button
- S2** Micro switch heater no. Standard all on OFF
- S3** Power supply thermostat standard S3 op 1
- T2** not used

### 5.7 Measuring and adjusting oil pump pressure.

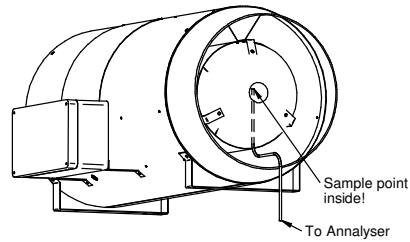
Key to the letters in figure

- |    |                          |   |  |
|----|--------------------------|---|--|
| P1 | : Pressure setting       | P | : Manometer connection, 1/8"G pressure         |
| S  | : Suction line 1/8"G     | V | : Manometer connection, 1/8"G vacuum           |
| R  | : Return line 1/8"G      | H | : Filter                                       |
| E  | : Atomiser line 1/8"G    | A | : Plug; with plug = open (single pipe system)  |
| B  | : Opening to access plug |   | Without plug = closed bypass (two pipe system) |

1. Switch the heater off, close the oil supply and open the body's access panel.
2. Unscrew the seal screw of the oil pump (P).
3. Fit a manometer (0 -16 mbar) to the measuring nipple.
4. Close the access panel, switch on the oil supply and switch on the heater.

5. Start heating manually by pressing the button on the operation panel.
6. Give the heater 5 minutes to warm up.
7. Check that the oil pump corresponds with the nominal oil pump pressure (see Specifications).
8. Make a note of the value measured as a reference for the next measurement.
9. If the oil pump pressure does not correspond with the prescribed value:
  - Turn the adjusting screw (P1) left or right until the manometer displays the prescribed value.
  - Check again the oil pump pressure according to the steps above.
10. Switch the heater off.
11. Allow the heater to cool down, switch off the oil supply and open the access panel.
12. Remove the manometer, tighten the screw of the measuring nipple (P) and close the access panel.

## 5.8 Measuring combustion values



Heater with probe

### CO<sub>2</sub> percentage (approximate)

Nominal CO<sub>2</sub> percentage (airtime 20°C)

Fuel type	DXB 75	DXB 100	DXB 120
Paraffin / kerosene	8.5-9.5%	9-10%	9-10%
Diesel	8.5-9.5%	9-10%	9-10%
	%	%	%
	%	%	%
	%	%	%

1. Switch off the heater.
  2. Place the probe (1) on the heater (refer to figure DX Heater with probe) and connect the (calibrated) flue gas analysis equipment.
  3. Switch on the heater and start heating manually by pressing the button on the operating panel.
  4. Allow the heater to heat for about 5 minutes.
  5. Measure the CO value.
  6. Measure the CO<sub>2</sub> percentage in the flue gas.
  7. Record the CO value reading and the CO<sub>2</sub> percentage as a reference for the next measurement.
  8. If the CO value exceeds 15 ppm, or if the CO<sub>2</sub> percentage does not correspond to the specified percentage, refer to the CO<sub>2</sub> percentages (average ambient temperature 20°C)
    - a. Check CO<sub>2</sub> percentage if deviates by more than 1 %, check the pump pressure also check the fuel supply for air bubbles, check the air inlet openings of the system fan.
    - b. Measure the pump pressure; refer to Measuring the burner pressure.
    - c. Check whether the oil pipe diameter is too small.
    - d. Check the CO value and the CO<sub>2</sub> percentage again following the steps outlined above.
  9. Switch off the heater.
- Allow the heater to cool down and then remove the probe and the flue gas analysis equipment

## 6 Maintaining the heater

It is recommended to have the heater checked and serviced by a service technician every year to guarantee reliable and safe operation. Heaters used in poultry sheds must be serviced more often and more extensively due to high levels of dust and dirt in these types of spaces.

### 6.1 General maintenance



The heater must be free of electricity during servicing. Remove the plug from the socket outlet. Do not use water when cleaning the unit.

Perform the following activities during general maintenance:

- Open the body access panel and especially clean the body, fan blades, fan motors, vane switch, maximum thermostat and swirl ring.
- Grease any parts and bolts that are loosened regularly for maintenance.
- Check whether the wiring, nuts and bolts are all properly tightened.
- Open the fuel valve and check whether the heater and the hoses are tight and leak free and do not contain air.

### 6.2 Extensive maintenance in a poultry shed



The heater must be free of electricity during servicing. Remove the plug from the socket outlet. Do not use water when cleaning the heater.

Clean and check heaters used in poultry sheds after every shed clean-out and before spreading sawdust. To do this, carry out the following actions:

1. Use compressed air to blow the parts clean, especially the inside and outside of the body, fan blades, fan motor, vane switch.
2. Remove all dust from the motor as the layer of dust acts as insulation, which can cause the motor to overheat.
3. Use a brush to remove any caked on dust.
4. Clean the burner unit (refer to Cleaning the burner unit).
5. Put the Power back on and let the heater heat for a while so that if any dust particles have remained behind, they are now burnt.
6. Stop heating and cover the heater once it has fully cooled off.
7. Make sure the heater is free of electricity by removing the plug from the socket outlet.
8. Disinfect the poultry shed and spread the sawdust.
9. Remove the cover from the heater.



To ensure the instructions below are carried out safely, it is recommended having these carried out exclusively by a service technician.

Perform the following checks after cleaning the heater:

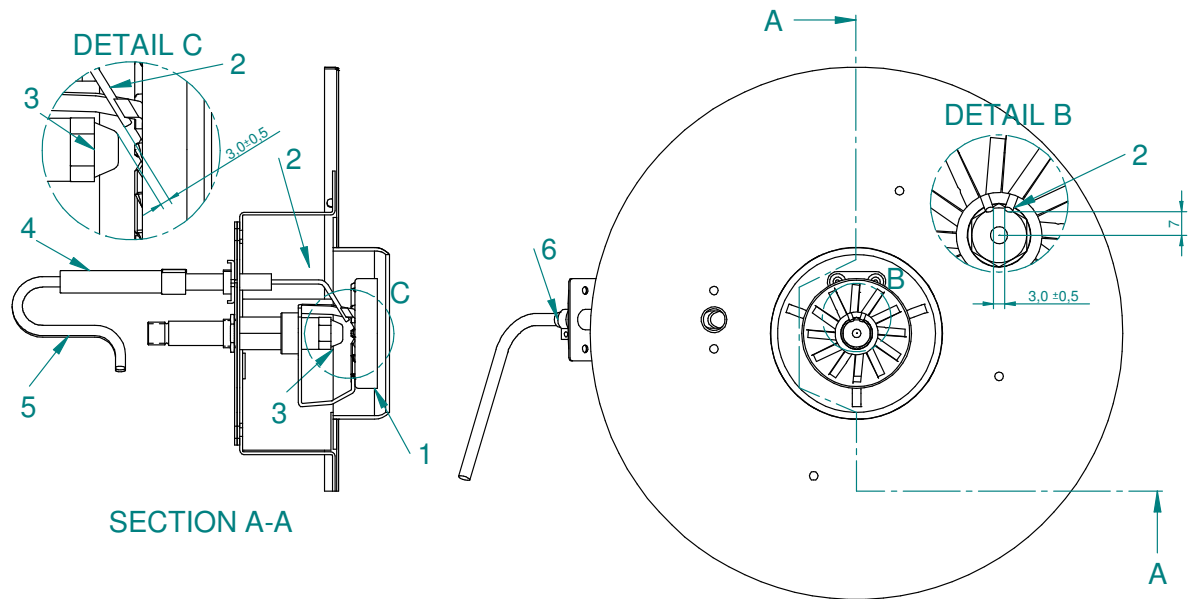
- Open the fuel valve and check whether the heater and the hoses are tight and leak free and do not contain air.
- If the heater has been moved, check whether the hoses are connected properly. Connections that slip off or that are improperly mounted can create a fire hazard.
- Check that the wiring is properly secured.

Finally, carry out all the checks that are performed during heater installation (refer to Performing checks :

1. Measure the pump pressure;
2. Measure combustion values;
3. General heater operation.

Place and close the access panels once you have completed all checks. The heater may now be used again.

### 6.3 Cleaning the burner unit



#### Heater burner units

- 1 swirl plate
- 2 ignition electrode
- 3 nozzle
- 4 Ignition electrode guard
- 5 Ignition cable
- 6 LDS Photocell

Clean the burner unit as follows (see also figure ):

1. Close the oil supply.
2. Open the body access panel.
3. Loosen the wing nuts of the burner unit and remove it from the heater.
4. Clean the swirl plate (1) and the ignition electrode (2).
5. Make sure the burner unit adjustments correspond with the electrode distance dimensions (See figure above).
6. Check that the oil system is leak-free and does not contain air, and that all hoses are attached correctly.
7. Replace the burner unit; retighten the wing nut and close the access panel.

Clean the various parts with a soft brush ,a cloth or compressed air.

Pay attention to dirt building up on the stabilizer, the ignition pen and photocell.

The distance between the electrodes should be  $3 \pm 0,5$  mm and the distance between the electrodes and the nozzle should be  $3 \pm 0,5$  mm.



#### **6.4 Changing fuel / oils type**



The heater is suited for different types of fuel, paraffin, kerosene, diesel. The pump pressure has to be set up right and in some cases the nozzle has to be changed.



To ensure the instructions below are carried out safely, it is recommended having these carried out exclusively by a service technician.

1. Close the oil supply.
1. Open the body access panel.
3. Loosen the wing nuts of the burner unit and remove it from the heater.

Disassemble the burner unit:

Take the new injector and assemble everything again.

Look at the table with the technical details in the back of this manual for the proper diameters from the nozzles and the right pump pressure.

When everything is assembled again, make the following checks:

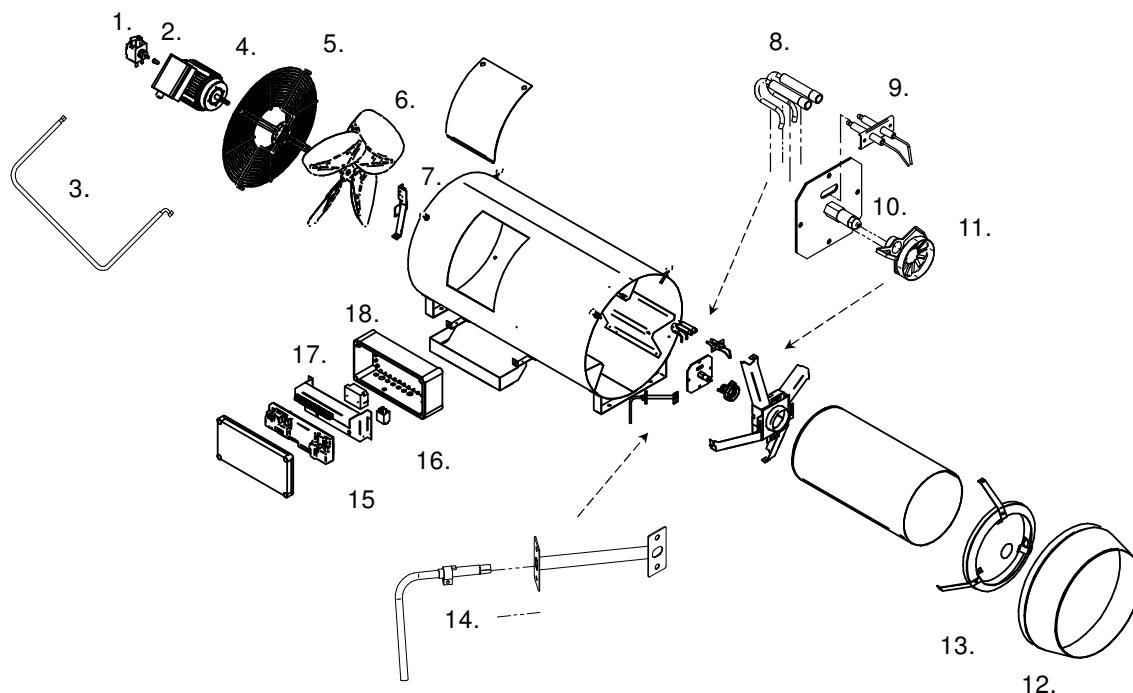
- Open the fuel valve and check whether the heater and the hoses are tight and leak free and do not contain air.
- If the heater has been moved, check whether the hoses are connected properly. Connections that slip off or that are improperly mounted can create a fire hazard.
- Check that the wiring is properly secured.

Finally, carry out all the checks that are performed during heater installation (refer to Performing checks :

1. Measure the pump pressure;
2. Measure combustion values;
3. General heater operation.

Place and close the access panels once you have completed all checks. The heater may now be used again.

## 6.5 Spare Parts



Nr.	Name	75	100	120
1.	Fuel Pump paraffin and diesel	GD3452	GD3452	GD3452
2.	Coupling motor/pump	IP200723	IP200723	IP200723
3.	Oil hose complete	GD3454	GD3454	GD3454
4.	Fan motor	IP4805	IP4805	IP4805
5.	Fan guard	GD4300	GD4300	GD4300
6.	Fan blade	IK4220	IK4212	IK4222
7.	Vane switch assembly	GD3409	GD3409	GD3409
8.	Ignition cable	GD3400	GD3400	GD3400
9.	Ignition electrode	IP3934	IP3934	IP3934
10.	Nozzle Diesel & Paraffin/kerosene	IP3249	IP3251	IP3232
11.	Burner stabilizer	IP200667	IP200667	IP200667
12.	C cone	GD2810	GD2810	GD2810
13.	After burner plate assembly	GD2812	GD2812	GD2812
14.	LDS photocell flame sensor	GD3380	GD3380	GD3380
15.	Burner control unit	IP5904	IP5904	IP5904
16.	Fan relay	IK5200	IK5200	IK5200
17.	Ignition transformer	GD3404	GD3404	GD3404
18.	Control box	GD4820	GD4820	GD4820
	Wire boom 230V	IP5914	IP5914	IP5914
	Wire boom 24V DXB	IP5918	IP5918	IP5918
	Service/Reset switch incl. Cover	GD3500	GD3500	GD3500

## 7 Problem solving

### 7.1 General

When it turns out that the problem is **not** caused by the external circumstances (i.e. no electric supply power or no oil), please take the following instructions into account. Please remember the built in waiting times of the heater (do not react too soon!) and the code on the display on the electronic circuit board.

To simplify the investigation of the failing heater please check first:

- the fuses as well as the wires and plugs in the heater for possible loose contacts.
- Use first the service/reset button to put the heater in run mode, try later the room thermostat.

### 7.2 Error codes

**Volatile lock out** : Can only be reset by hand

<b>A/0</b> Blinking	Internal failure	Defective print board
<b>A/1</b> Blinking	No flame	Within 5 sec flame, then flame failure: Cause 1 No flame: Cause 2
<b>A/4</b> Blinking	Too many flame failures	Too many flame failures on ionization: Cause 1, 5
<b>A/5</b> Blinking	Internal error	Too many problems with power supply. Try other Fase if possible. Control unit defective, change control unit.
<b>A/6</b> Blinking	Internal error	Too many problems with power supply. Try other Fase if possible. Control unit defective, change control unit.
<b>A/7</b> Blinking	Flame	Flame detection when there should not be a flame
<b>A/8</b> Blinking	Vane switch / Fan	Fan does not run: Cause 6 Fan runs: Cause 7

**Non volatile lockout**: will disappear when the error is cleared.

<b>E/0</b> Blinking	Internal defect	Defective print board
<b>E/2</b> Blinking	Selection resistance	Heater recognition does not work: Cause 8
<b>E/3</b> Blinking	Selection resistance	Heater recognition does not work: Cause 8
<b>E/4</b> Blinking	Flame safety	Flame detection when there should not be a flame: Cause 10
<b>E/8</b> Blinking	Fan / Vane switch	Fan does not run: Cause 6 Fan runs: Cause 7
<b>E/9</b> Blinking	Reset error	Too many switches on reset button: Cause 9

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**Cause 1:** Within 5 sec flame, then flames failure.

- The flame is not detected. Check the Photo cell. (resistances photo cell: no flame  $>2M\Omega$ , flame  $\pm 10k\Omega$ )
- The heater has electrically a poor earth.
- The print board is defective.

**Cause 2:**

- There is not enough oil pressure.
- The burner pressure is too low, adjust the pump pressure
- The oil valve does not open, check during ignition on 230V on the valve.
- Check whether the ignition electrode sparks, replace cable, electrode or ignition transformer.

**Cause 3:** not applicable

**Cause 4:** not applicable

**Cause 5:** Too many flame failures while burning

- Bad earth connection on the heater
- Oil pump pressure fluctuates, is too low. → check the oil supply.
- Check the photo cell resistance value, see cause 1.
- CO<sub>2</sub> concentration is too high (lack of oxygen)

**Cause 6:** System Fan is not running

- The vane switch is not in the rest position at start.
- The Fan has no power or is blocked.
- Check the fan motor relay

**Cause 7:** System fan runs

- Check if the fan is dirty
- Check if the vane switch can move freely
- Check the wiring from the vane switch
- Check if the heater is extremely dirty
- Check if the supply voltage to the heater is sufficient
- Check the fan motor relay

**Case 8:** Selection resistance error

- Check the appliance recognition part, replace if necessary

**Case 9:** Reset button error

- Too many switches on reset button in a short period of time. These error will disappear after some time, or if the main power is disconnected for a while.

**Case 10:** flame safety

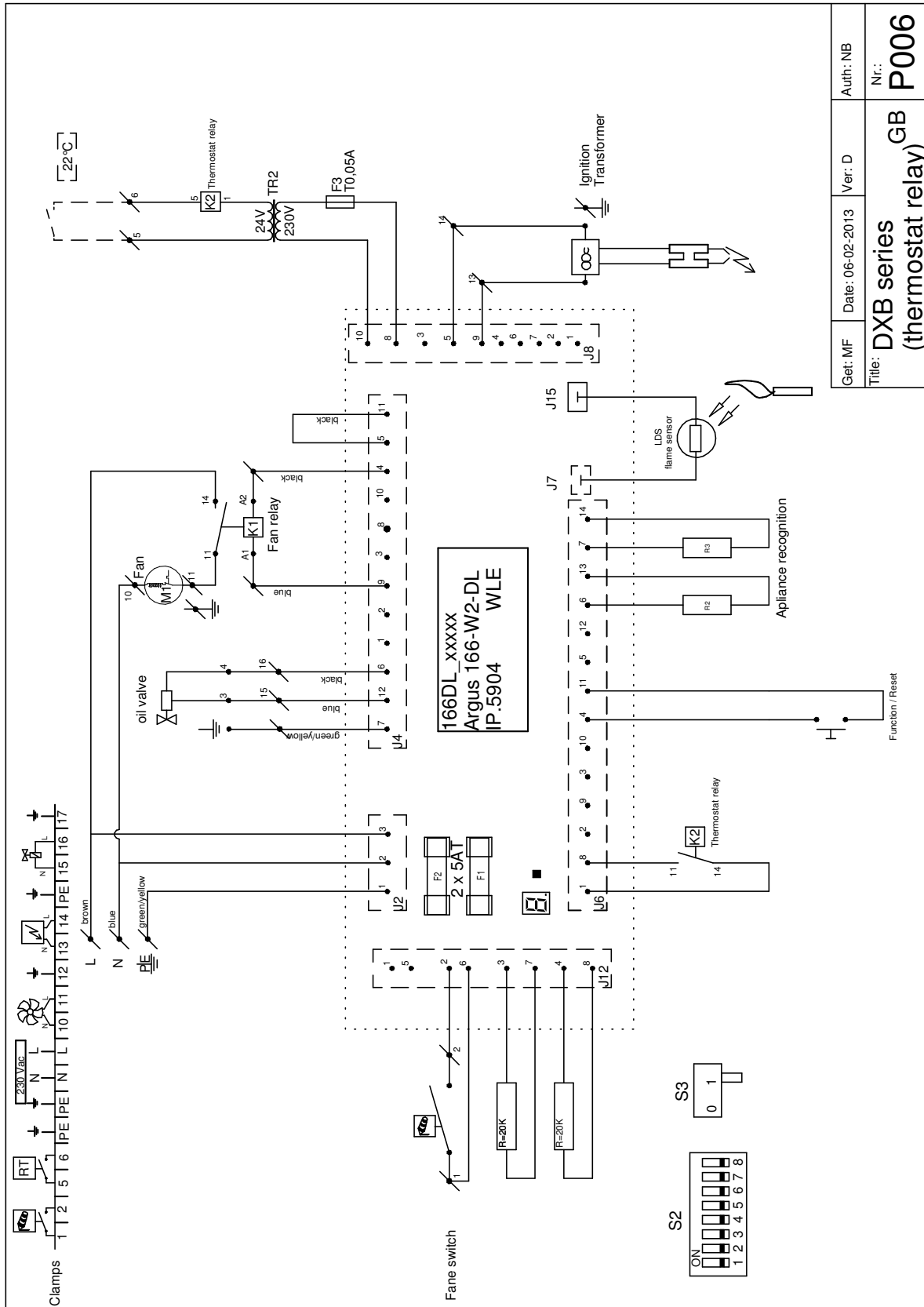
- Check the LDS photocell and wiring, the resistance of the photocell  $> 2M\Omega$ .
- (Sun)light reach the photocell → check / avoid light into burner chamber.

**Heater starts but other problems.**

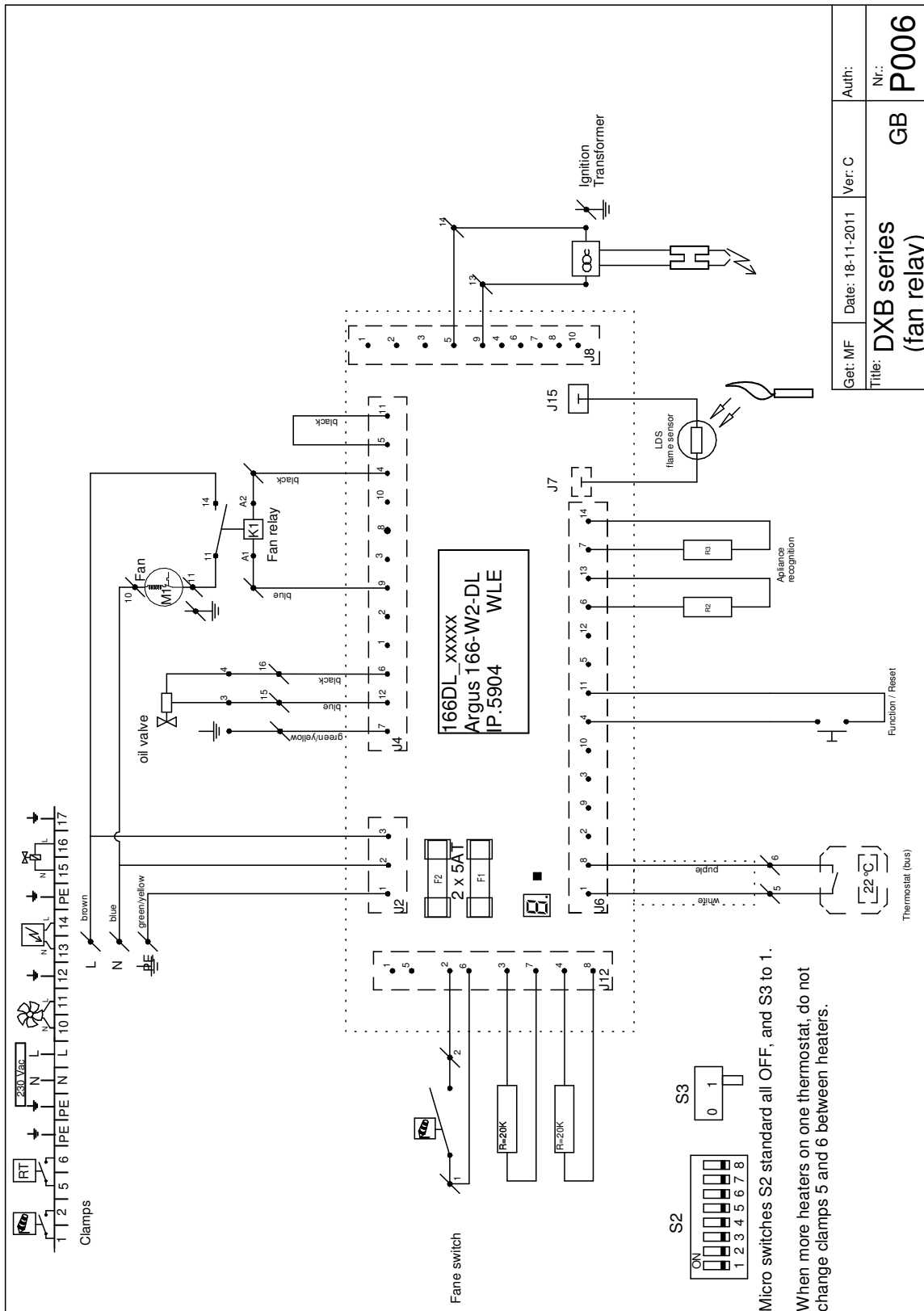
- a) Check the heater by firing it up with the reset/service button. Push it for 5 seconds and the heater fires up, push it again (2 seconds) and the heater stops. If the reset/service button is pushed for 7 seconds ("t" in the display), the system Fan will run. Push it again and the heater stops. Try to operate the heater with another room thermostat.

# 8 Wiring diagrams

## 8.1 Heater with relay in thermostat circuit.



## 8.2 Heater with no relay for thermostat



Get. MF	Date: 18-11-2011	Ver: C	Auth:
Title: DXB series (fan relay)		GB	Nr.: P006

## 9 Specifications

General	DXB75-3	DXB100-3	DXB120-3
Nominal load Qn(Hi) is output. Pn	75 kW	100 kW	120 kW
Air displacement	5000 m³/h	6000 m³/h	7000 m³/h
Throw	40 m	45 m	45m
weight	45 Kg	45kg	45kg
Dimensions (d x w x h)	655 x 1320 x 534 mm	655 x 1320 x 534 mm	655 x 1320 x 534 mm
permitted ambient temperature	0 - 45 °C	0 - 45 °C	0 - 45 °C
noise level	79 dB(A)	79 dB(A)	79 dB(A)
Fan diam. / angle (50 Hz)	Ø 508 mm / 17°	Ø 508 mm / 26°	Ø 508 mm / 33°
Fan diam. / angle (60 Hz)	Ø 508 mm / 17°	Ø 508 mm / 20°	Ø 508 mm / 22°
RPM Fan 50 / 60 Hz	1400 / 1700 rpm	1400 / 1700 rpm	1400 / 1700 rpm

CE-marking	
standard(s) against which the heater is tested	NEN-EN 60335-1; 2002 NEN-EN 60335-2-102; 2006 NEN-EN 55014 and NEN-EN-IEC 61000 (EMC) NEN-EN-IEC 60529 (IP code) NEN-EN-IEC 61558 (safety of transformers, power supply units and similar)
directives with which the heater complies	Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC
CE statement	On request

Fuel	DXB 75 Kerosene	DXB 75 Diesel	DXB 100 Kerosene	DXB 100 Diesel	DXB 120 Kerosene	DXB 120 Diesel
nominal oil consumption	7,5 l/h	7,5 l/h	10,1 l/h	9,8 l/h	12,1 l/h	11,7 l/h
nominal oil consumption	6,0 kg/h	6,4 kg/h	8,13 kg/h	8,3 kg/h	9,7 kg/h	10,0 kg/h
Nozzle / atomiser (@ 50Hz / 60Hz)	2,0 80°S	2,0 80°	2,25 80°S	2,25 80°S	2,75 80°S	2,75 80°S
nominal oil pump pressure (@ 50Hz)	8,0 bar	7,5 bar	9,5 bar	9,0 bar	9,0 bar	9,0 bar
nominal oil pump pressure (@ 60Hz)	9,5 bar	9,0 bar	9,5 bar	9,0 bar	9,0 bar	9,0 bar
diameter of oil pipe	6 mm	6 mm	6 mm	6 mm	6 mm	6 mm

Electricity	
mains voltage	230 V
required mains frequency	50 Hz or 60 Hz
maximum power intake (@50 Hz)	3,1 A
electric power (@50Hz)	700 W
maximum power intake (@60 Hz)	3,6 A
electric power (@60Hz)	800 W

### 9.1 Dimensions

