

# Operating Manual

# Oil Fired Heaters

## BV 135



Perfection is our aim.



# EC – Declaration of Conformity

according to machine directive 2006 / 42 / EEC

## appendix II A

### Structure of the machine

Mobile oil-fired heaters ( with and without heat exchanger )

### Description:

BV 135

**is designed, constructed and manufactured in accordance with the above-mentioned directive and the low voltage directive 2014 / 35 / EEC and also EMV 2014 / 30 EEC.**

### The following harmonized standards have been used:

- DIN EN 61000-3-2                      EMC Limits for harmonic current emissions
- EN 55011                                EMC Requirements
- DIN EN ISO 12100                    Safety of machinery
- EN 60335                                Safety of electrical machines
- DIN EN ISO 13857                    Safety of machinery

Note: The observance of DIN EN ISO 13857 refers only to the protection against accidental contacts of the fan. For the complete fulfillment of EN 13857 the user resp. installer is responsible.

### The following national standards, directives and specifications have been used:

DIN EN 13842 „Mobile oil-fired heaters ( with and without heat exchanger )“

Mönchengladbach 25.06.2014

Place, Date



Signature

Managing Director

Title

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### **Important Notice!**

1. Use only clean (if possible filtered) Heizöl EL (Diesel).
2. Clean fuel filter regularly.

### **ATTENTION :**

Notice: Heizöl EL changes viscosity in low temperature.

This heater is **standard** equipped with a fuel preheating device. This requires also during the heating interruptions (during the night, on weekends) tension, so it remains effective. Therefore, leave the plug into the socket.

When ordering spare parts please give the type, serial number of the heater and the part number, otherwise a correct delivery is not possible.

The admissible ambient temperature for securing the function of the control is – 15°C and max. + 50°C. This is to be especially taken into consideration whilst drying grain or using the heater outdoors. The heater resp. the flame control has to be protected against direct influence from the bright sun light.

**Technical specifications are subject to changes without any notice!**

## **FUNCTIONAL CHARACTERISTICS**

The heater is equipped with mounted fuel tank, low-maintenance axial fan, high pressure spraying burner with automatic flame control, cable with plug, socket for room thermostat and quintuple filtersystem.

### **Operating System:**

The fan runs after starting the heater or in case of heat demand. Fuel is drawn from the tank and pumped into the solenoid valve. The solenoid valve opens and allows fuel to flow to the nozzle. The spark between the electrodes will ignite the atomized fuel. The light of the flame activates the photo-cell and ignition switches off automatically.

In case of disturbance or instable burning the flame control switches off the heater. The operation lamp of the burner control flashes. A restart can only be made after reset of the burner controller. In case of overheating of the machine the safety thermostat (STB) switches off and blocks all functions of the machine.

The manual unlocking of the safety thermostat can only be done after elimination of the fault and cooling of the heater.

Switching to position „O“ closes the solenoid valve and the flame is extinguished. The fan will keep running until the cooling cycle is complete.

## **READ CAREFULLY BEFORE STARTING YOUR HEATER!**

### **Important Notice!**

This unit is a space heater with indirect heating, heat exchanger and exhaust. The heater may not be set up near explosive or flammable materials and may not be used in explosion or fire endangered rooms. It may also not be used in areas with high dust development. The heater should be positioned at adequate distance to flammable material such as wood etc. It is essential that there is a sufficient ventilation of the room. The heater may not be worked on or transported during operation.

If the heater is used for drying of grain the set-up has to be in a correct angle in front of the radial fan or alternatively with sufficient distance. This has to be done so that the function of the heater is not influenced by the immense suction of the radial fan.

The heater is **standard** equipped with a fuel pre-heating device. This requires also during the heating interruption (during the night, on weekends) tension so it remains effective. Therefore leave the plug into the socket.

## TECHNICAL DATA

<b>Type:</b>		<b>BV 135</b>
Voltage	V/Hz	230/50
Rated current	A	2,43
Nominal capacity	kW	0,56
Protection		IP 44
Capacity	kW kcal/h	24,8 21.300
Air volume	m <sup>3</sup> /h	1.500
Pressing max. total	Pa	100
Max. fuel consumption (Heizöl EL or Petroleum)	approx. kg/h	2,09
Tank capacity	Ltr.	40
Dimensions	L mm W mm H mm	1250 490 690
Weight	kg	60
Cone	Ø mm	300
Chimney	Ø mm	150
Photo cell		standard
Thermostat for wet rooms with 10 m cable		standard
Noise level (EN ISO 11201)	dB (A)	69

## 1. **Starting**

Only well instructed persons should start and work with the heater.

Before starting the heater check for obvious defaults, proper setting up and as well the electr. supply.

- a) Ensure a stable set up of the heater.
- b) Fill the tank with clean Heizöl EL (Diesel).
- c) Install exhaust system according to the drawing, see page 10.
- d) Power supply: Connect heater to the 230 V - 50 Hz power supply.
- e) Put room thermostat on suitable place in the room and set to desired temperature. (Must be above ambient temperature).

### **A T T E N T I O N**

The heater is standard equipped with a fuel preheating device. The function of the preheating is only given if the heater remains on stand-by with plugged-in electrical plug for appr. 15-20 min. before the first starting.

During this time the oil is preheated so that the sorting out of paraffine is avoided.

During service always obey the surface temperature from the fuel preheating device. Disconnect the heater first from the power supply and let it cool down (danger of burning).

### **Operation "Heating without room thermostat"**

Set main switch to position "1".

The automatic heating operation is started when the switch is set to position "1".

The heaters works continuously, the delivered blind plug must be connected with the thermostat socket.

### **Operation "Heating with room thermostat"**

The heater works automatically and depends on the temperature. Remove the blind plug, connect the plug of the room thermostat with the thermostat socket. Adjust required temperature on the room thermostat, turn again main switch to position "1". Set room thermostat to desired temperature.

### **Operation with warm air hose**

The device can be operated with a warm air hose (max. length 7.60 m). This is only to be used in connection with a hose adapter. It is essential to ensure proper installation; reducing the diameter can lead to overheating and shutdown of the device (safety thermostat)!

## **2. Stopping of the heater**

Set main switch to pos. "O", or reverse the thermostat below the present state.

If the heater has been running on position "Heating" (Heizen) it has an automatic cooling of the heater until it completely shuts off.

### **Important!**

Pull the main plug only after the heater has cooled down and stopped.

Before repairing or servicing always pull the main plug.

## **3. Safety and control devices**

In case there is no flame - for example caused by lack of fuel - the oil burner relay shuts off the heater. The control lamp on the side of the burner reset button lights up.

After the cause of the malfunction has been cleared the reset button can be pushed, and the burner can be restarted.

In case the limit switch has shut off, check the malfunction and eliminate it (overheating).

After eliminating of the overheating unlock the limit switch by removing the cap on the right side and pushing the unlocking key (after cooling down of the heater). Then screw on the protection cap.

### **Room thermostat**

The thermostat has a temperature regulation range of 5° C - 30° C and shuts the burner off after the preset temperature has been reached. The fan continues to run in order to cool the heater down to a temperature of appr. 30° C before it stops. After the room temperature drops several °C the heater automatically starts running again.

#### **4. Cleaning**

The heater should be cleaned minimum once a year including combustion chamber and burner head. Also the fuel filter should be cleaned minimum once a year or even be changed depending on contamination level.

##### **Cleaning of the fuel tank**

If the heater has not been used for a longer period of time and also after each heating period clean the fuel tank by removing the drain plug on the bottom of the tank. Collect the dirty fuel in an external container.

Rinse the fuel tank several times with clean fuel, no dirt particle should remain in the tank. Check the gasket of the drain plug and replace it if necessary, then install the drain plug again.

Fill the tank with the clean fuel (Heizöl) and let the heater burn for 3 minutes, and the pump will be protected against corrosion.

**Before repairing or servicing the heater pull the main plug!**

**Repair or service of electrical components may only be made by authorized specialists!!!**

## 5. Trouble Shooting

Repairs or service of electrical components may only be made by authorized specialists!

<b>Fault</b>	<b>Cause</b>	<b>Remedy</b>
Main switch on position 1, heater does not start	No electricity.	Check if there is power.
	Setting of room thermostat. The preset temperature is lower than the ambient temperature.	Reset thermostat.
	Safety thermostat shuts off.	Push reset button of safety thermostat. Restart heater.
Burner starts shortly and shuts off. The red lamp lights up.	Lack of fuel.	Check oil level in tank.
	Air bubbles in the suction line.	Check fuel suction - and return line. Control-lamp = push reset button.
On initial start the burner runs shortly and shuts off.	Lack of fuel.	Push the reset button until enough fuel is injected.
	Air bubbles in the suction line. There is not enough fuel.	
Burner shuts off during operation.	Fuel filter dirty.	Clean (replace) fuel filter.
	Photo cell dirty.	Clean the photo cell carefully.
	Nozzle dirty or defect.	Replace nozzle.

If your heater does not work properly in spite of these checks, call your nearest service.

## 6. Important Notice

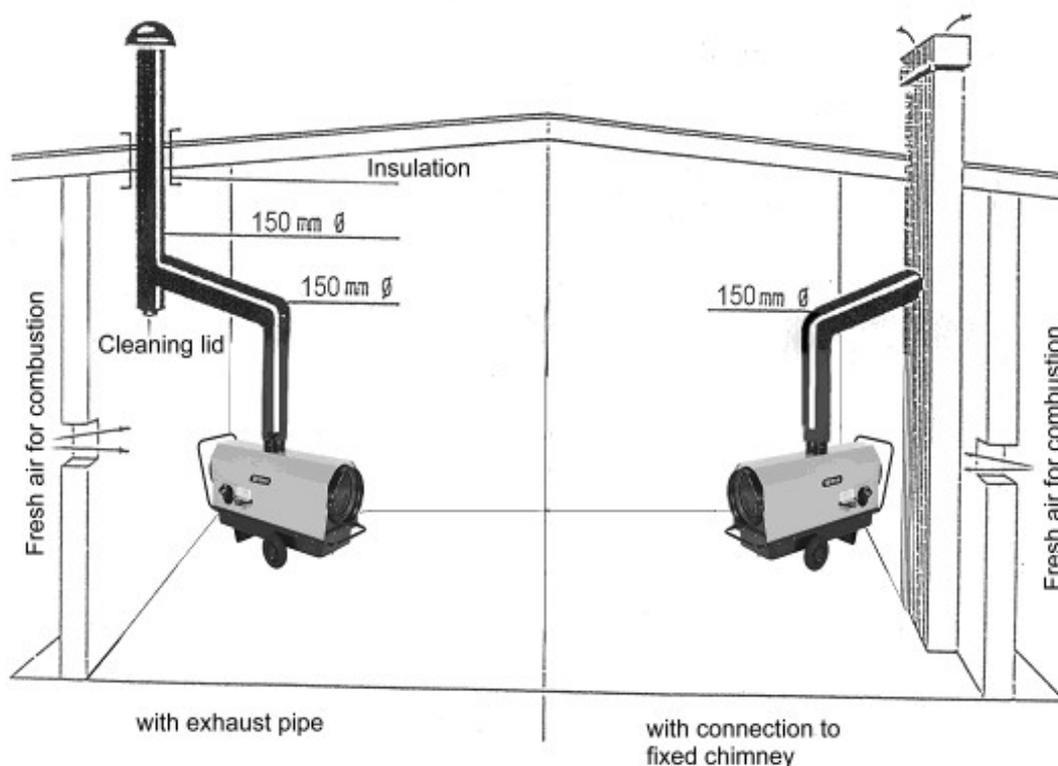
These units are oil fired space heaters, equipped with a chimney connection. If connected to a chimney the installation should be made only according to the below drawing.

The connection should be made only with a fixed chimney according to the regulations or an installed exhaust pipe as shown in the drawing.

Never start the heaters connected to just an exhaust pipe which has been lead through the wall.

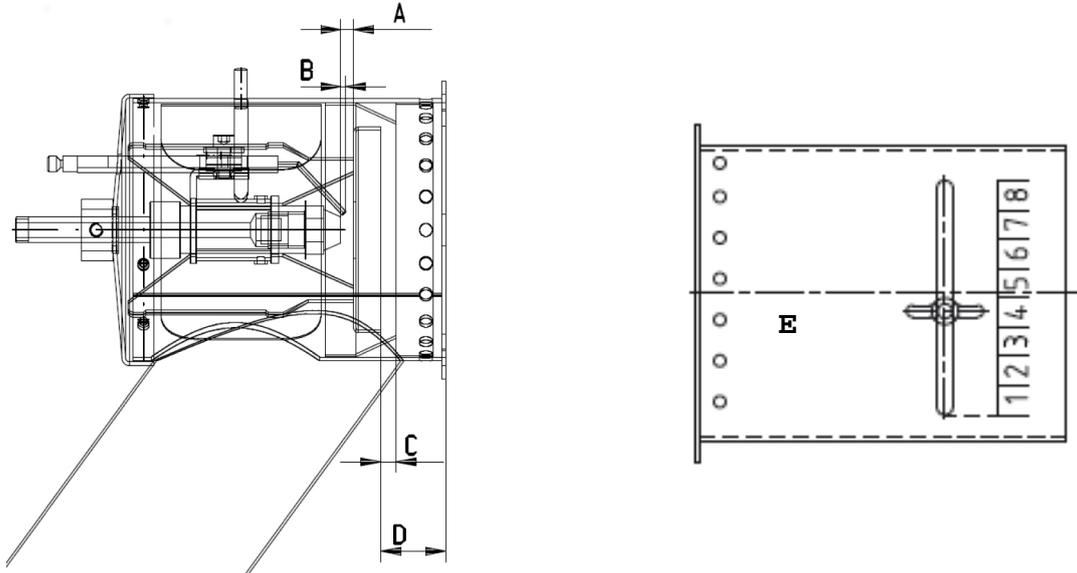
Use it only with an additional exhaust pipe, minimum above the ridge. In case of horizontal outlet through the wall, use only with T-shaped pipe, refer below drawing.

Top of exhaust pipe or chimney should be 0,5 m above ridge.



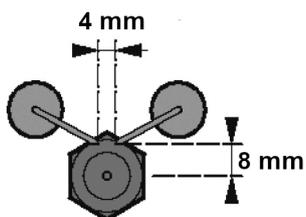
The horizontally laid exhaust pipe up to the actual chimney must be installed with a slope of at least 10%.

## 7. Adjustment of the burner head

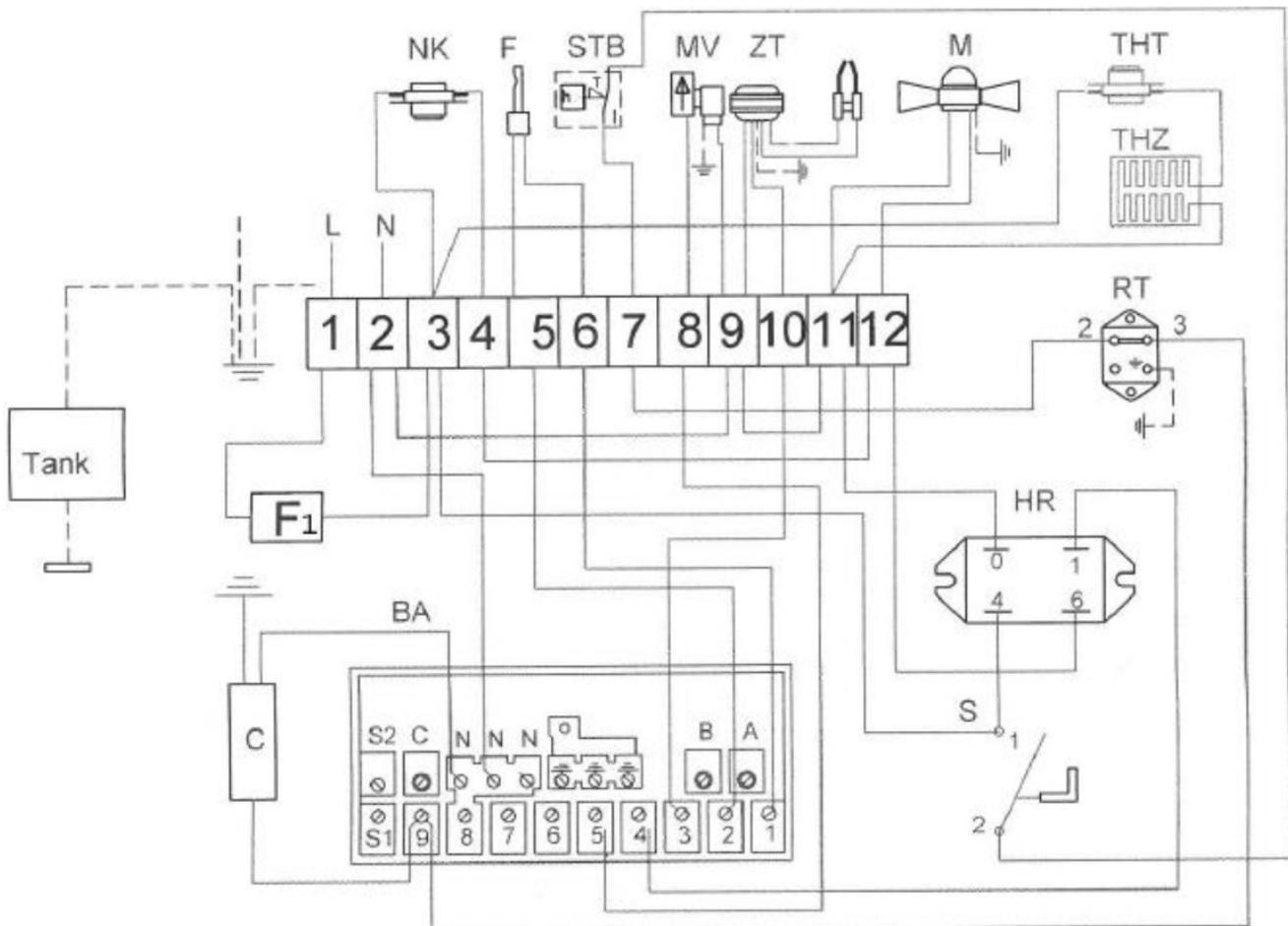


Measure A	4 mm
Measure B	2 mm
Measure C	0 mm
Measure D	9 mm
Measure E	Between 2 and 3 (for approx. 12 % CO <sup>2</sup> )
Burner Nozzle	Danfoss 0,50 usgal/h 80° S
Pump Pressure	12 bar

## Adjustment of the ignition electrode



### 8. Wiring Diagram BV 135



#### Legend

NK	= Thermostat - Fan	THZ	= Tank Heating
F	= Photocell	RT	= Socket for thermostat
STB	= Safety Thermostat	BA	= Controller - lower part
MV	= Solenoid Valve	HR	= Relays
ZT	= Ignition Transformer	S	= Switch
M	= Motor	C	= Condensor
THT	= Thermostat Tank Heating	F1	= Fuse

**9. Spare Parts List**

**From machine no. 46-0001**

<u>Pos.</u>	<u>Order-No.</u>	<u>DESCRIPTION</u>	<u>Qty.</u>
01	6162340	Cover	01
02	6162341	Fan Guard	01
03	6162318	Fan Housing	01
04	6162319	Fan	01
05	6162405	Engine	01
07	3308072	Coupling Motor-Pump	01
08	3309764	Pump	01
09	3300064	Nipple 1/4" x 7 mm	01
11	3308074	Solenoid Valve	01
12	6163416	Elbow	01
13	6162406	Condenser	01
14	6162407	Ring	02
15	6162475	Copper Connection	01
16	6162409	Elbow	01
18	6162302	Electrode	01
19	6162476	Slide	01
21	6162303	Nozzle Holder	01
22	6162308	Baffle Plate	01
23	6162479	Nozzle	01
24	6162301	Burner Head	01
25	6162734	Flame Control	01
26	6162417	Bracket	01
27	6162418	Thermostat	01
28	6162419	Bracket	01
29	6162323	Combustion Chamber	01
31	6162422	Lead Through	01
32	6162423	Lead Through	02
33	6162424	Cable with Plug	01
34	6162331	Ignition Transformer	01
35	6162426	Strip Terminal	01
37	6162481	Strain Relief Bushing	01
38	6162428	Switch	01
39	6162808	Quick Coupling for Room Thermostat	01
41	6160160	Jumper	01
42	6162430	Contactora	01
43	6163035	Control Box	01
44	6162342	Housing Bottom	01
46	6162432	Sustainer	01
47	6162343	Side Part - Right	01
48	6162344	Side Part - Front/Back	02
49	6162345	Side Part - Left	01
50	6162436	Fuel Filter	01
51	6162490	Tank Cap	01
52	6162438	Filter	01

**9. Spare Parts List**

**From machine no. 46-0001**

<b><u>Pos.</u></b>	<b><u>Order-No.</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>Qty.</u></b>
53	6162346	Fuel Tank	01
54	6162440	Gasket	01
55	6162441	Screw	01
56	6162347	Handle	01
58	6162444	Wheel	02
59	6162445	Ring	02
60	6162446	Cap	02
61	6162447	Fuel Line	m
62	6162483	Switch Panel	01
63	6162484	Connecting Pipe	01
66	6162315	Outlet Cone	01
68	1130046	Clamp Hose	02
70	6162304	Burner Cover	01
71	6161318	Safety Thermostat	01
72	6162306	Ignition Cable	02
73	6162454	Cable with Plug	01
74	6162754	Control Box Socket	01
75	6162486	Grommet	01
77	6162300	Spacer	02
78	6162456	Gasket	01
79	6162457	Cleaning Lid	02
80	6162458	Gasket	02
81	6162348	Plate	01
82	6163450	Condenser	01
83	6162460	Disc	02
87	6162461	Bracket	01
92	6162349	Handle	01
98	6162487	Isolation Plate	01
99	6162488	Fuse	01
100	6162489	Fuse Holder	01
101	6162465	Cover for Pre-Heater	01
102	6162466	Pre-Heater	01

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BV 135 Exploded view

