USER MANUAL

(1/06)

POLAR WHT 45

Portable fan heater for water-carried central heating

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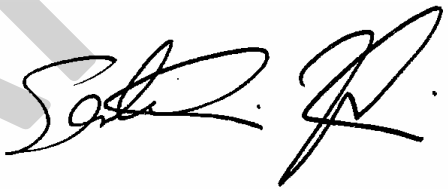
EU DECLARATION OF CONFORMITY

EU:N VAATIMUKSENMUKAISUUSVAKUUTUS

It is ensured through internal quality control that the equipment specified here comply with the requirements of the current Directive(s) and the relevant standards at all times.
Sisäisellä laatuvalvonnalla on varmistettu, että tässä eritelty laite vastaa nykyisten direktiivien ja standardien vaatimuksia.

Type of equipment Laitetyyppi	Water-to-air heater Kiertovesitoiminen lämpöpuhallin
Type of designation Tyyppimerkintä	POLAR WHT 45
Directives Direktiivit	Machinery Directive – Konedirektiivi: 89/396/EEC Low Voltage Directive – Pienjännitedirektiivi: 73/23/EEC EMC-directive – EMC-direktiivi: 89/336/EU
Manufacturer Valmistaja	**POLARTHERM OY** Polarintie 1 FIN-29100 Luvia, Finland
Date Päiväys	Luvia 9.1.2006

Signature
Allekirjoitus



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1. Introduction

Before using the heater please read this manual carefully. This manual should be always situated close to the heater.

Terms of warranty:

WHT heaters have a warranty of 1 year for defects in material or manufacturing. All use, placement, maintenance etc. of the heater which is not in accordance with the instructions specified in this manual will lead into avoidance of warranty.

2. Safety instructions

WHT heaters are manufactured according to the latest level of technical development. Improper use of the equipment by untrained personnel may lead to dangerous situations.

- local building regulations must be complied
- person using the equipment is responsible for safe installation of the equipment and electricity
- equipment must be situated only on a level surface. NOTE! DANGER OF CAPSIZING due to high equipment
- installation of the equipment, water couplings and electricity is allowed only by trained professional personnel
- the equipment should not be placed or used in highly combustible or explosive environment
- the equipment should be placed outside passages, min. 1 m safety area around the heater
- water hoses should be placed and protected to prevent them from being damaged
- when moving equipment while connected to water circulation one should be very careful to avoid unnecessary water damage
- water hoses must meet the standards for pressurized hoses
- roll cage and air filter must not be removed
- equipment can only be used within the specified power limits
- the guard net for incoming air must be clean and free from any objects
- filter must be cleaned or replaced regularly
- discharge opening must not be closed when using the equipment
- any objects are not to be placed inside the heater
- the equipment must not be exposed to water jet
- water leakage inside the equipment must be avoided
- external electric cables must be protected from damage

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3. Placement and installation

- equipment should be placed in a way which does not cause direct air flow to lounges or work spaces of personnel
- equipment must be placed only horizontally on even floor. NOTE! DANGER OF CAPSIZING!
- enough free space (min. 250 mm) should be left outside the equipment onto the incoming air side to assure enough air flow
- hoses / pipes and heat exchangers should be connected in a way which does not cause stress or distortion
- the boiler and water pump power should be sufficient when the equipment is connected to an existing water heating system
- make sure that the 3 phase fan is rotating in the right direction (very strong air outflow). In case the rotating direction is not correct turn the direction from the electric plug (plug is equipped with a phase turning switch)

4. Information on water cell and circulated water couplings

Heat exchangers are made of copper pipes and jointed aluminium baffles. Other parts are made out of metal or steel.

- standard delivery: circulated water coupling consists of 1" aluminium cam-lock joints with female joint for incoming water and male joint for return water
    - incoming water is below (left); elbow joint, reducing double nipple and male cam-lock joint on the incoming side
    - return water is above (right); elbow joint with air valve, reducing double nipple, closing valve and female cam-lock joint
- made to order: joints etc. removed and circulated water is connected straight to water cell couplings (R1 $^{1}/_{4}$" external thread)
- all threaded couplings are secured with glue (Loctite 577)
- max water temperature 130 °C
- max water pressure 16 bar
- **WARNING! Heat exchanger are not suitable for steam or oil use**

5. Connecting to heating equipment

Make sure that the heating and water pump power meet the technical specifications of the equipment. The heater will work properly only when the incoming water temperature and water flow are sufficient.

After installation the air should be removed carefully from the heater water cell. The air pockets left inside the heater will lower the output power.

Important!
If the couplings should be tightened or other plumbing should be done use a suitable tool to avoid any damage to pipe connections of the water cell.

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6. Preventing the equipment from freezing

The heater is equipped with a freeze protection thermostat to prevent the equipment from freezing.

When the discharge air temperature goes below +4 °C the thermostat stops the fan (thermostat value should not be changed). The low temp sensor is situated inside the heater on suction side.

NOTE!
At times the low twmp thermostat may prevent the fan from working normally. This may happen for instance when the heater is taken into use straight from a cold warehouse etc. when the sensor is not warm enough. To warm up the sensor you may use just fingers and the fan will start after a while.

Warning!

- **The heater does not empty water throughout by itself. To empty the heat exchanger totally from water it is necessary to use compressed air.**
- **In freezing conditions make sure that the water cell is empty. If it is not possible to empty the cell mix antifreeze with the water.**
- **Warranty is void in cases where the cell is frozen!**

7. Electric connection

Neglecting proper user manuals and electrical diagrams or changing them may cause malfunctions and other consequences. In these cases the warranty is void.

Connecting the equipment

The heater is connected to electric power supply (400/230 V / 3N~ / 50Hz / 16 A) using a 16 A electric plug. Plug is equipped with a phase turning switch (to enable turning the rotation direction of the fan).

The equipment is equipped with a control box containing all necessary electric couplings (see 12. Electrical diagram). The fan shuts off only when the switch is turned to the “stop” position.

The heater also contains an hour counter that measures the operating time of the fan.

8. Implementation

Before first use:

- make sure that all couplings are appropriate
- check the safety distances around the equipment
- cabling should be made according to existing regulations
- make sure the air intake filter is clean
- make sure that the discharge opening and sound absorber are free from any objects
- make sure that the fan is rotating in the right direction

During first use:

- check the balance of the fan blade

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- check the equipment for any possible vibration
- check the installation protection and tightness of the plumbing / hoses

9. Maintenance

In normal use the WHT heaters are almost maintenance free except for the air intake filter. To assure trouble-free working of the equipment the heaters must be checked regularly and cleaned if necessary.

Air intake filter should be cleaned regularly and changed into new one when necessary. Do not use the equipment without the filter!

Before maintenance:

- close the water circulation and prevent it from opening
- wait until the heat exchanger has cooled down
- stop the heater appropriately remove it from the electric network

Cleansing agents

Do not use any abrasive scratchy or agents including solvents. Soft cloth and soap solution are enough in most cases to remove the dirt.

Cleaning the equipment:

- remove the filter unit and clean or replace it with a new one
- clean the air intake openings and discharge baffles
- clean the fan blade with e.g. compressed air, mild pressure. **NOTE! Do not lose the balancing weights of the fan blade!**
- heat exchanger baffles are cleaned by blowing, vacuum-cleaning or soft brush. The most dirt from the fan blades and baffles can be removed by soap solution
- in case the fan motor holders and guard net have been removed they should be reinstalled after which the free rotation of the fan blade should be checked carefully

Maintenance precautionary measures:

- do not water the motor
- in any case do not use high pressure water or steam
- avoid damaging or bending the baffles and fan blades during maintenance and make sure not to remove the balancing weights of the fan blade

Maintenance repair:

- Always before repair unplug the equipment from electric network to prevent the heater from turning on
- In cold conditions empty the heat exchanger from water or fill it with e.g. glycol Note! Emptying the heat exchanger can only be done with compressed air.

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10. Technical information

POLAR water-to-air heater		**WHT 45**
product code		6103
nominal heat output @ 90/70 ° & 0 °C suction air	kW	45,1
voltage	V / Hz	400 / 3N~ / 50
power input	kW	2,2
nominal amperage	A	4,8
fuse size, max.	A	16
fan rotation speed	rpm	1800
air flow	m^3/h	3200
air outlet	mm	Ø 315
air outlet rubber nozzles (Ø125/95)	pcs	4
sound absorber		yes
noise level	dB(A)	70
protection class		IP 34
circulated water couplings (standard)		1" cam-lock
circulated water couplings		R$1^1/_4$" external thread
heating intermediate agent		hot water max 130 °C
water pressure, max.	bar	16
nominal circulated water flow @ nominal heat output	m^3/h	1,9 (0,54 l/s)
water cell counter pressure @ nominal water flow	kPa	4,8 (48 mbar)
dimensions (l x h x w)	mm	630x2775x950
weight (dry)	kg	164

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Circulated water (in/out) °C	intake air temperature °C	WHT 45	
		output power, kW	out-blown air temperature °C
60 / 50	+ /- 0	34,6	30
70 / 50	-15	46,1	25
	-10	42,6	27
	-5	48,8	28
	+/- 0	**34,9**	**30**
	+5	31,4	34
	+10	27,6	36
	+15	22,8	36
	+20	18,2	37
80 / 60	-15	52,9	31
	-10	49,7	33
	-5	46,1	35
	+/- 0	**42,6**	**37**
	+5	38,8	41
	+10	34,9	43
	+15	31,4	44
	+20	27,6	46
90 / 70	-15	54,0	31
	-10	50,8	34
	-5	48,1	36
	+/- 0	**45,1**	**39**
	+5	41,9	44
	+10	38,6	46
	+15	35,3	48
	+20	31,8	50
110 / 90	+/- 0	58,8	54

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11. Parts list

		WHT 45
1	Wheel, turning with brake, 2 pcs	74400
2	Wheel, 2 pcs	74410
3	Centrifugal fan	12390
4	Bumper, rubber, 4 pcs	80720
5	V-belt, SPA	73380
6	Belt pulley, fan + mounting adapter	73219 + 73220
7	Belt pulley, motor + mounting adapter	73260 + 73240
8	Fan motor	15122
9	Air intake filter (G4)	80710
10	Water cell / heate exchanger (Cu/Al) with couplings ($R1^1/_4$)	81020
11	Corner adapter 90°, contracting ($R1^1/_4$" / 1"), 2 pcs	65355
12	Double nipple (R1"), 2 pcs	65400
13	Valve (R1") + thermostat regulator with fixed temp sensor	67600 + 67700
14	Air screw	67150
15	Vent valve, automatic	67550
16	Branch tee	65500
17	Contracting nipple ($R^1/_2$ / 3 / 8")	65600
18	Cam lever joint (R1", male female, aluminium)	82450
19	Cover plugs for cam lever joints	82451
20	Sound absorber	69210
21	4-way air outlet adapter	
22	Air outlet corner piece Ø125 / 90°, 4 pcs	69220
23	Air outlet rubber nozzle, 4 pcs	80730
24	Hose clamp, 4 pcs	69530
25	Finger screw, 4 pcs	82305

See other electric parts from "12. Electric diagram"

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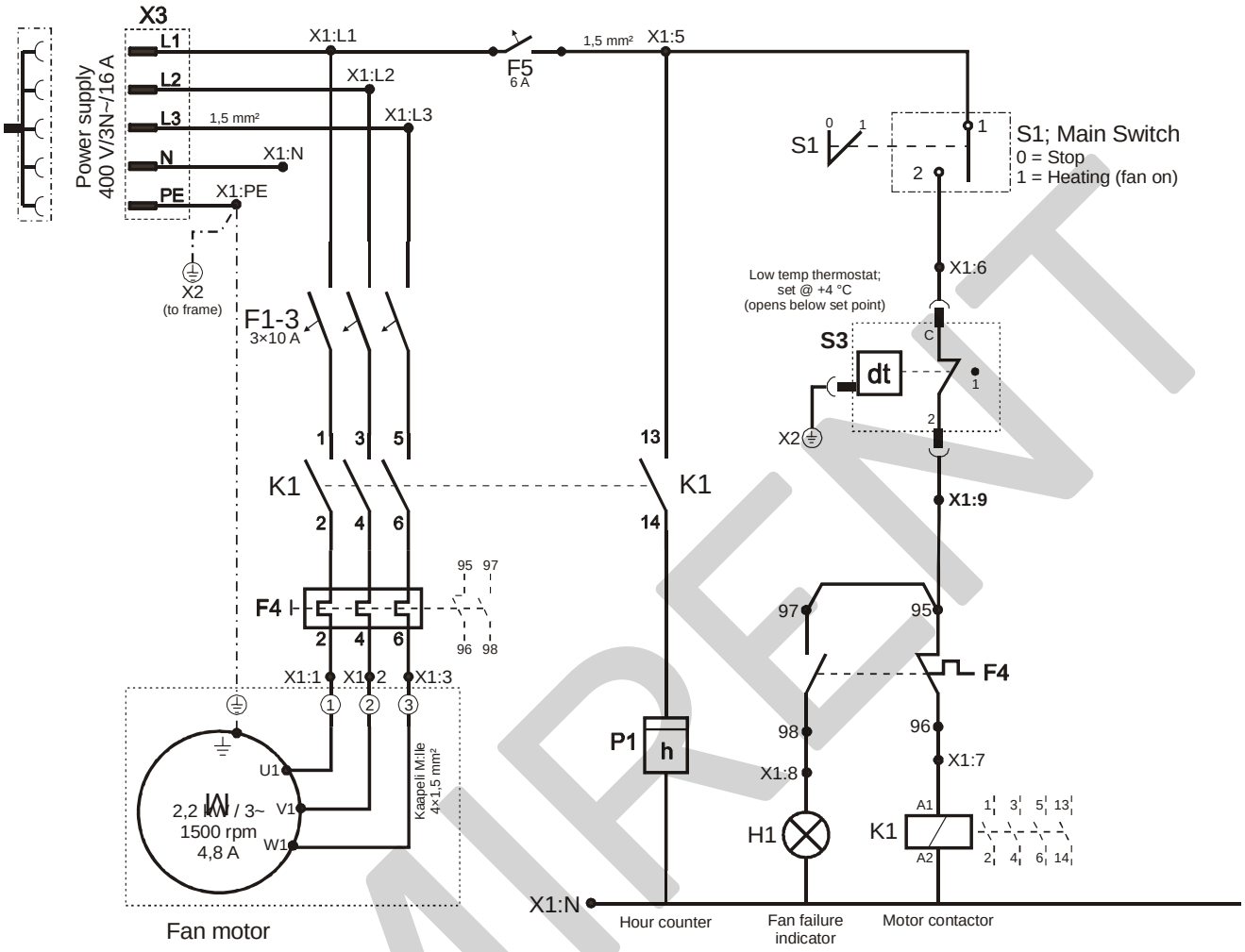
12. Electrical diagram



M	Fan motor WHT 45; Mez 400 V/3~/2,2 kW/1500 rpm/4,8 A
K1	Contactor / Danfoss CI9, 230 V
S1	Main switch, 0-1
S3	Low twmp thermostat, @ +4 °C / Imit #20211
F1-3	Fuses / 10 A
F4	Thermal relay, motor / Danfoss / 4-6,2 A
F5	Control fuse / 6 A
H1	Indicator / Fan failure / Arcolectric, 230 V, red
P1	Hour counter / 230 V
X1	Terminal block / 4 mm² / Wieland WK4
X2	Ground terminal
X3	Appliance receptacle / 3P+N+G / 16 A

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