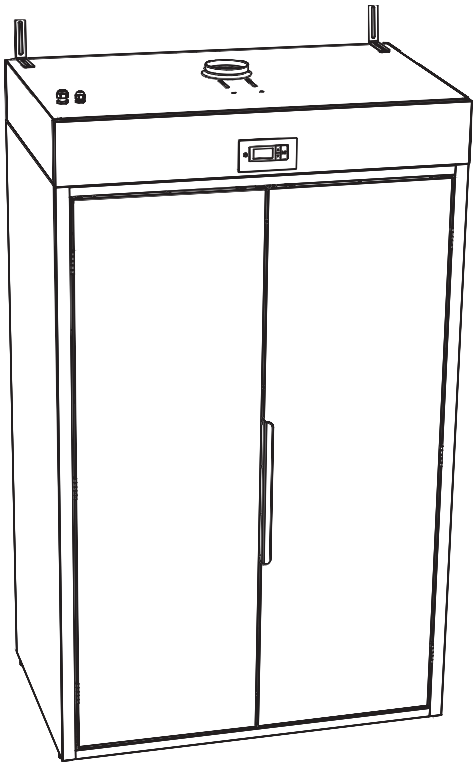
NIMO

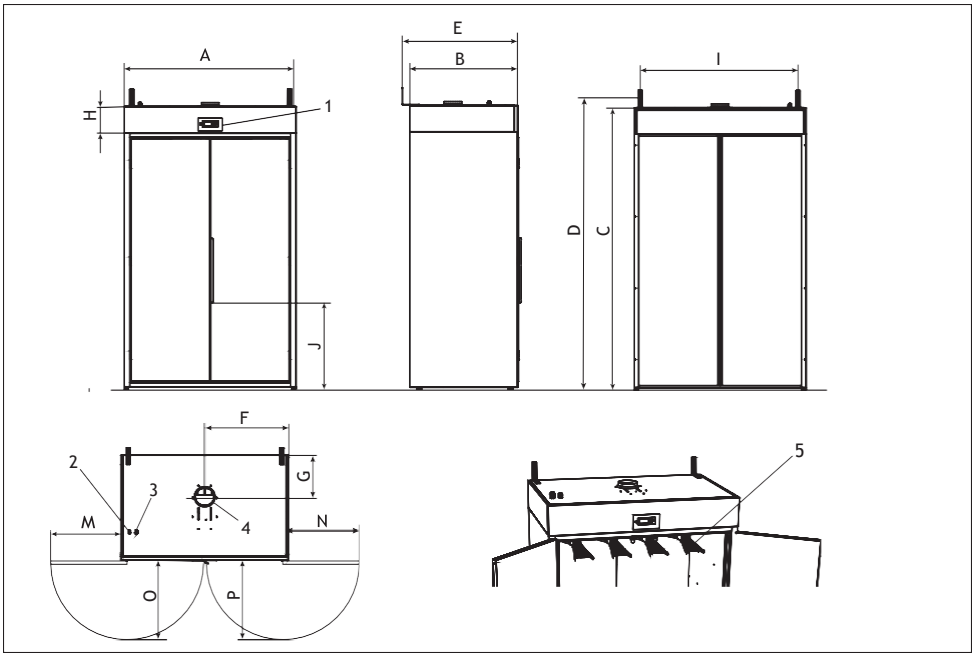
DC 120 WW



427001278

Keep this Manual so that it is
always available for future use.

Service Manual

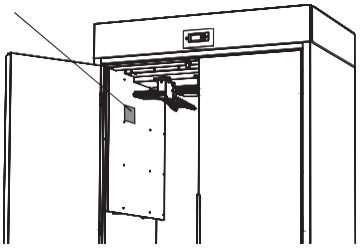


1	Control panel		
2	Electrical connection for external fan		
3	Electrical connection mains		
4	Exhaust air connection ø125 mm. Permanently connected to a separate duct or general ventilation.		
5	Hanger		

	A	B	C	D	E	F	G	H	I	J	M	N	O	P
mm	1200	750	1970	2035	820	600	300	185	1100	600	535	510	580	535

Type plate

Manufacturer: NIMO-VERKEN AB
Box 124, S-548 22 HOVA
nimo@nimoverken.com
www.nimoverken.com



Doc. No: 427001278 / 01

Content

This safe handling advice is provided to help you avoid misuse and unnecessary risks of accidents and should be read before installing and using the drying cabinet.

DO NOT MODIFY THIS MACHINE.

The drying cabinet must be installed and stored indoors.

WARNING! This equipment is intended to be used only for drying textiles washed in water. Remove all items from pockets, such as cigarette lighters and matches, before drying.

Maintenance may only be carried out by the manufacturer, its service representative or similarly qualified persons.

Only approved spare parts may be used.

Make sure the power is disconnected when performing maintenance or replacing parts.

Applies to installation within the EU

This appliance can be used by children aged 8 and above and persons (including children) with various disabilities or lack of experience and knowledge if they are supervised or given instructions on the safe use of the appliance and understand the risks involved.

Children must not play with the appliance.

Applies to installation in countries outside the EU

The appliance is not intended for use by persons (including children) with various disabilities or a lack of experience and knowledge.

They may only use the appliance under supervision or if they are given instructions on how to use the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

1.1 Symbols

	Warning!
	Read the instructions before using the appliance
	Be careful as the drying cabinet is top-heavy and can easily tip over.

2 Air flow

The cabinet operates with negative pressure in the drying compartment.

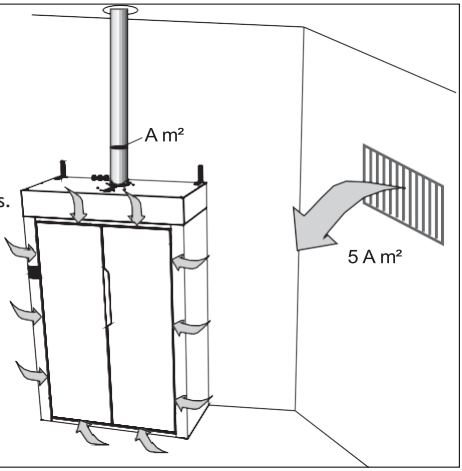
Air is drawn in by two fans through an air intake in the upper part of the cabinet and through the cabinet door slots

The air is heated by three elements on the left side and three elements on the right side of the fan unit and blows over the damp garments through two openings, one on the left and one on the right.

The heated air then carries moisture away from the garments.

The fan sucks in the moist air which is finally evacuated through the exhaust air hose (duct) on the top of the cabinet.

The exhaust air hose can be connected to the building's exhaust air duct.



Function test

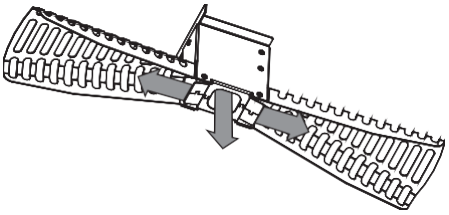
Check that:

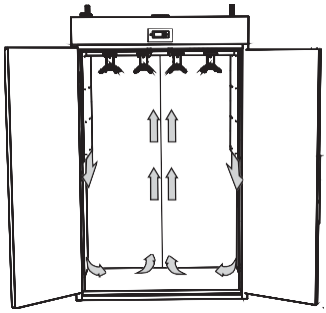
- The fan starts
- The heating works by letting the cabinet work for 5 minutes in a program with heating and then opening the door to feel if the cabinet has heated up.

Air flow inside the cabinet

The figure shows the air flow in the drying cabinet.

Air intake is available on both the left and right side as well as through the hangers.





Evacuation system

Outgoing air flows through four filters and on to the exhaust air connection.

The drying cabinet must be connected directly to the ventilation duct (not via intermediate pipes or hoses).

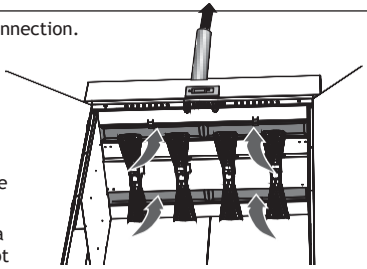
The drying cabinet has an exhaust air flow of up to 250 cubic metres per hour. This air is initially taken from inside the room where the drying cabinet is located.

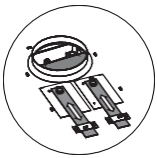
It is important to ensure that fresh air can enter the room from the outside at the same rate as that which is blown out of the room.

The area of the air intake must be five times greater than the area of the evacuation pipe. The resistance in the grid/damper must not exceed 10 Pa (0.1 mbar).

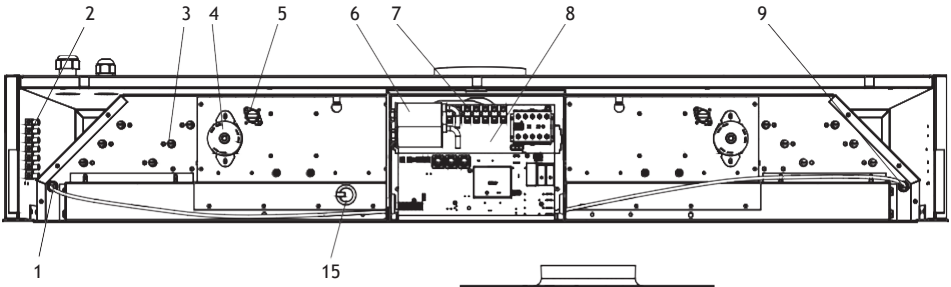
The drying cabinet works most efficiently if the air flow is optimal.

On the top of the drying cabinet there is a damper that can be adjusted to a value corresponding to the pressure drop in the duct. The maximum permissible pressure drop is 70 Pa. If the pressure drop is greater than this, an external fan must be installed. The drying cabinet has an electrical connection for an external fan

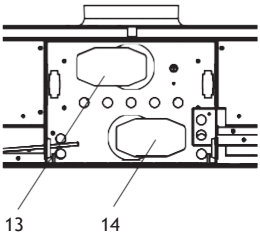




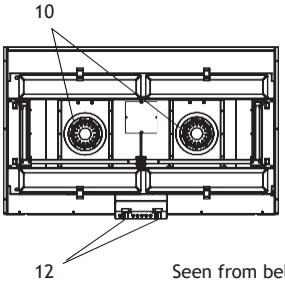
3 The fan unit components



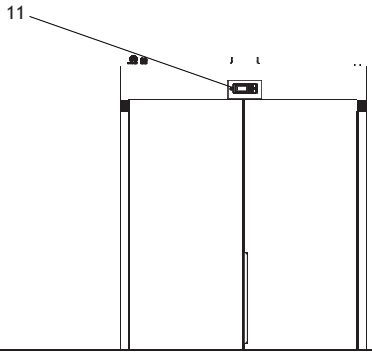
Moisture sensor: See section 7.2



With the electronics unit removed



Seen from below



1	Temperature sensor, cabinet temperature. Left
2	Terminal block, mains
3	Element
4	Main control - Overheat protector
5	Thermostat / Overheat protector
6	Capacitor
7	Internal terminal block
8	Electronics unit with circuit board

9	Temperature sensor, cabinet temperature. Right side
10	Fan motors
11	Control panel
12	Door switch
13	Damper motor, evacuated air volume
14	Damper motor, controls the drying process internally and externally
15	Moisture sensor

4 Fan motor and capacitor

Function

The cabinet has two fans that create the right air flow in the cabinet. The capacitor creates the right operating conditions for the fan.

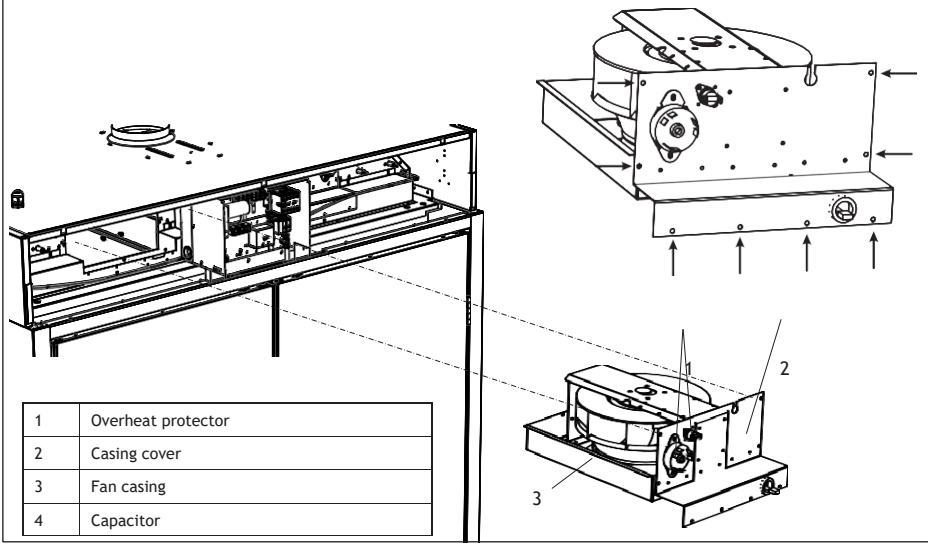
Troubleshooting

- If none of the fans are running, check that there is power supply from the electronics.
- If one of the fans is not running, replace the associated capacitor.
- If that doesn't help, replace the fan.
- Does the fan make a strange noise? Replace the fan and capacitor.

ATTENTION! When replacing the fan motor, the associated capacitor must also be replaced.

4.1 Replacing a fan

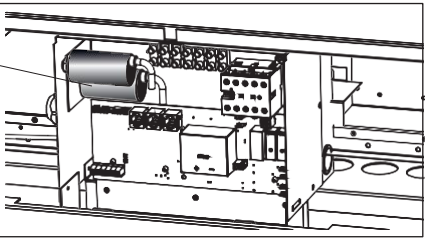
- **Disconnect the power supply from the machine.**
- Disconnect the flat pin connectors on the two overheat protectors (1).
- Dismantle the casing cover (2) that holds the fan casing (3). The casing cover is attached with 8 screws to the chassis, while 8 screws hold the fan casing.
- Loosen the screws marked with arrows.
- Pull the unit out slightly to expose the flat pin connectors for the fan. Loosen these.
- Pull out the unit out completely.
- Remove the fan from the motor mounting.
- Fit the new fan to the motor mounting.
- Slide the fan casing in so that it is easy to connect the fan cable and connect it.
- Push the fan unit in completely.
- Reassemble the casing cover and connect the cables.
- Reassemble the front panel.



1	Overheat protector
2	Casing cover
3	Fan casing
4	Capacitor

4.2 Replacing the capacitor

- Detach the capacitor associated with the replacement fan from the terminal block. The capacitor is mounted with a lock washer and nut.
- Reassemble the new capacitor with the lock washer and nut, and connect the cables to the terminal block.
- Reassemble the front panel.



5 Door switch

Function

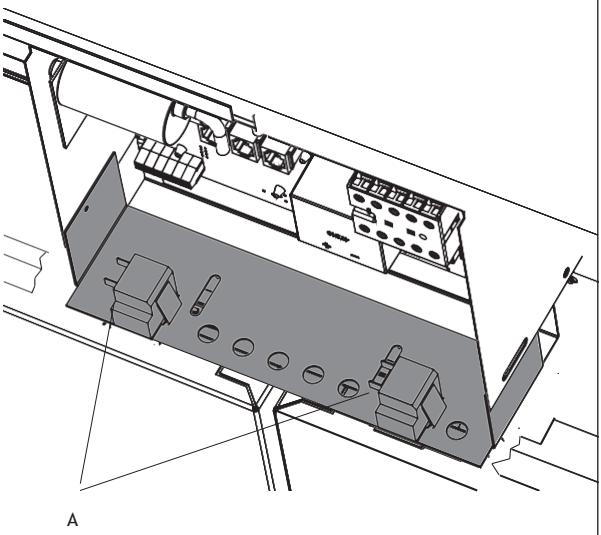
Start regulation, the cabinet will not start unless the door is closed. If the door switch is not activated, the cabinet will not start.

Troubleshooting

- **Disconnect the power supply to the drying cabinet.**
- Use a multimeter with a buzzer function.
- Check that the cables to the door switch are intact and connected properly. It is connected with 2 flat pins to the door switch and with a contact on the circuit board. The door switch contact is normally open. Check that there is contact between the pins when the switch is activated.

5.1 Replacing thedoor switch

- **Disconnect the power supply from the machine.**
- Disconnect the two flat pin connectors on the door switch to be replaced.
- Press out the door switch (A) from the door switch plate in the fan box.
- Install the new door switch in reverse order.



6 Overheat protector

6.1 Thermostat / Overheat protector for heat regulation

Function

This overheat protector interrupts the drying process if the cabinet gets hotter than the set optimum value. The thermostat is automatically reset when the temperature drops below the factory-set value.

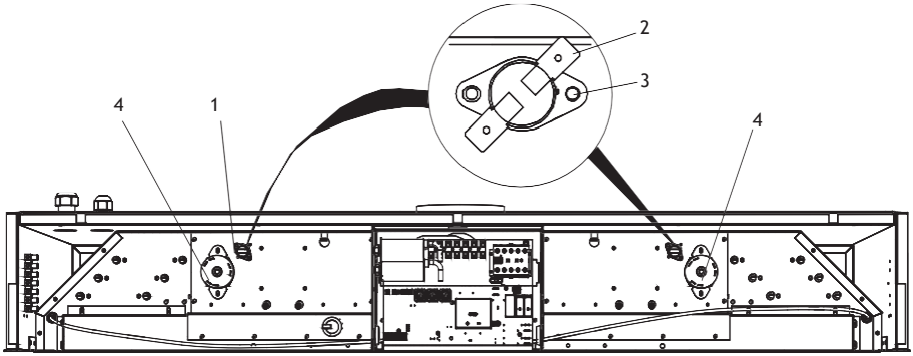
Troubleshooting

Disconnect the power supply to the drying cabinet.

Thermostat / Overheat protector for heat regulation. At normal operating temperature, the contact is closed, NC. Cut-off temperature 110°C.

Replacing the thermostat

- Disconnect the flat pin connectors (2) in the faulty thermostat. Carefully unscrew the two mounting screws (3).
- Replace the thermostat.
- Reassemble in reverse order.



6.2 Main control / Overheat protector for overheated drying cabinet

Function

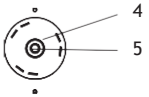
If the drying cabinet is overheated, these overheating thermostats open and the drying cabinet shuts down.
The drying cabinet cannot be used until the overheating thermostats have been reset.

Reset manually with button in the centre of the overheating thermostats.

Reset is done by the service technician after the cause is identified and corrected.

Resetting the overheat thermostats

- **Disconnect the power supply from the machine.**
- Press the reset button (5) on the overheat thermostat that has opened (check both).



Do not reset until the cause of the overheating has been identified and corrected. Check, for example, the fans and the filter.

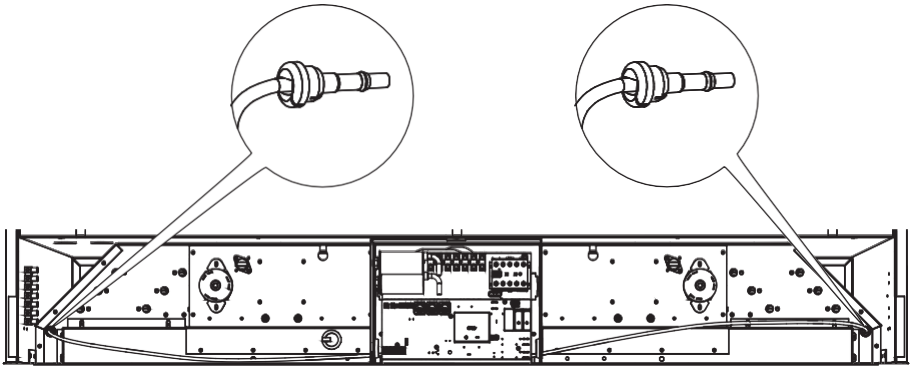
1	Thermostat / Overheat protector for heat regulation
2	Flat pin connector
3	Mounting screw
4	Main control / Overheat protector for overheated drying cabinet
5	Reset button

7 Regulation of drying process

Function

The drying process is controlled by two **temperature sensors,** KTY81-110. and a **moisture sensor**. The moisture sensor reads the humidity in the cabinet. If the sensors are not working properly, the laundry will not dry.

7.1 Temperature sensor



Troubleshooting

Check the sensors by measuring them using the table under the section Technical Data. If the values are not correct according to the table, the sensors must be replaced.

Replacing a temperature sensor

- **Disconnect the power supply from the machine.**
- Carefully loosen the cable gland and replace the temperature sensor.
- Reassemble in reverse order.

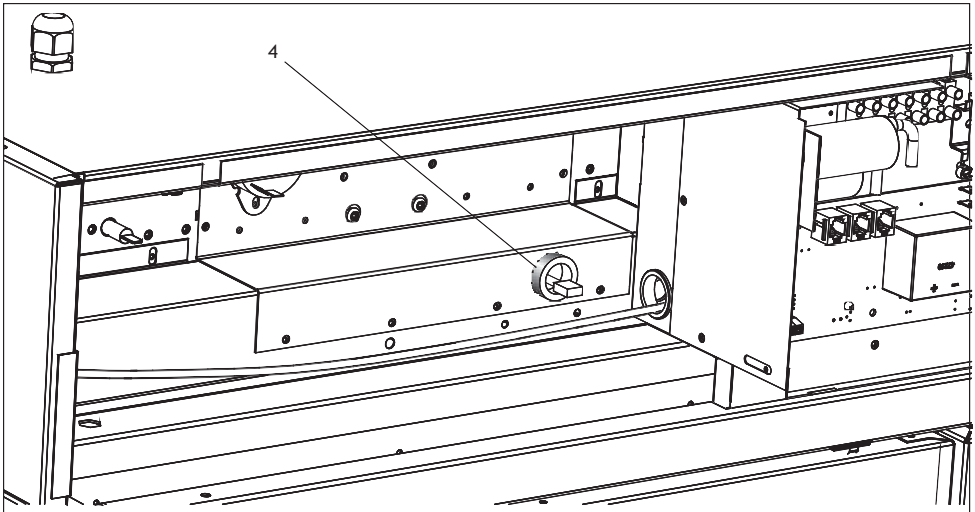
7.2 Moisture sensor

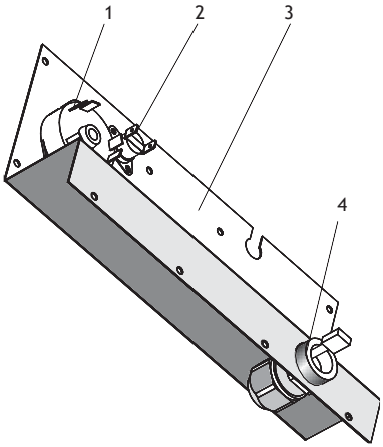
The moisture sensor is mounted in the mounting plate of the left fan unit.

Function

The drying process is controlled using a moisture sensor, HIH 4000. The drying process is interrupted when the humidity in the cabinet has dropped to the set level.

If the sensor is not working properly, the laundry will not dry or will dry too much.





- **Disconnect the power supply from the machine.**
- Loosen the flat pin connectors on both overheat protectors.
- Dismantle the mounting plate (3) which is attached with 16 screws.
- The moisture sensor is now accessible for replacement.
- Reassemble in reverse order.

1	Thermostat - Overheat protector
2	Main control - Overheat protector
3	Mounting plate
4	Moisture sensor

8 Heating element

Function
Generates heat in the cabinet.

Troubleshooting
The power supply must be disconnected from the drying cabinet.

When measuring a cold element, the resistance value should be between 48.8 and 56.7 ohms between element connection and ground.

Perform an insulation test, measure between outer casing and element. The value should be above 10 ohms.

You can also measure power / current to check that the spiral is complete. This can only be done with the cabinet in operation.

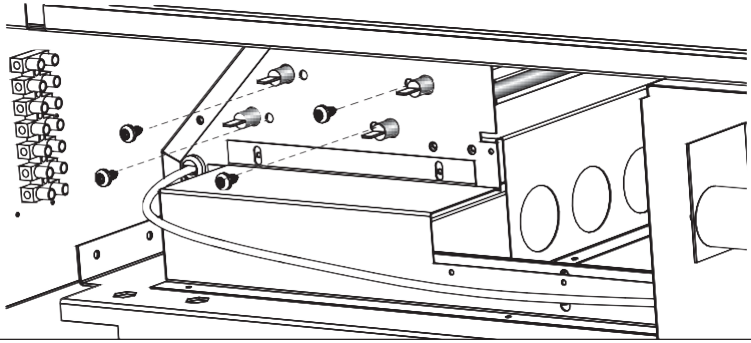
8.1 Replacing a heating element

- Disconnect the power supply from the machine.
- Disassemble the casing cover. The casing cover is attached with 8 screws.
- Pull out the fan casing slightly so that you can loosen the connection to the fan motor, then pull out the entire casing.

Disassemble the fan unit according to section 4.1

When the fan unit is removed, the heating elements are easily accessible. There are three heating elements on each side.

- Disconnect the cables to the heating element to be replaced and remove the element
- Install and connect the new heating element.
- Slide in the fan unit, connect the fan motor and screw down.
- Put back the front panel.



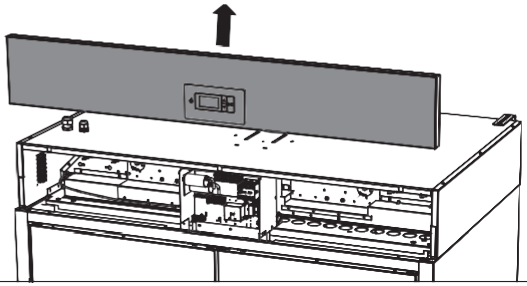
9 Control panel

Function
Program selector for the automatic drying programs for impregnation of membrane garments or normal drying suitable for padded work clothes / emergency clothes.

9.1 Replacing the control panel

Disconnect the power supply to the cabinet before starting work.

- Loosen two screws (Torx T20) on the bottom of the front panel. Square holes in the frame.
- Slide the front plate upwards until it releases from the guide flanges.
- Carefully loosen the modular connector on the back of the control panel.
- Push in the locking tabs to release the control panel.
- Connect the cable to the new control panel and press it into the front plate.



10 Damper motors

Function
The cabinet has 2 dampers with associated damper motors.

The **upper damper motor (A)** controls the amount of evacuated air. The **lower damper motor (B)** controls the air flow during the drying process internally and externally. Internally through the hangers and externally through both sides of the air drums.

Troubleshooting
Check that 230V power supply is available up to **the damper motor.**

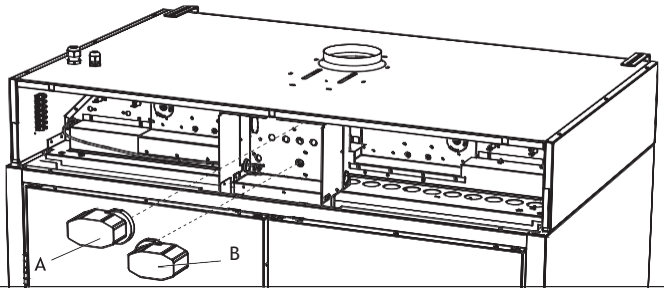
Measure between pin 2 = N (blue cable) and pin 3 = L (white cable) on the Mate-N-Lock connector.

If a different value is obtained, the motor should be replaced.

10.1 Replacing a damper motor

Disconnect the power supply from the machine.

- Disassemble the electronics unit.
- Disconnect, 3-pin Mate-N-Lock connector, to associated damper motor.
- Grab the motor with your hand and pull out.



A	Damper motor that controls the amount of evacuated air
B	Damper motor that controls the air flow during the drying process

11 The electronics unit

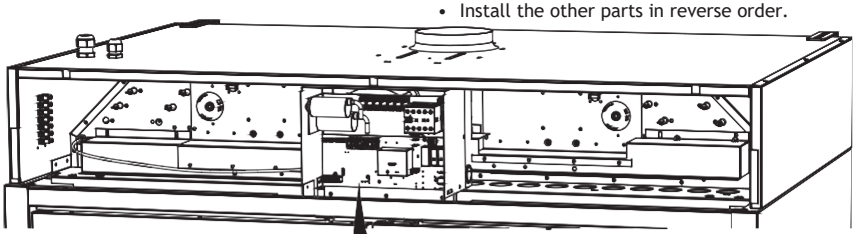
Function
Controls the drying process.

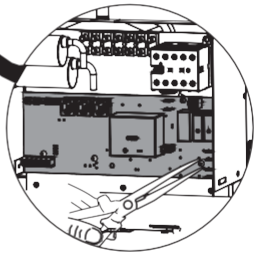
Troubleshooting
- Check that 230V power supply is available up to the electronics. Connection to the two flat pins (C).
- Start the drying program.
- Check the electronics relay output (D). This closes a circuit to the fan unit.

The work must be done with the machine switched on

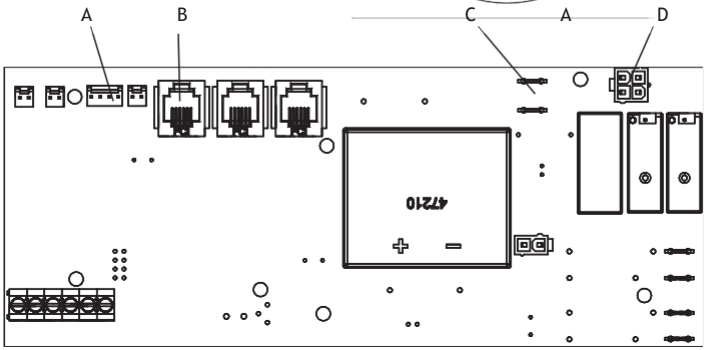
11.1 Replacing a circuit board

- **Disconnect the power supply from the machine.**
- Disconnect the connection to the moisture sensor (A), the control panel (B), the connection cables (C) and the cables to the relay output (D) from the circuit board.
- Using needle nose pliers, loosen 6 PCB holders on the front of the circuit board. New ones are included when replacing circuit boards.
- Install the new circuit board with the new PCB holders.
- Install the other parts in reverse order.





A	Moisture sensor connection
B	Control panel connection
C	Mains connection
D	Relay output



12 Setting of drying program

It is possible to optimise the drying cabinet's two automatic programs against the prevailing installation conditions.

This is done by adjusting parameter values for the respective automatic programs via the control panel.

Values are shown as follows:

the current parameter is shown on **the top row** of the display, e.g. "P 2195",

the lower row shows the set value of the parameter.

A change should only be made if you feel that;

- the laundry is not dried sufficiently.
- the laundry is overdried - long drying time.

12.1 Introduction

The drying cabinet is equipped with two automatic programs **Normal dry** and **Impregnation**

Program **Normal dry** ***is controlled via moisture sensor***.

Program **Impregnation** ***is controlled via moisture sensor and a time factor***.

The drying process ends automatically when the laundry is dry.

To determine when the laundry is dry, a measured value is compared against a parameter. See table section 13.

Optimisation of drying processes must always be done incrementally, starting with adjusting the relevant parameter 1–2 units up or down, then checking the result after the next drying process and making further adjustment if necessary.

- If you feel that the laundry is not dried sufficiently in;

  automatic program **Normal dry** ***reduce*** the parameter value of **P 2195**.

  automatic program **Impregnation** ***increase*** the parameter value of **P 2205**.

- If you feel that the laundry is overdried, long drying time in;

  automatic program **Normal dry, *increase*** the parameter value for **P 2195**.

  automatic program **Impregnation, *reduce*** the parameter value of **P 2205**.

12.2 Procedure

- Make sure the drying cabinet's main ON/OFF switch is turned off. The display is off.
- Hold the UP and DOWN buttons and press the ON/OFF main switch to the "ON" position.

  The display lights up and shows parameter "P105" and the set value for P 105.

  The row with the current parameter flashes in the display.
- Scroll to the current parameter by pressing the UP or DOWN ARROW button repeatedly.

  If you go too far, just keep scrolling until the display shows the correct parameter.
- When the display shows the correct parameter, for example "P2195", press START/STOP to confirm parameter selection.

  Now the row with the parameter's set value flashes.
- Increase or decrease the parameter value with the UP or DOWN ARROW buttons.
- To save the set value, press START/STOP.
- To return to the operating value press ARROW DOWN and START/STOP.

12.3 Factory reset

- Enter parameter display mode as explained above.
- Hold down the UP ARROW and DOWN ARROW buttons and press START/STOP.
  The factory settings are saved and replace any adjustments made. The display shows the most recently run programs.

			DEF	MIN	MAX	Unit	
	P_105	Language	0	10	0		Language selection
	P_114	Filter alarm ON/OFF	0	1	0		Filter alarm
	P_115	Parental control ON/OFF	0	1	0		Child lock, requires that all buttons need to be held down for 3 seconds
	P_140	Test sequence on time in secs	10	255	0		Test
	P_141	Test sequence pause time in secs	3	255	0		Test
	P_150	Enable appl specific runtime params	0	255	0		Test
Normal	P_2192	Max_operating_time	300	500	30	min	Maximum time for the entire program
	P_2193	Setpoint_heating	55	120	30	C	The cabinet is heated to this temp with the dampers closed
	P_2194	Setpoint_drying	72	120	30	C	Control temperature for the drying process
	P_2195	Drying_humidity	12	90	10	%	Air humidity limit when dry
	P_2196	Deep_drying_time	30	120	30	min	Extra time for drying inside clothes
	P_2197	Drying_outside_time	20	120	20	min	Extra time for drying outside clothes
Impreg	P_2202	Max_operating_time	300	500	30	min	Maximum time for the entire program
	P_2203	Setpoint_heating	70	120	30	C	The cabinet is heated to this temp with the dampers closed
	P_2204	Setpoint_drying	78	120	30	o	Control temperature for the drying process
	P_2205	Drying_humidity	16	90	10	%	Air humidity limit when dry
	P_2206	Deep_drying_time	30	120	30	min	Extra time for drying inside clothes
	P_2207	Setpoint_impr	80	120	30	C	Control temperature for the impregnation process
	P_2208	impr_time	25	50	5	min	Time for the impregnation process
Man 40	P_2222	Setpoint_heating	35	60	20	C	The cabinet heats up to this temperature with closed dampers
	P_2223	Setpoint_drying	40	70	30	C	Control temperature for the drying process
	P_2224	Drying_inside_perc	50	90	10	%	Regulation parameter for air flow inside/outside
Man 50	P_2232	Setpoint_heating	45	60	20	C	The cabinet is heated to this temp with the dampers closed
	P_2233	Setpoint_drying	50	70	30	C	Control temperature for the drying process
	P_2234	Drying_inside_perc	50	90	10	%	Regulation parameter for air flow inside/outside
Man FL	P_2242	Setpoint_heating	35	60	20	C	The cabinet is heated to this temp with the dampers closed
	P_2243	Setpoint_drying	40	70	30	C	Control temperature for the drying process
	P_2244	Drying_inside_perc	0	100	0	%	Regulation parameter for air flow inside/outside

14 Error codes / Troubleshooting guide

No.	Name.	Description / Action
ERR 04	The maximum time for the drying process has been exceeded	Default value 300 min can be changed with parameter P 2193
ERR 05	Overheating	See section 6
ERR 08	Clean filter 100 hours	Clean the lint filter. See the User Manual
ERR 12	Timeout communication	Communication between the control panel and the electronics has been interrupted temporarily. See section 11.

To reset an error code, hold down the **START/STOP** button for 5 seconds.

Questions	Action
The drying cabinet does not work	1. Check that the power cable is connected securely. 2. Check that no fuse has tripped. 3. Have you pressed the start button? 4. Are the doors closed? 5. The overheat protector may have tripped. 6. The main control may have tripped.
The door is not closed tightly/is ajar	Check that the cabinet is level. Check with spirit level, adjust if necessary with the adjustable feet.
No heat in the cabinet	1. Check the temperature sensors for the cabinet temperature. See section 7.1 2. Check elements. See section 8.
The drying cabinet does not start	1. Check that no fuse has tripped. 2. Have you pressed the start button? 3. Are the doors closed? 4. Check connection cable. 5. Check the control panel. 6. Check the door switch. 7. The overheat protector may have tripped. See section 6. 8. The main control may have tripped. See section 6.
Drying takes a long time	1. Check that the correct program has been selected for the type of laundry. 2. Check moisture sensors. See section 7.2. 3. One of the fans does not start. See section 4.
The laundry does not get dry	1. Check that the correct program has been selected for the type of laundry. 2. The overheat protector may have tripped. See section 6. 3. One of the fans does not start. See section 4. 4. Check the door switch. See section 5. 5. Check temperature sensor, cabinet temperature. See section 7.1 6. Check the moisture sensor. See section 7.2 7. The element does not start. See section 8
Troubleshooting at component level	Door switch. Overheat protector Temperature sensor, cabinet temperature Moisture sensor Element Fans Connection cable Electronics unit (PCB) Control panel

15 Technical data

Capacity			kg laundry	15
Dewatering capacity			g/min *)	57
Power connection			400V 3N AC 50Hz	
Traditional thread locking			A	10
Automatic fuse			A	13
Motor			W	2 x 155
Element output			W	6 x 1000
Overheat protector				Ja/Kylä/Yes
Evacuated air volume			m^3/hour	250
Detachable hangers				4
Net weight			kg	134
Sound pressure level A-weighted emission sound pressure level			dB(A)	< 70

*) 15 kg dry weight at 42% residual moisture

Manufacturing standards
See the cabinet type plate

Wiring diagram
Wiring diagram is enclosed with the product and is available for download from the manufacturer.

CE declaration
CE declaration (Declaration of Conformity) is enclosed with the product.

16 Temperature sensor KTY

Measurement table

Ambient temperature, equivalent resistance, temperature coefficient and maximum expected temperature error for KTY81-110.

I cont = 1 mA

Ambient temperature		Temp. coeff	KTY81-110			
°C	°F	%/K	Resistance (Ω)			Temp. error (K)
			Min.	Type.	Max.	
-55	-67	0.99	475	490	505	±3.02
-50	-58	0.98	500	515	530	±2.92
-40	-40	0.96	552	567	582	±2.74
-30	-22	0.93	609	624	638	±2.55
-20	-4	0.91	669	684	698	±2.35
-10	14	0.88	733	747	761	±2.14
0	32	0.85	802	815	828	±1.91
10	50	0.83	874	886	898	±1.67
20	68	0.80	950	961	972	±1.41
25	77	0.79	990	1000	1010	±1.27
30	86	0.78	1029	1040	1051	±1.39
40	104	0.75	1108	1122	1136	±1.64
50	122	0.73	1192	1209	1225	±1.91
60	140	0.71	1278	1299	1319	±2.19
70	158	0.69	1369	1392	1416	±2.49
80	176	0.67	1462	1490	1518	±2.8
90	194	0.65	1559	1591	1623	±3.12
100	212	0.63	1659	1696	1733	±3.46
110	230	0.61	1762	1805	1847	±3.83
120	248	0.58	1867	1915	1963	±4.33
125	257	0.55	1919	1970	2020	±4.66
130	266	0.52	1970	2023	2077	±5.07
140	284	0.45	2065	2124	2184	±6.28
150	302	0.35	2145	2211	2277	±8.55