SERVICE MANUAL

LDR-8 S auto-clean Electric
LDR-8+8 S auto-clean Electric

- NOTICE -

This manual is prepared for the use of trained Service Technicians and should not be used by those not properly qualified. If you have attended a training for this product, you may be qualified to perform all the procedures in this manual.

This manual is not intended to be all encompassing. If you have not attended a training for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained technician.

Table of contents:

Versions		
Version	Issue date dd/mm/yy	Remarks
20220930	30/09/2022	First release
20230721	21/07/2023	LDR stacked added + update software and scematics

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LDR-8 S AC, TECHNICAL DATA

Consult the identification plate to get the proper specifications of the unit. The electrical data may vary from country to country.

American models

Models			LDR-8 s AC	LDR-8+8 s AC
Dimensions approx.	Width	inch	52	50 3/4
	Depth	inch	38 1/4	38 1/4
	Height	inch	70 3/4	83 3/4
Weight	Gross	lbs	745.2	809
	Net	lbs	635	925
Maximum ambient temperature		°F	95	95
Sound pressure		dB (A)	< 70	< 70
Electrical installation	Voltage	V	3 ~ 208	3 ~ 208
	Frequency	Hz	50/60	50/60
	Required power	kW	20.6	2x 20.6
	Max. nominal current**	A	60	2x 60
Water connection	Aerated	inch	¾ (1x)	¾ (2x)
Water	pressure	kPa	200 – 500	200 – 500
	Acidity	pH	7.0 - 8.0	7.0 - 8.0
	Chlorides	ppm	<30	<30
	Hardness [1]	dH	<4	<4
Drain	Open connection	inch	min. 1 5⁄8	min. 1 5⁄8 (2x)
** Supplied without power cord and plug, with M50 cable gland (i.d. 1 5/8”) Use 80 Amp fused power supply.				

[1] See chapter “water requirements” for detailed information

European models

Model			LDR-8 s AC	LDR-8+8 s AC
Dimensions	Width	mm	1320	1290
	Depth	mm	972	972
	Height	mm	1800	2130
Weight	Gross	kg	338	420
	Net	kg	288	367
Maximum ambient temperature		°C	35	35
Sound pressure		dB (A)	< 70	< 70
Electrical installation	Voltage	V	3N ~ 400/230	3N ~ 400/230
	Frequency	Hz	50/60	50/60
	Required power	kW	20.6	41.2
	Max. nominal current	A	31	62
	Plug, CEE-form	A	32	63
Water connection	Aerated	inch	¾ (1x)	¾ (2x)
Water	pressure	kPa	200 – 500	200 – 500
	Acidity	pH	7.0 - 8.0	7.0 - 8.0
	Chlorides	ppm	<30	<30
	Hardness [1]	dH	<4	<4
Drain	Open connection	mm	min. 40mm	min. 40mm

[1] See chapter “water requirements” for detailed information

INTRODUCTION

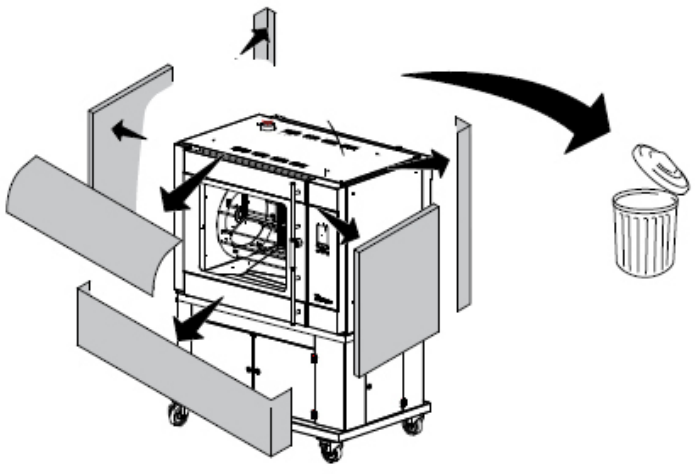
- Unpacking of the unit.
- Remove the pallet under the unit with the help of a fork lift.
- Put the unit on his location.
- Check if there is enough free space around the unit (see installation drawing).
- Check the electrical supply.
- Tethering of the unit.
- Connect the water.
- Connect drain.
- Grease collection.
- Make a test run on 220 °C (425°F).
- Give instructions to the operator.

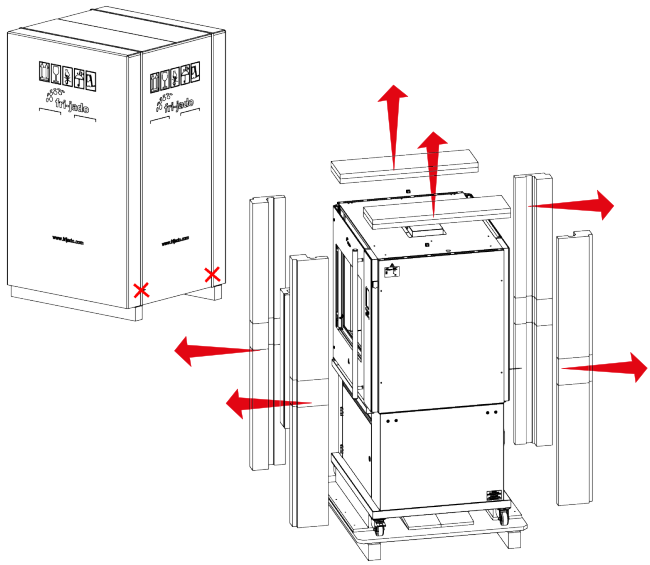
UNPACKING THE UNIT

Immediately after unpacking the oven, check for possible shipping damage. If the oven is found to be damaged, save the packaging material and contact the carrier.
The standard way to remove the oven from a pallet is with a fork lift.

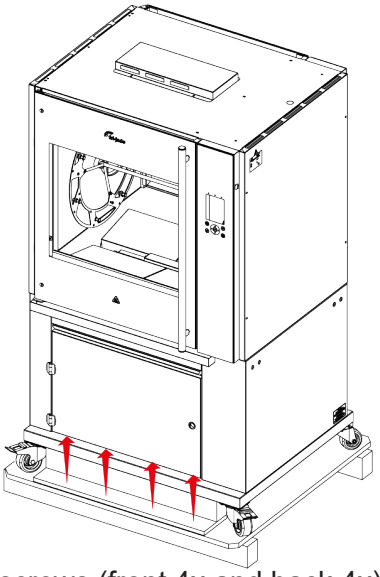
The alternative way is explained on the next page.
Do this with at least 2 people.

Dispose the packagaging according local legislation..

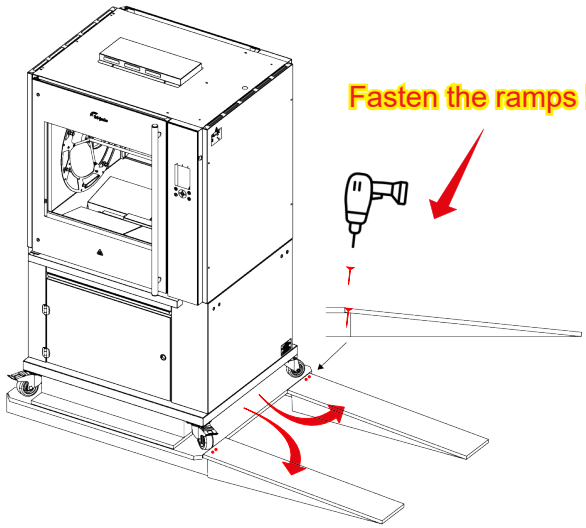




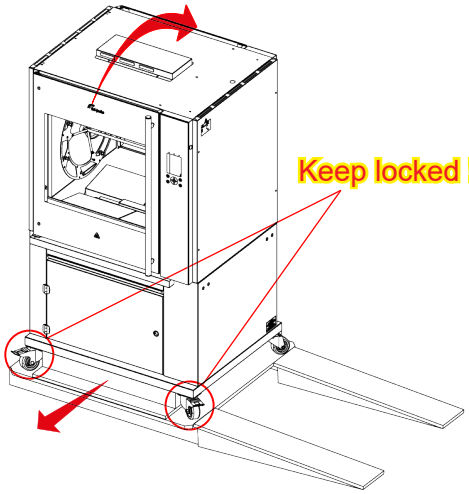
Cut straps, remove box and tempex.



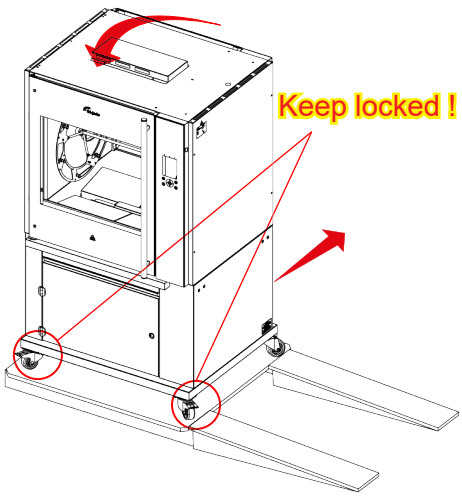
Remove screws (front 4x and back 4x)



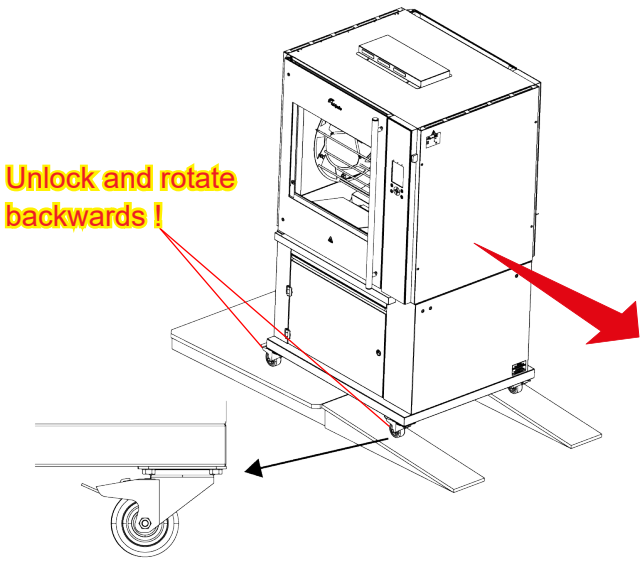
Place the ramps in front of the pallet and fasten them.



Tilt the unit slightly and remove the front beam.



Tilt the unit the other way and remove the beam at the back..



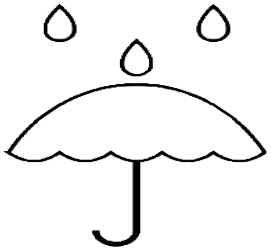
Carefully roll the unit onto the floor.

LOCATION

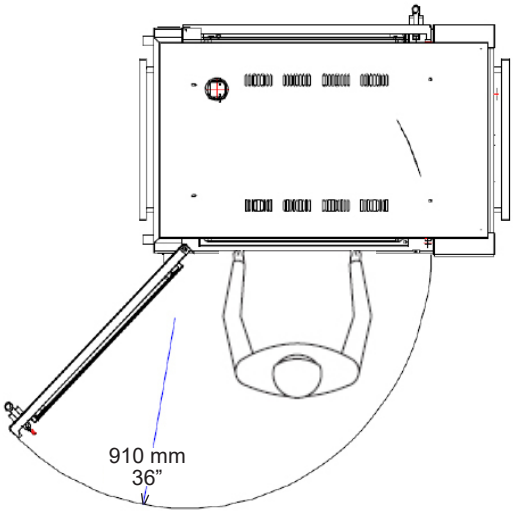
The oven must be installed on a level surface.

The installation location must allow adequate clearances for servicing and proper operation.

The oven must be protected against falling moisture !



IMPORTANT: Make sure you leave sufficient space around the rotisserie to easily remove or insert the rotor.



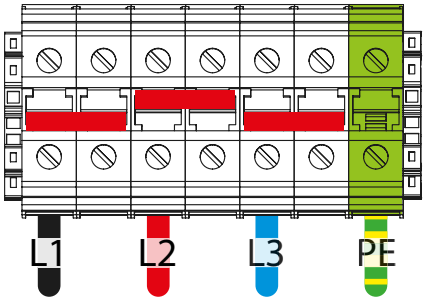
ELECTRICAL SUPPLY

Prior to installation, test the electrical service to assure that it agrees with the specifications on the machine data plate located on the right side panel near the controls. The connecting cable for the unit must be equipped with an approved plug connection. If use is to be made of a permanent connection, the connecting cable must be connected to a manual on/off switch that is installed near the unit in a clear visible manner.

The unit must be connected according to one of the the figures below.

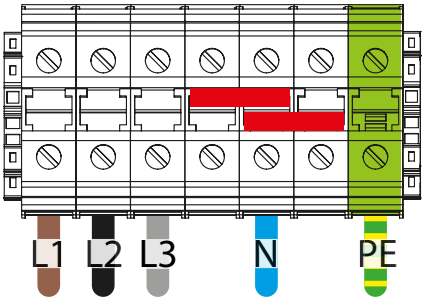
Factory default !
American models

200 V - 230 V, 3 ~ 50/60 Hz



Factory default !
European models

400 V, 3N ~ 50/60 Hz



CASTORS

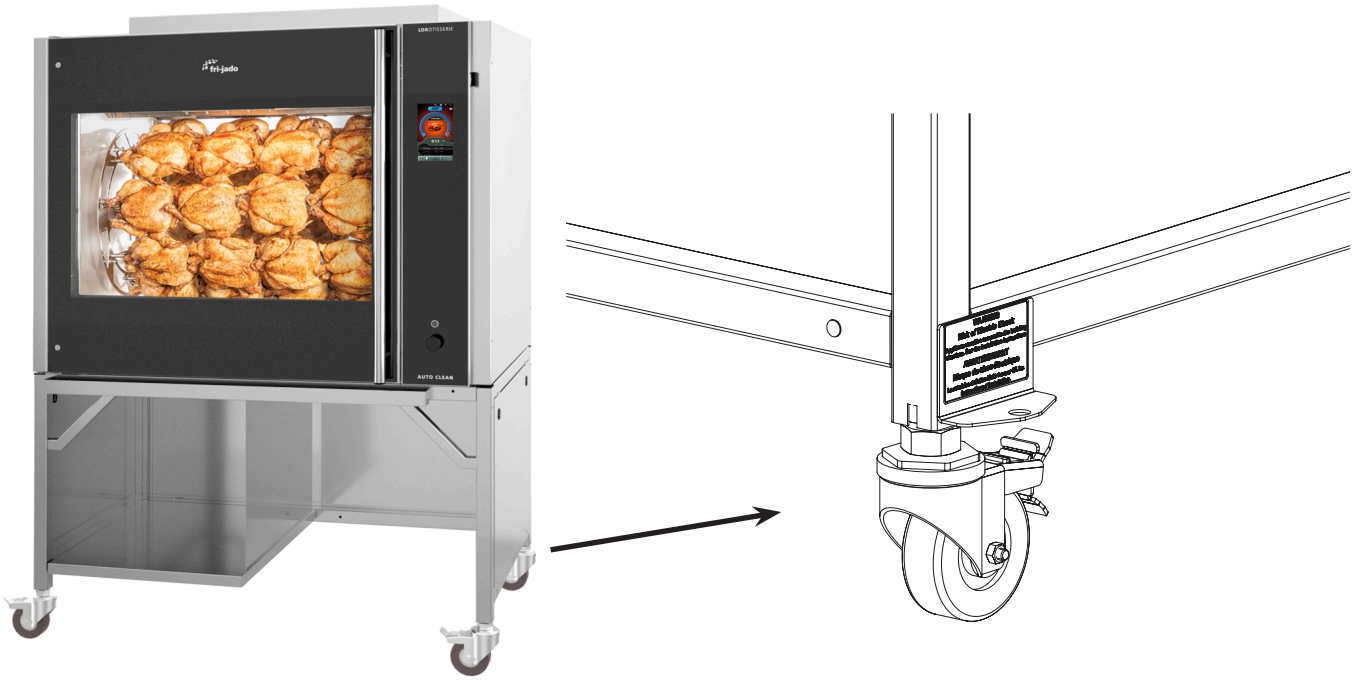
The LDR ac is placed on a stand with 4 locking swivel castors.

TETHERING OF THE UNIT

Warning: Safety standards require that, when this appliance is properly connected to the electrical power supply using flexible conduit, adequate means be provided to limit movement of the appliance without depending on or transmitting stress to the electrical conduit. This means that, as part of the installation, the base or bottom unit of stacked models must be secured to the building structure (typically either wall or floor) to limit the movement of the appliance and, thus, helping to prevent damage to the conduit during cleaning, maintenance and service operations.

A tether bracket, as shown on the drawing below, is provided with the stand. Based on the routing of the flexible conduit, the bracket must be installed along with the caster to one corner of the base using the hardware provided. The remaining open hole in the center of the tether bracket is to be used to secure one end of the tether (locally supplied chain, cable, etc.). The other end of the tether is to be secured to an anchoring point in the building structure.

Note: *Length of tether must be shorter than the flexible conduit to make sure that during appliance movement, no stress is transmitted to the conduit.*

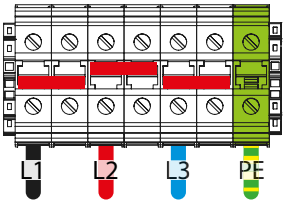


POWER, WATER AND DRAIN CONNECTIONS LDR8 AC

The Power, water and drain connections can be found underneath the unit.

200-230 V USA models.

Remove the side panel to get access to the connection block

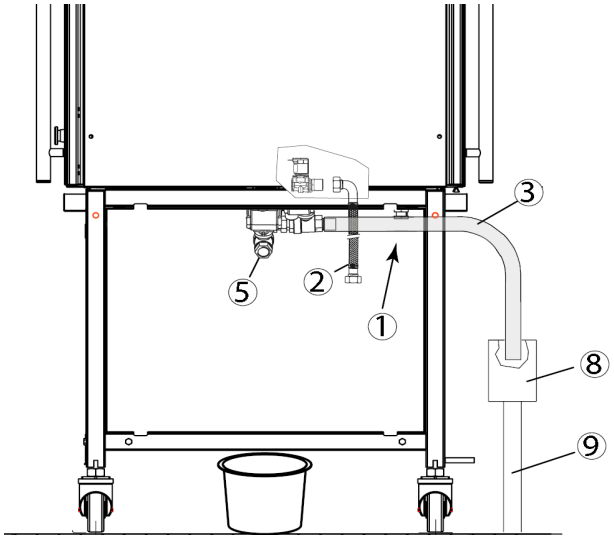


400 V European models
Power connection
Cee form 32 A
L= 2,5 mtr (98”)

Water supply hose

G 3/4”, L= 1,1 mtr (43”)

Flush the tap before connecting



Drain hose, Ø 33 x Ø 25, L= 1,2 mtr
(Ø 1 5/16 x Ø 1”, L= 47”)
See chapter “connecting the drain tube” for further information.

WATER REQUIREMENTS

The supplied tap water must have the following conditions:

1. Minimum pressure 200 kPa (2 bar)
2. Maximum pressure 500 kPa (5 bar)
3. Maximum water temperature 40 °C (100 °F)
4. Acidity pH 7.0 - 8.0
5. Chlorides less than 30 ppm
6. Use a sediment pre-filter or a strainer for the reduction of silica and other non-dissolved sediments.

Water hardness and descaling filters.

7. A descaling filter is advised when the hardness of the water is > 4° dH (4 Grains/Gal).
8. A descaling filter is mandatory when the hardness of the water is > 20° dH (20 Grains/Gal).

Note that the cleaning capacity of the cleaning tablets will decrease with harder water.

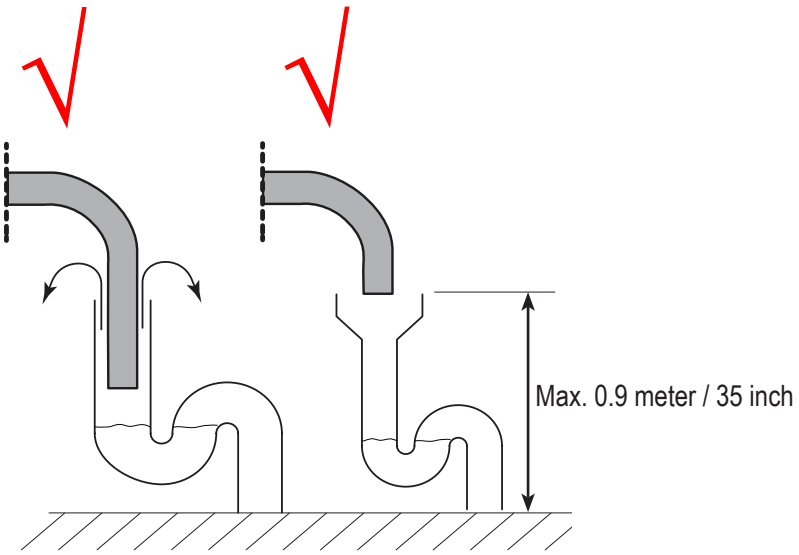
The by-pass of the descaling filter, if applicable, **needs to be adjusted to zero.**
Refer to the filters manual to determine the filter capacity. This filter capacity needs to be adjusted in the manager parameters.

CONNECTING THE DRAIN TUBE

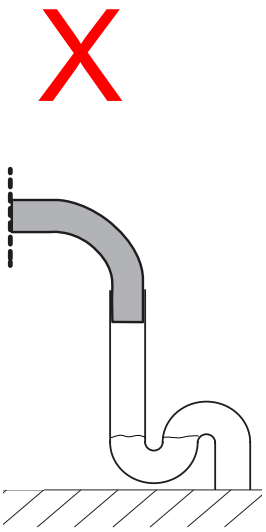
An open draining system with a 110 mm (4 1/2”) funnel is recommended. The drain tube has an outside diameter of 33 mm (1 5/16”).

- It is not allowed to make a closed connection!
- Make sure that the tube is not kinked and is sloping downwards to the drain funnel.
- The minimum inside diameter of the sewer pipe needs to be 40 mm (1 1/2”).
- A siphon in the customers sewer is highly recommended to prevent odors from coming out of the sewer.
- See below examples.

Possible lay outs of drain



Faulty lay outs of drain



EXTRACTION OF THE ROTISSERIE

An extraction hood is prescribed when the unit is NOT delivered with the special Fri-Jado Exhaust Hood mounted on it.
The LDR 8 produces about 20 m³ (700 cf) vapour during a cooking cycle. When placing the rotisserie under an extraction hood, the following guide lines have to be considered:

- The minimum capacity of the extraction hood has to be 1600 m³/h (50000 cf/h).
- The extraction hood has to extend minimum by 20 cm (8”) on all sides of the rotisserie.
- The extraction hood has to have a free hight, above the rotisserie, of a minimum of 30 cm (12”).
- The rotisserie has to be accessible for service purposes.
- The extraction hood has to have facilities to drain any condensation, down to a drain.

GREASE COLLECTION

Place the bucket, which is delivered with the unit, inside the stand under the drain pipe.

It is also possible to put other containers in the underframe to collect the grease.
Note 1: In one run, 8 liters (1.75 gallon) grease can come out.
Note 2: The temperature of the grease can go up to 80 °C (176 °F).
Make sure that the container meets the above requirements.

TEST RUN

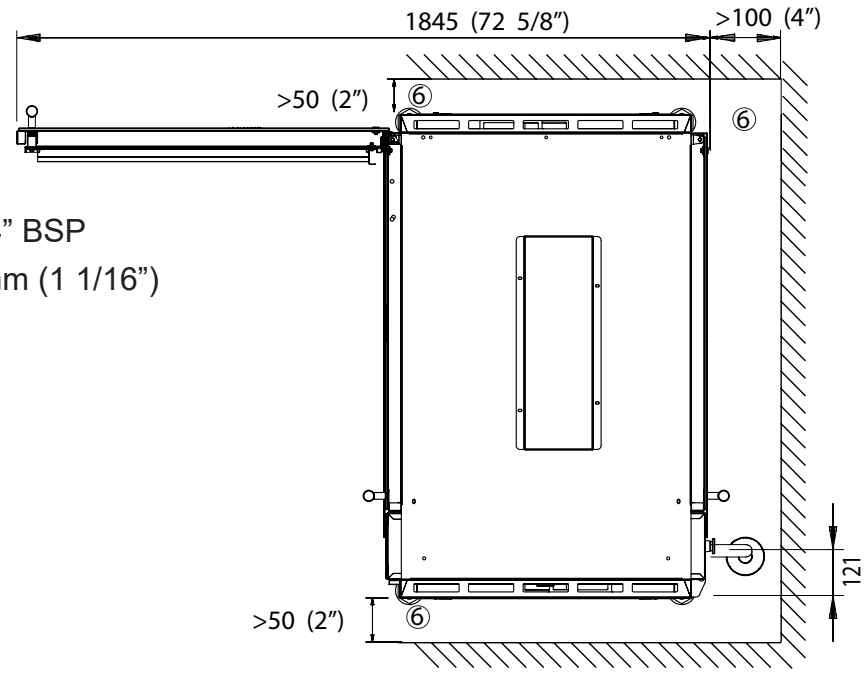
The oven must be burned in to release any odours that might result from heating the new oven surfaces. Operate the oven at maximum temperature setting of 220°C (425°F) for 30 minutes. Smoke with an unpleasant odour will normally be given off during this burn-in period.

INSTRUCTIONS FOR OPERATORS

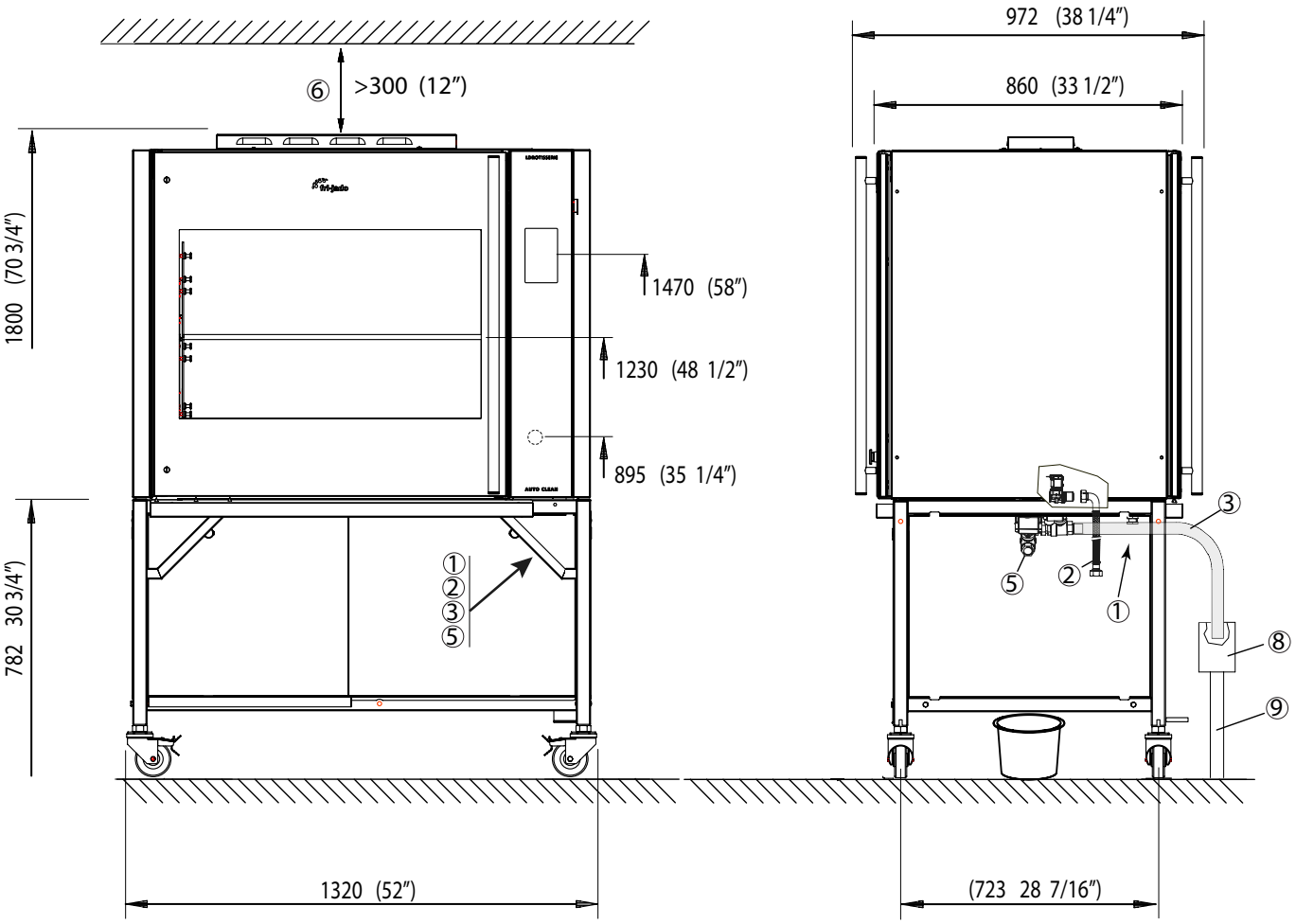
After installation of the rotisserie the operator of the unit has to be instructed.
The instruction has to cover the following subjects:

- Programming and options.
- Working of the unit.
- Free space of unit for cooling of drive motor and blowers.
- Run through the user manual.
- How to run the cleaning program and placing cleaning tablets.
- Cleaning of the bottom filters after the cleaning program has finished.
- Periodical maintenance:
  - Cleaning of fan plate every 3 months.
  - Yearly maintenance by service agent.
- How to react for information or service calls.

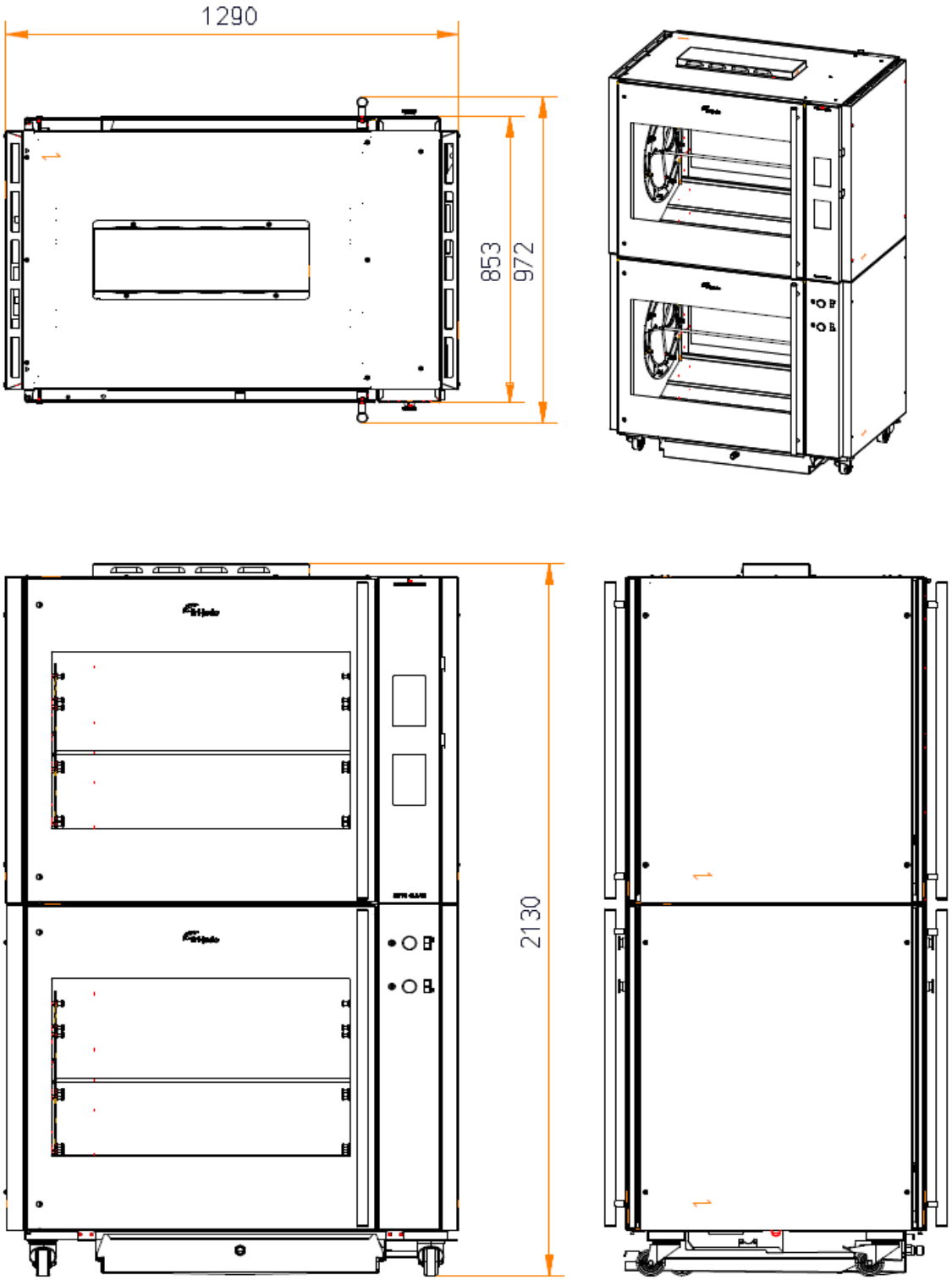
LDR8 AC ON STAND



① Location of mains connection
② Location of water connectionG 3/4" BSP
③ Location of drain hose OD Ø 33 mm (1 1/16")
⑤ Location of fat drain
⑥ Minimum required space
⑧ Example of funnel
⑨ Sewer pipe ID ≥ Ø 40 mm (1 5/8")



LDR-8+8 S AC

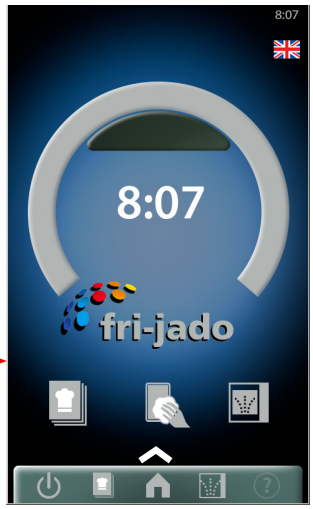


SWITCHING ON

Touch the screen somewhere

Touch the ON / OFF symbol

Home screen



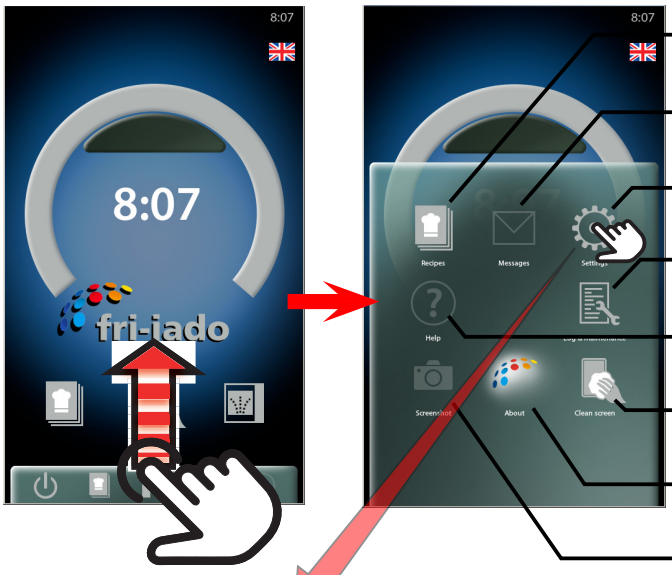
Main functions

- Language
- ON / OFF or stop program
- Recipes menu
- Home screen
- Cleaning program
- Help function
- Settings
- Wipe/clean touch screen (locks screen for 60s.)

Other symbols

- Pause
- Extra time
- Continue
- Create recipe
- Edit recipe
- Confirm
- Step back
- Delete
- Tap screen
- Swipe

MENU OVERVIEW SW VERSION 1.00.17



Recipes menu

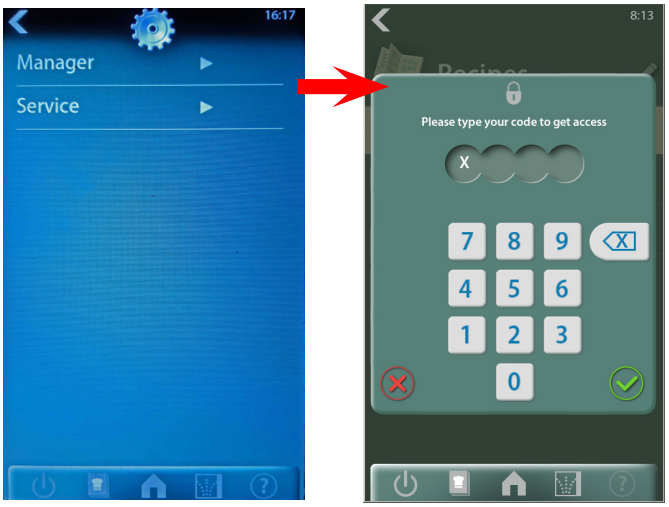
Messages (under construction)

Manager and service settings (see below)

Log & maintenance menu

Help menu (under construction)

Clean screen. Locks the touch screen for 60 seconds.
About. Gives information about soft- and hard-ware.
Screenshot. Only available with a wifi connection.



The manager pin code can be chosen freely.
0000 = free access.
The service pin code is 4878.

Once the service menu is entered, also the manager menu is unlocked.

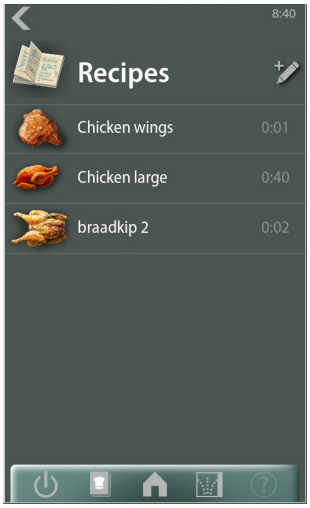
Once the manager or service menu is opened, it stays unlocked for 30 minutes.

See parameter lists at the end of this chapter.

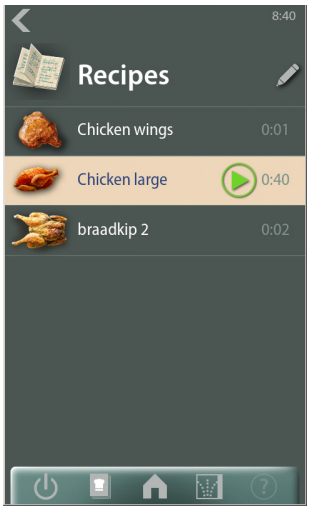
RUNNING A COOKING PROGRAM

Push recipes icon

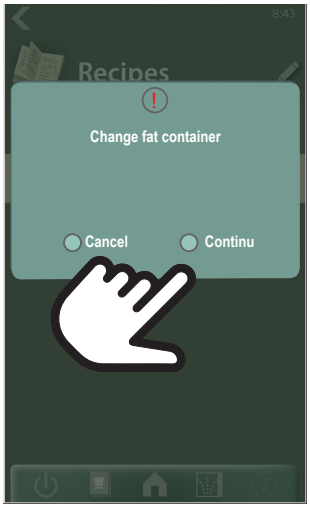
Choose program



Start program

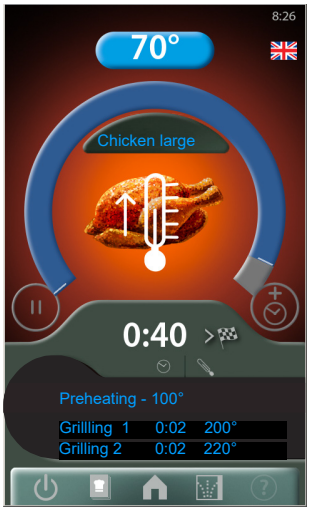


Check fat container and push “continue”

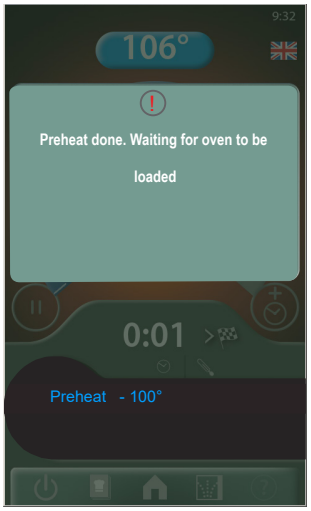


The below 4 steps are only applicable in case the cooking program has a pre-heat step.

Preheat starts.
Actual temperature shown.



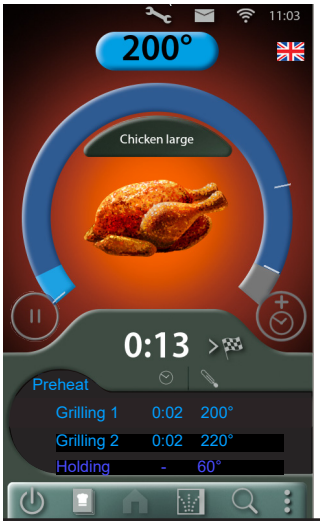
Preheat done, open the door.



Load products and close the door.

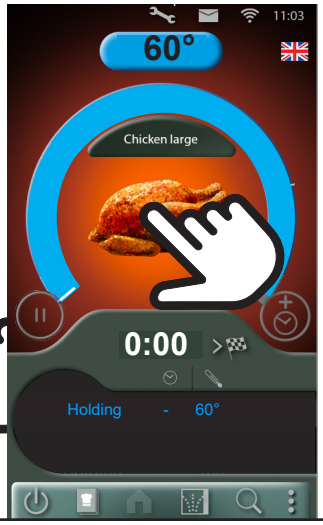
Push ▶

Program running.
Push to see actual temperature.
⏸ = Pause button

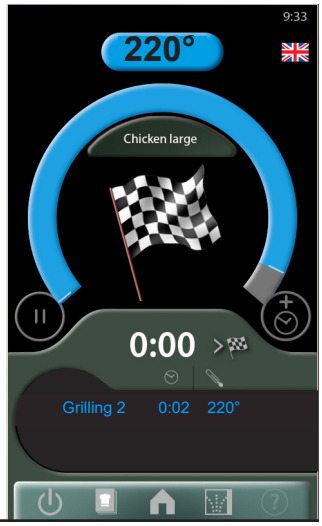


A short sound comes when going into the next step.
Push “boost” icon for extra time, if desired.

Program in holding step, if applicable. Touch the screen to stop the sound



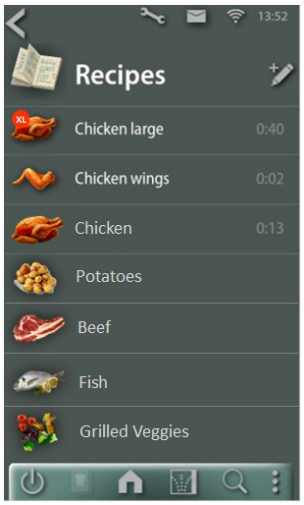
End of program when no holding is programmed.



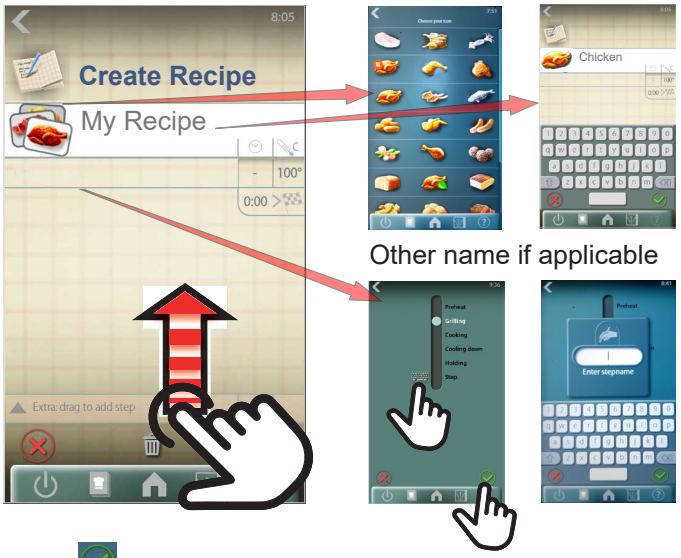
CREATING A COOKING PROGRAM

Push recipes icon

Push icon

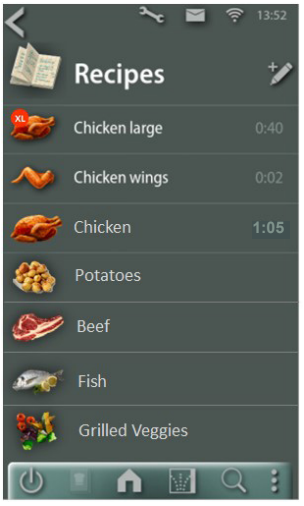


Chose product icon and fill in recipe name.
Chose or change step name if applicable.
Drag up for an extra cooking step.



Push time and temperature and adjust.

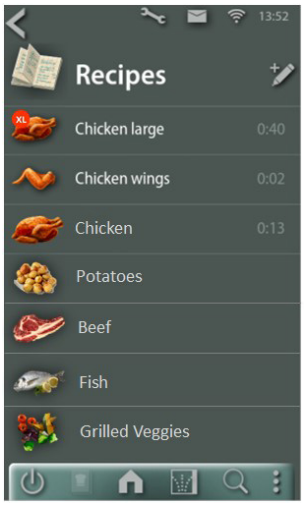
Push when ready



EDITING A COOKING PROGRAM

Push recipes icon

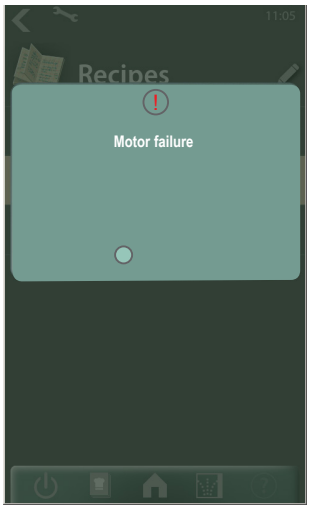
Choose program



Push icon to edit the highlighted recipe. Now follow the steps as described above.

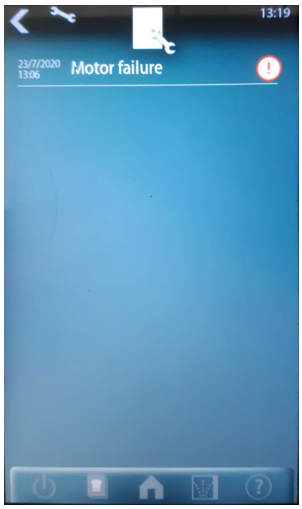
EXAMPLE OF ERROR MESSAGE

Example motor failure during cooking.

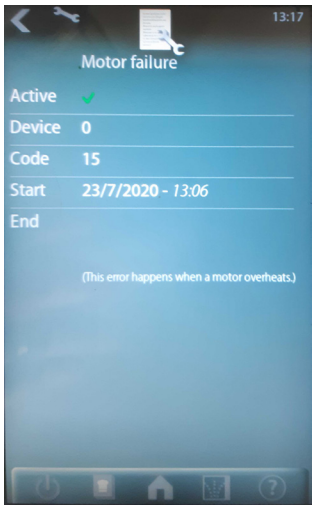


In the “log” menu the error can be found

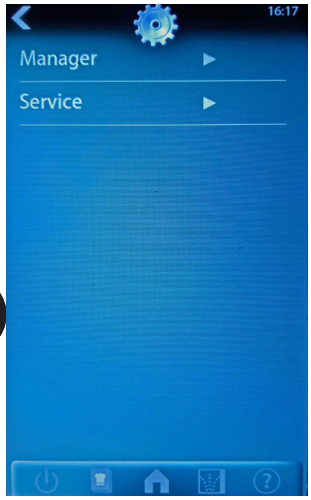
Select the error



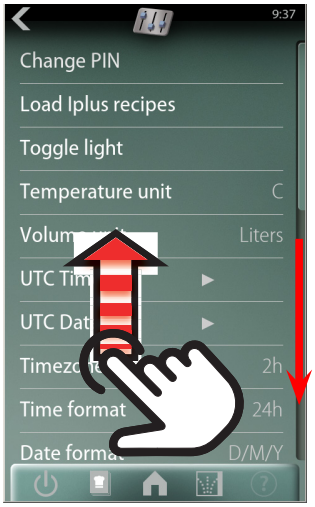
Meta data is shown

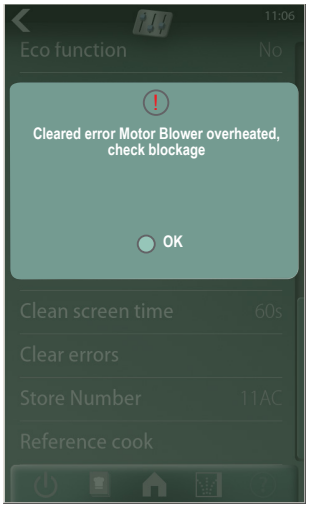


Go to the manager menu to clear the error.



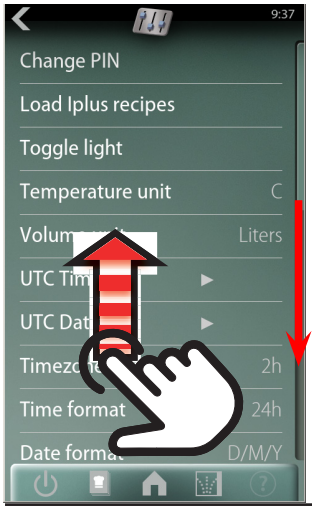
In manager menu:
Scroll to “Clear errors” and push ▶



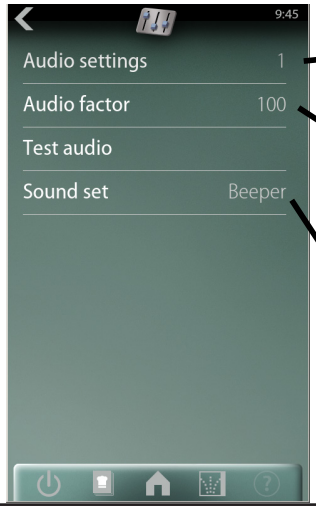


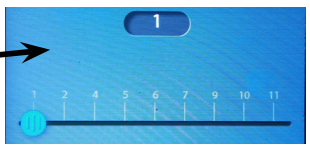
AUDIO VOLUME AND SOUND SETTING

In manager menu:
Scroll to “Audio” and push ▶



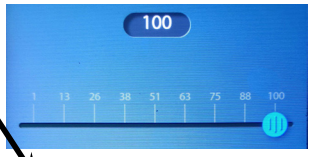
4 options.
With “Test audio” the chosen volume or sound can be checked.



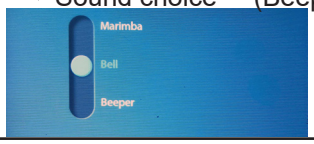


This is no setting. Different sounds can be heard in combination with “Test audio”.

Volume



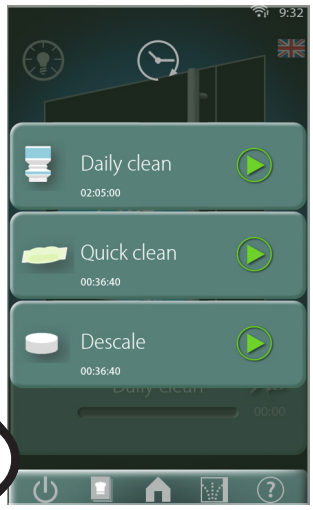
Sound choice (Beeper has highest volume)



THE CLEANING PROGRAM

Push cleaning icon

Choose program

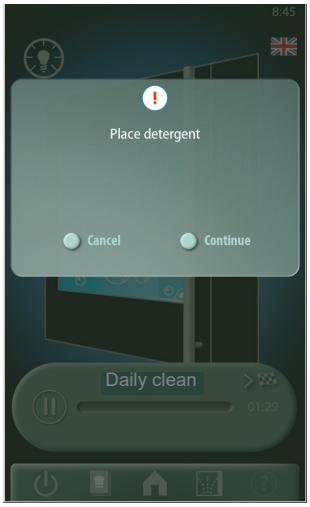


If unit is too hot, it will cool down first.

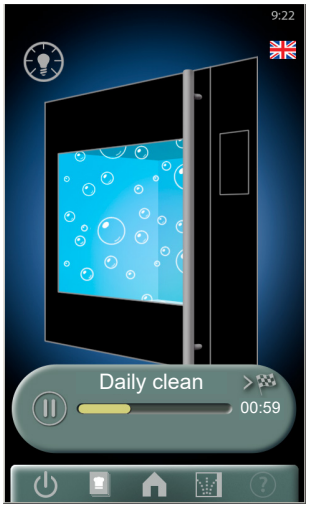
Now it is asked to place the detergent.

Follow the instructions that can be found in the container with detergent.

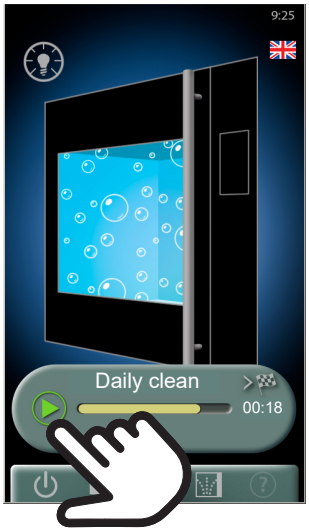
Place the detergent.



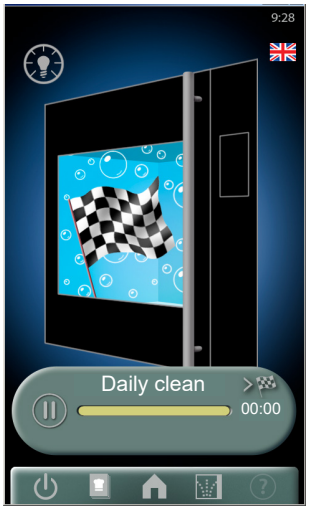
Push ⏸ to pause, if applicable.



Push ▶ to continue



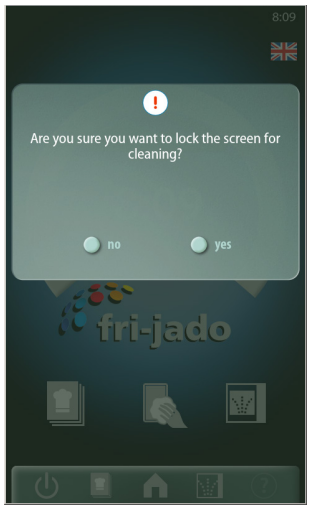
Cleaning program has finished.



CLEANING THE TOUCH SCREEN (WHILE IN OPERATION)

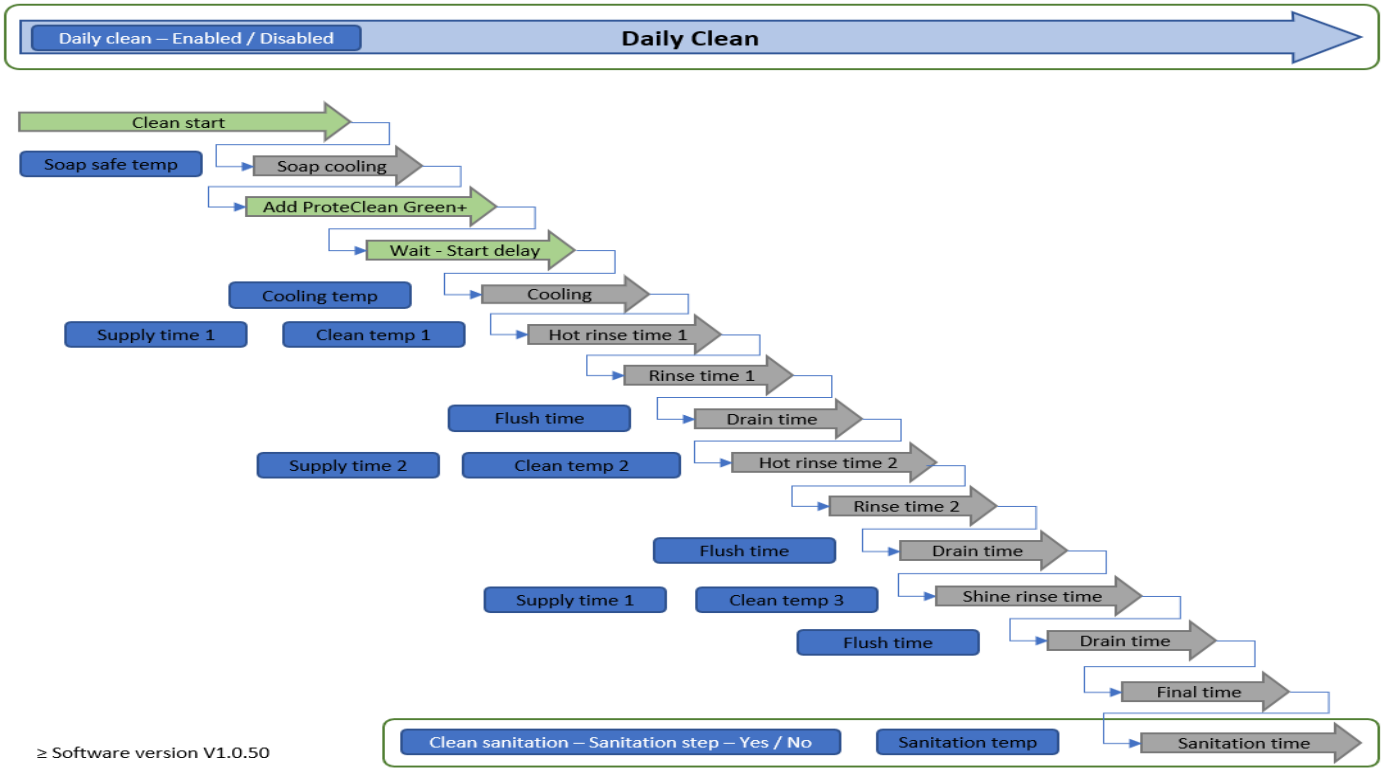
Push  icon

Push “yes”

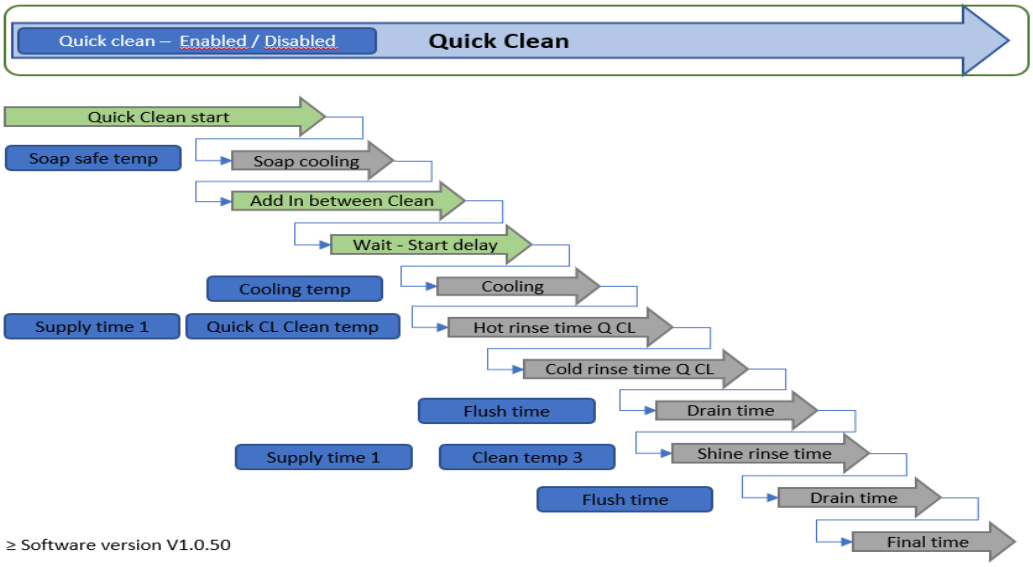


The screen is now locked for 60 seconds and counting down

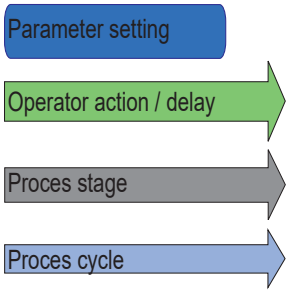
CLEANING PROCESS STEPS & PARAMETERS LDR AC

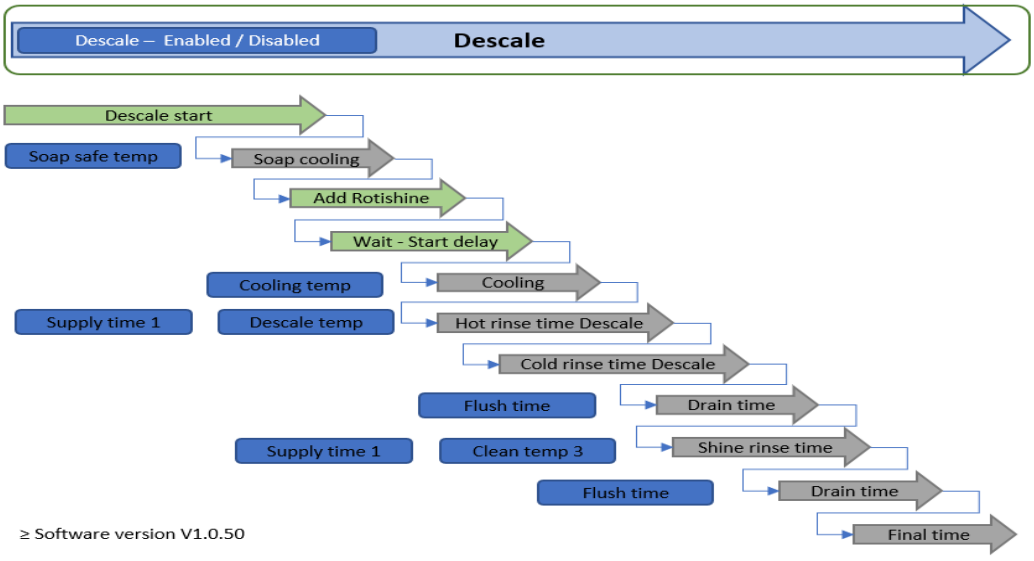


≥ Software version V1.0.50



≥ Software version V1.0.50

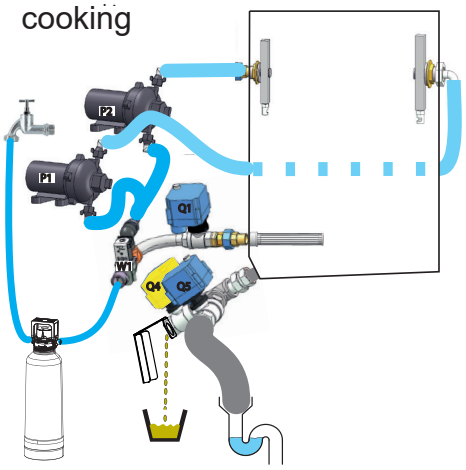




≥ Software version V1.0.50

2 PUMPS SYSTEM AND VALVES IN ACTION DURING CLEANING

Valve position during cooking



The pictures below show each stage in the cleaning program.

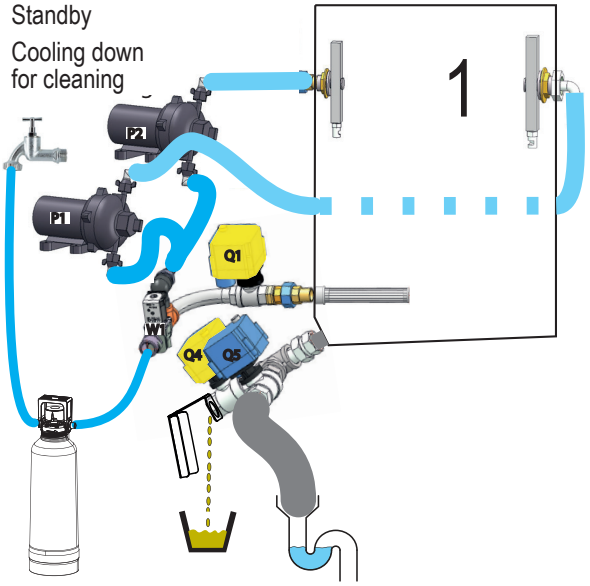
-Tubes in red, are flowing
-Pumps or valves in yellow are active / open.
-Soap has to be added after stage 1

-The first cycle is following stage 1 untill 10.
-The second cycle is following stage 2 untill 10.
-The third cycle is following 2 untill 9 and then 5 as last stage.

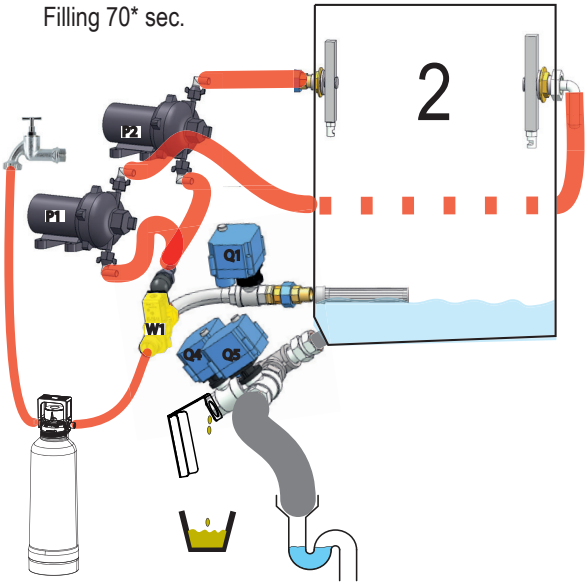
The stages 3 and 4 are rehearsing alternately, during 1 minute each, over a period of 20* minutes, with the heating on and after that, during 10* minutes with the heating off.
The third cycle has only heating on.

Note: * = parameter setting

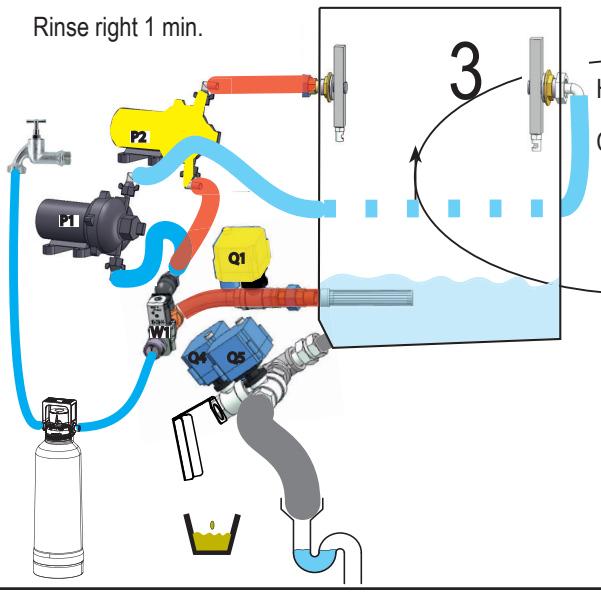
Standby
Cooling down for cleaning



Filling 70* sec.

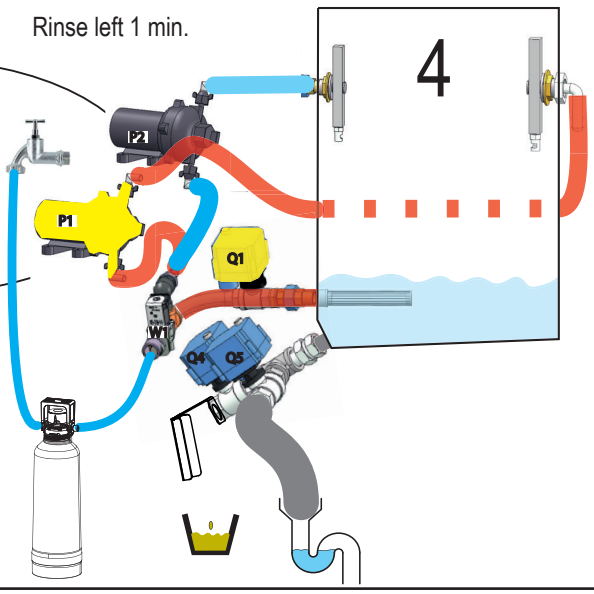


Rinse right 1 min.



Hot 20* min.
Cold 10* min.

Rinse left 1 min.

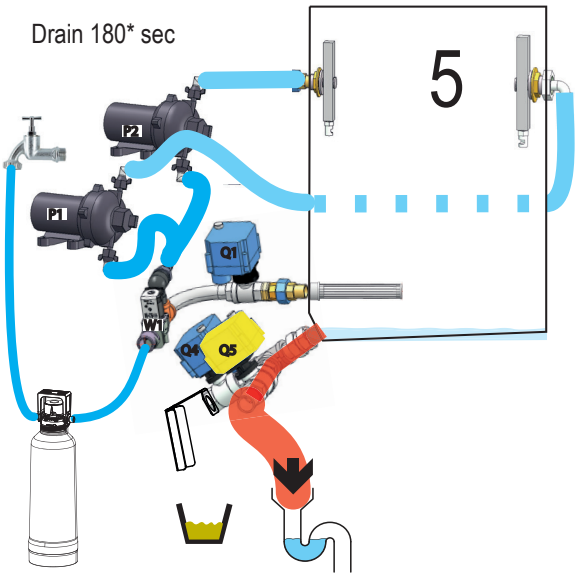


The stage 3 and 4 are rehearsing alternately, during 1 minute each, over a period of 20 minutes, with the heating on and after that, during 10 minutes with the heating off.

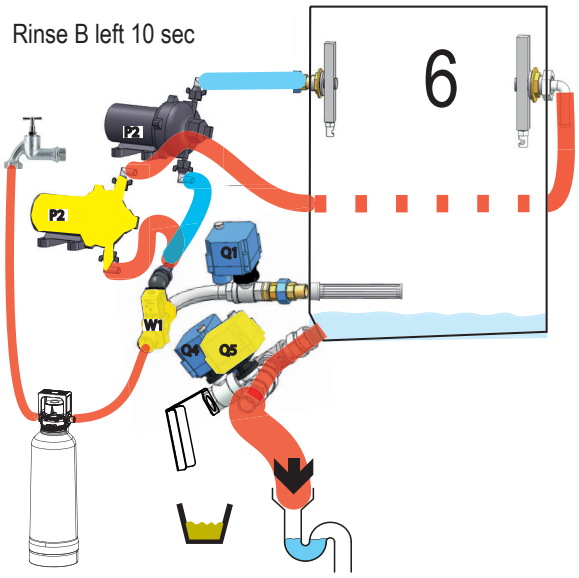
The third cycle has only heating on.

In case of a sanitation step, that will be like stage 10, but then only with the heating on.

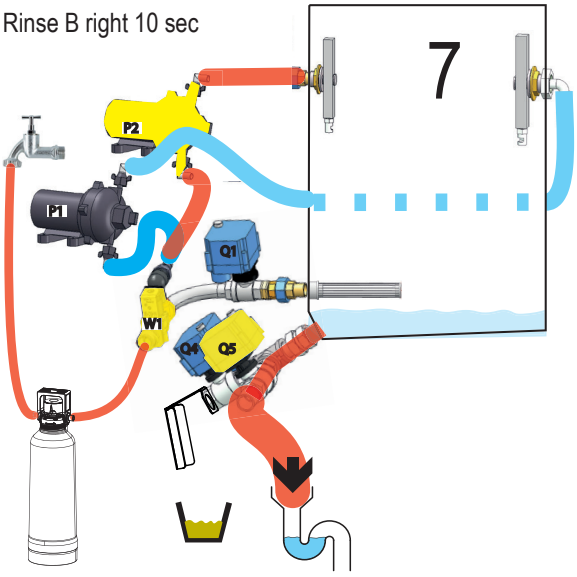
Drain 180* sec



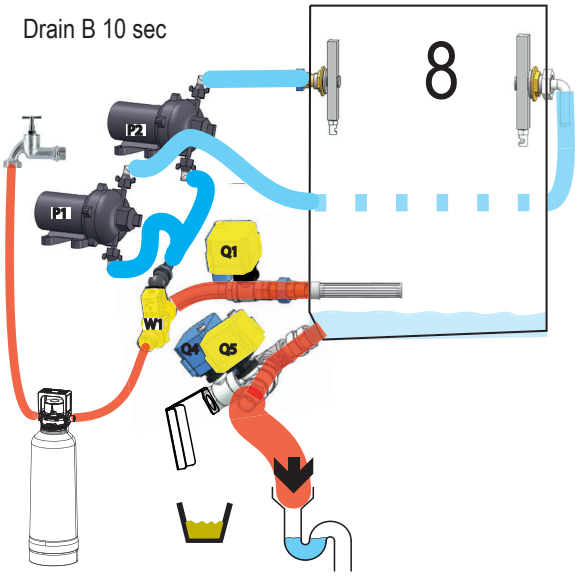
Rinse B left 10 sec



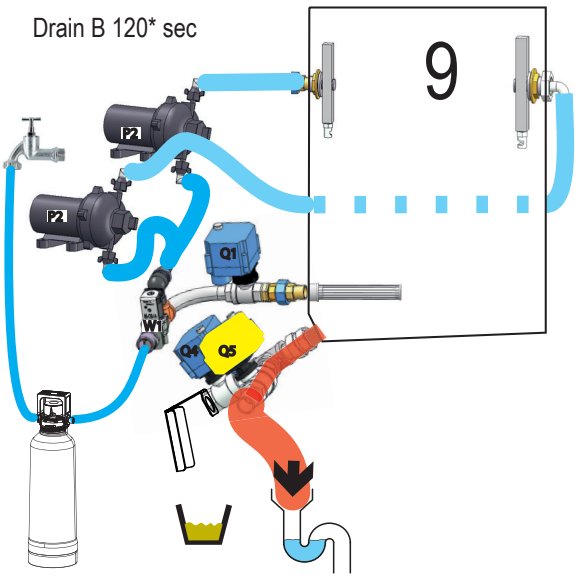
Rinse B right 10 sec



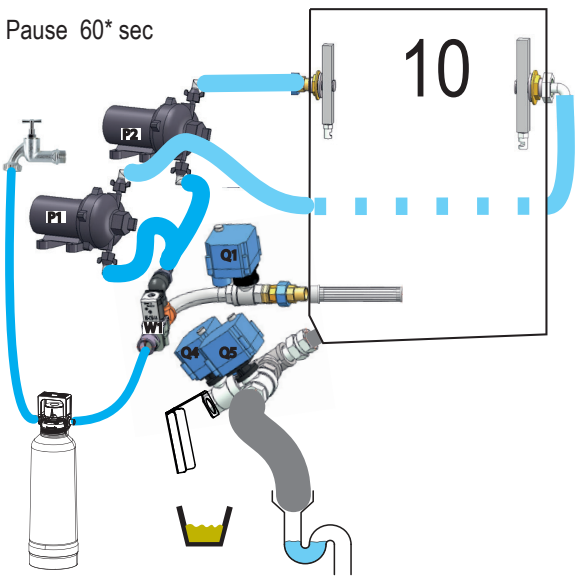
Drain B 10 sec



Drain B 120* sec



Pause 60* sec

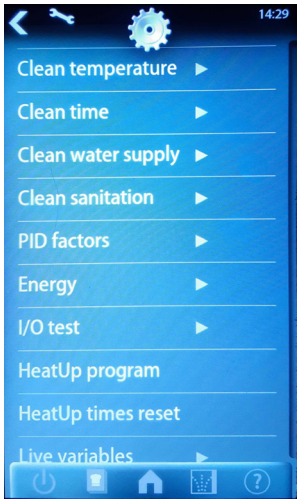


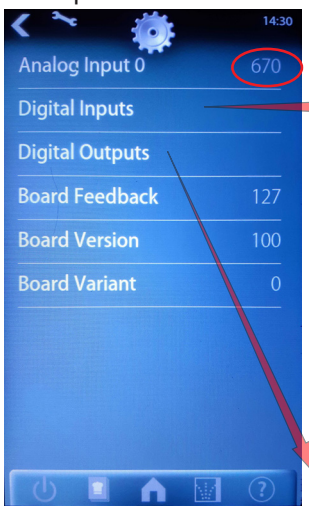
I/O TEST

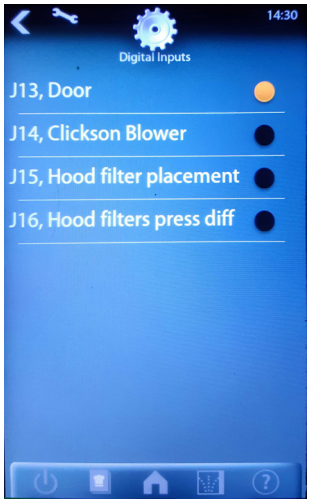
Gain access to the service menu 4878

Select “I/O test”

“Analog input” shows PT1000 temperature (in 0,1 degrees)
Example below is 67°C



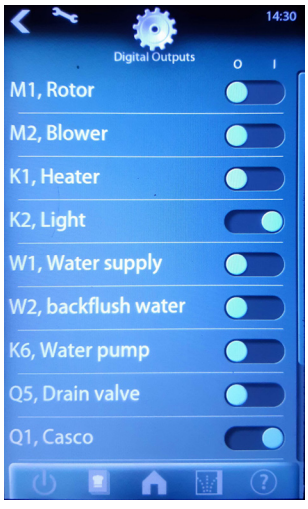




“Digital inputs” is showing the available inputs and also which contacts are closed.

J13 shows that the door is closed.

J14 shows an open thermistor in the blower, causing a blower error.

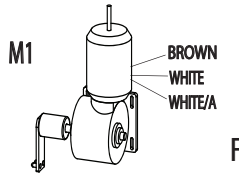


“Digital outputs” is showing the available outputs and also which are activated.

Push the button to activate or disactivate the output of your choice.

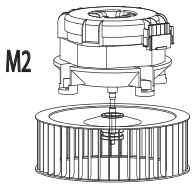
See chapter “software i-controller” (I/O test) for a hardware overview of the outputs.

Device	Relay	Connec-tor
M1 Rotor	R1	J2-4
M2 Blower	R3	J2-3
K1 + K2 Heater	R2	J2-1
Light	R4	J2-6
W1 Water Supply	R5	J32
W2 Water Supply	R6	J31
K6 Water Pump	R12	J61
Q1 Casco	R9	J42
Q2 Spray Right / P2	R8	J41
K4	R11	J52
Q4 Fat Drain	R10	J51
Q5 Drain Valve and/or pump	R7	J33



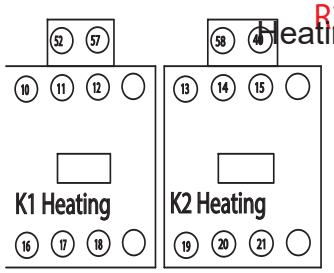
R1 -> J2-4

Rotor motor



R3 -> J2-3

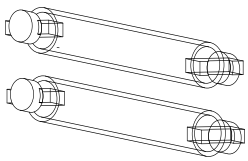
Blower



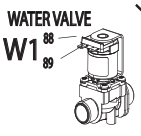
R2 -> J2-1

Heating

Illumination



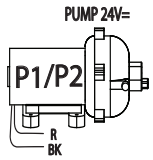
R4 -> J2-6



R5 -> J32

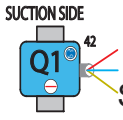
R6 -> J31

Water solenoïd



R12 -> J61

Water pump



R9 -> J42

Suction side

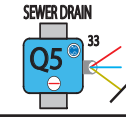
R8 -> J41

R11 -> J52

Sprinkler left

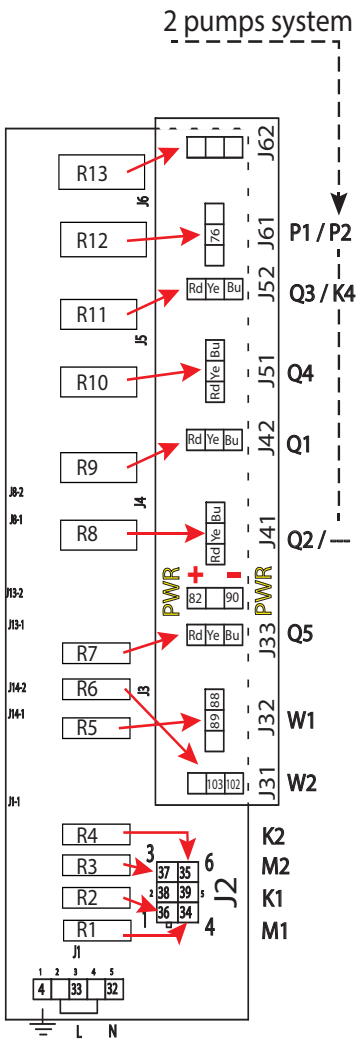
R10 -> J51

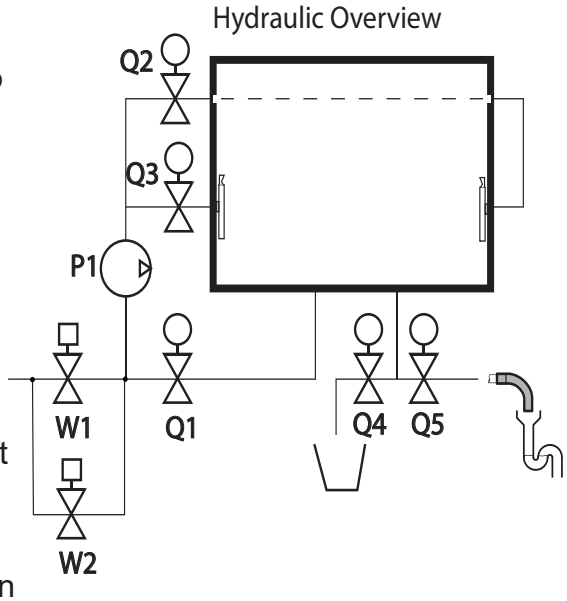
Grease drain

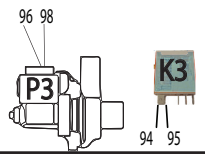


R7 -> J33

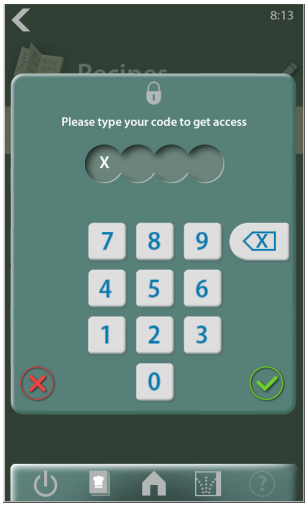
Water drain Valve and/or pump



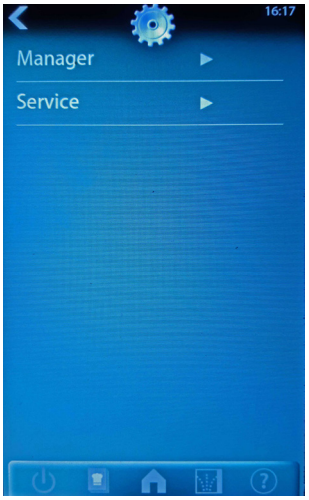


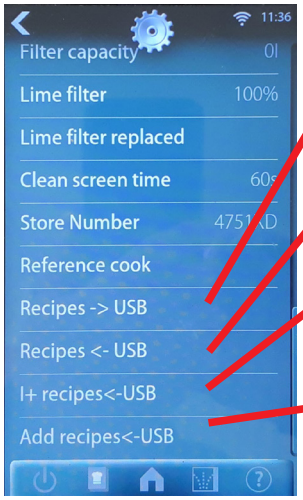


EXCHANGING DATA WITH THE USB DRIVE



The password for service is 4878.
Once the service menu is entered, also the manager menu is unlocked.



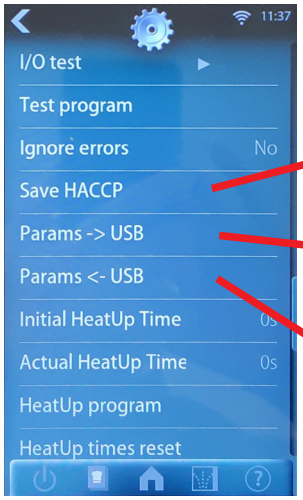


Copies recipes from the controller to the USB drive

Copies recipes from the USB drive to the controller. The existing recipes will be overwritten.

Copies i-control recipes from the USB drive to the controller. The current recipes will be overwritten.

Copies recipes from the USB drive to the controller. The recipes will be added to the current recipes.



Copies HACCP files from the last 3 days to the USB drive.

Copies the parameter list from the controller to the USB drive.

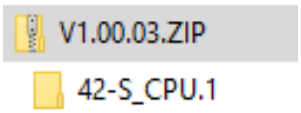
Copies the parameter list from the USB drive to the controller. The current parameters will be overwritten.

UPDATING SOFTWARE TDRAC (S-CONTROL)

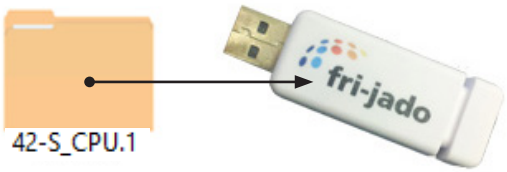
Preparing the software (firmware)

The software comes in a .zip file. The name corresponds with the version of the software. For example: *V1_00_3.zip*.

1. Extract the zip file

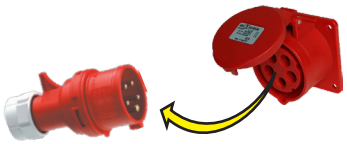


2. Copy or move the folder "*42-S_CPU.1*" to the USB drive.



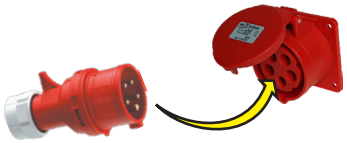
Updating the software (firmware)

1. Disconnect the mains supply



2. Connect the USB drive.

3. Connect the mains supply



4. The following messages appear

Bootloader version V4.03.04
-USB stick found
starting upgrade

-Copying update.tar

-in progress .. %

-USB can be removed

-Removing current application

-Extracting archive .. %

-Please remove USB stick

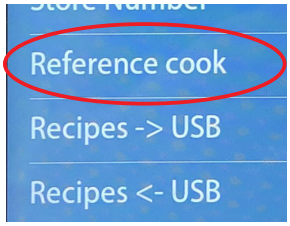
5. Disconnect the USB drive and wait untill the screencomes back.

Important first setting !!
In the service menu, the parameter "commision apply" needs to be set on "yes".
Otherwise, cooking programs will be lost after a power disconnection.

In case a new board has just been put into a unit, it has to be set to the right device type! -> TDRac

AUTOMATIC COOK CORRECTION

The automatic cook correction facility will automaticly add or deduct time to the programmed cooking time in order to have constant cooking quality.
To activate it, the parameter "auto correct" has to be put on "time".



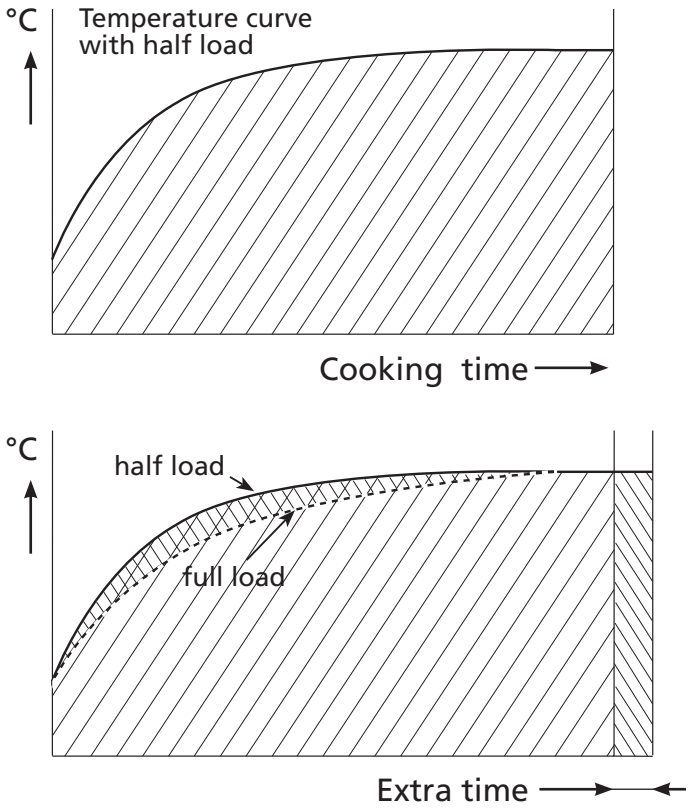
Go to the manager menu --> Reference cook and activate it.
Then select a (new) program.

It is recommended to do that cook with a half to 3/4 load.

The program calculates the surface from the diagram below the curved line. (temperature * time). The result is the so called heat number. This heat number is stored into the cooking program.

All further cooking programs will try to get the same heat number.

The second diagram shows an example with full load. It takes more time for the unit to reach the programmed cooking temperature. See dashed line. The surface above the dashed line represents the missing part of the heat number. The cook correction will put this missing part behind the normal cooking time. Therefore extra time is added in order to reach the desired heat number.
It is also possible that time is deducted in case a smaller load has been put into the oven.



Time will be added in case of:
A bigger load.
A colder load. (straight from the freezer)
A lower mains voltage.
Somebody opened the door.

Time will be deducted in case of:
A smaller load.
A warmer load. (defrosted)
Higher mains voltage.

Note that:
In case the time or temperature will be changed in the cooking program, the heat number will be adapted with this amount.

The heat number is stored in the cooking program. In case such a program is copied, the heat number goes with it.
It is possible that in case the program has changed a lot, the cook correction is not able to perform well anymore. In that case the program has to be deleted and reprogrammed with the good parameters.
It is possible to disable this auto cook correction feature in the service parameters. See "parameter listings" -> "auto correct.

DEFAULT PARAMETERS LDR-AC

Parameters LDR-8 S AC 230V software version 1050					
Level 1	Level 2	Level 3		Default	Possibilities
Information				1050	software version
Manager					
	Change Pin code			0000	0000 - 9999
	Toggle Light				on - off
	Temperature unit			°C	°C - °F
	Volume unit filter			lit	lit - gal
	UTC time			Local time	
	UTC Date			Actual date	
	Timezone offset			0h	-12 - 12
	Time format			24 hr	24 hr - AM/PM
	Date format			DMY	DMY - MDY
	Start delay recipe			no	no - yes
	Alarm signal			on	off - on
	End-user recipe editing			no	no - yes
	Ask weight			no	no - yes
	Preheat mode			Continues	no - 1x - continues
	Preheat temp default			150	50 - 150°C
	Eco function			no	no - yes
	Audio	Audio setting		1	1 - 11
		Audio factor		100	1 - 100
		Test audio			
		Sound set		Marimba	Marimba - Bell - Beeper
	Keyboard beep			on	off - on
	Filter capacity			↔	50 - 30000, or ↔
	Lime filter				remaining capacity of lime filter
	Lime filter replaced				no - yes
	Clean screen time			30 sec	10 - 60 sec
	Store Number				
	Reference cook				
	Recipes -> USB				
	Recipes <- USB				
	Add recipes <- USB				
	Restart hard				
Service				4878	
	device type			LDR-8 S AC	LDR-8 S AC gas, TDR-8 S, TDR-8 S AC, TDR-7 S AC 208V, TDR-5 S AC, TDR-5 S, LDR-8 S AC, TDR-5 S 208V, TDR-7 S 208V, LDR-8 S AC 208V, LDR-8 S AC gas 208V
	smart temperature			off	off - on
	auto-correct			off	off - on
	Language			english	englisch - deutsch - francais - nederlands - espanol - japanese - danish - italiano - russian - norsk - polish
	save errors				save error history on usb
	clear error history				
	Demo mode menu	Demo mode		off	off - on
		Demo param.	Rinse time	5 min	2 - 40
			Drain time	5 min	2 - 40
			Supply time	70 sec	0 - 120
		Demo clean start			
	auto off time			60 min	10 - 240
	Change pin			****	read out of the manager pin code
	Sensor offset			0°C	-30 - 30°C
	Cleaning	Clean temp	Clean temp 1	48°C	25 - 60
			Clean temp 2	60°C	25 - 60
			Clean temp 3	55°C	10 - 70
			Quick CL temp	55°C	10 - 70
			Descale temp	55°C	10 - 70
			Soap safe temp	75°C	25 - 100
			Cooling temp	75°C	25 - 100
		Clean times	Hot rinse time 1	40 min	5 - 40
			Hot rinse time 2	40 min	5 - 40
			Hot rinse time Q Cl	20 min	5 - 40
			Hot rinse time Desc	20 min	5 - 40
			Cold rinse time 1	10 min	5 - 40
			Cold rinse time 2	10 min	5 - 40
			Cold rinse time Q Cl	10 min	5 - 40
			Cold rinse time Desc	10 min	5 - 40
			Drain time	3 min	1 - 10
			Flush time	15 sec	5 - 60
			Drain backflush time	2 min	1 - 15
			Final time	1 min	1 -15
			Shine rinse time	5 min	1 - 30
		Clean water supply	supply time 1	70 sec.	1 - 120
			supply time 2	70 sec	1 - 120
			add water interv.	20 min	1 -60 min
			add water time	5 sec	1 - 30 sec
		Clean sanitation	sanitation step	no	no - yes
			sanitation time	20 min	0 - 30

		sanitation temp	110°	25 - 125
	Descale warning		0	0 - 30
	Daily clean warning		0	0 - 30
	Open door cooling		disabled	disabled - enabled
	Force cleaning		on	off - on
	Cleaning options	Quick Clean	disabled	disabled - enabled
		Daily Clean	enabled	disabled - enabled
		Descale	disabled	disabled - enabled
	Clear cleaning status			
Delete all programs				no - yes
Hood			off	off - on
I/O test				read the inputs and set the outputs
test program				
Ignore errors			no	no - yes
save HACCP log				save haccp log on usb
HACCP days			10	1 - 100
params -> USB				save parameters on usb
params <- USB				load parameters from usb
Initial heat up time				
Actual heat up time				
Heat up program				no - yes
Heat up time reset				no - yes
Wifi	Wifi smartphone		Blocked	blocked - allowed
	Wifi cloud		Disabled	disabled - enabled
	Wifi RSSI			
	Wifi auto restart		60	0 - 240
	start config			
	Allow open WLAN		Disabled	disabled - enabled
	reset Wifi chip			no -yes
Factory settings	Fact reset settings			no -yes
	Fact reset recipes			no -yes
	Fact reset data			no -yes
	Lights out		Disabled	disabled - enabled
	Eco variable		2	1 - 10
	Correction factor		4	1 - 10
	Fat drain		open	open - auto
	RS485 debugging		off	off - on
	PID factors	P	100	0 - 100
		I	5	0 - 100
		D	100	0 - 500
		iMax	100	10 - 300
		Relay actions	80	16 - 160
	S/N			
Commision reset				no -yes
Commission apply				no -yes
Customer ID				1 - 10
Restart soft				no -yes
Restart hard				no -yes
Swipe sensitivity			25	0 - 100
Live variables	Status counter			
	Output counters			
	Start/end counters			
	UTC system time			
	Commission time			
	Time lime filter			

Commission apply YES

* Descale warning 0 (=disabled) for all units
* Daily/Deep clean warning 0 (=disabled) for all units

Latest software and settings files are available on the Fri-Jado resource library.

https://www.frijado.com/resource-library/

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EXPLANATION OF PARAMETERS

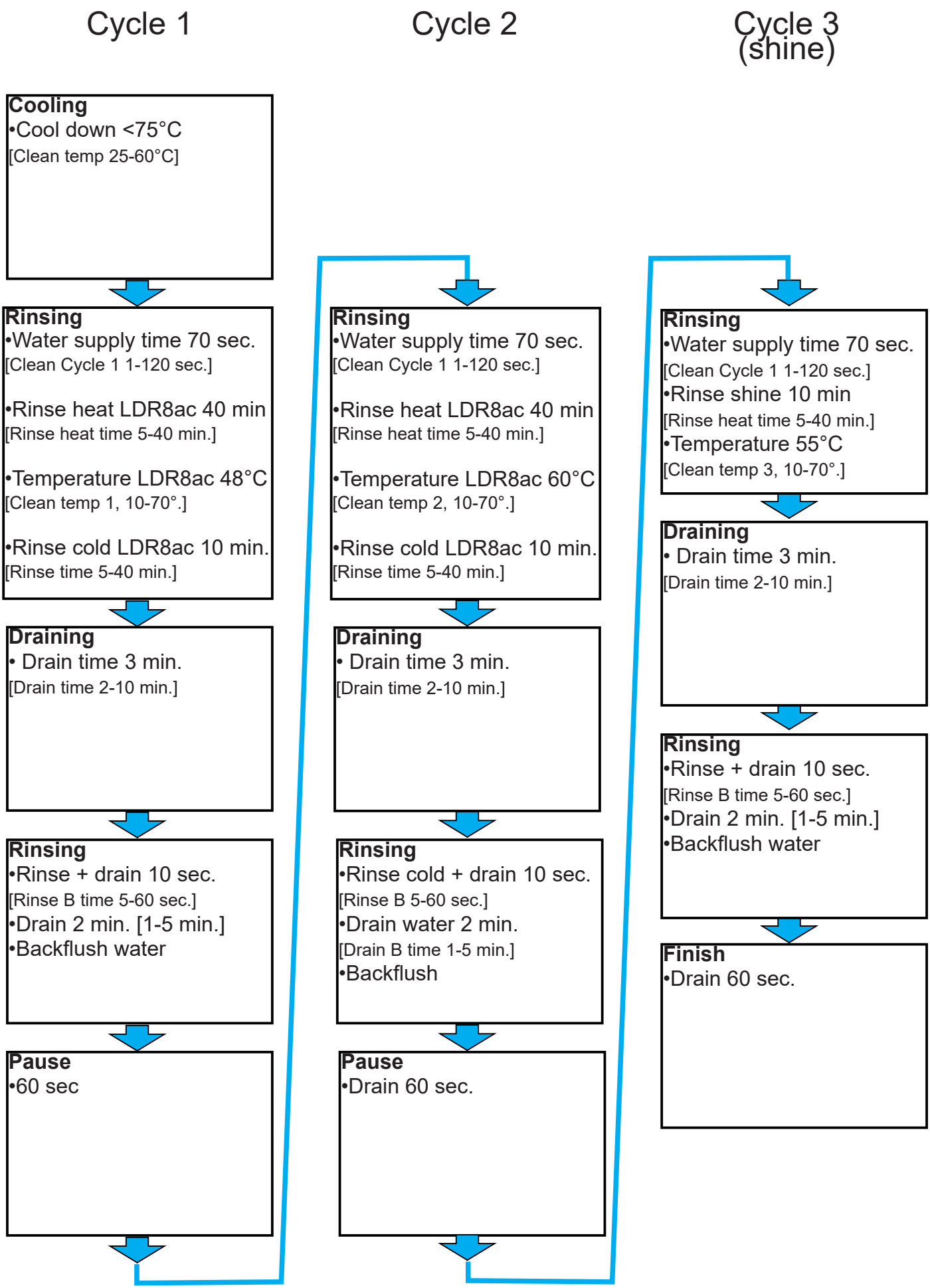
Level 1	Level 2	Level 3
Change Pin code		Option to change the manager pin code
Toggle Light		Option to switch on or off the interior light.
Temperature unit		Change the temperature units from Fahrenheit to Celcius or from Clecius to Fahrenheit.
Volume unit filter		Change the volulme units from Liters to Gallon or from Gallon to Liters.
UTC time		Set to local time
UTC date		Set to local date
Time zone offset		Option to set a offset to the timezone (12 to +12 hours)
Time format		Option to select the desired time format
Date format		Option to select the desired date format
Alarm		Switch alarms on or off
End-user recipe editing		Enables the end user to change and save recipes
Ask weight		Option to activate or deactivate the question at the start of a recipe for a low/middel of full load.
Preheat mode		Option to deactivate or activate preheat. !x means once at the beginning of the day, continue means at each recipe start.
Preheat temp default		Option to set the desired default preheat temperature
Eco function		Option to enable or deactivate the Eco function. The eco mode saves enery to use latent heat at the end of the recipe. (this will increase the total recipe time)
Audio	Audio setting	Option to set the desired audio sound (tone)
	Audio factor	Option to adjust the audio volume
	Test audio	Function to test the set audio options
	Sound set	Option to set the desired sound/melodie
key board beep		Option to activate or deactivate the beep at the touch of the key board.
Filter capacity		Option to set the actual filter capacity of the used water filter system in relation to the water quality on site. Set "-" if no filter is installed.
Lime filter		Shows the remaining filter capacity of the lime filter.
Lime filter replaced		When the lime filter is replaced set to yes so the counter will be reset to the start filter capacity.
Clean screen time		Option to set the time for cleaning the screen without a response of the controller.
Store number		Here you can enter the store number or other store references
Reference cook		
Recipes -> USB		Copy all recipes from the rotisserie to the USB key.
Recipes <- USB		Copy all recipes from a USB key to the rotisserie.
Add recipes <- USB		Copy selected recipes from a USB key to the rotisserie.
device type		Option te set the correct device type so the oven configuration will be active.
Smart temperature		Do not change
auto-correct		Option to activate or deactivate the auto correct function which adds time if neccasarry (Due to high product load or temperature loss) to the remaining time.
Correction factor		With this setting you can change the effect of the auto-correct.

Level 1	Level 2	Level 3
language		Option to select the desired language
Eco variable		Option to set the influence of the Eco mode
save errors		Option to save the error log/history to a USB key.
clear error history		Option to clear the error log/history
RS485 debugging		Option to activate or deactivate the RS485 debugging
demo mode		Option to activate or deactivate the demo mode of the rotisserie on for instance during a trade show. (no power will be activated to the main high power components)
demo parameters	Rinse time	Option to set the rinse time when demo mode is activated
	Drain time	Option to set the drain time when demo mode is activated
	Supply time 1	Option to set the (water) Supply time when demo mode is activated
demo clean start		Option to start a demo clean cycle
auto off time		Option to swith off the rotisserie automaticly after the set time when not operated. When set to "no" the rotisserie will not be switched off automatically.
change pin		Option to change the manager pin code
Drain duration		Sets the open time for the drain valve and backflush valve
Fat drain		Option to controll the fat drain by the recipe or default open
Clean Cycles		Sets the number of repeated clean cycles during cleaning
Clean temperature	temp 1	Set clean temperature during cycle 1
	temp 2	Set clean temperature during cycle 2
	temp 3	Set clean temperature during cycle 3
	Soap safe temp	Sets the "safe" temperature to cool down to before soap can be added to the oven at the beginning of the cleaning cycle.
	Cooling temp	Set temperature to cool down to before the cleaning starts
Clean Times	Hot rinse time	Set time for hot rinse step in cleaning cycle
	Rinse time	Set time for rinse step in cleaning cycle
	Drain time	Set time for drain open step in cleaning cycle
	Flush time	Set time for flush step in cleaning cycle
	Drain back-flush time	Set time for drain backflush step in cleaning cycle
	Final time	Set time for final step in cleaning cycle
	Shine rinse time	Set time for shine rinse step in cleaning cycle
Clean water supply	supply time 1	Set time 1 for filling the oven with clean water
	supply time 2	Set time 2 for filling the oven with clean water
	add water interv.	Interval time for adding water during cleaning
	add water time	set time for water adding during cleaning
Clean sanitation	sanitation step	Option to able or enable a sanitation step
	sanitation time	Set time for sanitation step in cleaning cycle
	sanitation temp	Set temperature during the sanitation step
Deep clean warn-ing		Number of cook cycles after which you receive a deep clean warning
Daily clean warn-ing		Number of cook cycles after which you receive a daily warning
Force cleaning		Option to enable a forced cleaning
Quick clean		Option to enable a Quick clean cycle
Daily clean		Option to enable a Daily clean cycle
Descale setting		Option to set the Descale cycle in a full / short cycle or to disable the descale cycle
Delete all pro-grams		Option to delete all recipes from the controller

Level 1	Level 2	Level 3
Hood		Option to activate the optional hood
PID factors	P	Temperature regulation setting (P= proportional)
	I	Temperature regulation setting (I= Integrating)
	D	Temperature regulation setting (D= Differentiating)
	iMax	Temperature regulation setting
	Relay actions:	Controlls the amount of relay switches in time
Energy	Volts	Set the actual voltage
	Machine model	
I/O test	Analog input	
	Digital inputs	read the inputs of; door (J13), Clickson Blower (J14), Hood filter placement (J15), Hood filter press diff (J16)
	Digital outputs	Set the ouputs of; Rotor (M1), Blower (M2), Heater (K1), Light (K2), Water supply (W1), Backflush water (W2), Water pump (K6), Drain valve (Q5), Casco (Q1), Spray right (Q2), Spray left (Q3), Fat drain (Q4)
	Board Feedback	Read feedback value
	Board Version	Read board version
	Board Variant	Read board variant
Test program		Yes activates a cleaning cycle
Ignore errors		If set to yes the controller does not show errors
save HACCP		Option to save the HACCP log to a USB key
HACCP days		Option to set the amount of days the HACCP log stores
save params on USB		Copy parameters from the rotisserie to the USB key.
save params from USB		Load parameters from a USB key to the rotisserie.
Initial heat up time		Recorded heat up time during initial cook
Actual heat up time		Recorded heat up time during last cook
Heat up program		Yes activates the heat up program and shows the heatup time in seconds. Note: if the oven is to hot when the heatup is activated it will cool down first
Heat up time reset		Resets the recorded heatup times
Lights out		Option to disable or enable the interiour lights during the cook
Wifi Smartphone		Optin to allow a connection to an Smartphone
Wifi smart Cloud		Option to enable a connection to the Fri-Jado Smart Connect website.
Wifi RSSI		Shows the signal level of the WiFi connection. Values are between -101dBm and -1dBm. In practice values are between -85dBm and -25dBm. A bad connection would give -85dBm, a very good connection would give -25dBm.
Wifi Auto Restart		"If you set a time of >= 5 minutes here, the machine will regularly check whether the WiFi no longer receives messages during the set time interval. In case there was no communication during that time interval, the WiFi communication will be restarted. This is intended to be able to automatically recover any loss of the WiFi connection if there should be long-term problems."
Start Config		"This allows you to force the machine to start a new cloud configuration. The old WiFi access point data will be deleted at that time and after a few seconds a smartphone symbol will appear in the top right corner of the status bar on the screen. From the moment that smartphone symbol appears, the user can set the cloud configuration on the machine via the smartphone."
Reset Wifi Chip		This option resets the wifi chip with an electronic reset signal and restarts the wifi communication in the software.
Fact reset settings		Reset to factory settings
Fact reset recipes		Reset to factory recipes
Fact reset data		Reset of factory data
Commision reset		Reset of set commission date
Commission apply		Option to apply the current date/time for commissioning

Level 1	Level 2	Level 3
Customer ID		By entering the a maching customer code the correct story boards and explanations are given in the help function
Restart soft		This performs a 'soft' reboot of the entire S control software. This means that the entire software restarts internally without an external electrical reset signal being issued.
Restart hard		This performs a 'hard' (electronic) reboot of the entire S control software, which is similar to turning the machine off and on again.
Swipe sensitivity		This option alows you to adjust the sensitivity of the touch display.
Live variables	Status Counters	Total hours oven was active
		Total hours oven was operational
		Total hours of preheat
		Yes resets the preheat total
		Total hours added time
		Yes resets the manually added total
		Total hours of cook corrections
		Yes resets the cook corrections total
	Output Counters	Shows hours of heater activation
		Resets the heater counter
		Shows hours of blower activation
		Resets the blower counter
		Shows hours of rotor activation
		Resets the rotor counter
		Shows hours of light activation
		Resets the light counter
		Shows hours of pump activation
		Resets the pump counter
	Start/End Counters	Number of started recipes after last counter reset.
		Number of ended recipes after last counter reset.
		Number of started quick cleans after last counter reset.
		Number of ended quick cleans after last counter reset.
		Number of started daily cleans after last counter reset.
		Number of ended daily cleans after last counter reset.
		Number of started full descales after last counter reset.
		Number of ended full descales after last counter reset.
		Number of short descales after last counter reset.
		Number of ended short descales after last counter reset.
		Reset of all starts and ended counters
	UTC System time	Set time and date
	Commission time	Time and date of commissioning
	Limefilter time	Last installation time and date of the water filter

CLEANING PROCESS LDR AC (3 STEPS) (PARAMETER "CLEANING CYCLES)



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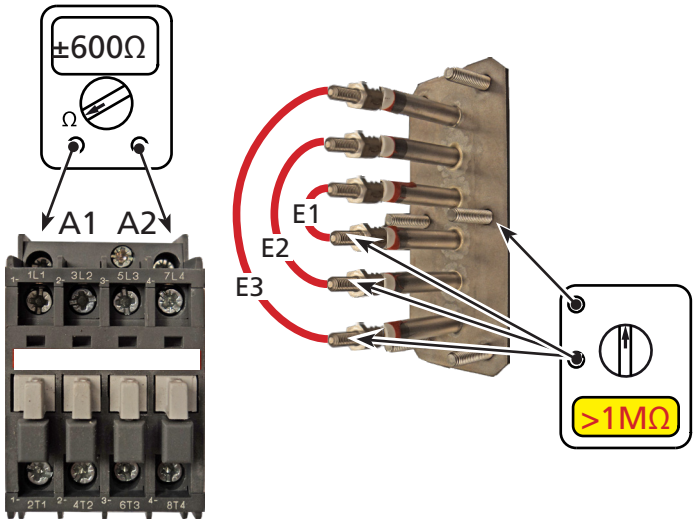
WARNING: Disconnect the electrical power to the machine at the main circuit box. Place a tag on the circuit box indicating the circuit is being serviced.

MEASURING THE HEATING ELEMENTS



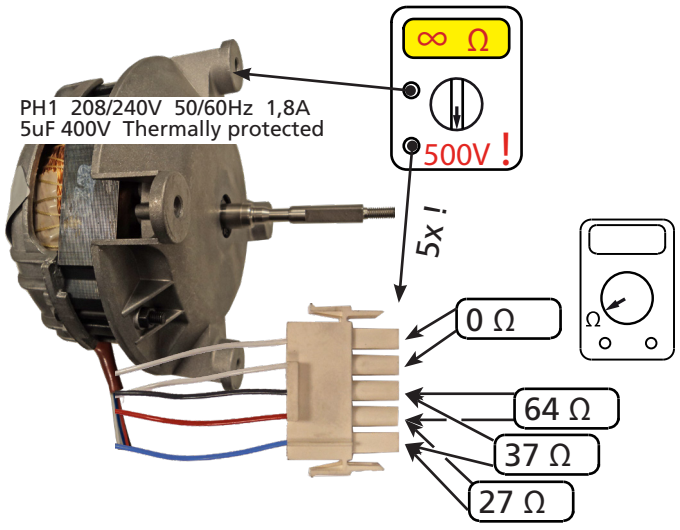
Heating element LDR 8

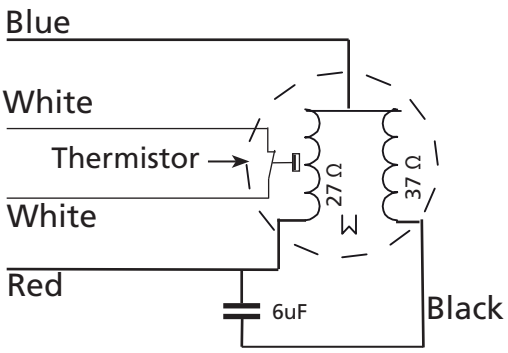
	200-208V (USA)	230V (EUR)
E1 (2x)	3000W 14,5 Ω	3000W 17,5 Ω
E2 (2x)	3000W 14,5 Ω	3000W 17,5 Ω
E3 (2x)	3300W 13 Ω	3300W 16 Ω

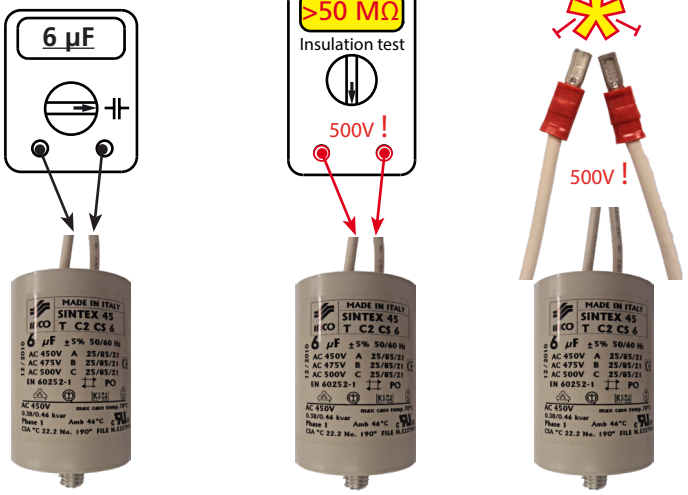
If heaters have been stored for a longer period, Moist can go in and the insulation resistance can go down. Therefore it is good to measure this insulation resistance before mounting it.
In case this Insulation resistance is too low, it could be considered to dry the heater in an oven for 24 hours on 130°C (266°F). The longer the better.
Advise:

- *Keep stock limited.*
- *Store in conditioned space (for example in a box with silica gel)*

Blower of rotisserie

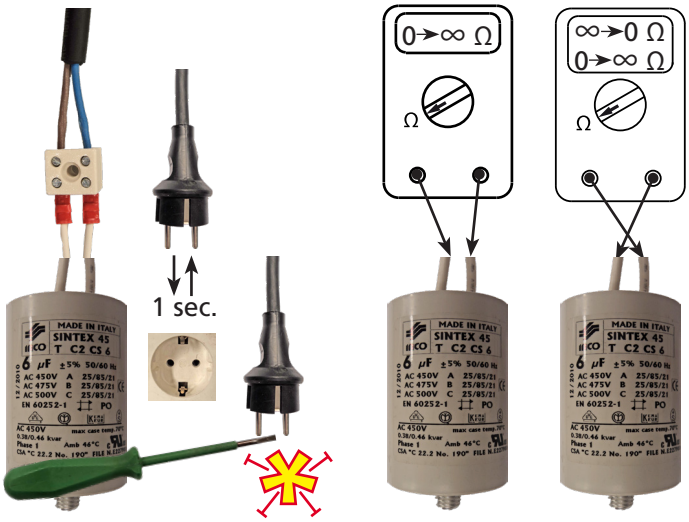






Charging with a test cable

Checking with Ω meter



The 6µF capacitor

General

Even with a capacitance meter it is impossible to determine for sure if the capacitor is ok or not, because it can be leaking when it is connected to mains power.

A quick optical check often tells more. Search for leaking oil and / or bulges (lumps).

Measuring with an insulation tester in 500V position.

Work under safe conditions according local legislation!

The value will not reach ∞ Ω, but will go up and down a little. When it is above 50MΩ it wil be ok. Disconnect the test leads while the value is at the highest position. The capacitor is now charged with ± 500VDC!!

Leave it for a few seconds and then put the wires together. A loud spark must arise. If not, the capacitor is leaking (loosing its charge).

It is also possible to charge the capacitor by shortly con necting it to the mains supply (208V~). The same spark must arise. Do this a few times. The capacitor will not be charged when the leads are disconnected during the "zero crossing" of the mains sinus. It is ok when a spark arises once.

Measuring with an Ω meter.

Be sure that the capacitor is empty!

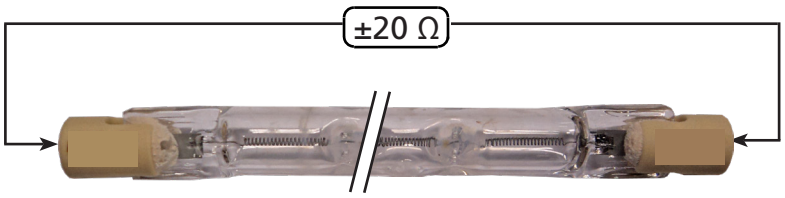
The value will go up until ∞ Ω is reached.

Exchange the test leads. The value will go down, through "0" and up again.

If not, the capacitor is broken.

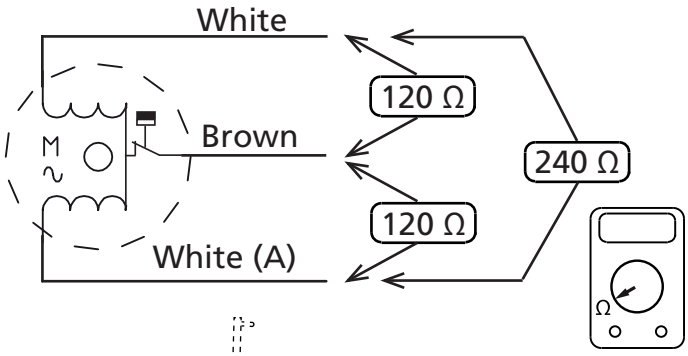
If ok, it is still not sure if the capacitor is ok. It might leak when it is connected to the mains power!

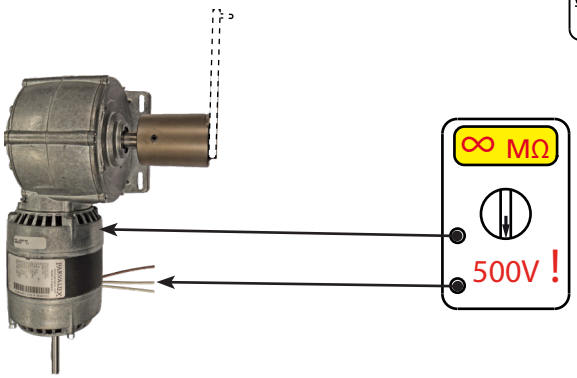
MEASURING THE 160W LAMP



230V 160Watt

MEASURING THE ROTOR (DRIVE) MOTOR





MEASURING THE PT1000 SENSOR

PT1000 sensor

The oven temperature is controlled by a PT1000 sensor, mounted in the top at the side.

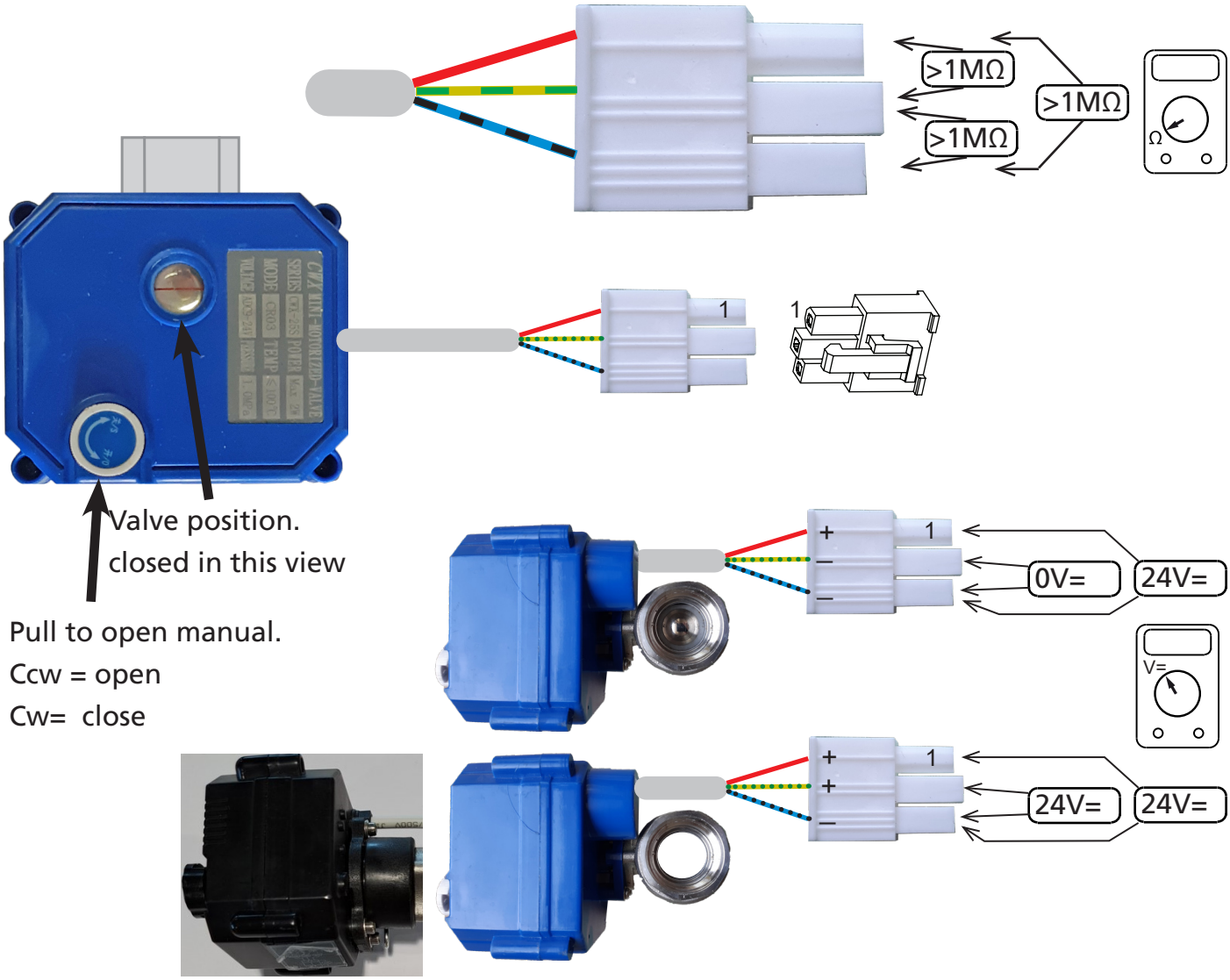
See the resistance overview for the PT1000 sensors.

°C	PT1000
-20	921,60
-10	960,90
0	1000,00
10	1039,00
20	1077,90
25	1097,40
30	1116,70

°C	PT1000
40	1155,40
50	1194,00
60	1232,40
70	1270,00
80	1308,90
90	1347,00
100	1385,00
110	1422,00

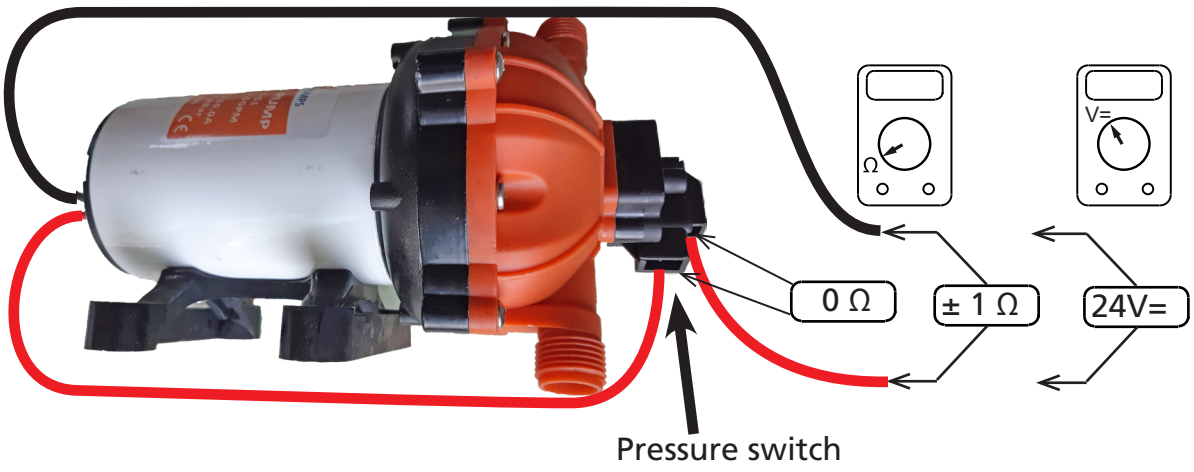
°C	PT1000
120	1460,60
130	1498,20
140	1535,80
150	1573,10
200	1758,43
250	1940,81
300	2120,30

MEASURING THE MOTOR VALVE



MEASURING THE PUMP

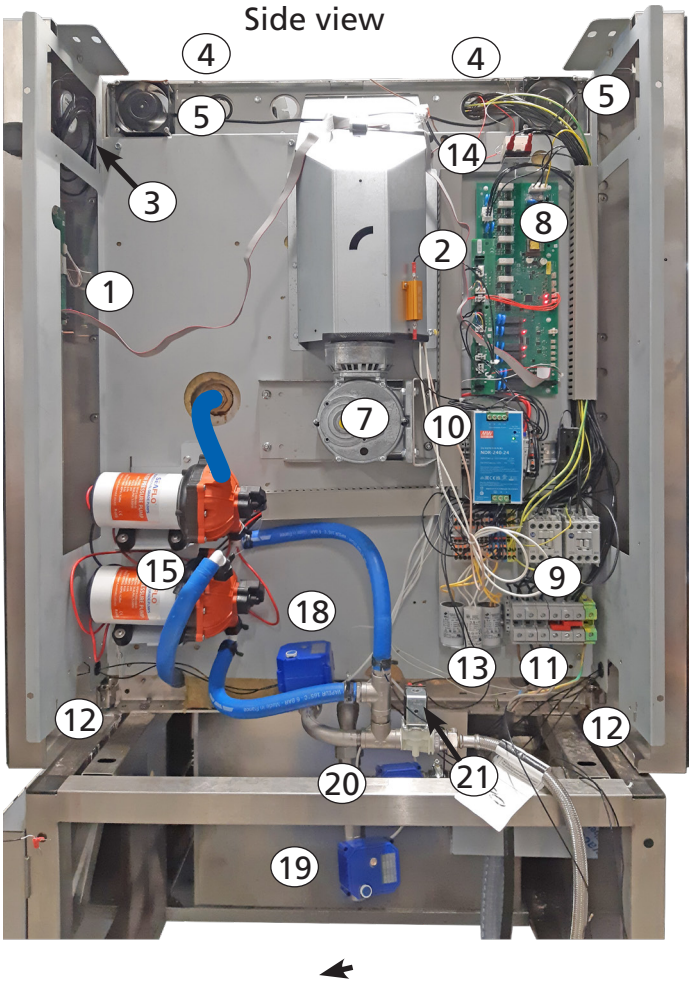
2 Amp. at free run
5-6 Amp. at full load



WARNING: Disconnect the electrical power to the machine at the main circuit box. Place a tag on the circuit box indicating the circuit is being serviced.

ACCESS TO SERVICE PARTS LDR-AC

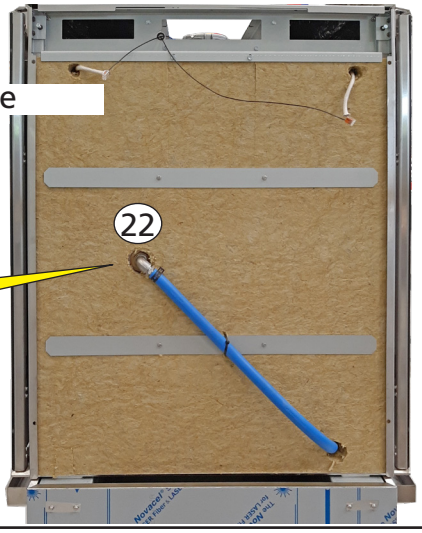
Side view



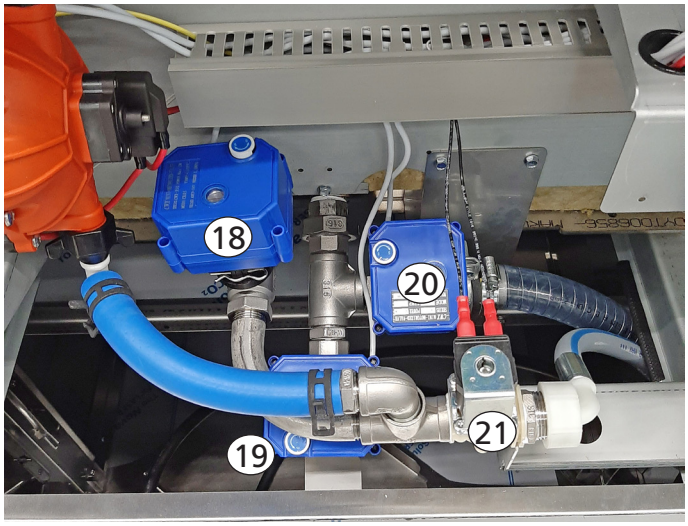
Unscrew 4 screws and open the panel from the electric compartment .
The same for the panel on the oposite side to reach the wiring from the light and also to “unlock” the top panel.
Remove the top panel and the blower panel on the inside, to reach the blower motor and the heating element.

1. CPU & LCD board and key board
2. Power & I/O board.
3. Speaker
4. Lamp connection
5. Cooling fans
6.
7. Rotor drive motor
8. Fuse on board (1A 5x20 slow acting).
9. Contactors (left = heating, right = light)
10. Power supply 24V 10A (short circuit protected)
11. Mains connection block
12. Door switch
13. Capacitors
14. Hi Limit thermostat
15. Rinse pump
16.
17.
18. Motor valve, suction side
19. Motor valve, grease drain
20. Motor valve, waste water (sewer) drain
21. Solenoïd valve, water inlet (10 ltr/min)
22. Elbow connection left rinse arm

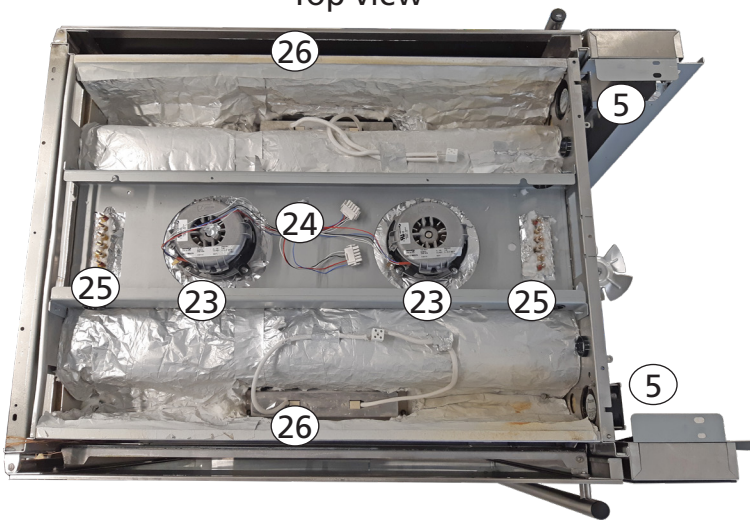
view opposite side



Close up view of water inlet valves and drain valves



Top view



23. Blower motor
24. 5 pole socket / plug connection of blower
25. Connections of heating element.
26. Illumination
27. Heating element
28. Turbine
29. PT1000 sensor

Inside view (with removed blower panel)

ACCESS TO SERVICE PARTS STACKED UNITS

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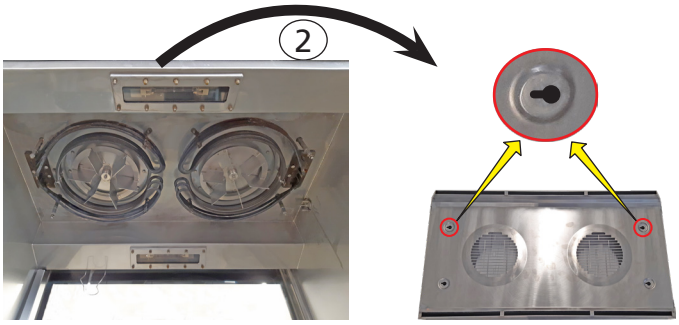
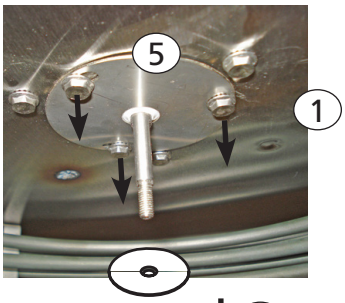
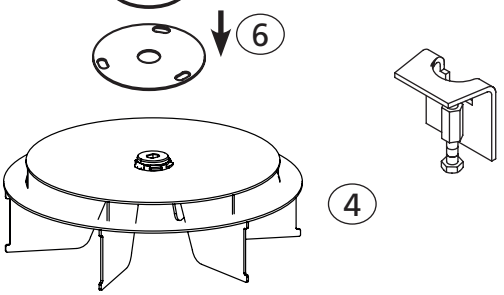
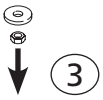
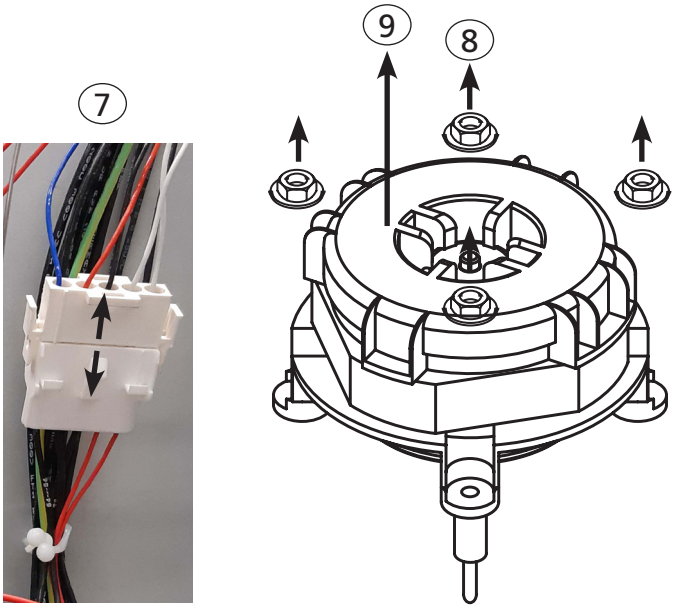
BLOWER MOTOR











Dismounting the blower assembly in the LDR8ac.

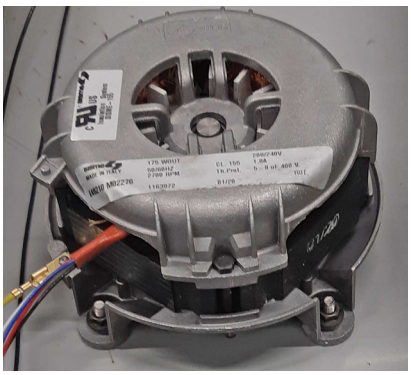
1. Remove both side panels and the top panel
2. Remove the blower panel.
   Slacken the nuts, move the panel a little sidewards and take it out.
3. Remove the M5 nut and washer from the motor shaft
4. Pull the turbine from the shaft. A puller is delivered with the new blower kit.
5. Unscrew 3 screws.
6. Pull off the shaft seal with pressure plate.
7. Disconnect the blower wiring.
8. Unscrew 4 nuts.
9. Take out the motor.

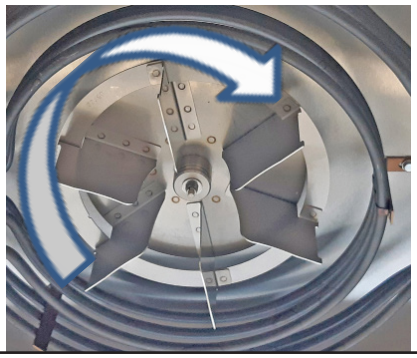
Mounting the blower assembly.

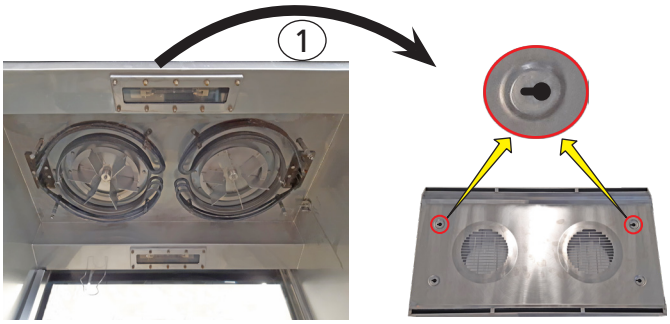
This has to be done in reversed order from disassembling.

Very important!

- First mount the motor and tighten the 4 nuts thorougly.
- Then mount the shaft seal.
- Never loosen or tighten, the 4 nuts from the motor afterwards.
- If this is necessary, then first loosen the shaft seal.
- Check the rotation direction.

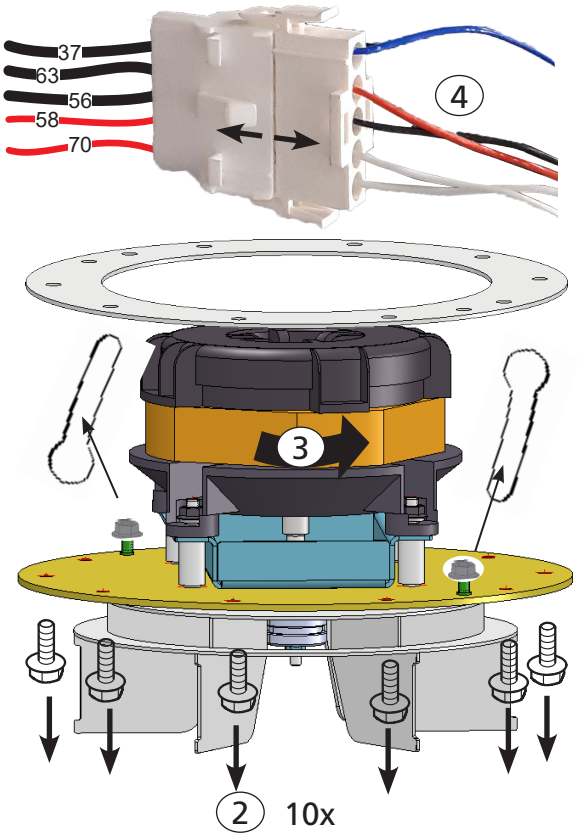






Dismounting the blower assembly from the inside.

1. Remove the blower panel.
   Slacken the nuts, move the panel a little sidewards and take it out.
2. Unscrew 10 screws around the turbine. The assembly will come down a little. If not, the seal is sticking. Loosen the mounting disc from the ceiling.
3. Turn the assembly a little to the right, hold it steady and let it come down.
4. Disconnect the 5 pole plug.

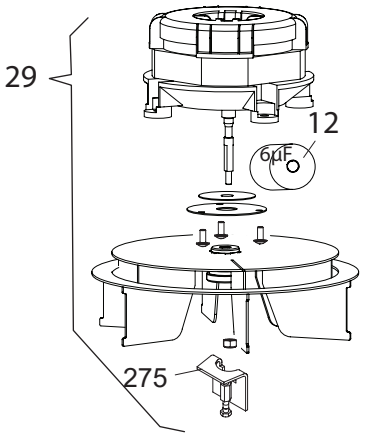


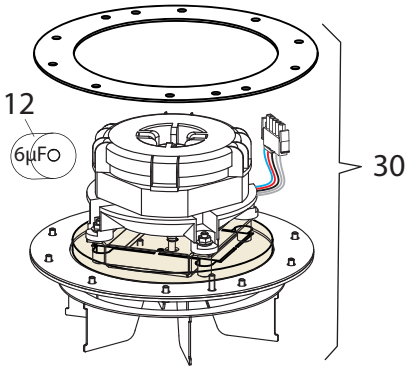
Mounting the blower assembly.

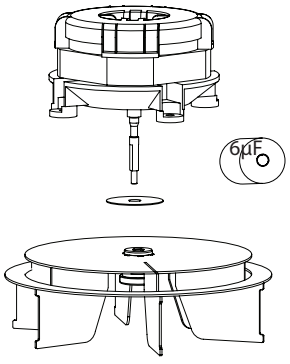
This has to be done in reversed order from disassembling.

Very important!
- Clean the remainigs of the gasket.
- Apply the new delivered gasket.

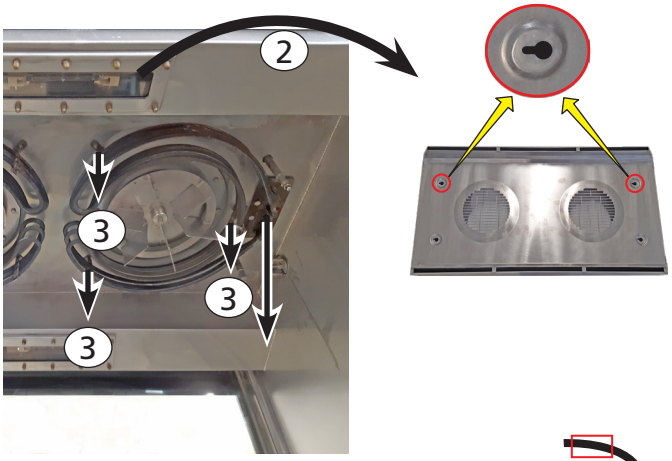
The below parts are available for service (drawings from exploded views)

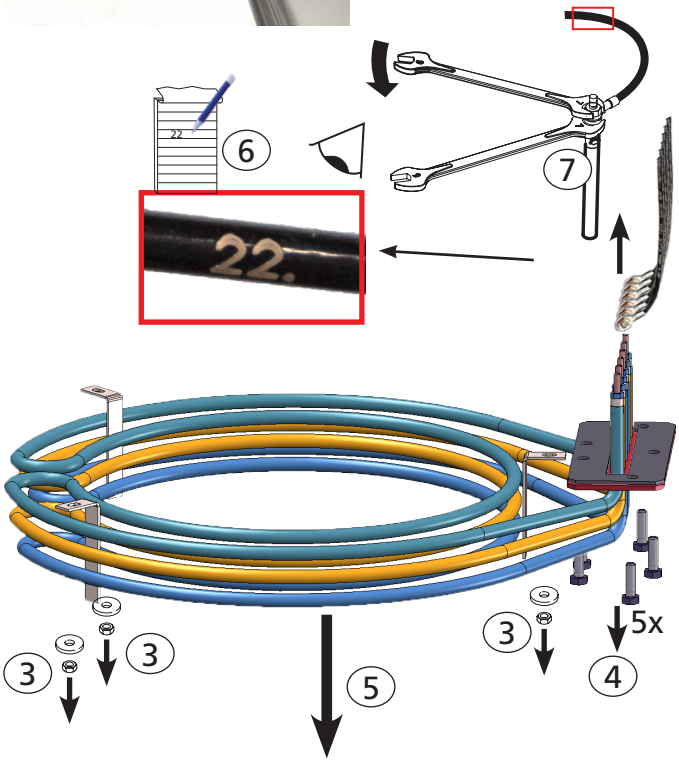






HEATING ELEMENT





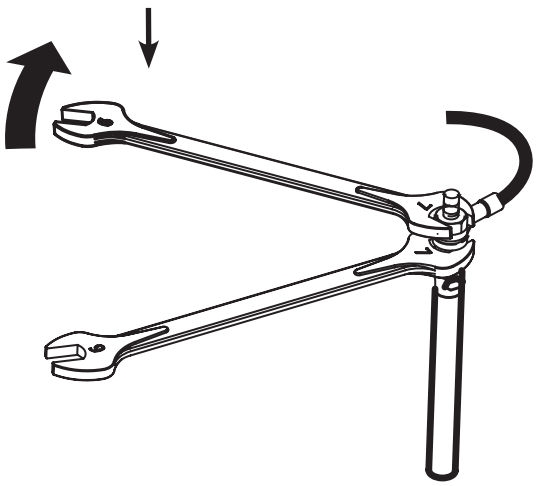
Dismounting the heating element.

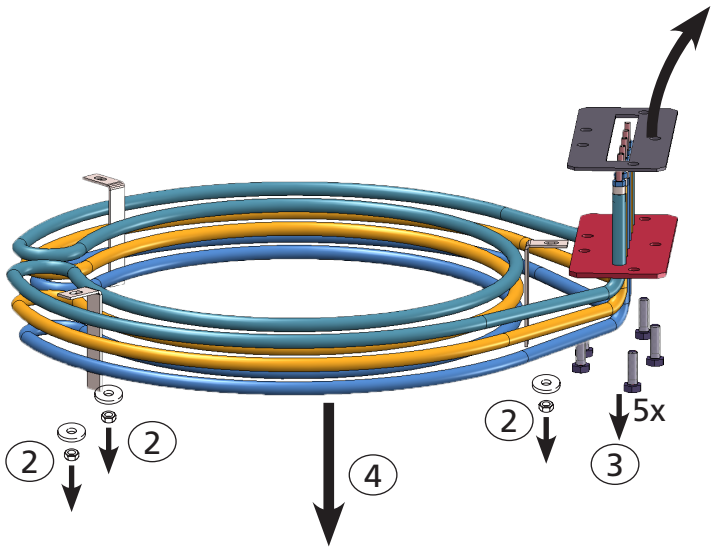
1. Remove both side panels and the top panel.
2. Remove the blower panel.
   Slacken the nuts, move the panel a little sidewards and take it out.
3. Unscrew the three M4 nuts that secure the heating element to the ceiling.
4. Unscrew the 5 screws from the mounting plate.
5. Hold the heating element or pull it down when the gasket sticks.
6. Note the wiring number and write down if necessary.
7. Disconnect the wiring. Note! Hold the rear nut with an open end spanner!
8. Clean the ceiling from residu's.

Mounting the heating element.

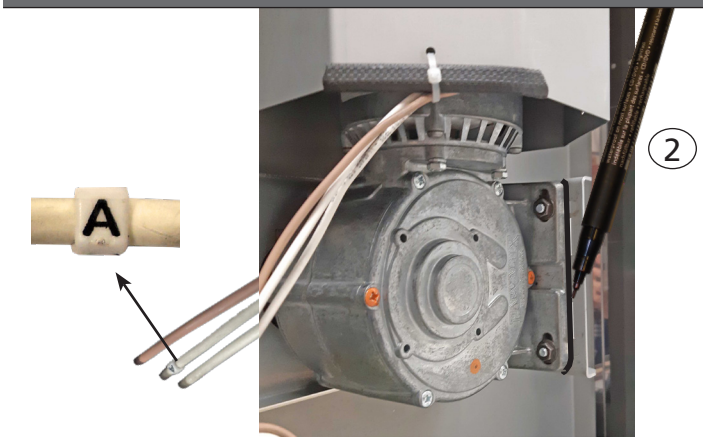
This has to be done in reversed order from disassembling.

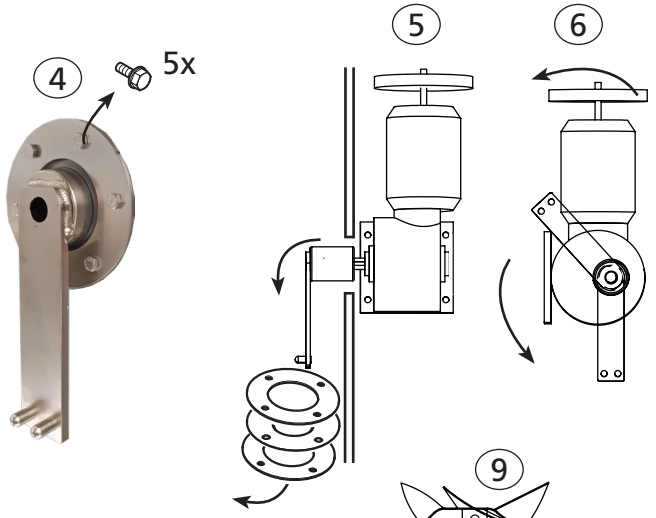
Very important!
- Take a new gasket.
- Firts place the gasket, then connect the wiring
- Do not forget to hold the rear nut with an open end spanner when connecting the wiring and tightening the nuts.

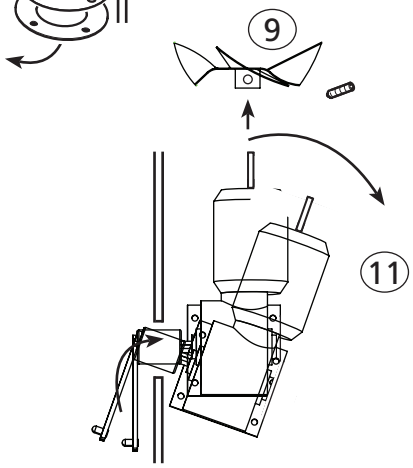


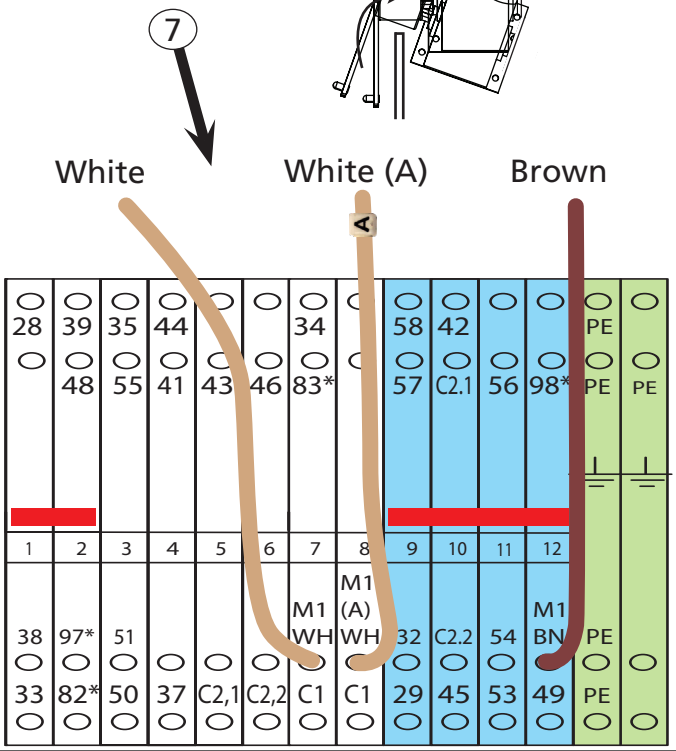


ROTOR DRIVE MOTOR



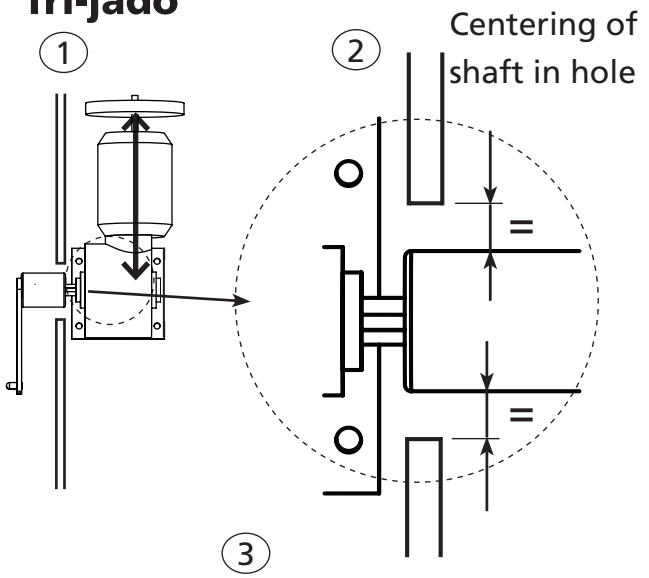


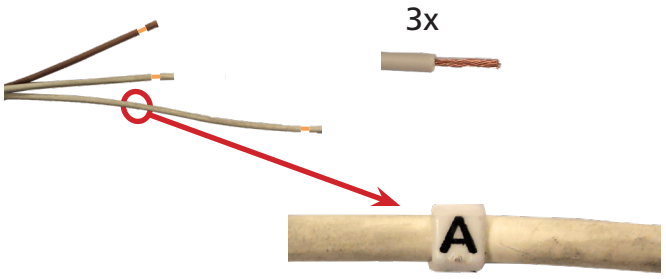


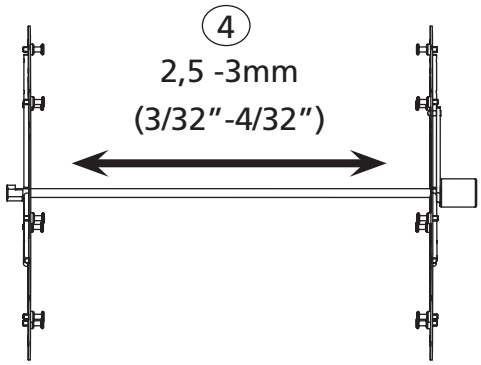


Dismounting the rotor motor:

1. Remove the side panel at the operator-panel side.
2. Mark the position of the motor on the bracket.
3. Take the rotor shaft out of the cooking cavity.
4. Unscrew the 5 bolts from the shaft seal mounting plate.
5. Slide the mounting plate and lip-seal from the drive arm.
6. Put the drive arm (If applicable)in the position as shown. This can be done manually, if necessary, by turning the fan blade on the motor.
7. Disconnect the wiring of the motor.
8. Unscrew 4 screws and put the air guide aside.
9. Remove the (cooling) fan blade.
10. Unscrew 4 screws with nuts.
11. Take out the motor as shown.





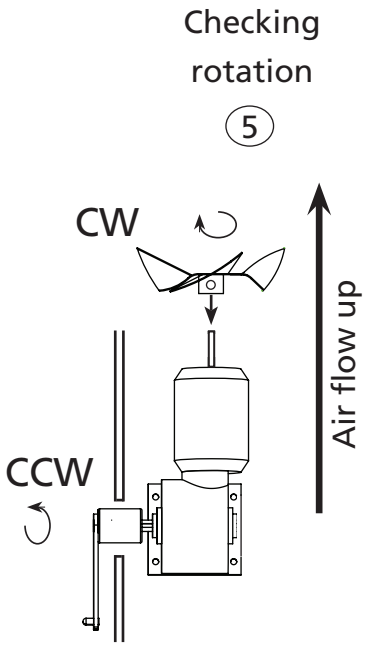


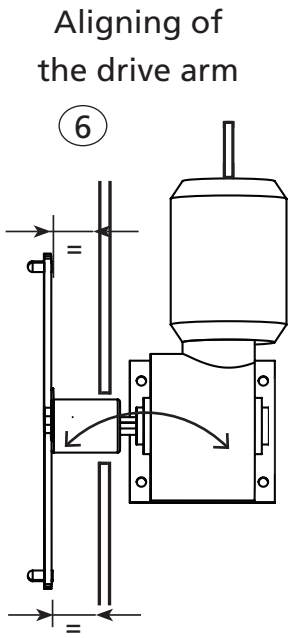
Mounting the rotor motor

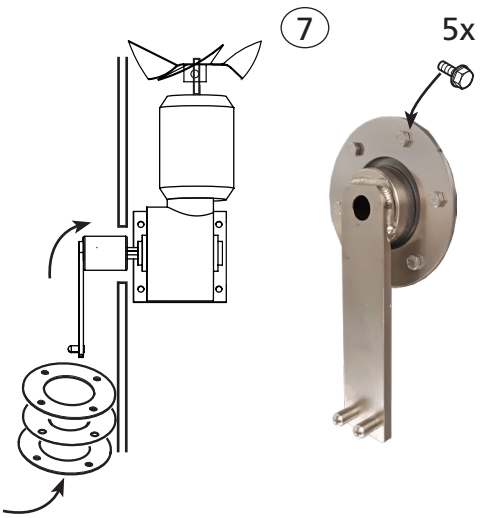
1. Mount the motor on the bracket using the previous made mark (see #2 from disassembling).
2. The motor shaft should come through the center of the hole!!
3. Connect the wiring of the (new) motor. See previous page for position of wires.

Note that the white wire, marked “A” is longer

4. Hook in the rotor and check the axial play. This should be 2,5 -3mm (3/32-4/32)
5. Put power on the unit and test the rotation of the rotor. Interchange the two white wires if wrong. The air flow should go up!
6. Check if the drive arm in top position has the same distance to the side wall as in bottom position.
7. Mount the shaft seal when the position of the motor is ok and the screws are mounted tight.







OVERVIEW OF ERROR CODES LDR AC.

Error message	Description	Possible causes
Sensor overflow	The temperature sensor input reads higher than 320°C (600°F). In resistance, this is higher than 2200Ω.	Wiring loose Broken sensor Broken I/O board
Sensor underflow	The temperature sensor input reads lower than 0°C (32°F). In resistance, this is lower than 1000Ω.	Wiring shorted Broken sensor Broken I/O board
Communication failure	Communication problem between the I/O board and the CPU board	Broken I/O board
		Broken I/O extension board. (Multisserie only)
		Broken Fan board. (Bake Star only)
		Connection problem in ribbon cable.
Motor failure	Blower motor overheated	Cooling air blocked Broken capacitor Broken motor
"Door open" picture	De doorswitch signal is not detected	The door is open
		Malfunction of doorswitch.
Lime filter full	The lime filter needs to be replaced and in the manager menu, the parameter "lime filter replaced" needs to be put on "yes"	The maximum amount of water has been used and a new filter cartridge needs to be placed.
		The water hardness setting in the service menu is wrong.
		No filter is connected. The water hardness setting has to be set to"-" in the service menu.
Please clean first	The cleaning program did not finish. Detergent remainings could be in the oven cavity. Start the cleaning program (in rinse)	The cleaning program has been stopped by the operator.
		The cleaning program has been interrupted by a power supply failure, or the power supply has been switched off during the cleaning program (at night).
The below messages are only possible when the USA hood is connected		
Hood: not active (USA hood only)		The ventless hood has not been switched on Power is disconnected
Activate hood (USA hood only)	Tells to switch on the Hood	
Hood: filter misplaced (USA hood only)		One or more filters are not placed correct
		One or more switches defect or disconnected
Hood: filter saturated (USA hood only)		Filters need to be replaced
		Malfunction of pressure switch

TROUBLE SHOOTING BY SYMPTOM.

Symptom	Possible cause	Caused by
Unit will not switch on.	Power disconnected	Power plug disconnected
		Mains switch in OFF position.
	Mains breaker open	Short circuit or insulation problem
	Fuse(s) blown	Power surge Check fuse(s) on the electric panel
	Wiring problem	Wiring loose of plugs or sockets inside and outside of unit.
		Ribbon cable loose between CPU and I/O board
	Control boards malfunction	Mains power surge. (fuse blown on I/O board)
	Keypad malfunction	Moist (condens)on the keypad
Unit does not heat up.	Contactor does not switch on	Defective contactor. Defective temperature sensor. Wiring problem. Unit is put in “DEMO Mode” (check parameters) Wrong cooking program.
	Hi Limit thermostat triggered	Hi limit thermostat triggered due to transport (hi vibrations).
		Defective hi-limit thermostat.
		Defective temperature sensor. (temp. too high)
Bad cooking results, uneven cooking	Air circulation problem	Fanblade loose
		Blower defect (coil or bearing) or thermistor open (140°C)
		Capacitor of blower defect
		Suction grid of ventilator plate blocked
	Too much heat	Contactor hangs
		PT1000 sensor malfunction , value too low
		PT1000 Sensor to far out of cooking chamber
	Rotor motor stops	Cooling air flow blocked
		Wrong rotation direction
Product not cooked, cooking takes more time	Short of heat	Heating element defect
		Lost phase
		Contactor defect
		PT1000 sensor malfunction , value too high
		PT1000 sensor too far into cooking chamber
		Wire loose
		High limit thermostat open
		Suction grid of ventilator plate blocked
	Cooking program wrong	Wrong programming
		Wrong product
	Missing inner door	Broken door
Beep functions missing	Speaker not functioning	Loose connection
		Speaker
		Parameter “key board beep” switched off

Symptom	Possible cause	Caused by
Mains fuse or breaker switched off	Short circuit or insulation problem	Mains plug burned, or wet
		Heating element broken
		Wiring shorted or wet
Rotor drive motor does not stop	Power stays on the motor	Rotor switch, if applicable in pass through units, pushed in. (unit is placed with the back to the wall.)
		Malfunction of I/O board
Less or no lighting	One or more lamps defect	Lamp defect
	No power on the lamps	Contactor malfunction
		Wiring loose
		Lighting switched off in manager menu
		Contactor malfunction
Door does not close well.	Door not right adjusted	Unit not placed level, uneven floor. Abuse by transport / operator. Hinge loose
Leakage of steam at the door	Door not right adjusted	
Light does not switch off	Power stays on the lamps	Contactor malfunction, contacts sticking.
Oven cavity fills up with grease	Drain grid clogged	Cleaning instructions neglected.
	Grease drain blocked	Unit is cooking porc meat and in cold environment. The grease gets solid, drain heating required.
	Drain valve malfunction	Wiring loose
		Broken valve
Controls malfunction	Leakage of steam through rotor shaft.	Worn out shaft seal.
	Excessive leakage of steam at door.	Wrong adjustment of door
	Controller overheated.	Cooling air flow blocked
	Fuses blown	Power surge
Water on the floor	Sewage clogged Water stays in the unit during cleaning and when the cleaning program has finished, the grease drain opens and the water falls in the grease container.	Sewer drain hose not installed properly
		Sewer drain hose clogged
		Malfunction of Sewer drain valve.
		Malfunction of sewer drain pump (if applicable).
	Too much water in unit	Water inlet valve (W1) broken
		Water inlet valve (W1) polluted
	Pump defect	Pump is leaking

Symptom	Possible cause	Caused by
Bad cleaning result. Check parameter settings!	Water issue	Water tap closed
		Descale filter saturated
		No descaling filter applied while the water hardness is high
	Detergent issue	Cleaning cartridge not placed on the right place
		Wrong (amount) detergent
	Drain issue	Sewer drain malfunction (Q5)
		Drain hose not installed properly
		Grease drain malfunction (Q4) (cleaning proces started while unit is still loaded with oil)
	Rinse issue	Suction filter blocked
		Malfunction of pump
		Malfunction of valve at suction side (Q1)
Black/ brown spots on the bottom / filter screens	Detergent not dissolved fast enough	Instructions not followed. Detergent and cartridge placed before the unit has cooled down. See storyboard.

TROUBLE SHOOTING BY PART / FUNCTION.

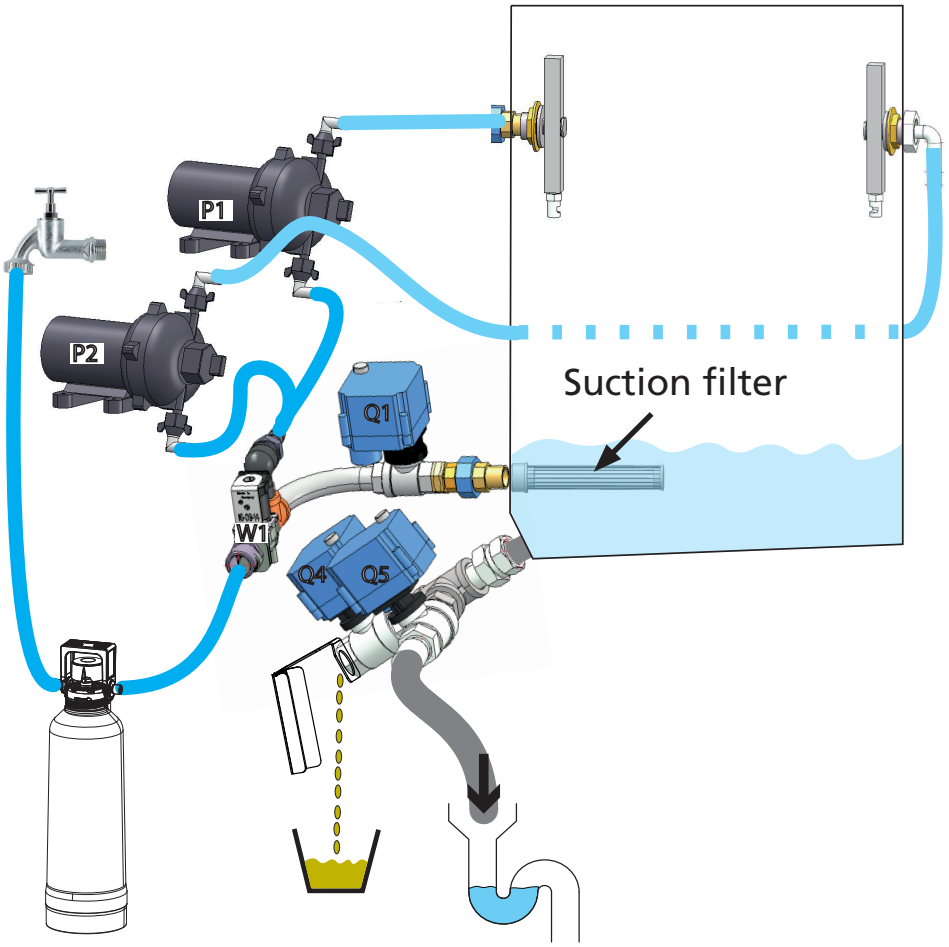
Description of part / function	Symptoms	Possible cause	Action
Inside door	Broken glass	Slamming of door.	Give instruction to operator.
		Fastening bolts and nuts are loose.	Tighten all fastenings.
		No PTFE ring between steel and glass.	Mount new door.
	Door does not properly open / close	Door not well adjusted.	Adjust outside and inside door
Outside door	Broken glass	Slamming of door.	Give instruction to operator.
		Fastening bolts and nuts are loose.	Tighten all fastenings.
	Door adjustment	Door not well adjusted.	Adjust outside and inside door
Heating element	Rotisserie doesn't reach adjusted temperature	Wiring.	Check the wiring. Check the power on the element.
		Contactor	Check the contactor
		Element malfunction.	Check the current with AC current tester.
	Duration of grilling time is too long	Wiring.	Check the wiring.
		Element malfunction.	Check the current with AC current tester.
Safety thermostat	Contactor does not switch on after starting of program	Wiring. Thermostat malfunction.	Check the wiring. Check if the thermostat is making contact.
	Contactor switches off before reaching the adjusted temperature in program	Thermostat malfunction.	Check if the thermostat is turned fully clockwise (contact closed).
		Thermostat probe not in right position.	Check the position of the thermostat probe.
Contactor	Contactor doesn't switch on	Wiring.	Check the wiring.
		Coil malfunction.	Check resistance of the coil. This should be ± 600Ω.
	Contactor switches on, but no power on lamp or heating element.	Contact burned.	Check the wiring. Check the power on al contacts. Check the contacts of the contactor.
Capacitor	Drive motor or blower don't work	Wiring. Capacitor malfunction.	Check the wiring. Check function after connecting a new capacitor. *Checking of capacitor:* *See chapter "electrical tests"*

Description of part / function	Symptoms	Possible cause	Action
Drive motor	Motor doesn't run and / or main fuse burned	Wiring.	Check the wiring. Check the power to the motor.
		Coil malfunction.	Check insulation value of coil with Megger on 500V. Minimum value is 0.5 MΩ. Check resistance of the coils. See chapter Electrical tests. Between whiteA and white wire 234Ω. Between whiteA and brown wire 117Ω. Between white and brown wire 117Ω.
		Gearbox.	Check if gearbox is blocked.
	Motor runs after starting it up by hand	Capacitor malfunction.	Check capacitor (see chapter electrical tests)
	Motor stops during process and comes in again after a period of time	Coil overheated, thermistor switches off (105°C – 221°F).	Check rotation direction. Air should be flowing upwards over the motor. Check cooling circuit of motor. Check if rotisserie is close to another heat source. Measure temperature motor during process.
		Broken capacitor	Check / repace capacitor
Seal of drive motor shaft	Grease leaking	Seal deteriorated Seal not properly mounted	Replace seal. Be sure that the motor shaft comes through the center of the hole,properly alligned and thorougly fastened. **After that,** mount the seal. Refer to chapter "service procedures".
Blower .	Blower doesn't run and / or Main fuse burned	Wiring.	Check the wiring. Check the power on the blower.
		Coil malfunction.	Check insulation value of coil with a Megger on 500V. Minimum value is 0.5 MΩ. Check resistance of the coils. *See chapter Electrical tests.* Replace motor if not ok
	Blower runs after starting it up by hand	Capacitor malfunction.	Check capacitor (see capacitor) or connect new capacitor.
	Blower stops during process and comes in again after a period of time	Coil overheated, thermistor switches off (140°C – 284°F).	Check cooling circuit of blower. Check rotation direction of rotor motor Check if rotisserie is close to another heat source. Measure temperature blower during process.
	Temperature indication on display runs up very fast (180°C - 355°F after 5 minutes)	Blower doesn't rotate and heat stays in top of cavity.	See above.

Description of part / function	Symptoms	Possible cause	Action
PT-sensor	Temperature inside rotisserie higher than set temperature	Resistance of sensor lower, caused by moist inside	Replace sensor
		Short circuit in sensor.	Replace sensor
		Sensor not in right position. Too far out the cooking chamber	Check / adjust position of sensor
	Rotisserie does not reach adjusted temperature	Resistance of sensor too high	Replace sensor
		Sensor not in right position. Too far into the cooking chamber	Check / adjust position of sensor
	Error message -PT1000 underflow -Sensor shorted	PT sensor, or wiring shorted	Check in I/O test Temperature 0°C / 32°F This is lower than 1000Ω
	Error message -PT1000 overflow -Sensor open	PT sensor, or wiring disconnected	Check in I/O test. Temperature 317°C / 603°F This is higher than 2200Ω
Keypad(s) / touch screen do not react	No possibility to make a program	One or more keys don't function.	Check flat cable connection between CPU board and keypad / touch screen
			Do a hard reset
			Replace key pad or CPU board
Keypad / touchscreen has bad reaction	Difficult to operate	Wrong parameter setting	Check parameter setting in Service menu
Keypad(s) / touch screen-react strange / automatic	Automatic stopping of program.	Moist on / or running over the keypad	1. Check for condensation. When the unit is cold and the environment is heating up, condensation can be expected. 2. Check for water, dripping on the top of the unit and running down.
Display/CPU on operation panel and power I/O board	No illumination on display	Wiring.	Check the wiring.
			Check the power on the CPU board by the 2 flashing red LED's just near the flatcable on the power and I/O board.
		Fuse burned.	Check the fuse on the power I/O board.
			Check other fuses.
		Flat cable.	Check grey flat cable connection.
		Display/CPU malfunction.	Replace the CPU board with display.
		Power board malfunction.	Replace the power I/O board.
	Display shows strange things.	Parameters not on right settings.	Check parameters.
		Wrong software or loss of data.	Check software version or upload latest software.

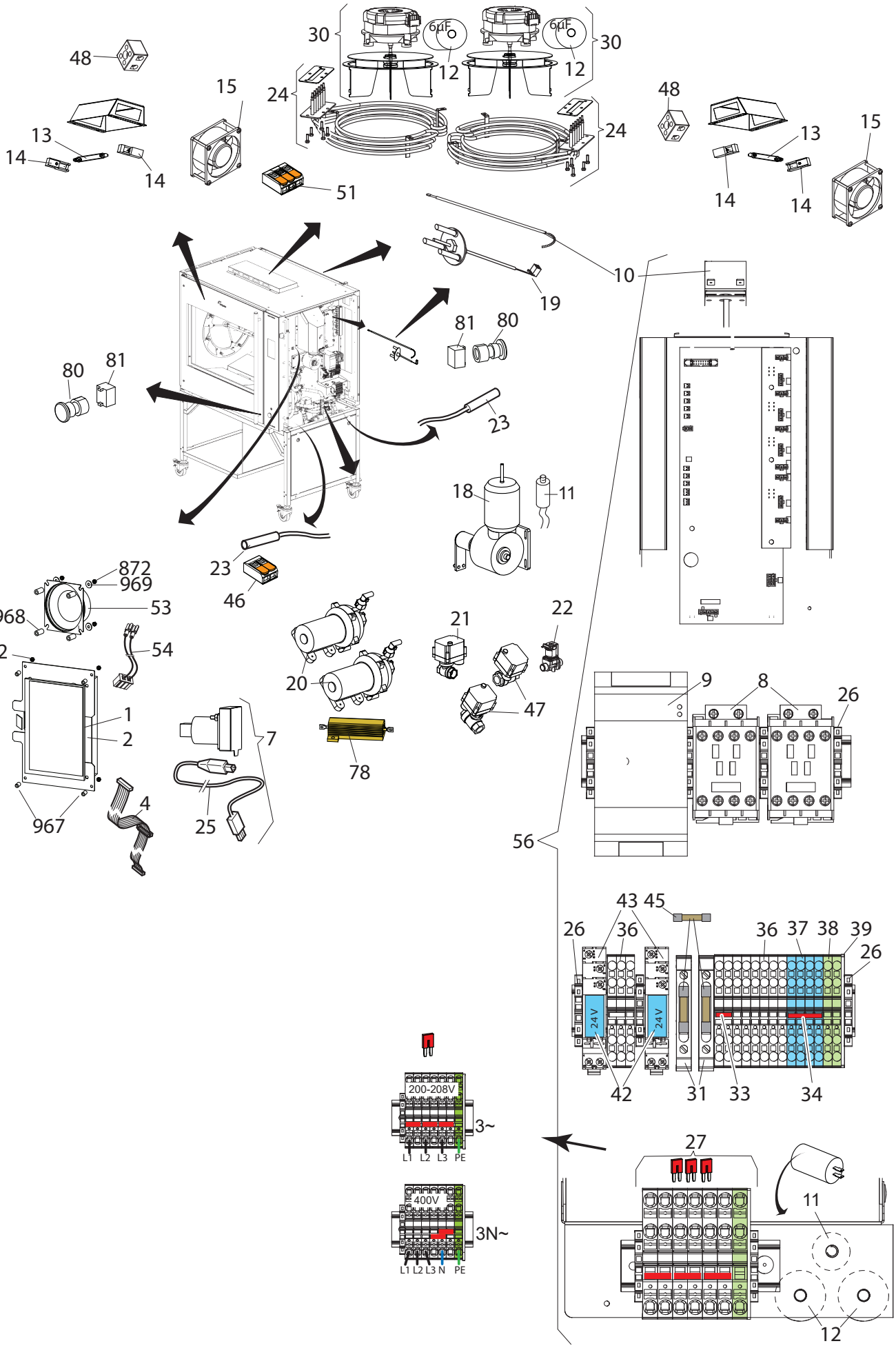
Description of part / function	Symptoms	Possible cause	Action
Pump See below overview P1 / P2	Not pumping	Suction valve Q1 (9311008s) malfunctioning	Check the valve if it is closed while the waterinlet valve is opened and the unit is being filled.
		Suction filter clogged	Check / clean the filter
		Wiring problem	Check function of pump in I/O test Check the connection on the pressure switch on the pump and other wiring
		Voltage dropped	Check the 24V power supply
	Leaking	swivel coupling loose, broken	Check / replace
		Pump membrane broken	Replace pump
Water inlet (solenoíd) valve See below overview W1	Too much water in unit	Valve polluted by dirty water	Clean valve
		Broken valve	Replace valve
		Missing reducer (10 ltr/min)	Replace valve by the right one
	No Water	Wiring loose	Check wiring
		Broken valve	Replace wiring
Motor valve suction side Q1	Not rinsing during cleaning	Valve does not close during filling of water	Check function of valve in I/O test Check wiring and plugs / sockets on the I/O board
		Valve does not open durng rinsing	
Motor valve grease drain See below overview Q4	Oil stays on the bottom.	Valve does not open	Check function of valve in I/O test Check wiring and plugs / sockets on the I/O board
	Water comes in the grease container (bucket) and probably on the floor	Valve does not close	
Motor valve sewer drain See below overview Q5	Water comes in the grease container (bucket) and probably on the floor	Valve does not open	Check function of valve in I/O test Check wiring and plugs / sockets on the I/O board
	Soap and grease still in unit after cleaning program	Valve does not close and water goes straight out, into the sewer	

HYDRAULIC OVERVIEW



Descaling filter
By-pass on zero!!

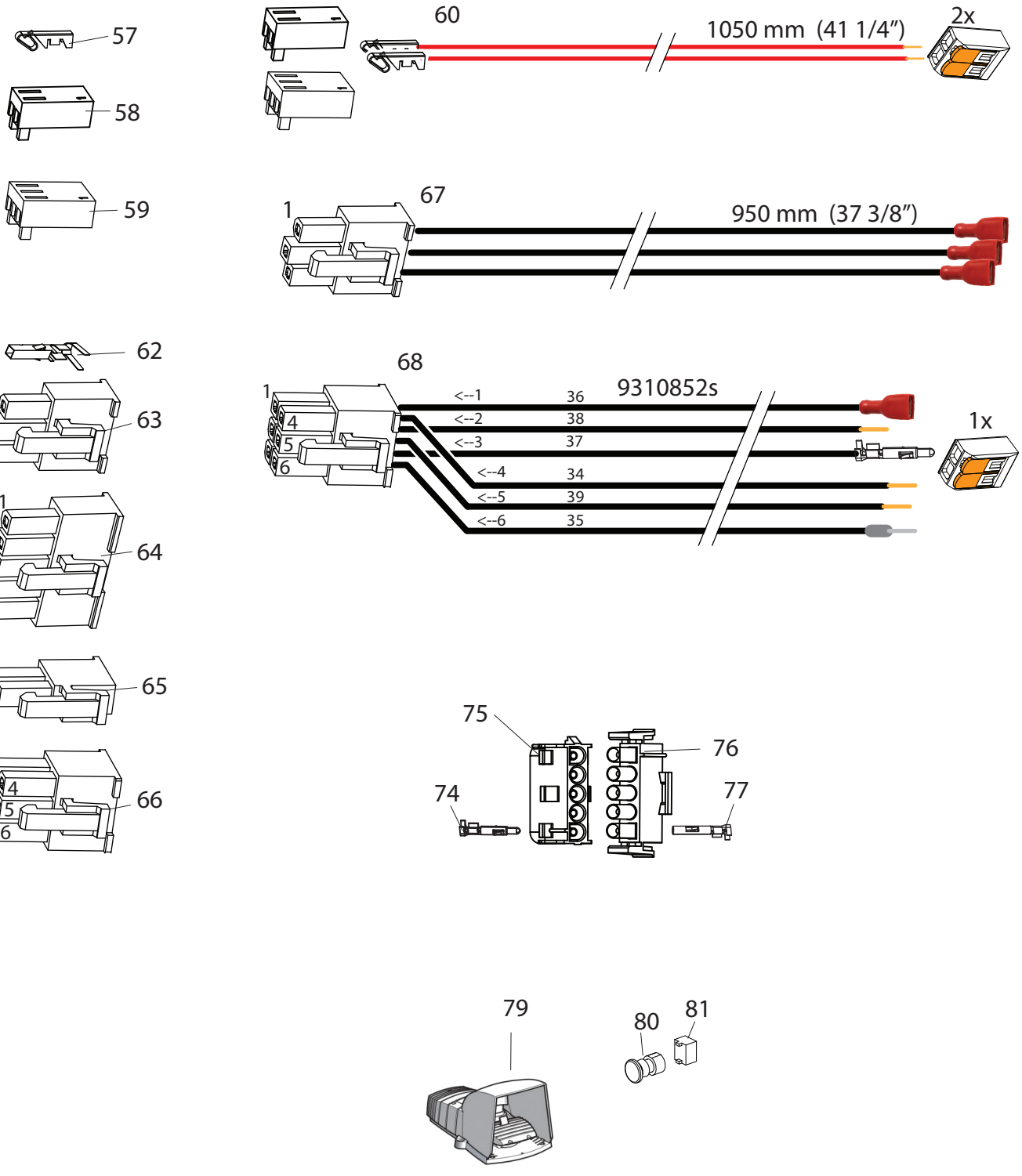
LDR-8 S AC, ELECTRICAL PARTS



LDR-8 S AC, PARTSLIST ELECTRICAL PARTS

Pos	Part nr.	Description	Qty	Pri	Comment
1	9292280s	CPU + LCD board s-control	1	1	
2	9292282s	CPU + LCD board s-control (without WIFI)	1	1	
4	9172314	Ribbon cable 14p	1	2	
5	9192400s	Power & I/O board	1	1	
6	9192401s	Interface board	1	1	
7	9310161	USB socket, ass.	1		
8	3500069	Contactor	2	1	
9	9311016	Power Supply 24V 10A	1	1	
10	9040970	Thermostat 50-320°C 122-608°F	1	2	
11	3701228	Capacitor 2,5µF	1	2	
12	9192034	Capacitor 6µF	2	2	
13	9351020s	Lamp 160W	2	1	
14	9311015	Lamp holder R7s ceramic	4	2	
15	8091005	Fan	2	1	
18	9340105s	Gearmotor, complete with drive head	1	1	
19	9340266s	Temperature sensor PT 1000	1	1	
20	9311006s	Pump	1	1	
21	9311008s	Motor valve -2/2 1/2" CR03	1	1	
22	9311007s	Solenoïd valve E 2/2 - 1/2" (reduced 9 ltr/min)	1	1	
23	3500020	Reed switch	2	2	
24	9312080s	Heating element 9300 W 230V	2	1	
25	9291012	USB cable	1		
26	9191222	End Clamp Clipfix 35-5 PHX	11		
31	9191218	Fuse holder Euro ABB	2		
33	9191238	Plug-in bridge FBS 2-6 PHX	1		
34	9191236	Plug-in bridge FBS 4-6 PHX	1		
36	9191240	Terminal PT 4 (GY) 4 qmm PHX	8		
37	9191241	Terminal PT 4 (BU) 4 qmm PHX	4		
38	9191239	Terminal PT 4 PE (GN/YE) 4 qmm PHX	1		
39	9191223	End Cover D-PT 4 PHX	1		
42	9311044	Relay, 24V Allen Bradley (blue)	2	1	
43	9291141	Socket, relay Allen Bradley	5	2	
45	9191197	Fuse 10A, ceramic 32x6,3	2	1	
46	9291122	Connector, 2 pole	6		
47	9311013s	Motor valve -2/2 3/4" CR03	2	1	
48	9171110	Connector, 2 pole ceramic	4	2	
49	9312083	Drain pump	1	1	
51	9291123	Connector, 3 pole	2		
53	9311046s	Speaker	1	1	
54	9311047	Cable, speaker s-control	1		
56	9340260	Electric panel	1		

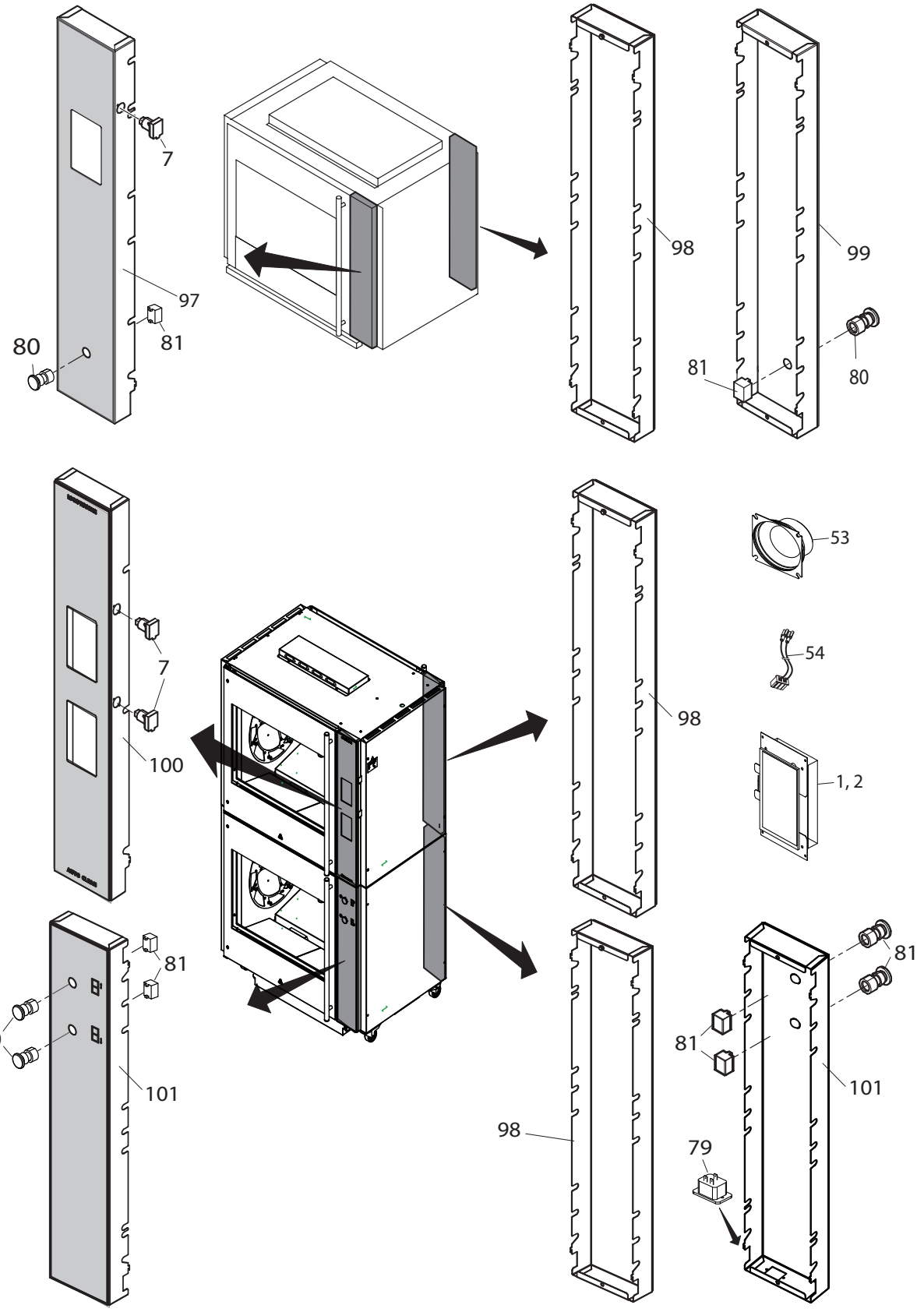
LDR-8 S AC, ELECTRICAL PARTS



LDR-8 S AC, PARTSLIST ELECTRICAL PARTS

Pos	Part nr.	Description	Qty	Priority	Comment
57	9291176	Crimp contact, inputs			
58	9291175	Socket, 2 p, inputs			
59	9291177	Socket, 3 p, inputs			
60	9310850s	Wire repair set inputs		2	
62	3701231	Crimp contact, outputs			
63	9291179	Plug, 3p, outputs			
64	9291170	Plug, 5p, power			
65	9291174	Plug, 2p, output			
66	9291173	Plug, 6p, outputs			
67	9310851s	Wire repair set 24V outputs		2	
68	9310852s	Wire repair set 208V outputs		2	
74	0601466	Crimp contact male, M-N-L			
75	9291014	Socket, 5p, Mate-N-Lock			
76	3701272	Plug, 5p, Mate-N-Lock			
77	0601458	Crimp contact female, M-N-L			
78	9311075	Resistor 0,5 Ω 50Watt	1	2	
79	9311054s	Pedal switch			
80	9291002	Pedestal button	2	2	
81	9310181	Switch block	2	2	

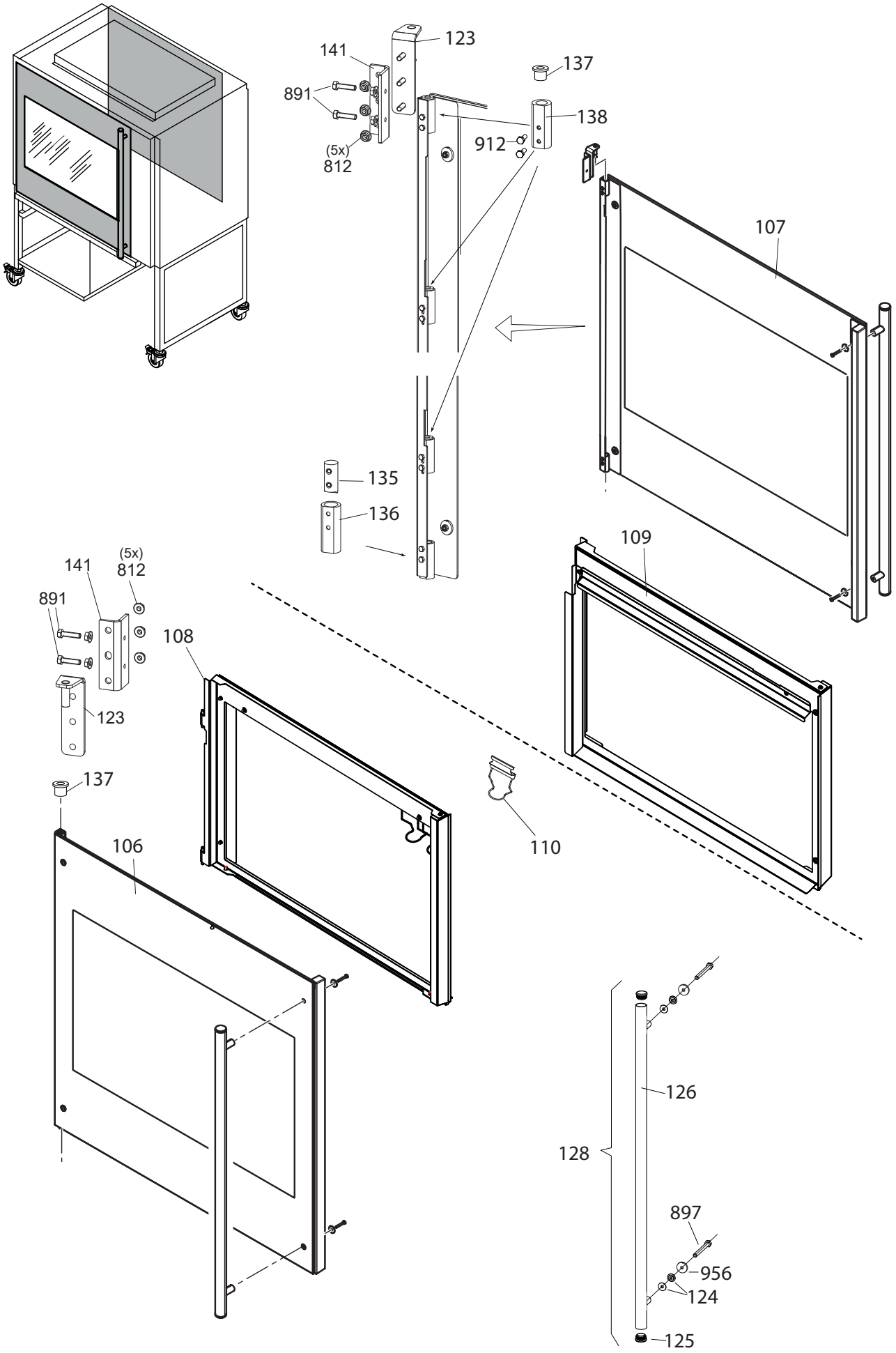
LDR-8 S AC, CONTROL PANELS



LDR-8 S AC, PARTSLIST CONTROL PANELS

Pos	Part nr.	Description	Qty	Priority	Comment
1	9292280s	CPU + LCD board s-control	1	1	
2	9292282s	CPU + LCD board s-control (without WIFI)	1	1	
7	9310161	USB socket, ass.	1		
53	9311046s	Speaker	1	1	
54	9311047	Cable, speaker s-control	1		
80	9291002	Pedestal button	2	2	
81	9310181	Switch block	2	2	
97	9318530s	Operator panel, ass.LDR8s AC Right-contr			
97*	9340150s	Operator panel, ass.LDR8s AC inclu-sive CPU + LCD boards			
98	9318522s	Panel, customer side L+R, ass. LDR8s AC			
99	9318528s	Panel, customer side L+R, ass. LDR8s AC, for rotor button			
100	9348531s	Operator panel, ass.LDR8+8s AC			
100*	9340275s	Operator panel, ass.LDR8+8s AC in-clusive CPU + LCD boards			
101	9318526s	Panel, customer side L+R, ass. LDR8+8s AC, incl. rotor buttons			

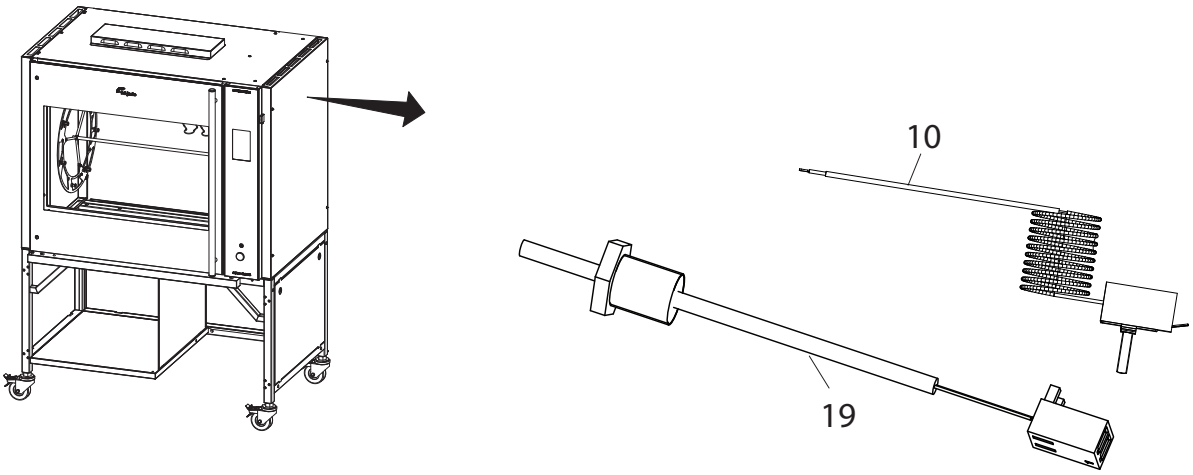
LDR-8 S AC, DOORS

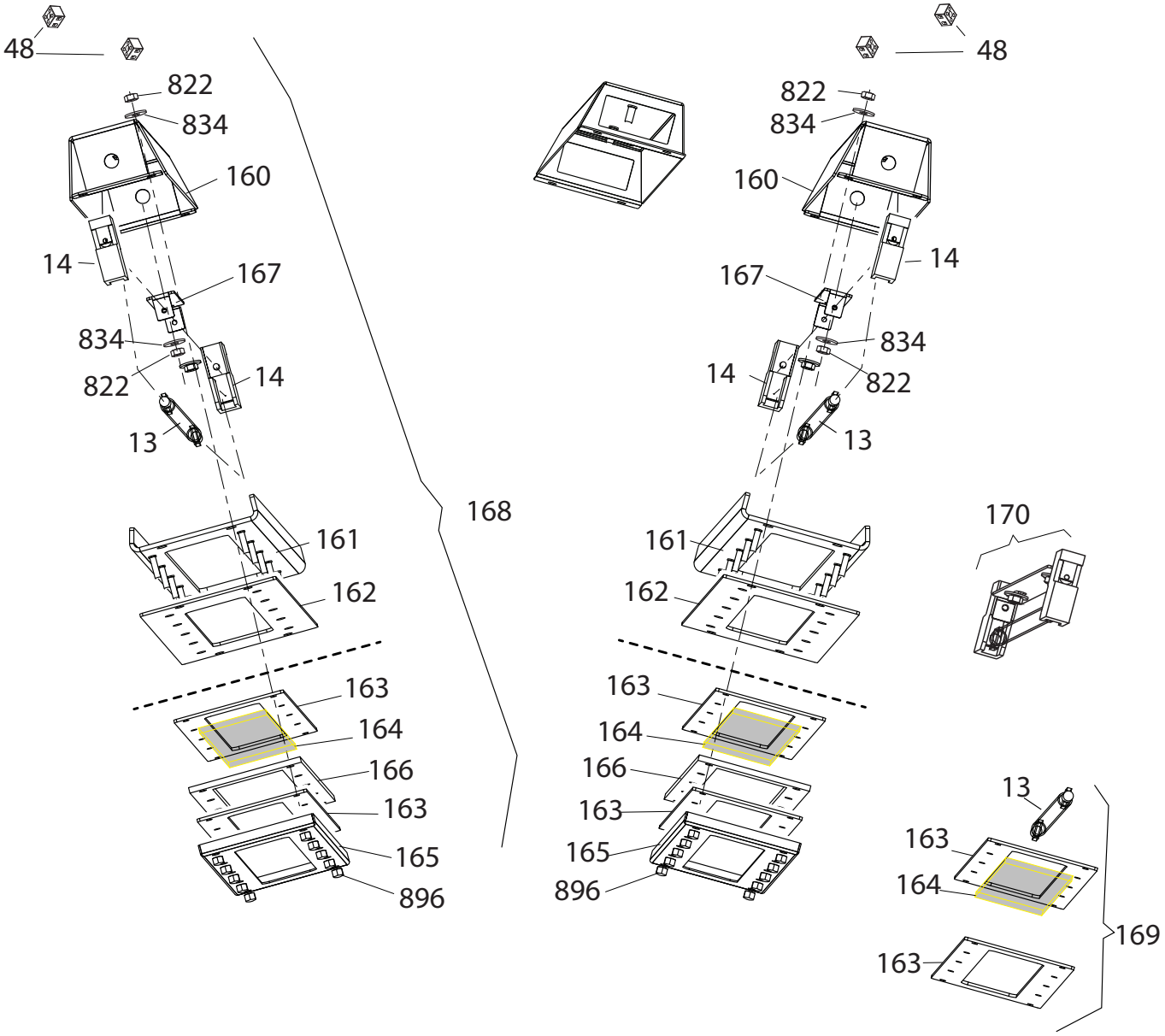


LDR-8 S AC, DOORS

Pos	Part number	Description	Qty	Priority	Comment
106	9348510s	Outer door Left turning LDR8s AC	1	2	
107	9348512s	Outer door Right turning LDR8s AC	1	2	
108	9348513s	Inner door Left turning LDR8s AC	1	2	
109	9348511s	Inner door Right turning LDR8s AC	1	2	
110	9312163	Soap cartridge holder		2	
123	9340405	hinge, top	2		
124	3702342	Collar bush 10x5x3,5	16		
125	2103209	Plug Ø 30mm	4		
126	9293008	Door handle	2		
128	9298101s	Doorhandle set TDR7/8			
135	9312014	Positioning pin, door hinge	2		
136	9312112	Bearing bush, lower hinge	2		
137	9172054	Collar bearing, bronze	3		
138	9312111	Bearing block, upper hinge	2		
141	9344023	Bracket door adjustment	2		

LDR-8 S AC, LIGHTING AND SENSORS

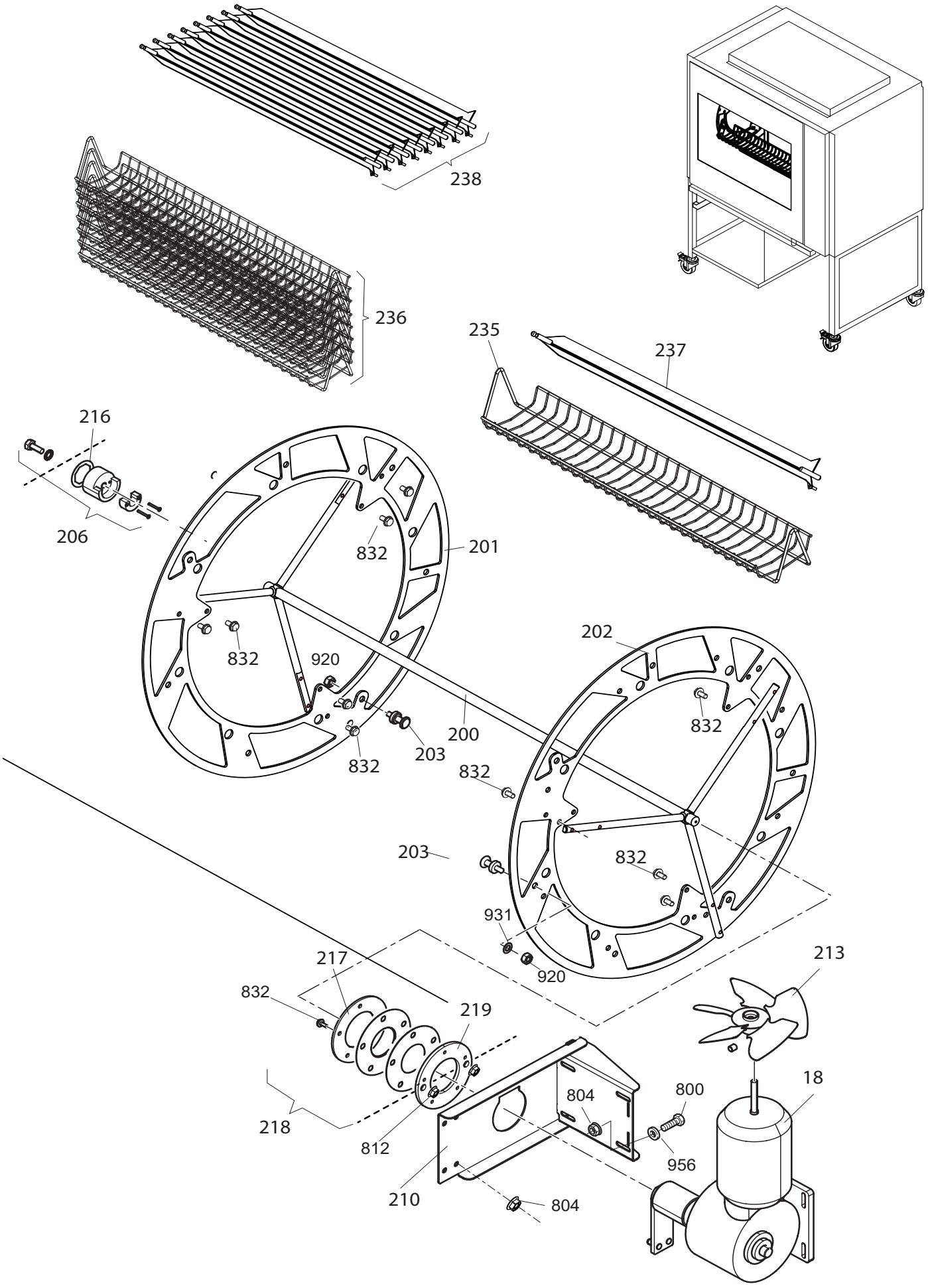




LDR-8 S AC, LIGHTING AND SENSORS

Pos	Part nr.	Description	Qty	Priority	Comment
10	9040970	Thermostat 50-320°C 122-608°F	1	2	
13	9351020s	Lamp 160W	2	1	
14	9311015	Lamp holder R7s ceramic	4	2	
19	9122158s	Temperature sensor PT 1000	1	1	
48	9171110	Connector, 2 pole ceramic	4	2	
160	9344052	Cover, lamp	2		
161	9314114	Mounting bracket, lamp fixture.	2		
162	9312054	Seal, top	2	2	
163	9312055	Seal light (for lamp 500W)	2	1	
164	9312020	Glass, oven illumination	2	1	
165	9314330	Cover profile, oven illumination	2		
166	9314331	Spacer plate	2		
167	9344051	Bracket, lamp holder.	2		
168	9310071s	Service kit, 1 lamp fixtures			
169		Lamp replacement kit		1	
170		Lamp holder kit			
172	9110072	Clamp	2		
173	9294069s	Bracket, sensors	1		
174	9313022	Silicon hose Ø12xø3, L=43	1	1	
175	9313023	Silicon hose Ø10xø4, L=43	1	1	
176					

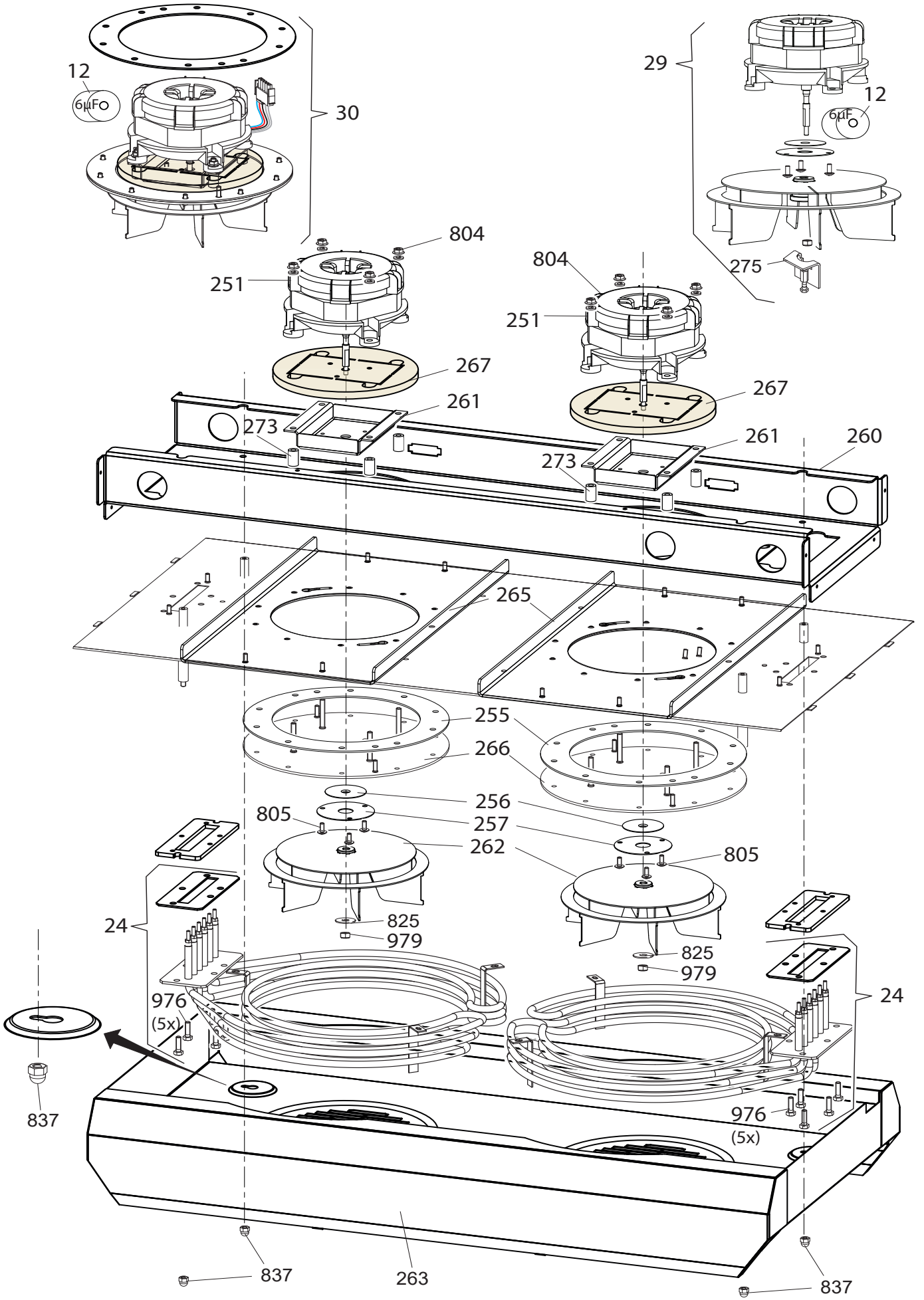
LDR-8 S AC, ROTOR



LDR-8 S AC, PARTSLIST ROTOR

Pos	Part nr.	Description	Qty	Priority	Comment
11	3701228	Capacitor 2,5µF	1	2	
18	9340105s	Gearmotor, complete with drive head	1	1	
200	9340416s	Rotor shaft	1		
201	9344160	Rotor disk, bearing side	1		
202	9344161	Rotor disk, drive side	2		
203	9302027	Support pin, meat baskets	16		
206	9310180s	Bearing ass., rotor TDR7/8ac	1	2	
210	9290444	Suspension plate, rotor motor	1		
213	9172078	fan blade 150mm	1		
216	9312019	Seal	3	2	
217	9314126	Pressure ring, 5 holes	1		
218	9312002s	Shaft seal, 5 holes	1		
219	9314125	Reinforcement ring, 5 holes	1		
235	9342007	Meat basket			
236	9340201	Meat basket, set of 7			
237	9342011	V-spit			
238	9340200	V-spit, set of 8			

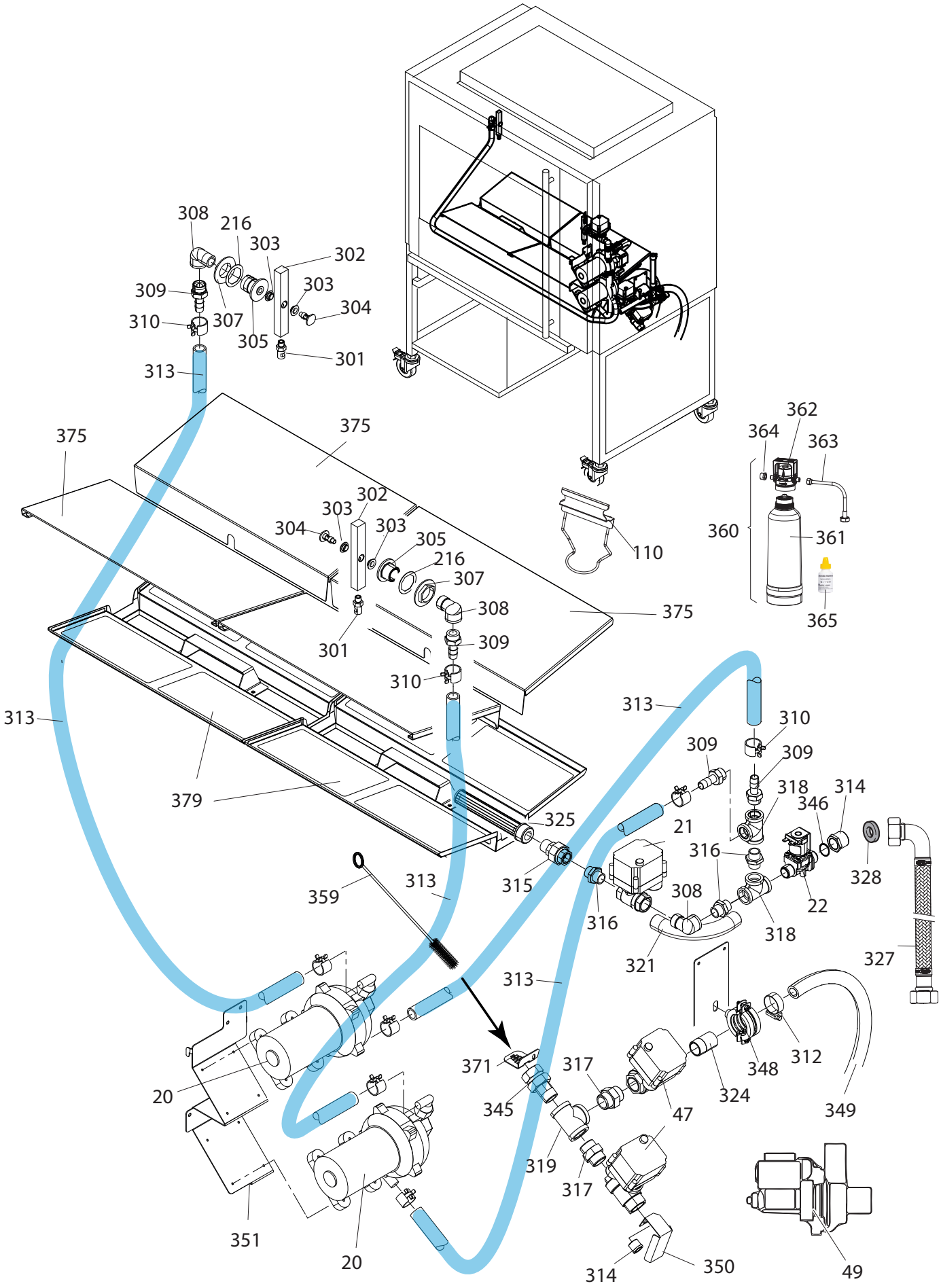
LDR-8 S AC, BLOWER & HEATING



LDR-8 S AC, PARTSLIST BLOWER & HEATING

Pos	Part nr.	Description	Qty	Priority	Comment
12	9192034	Capacitor 6µF	2	2	
24	9312080s	Heating element 9300W 230V	2	1	
29	9310148s	Blower assembly	2	1	
30	9310149s	Blower assembly complete	2	1	
251	9293020s	Blower motor	2		
255	9312018	Seal, Fan suspension	2		
256	3702325	Shaft seal	2		
257	9294007	Pressure ring	2		
260	9344176	Reinforcement beam, blower panel	1		
261	9314137	Mounting bracket, blower motor	2		
262	9351001	Turbine, straight radial Ø200x61	2		
263	9340256	Blower panel LDR 8s ac	1		
265	9314138	Suspension plate, blower motor	2		
266	9314136	Mounting plate, blower motor	2		
267	9313018	Insulation, blower motor	2		
273	9312075	Spacer 20,5 mm	8		

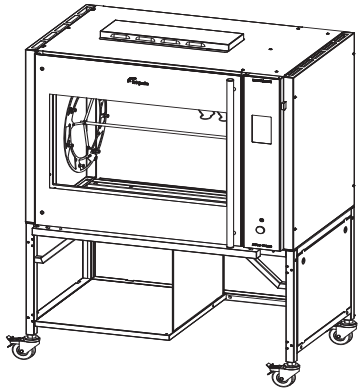
LDR-8 S AC, CLEANING SYSTEM

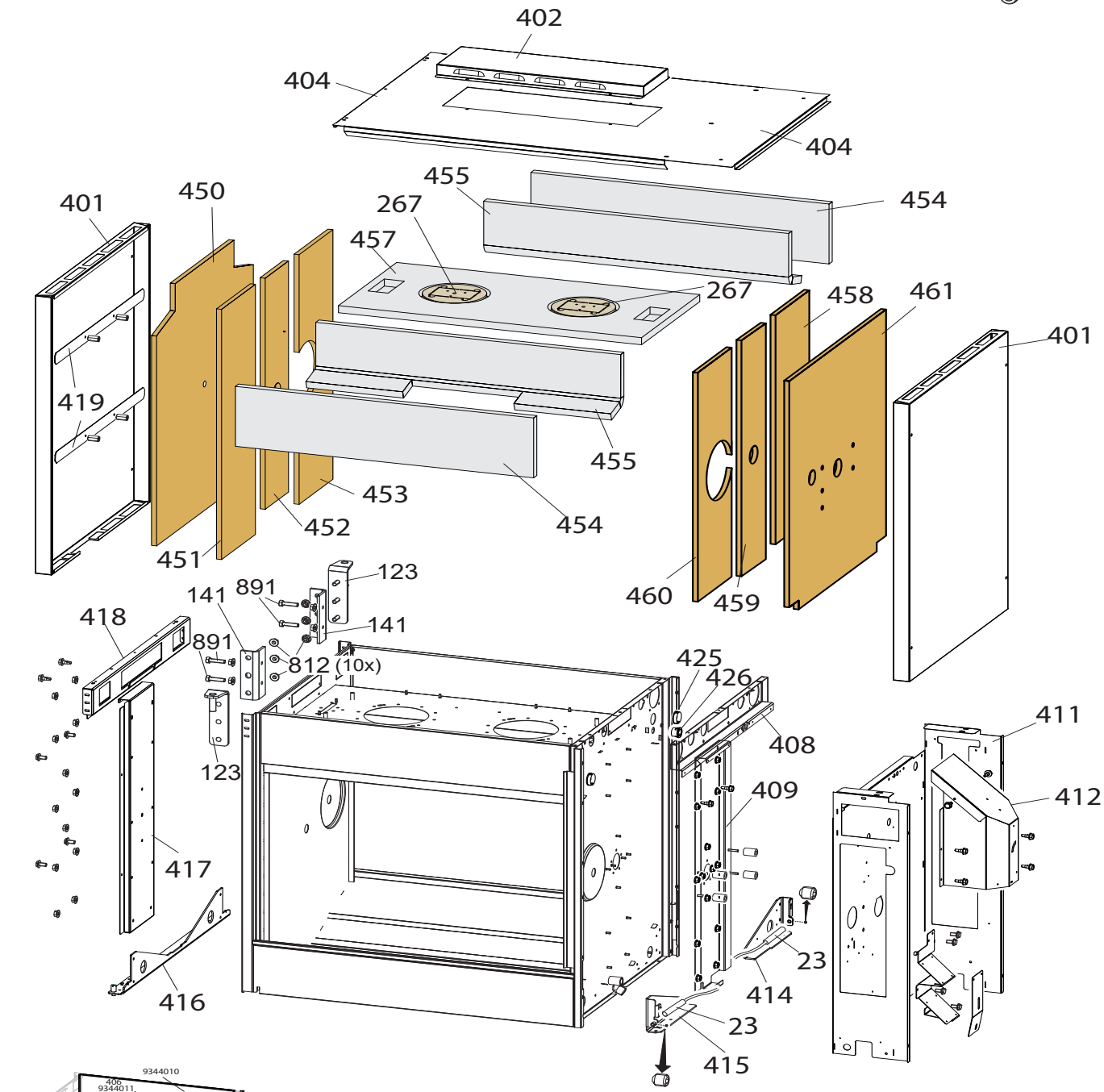


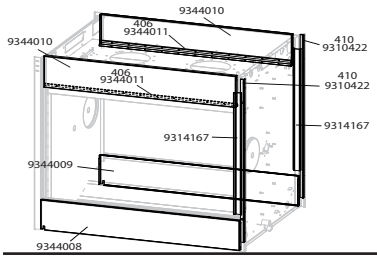
LDR-8 S AC, PARTSLIST CLEANING SYSTEM FROM SERIAL NR 100108720

Pos	Part nr.	Description	Qty	Pri-ority
20	9311006s	Pump	1	1
21	9311008s	Motor valve -2/2 1/2" CR03	1	1
22	9311007s	Solenoïd valve E 2/2 - 1/2" (reduced 9 ltr/min)	1	1
47	9311013s	Motor valve -2/2 3/4" CR03	2	1
49	9312083	Drain pump	1	1
301	9301007	Nozzle, spoon shape	2	
302	9312117	Spray arm TDR5ac and 7/8ac	2	
303	9311014	Collar bearing, Ø12xø10	4	1
304	9312012	Shaft , spray arm	2	2
305	9312011	Adapter, spray arm	2	
307	9311021	Nut, 3/4"	2	
308	3721050	Elbow threaded 1/2" (F-M) BSP	4	
309	9311011	Hose Pillar 1/2" (M) SS	4	
310	9311038	Hose clamp,23 mm	8	
312	6000032	Hose clamp, 26-38 mm	2	
313	9301108	Hose 13x23	3 m	
314	9311028	Reducing bushing 3/4"x1/2", SS	1	
315	9311009	Union conicle 1/2" (M-F) SS	3	
316	3721047	Hexagon nipple threaded 1/2" (M-M) BSP	7	
317	3721029	Hexagon nipple threaded 3/4" (M-M) BSP	2	
318	3721046	Tee threaded 1/2" (F-F-F) BSP	3	
319	9301028	Tee threaded 3/4" (F-F-F) BSP	1	
321	9311010	Bend 90° threaded 1/2" (M-M) SS	1	
324	9301006	Welding nipple, 3/4"	1	
325	9310401s	Suction filter	1	2
327	9191203	Water supply hose	1	
328	9191227	Gasket Ø24xø16x2	1	1
345	9301027	Union conicle 3/4" (M-F) SS	1	
346	9311033	O-ring	1	
348	2650217	Clamp, suspension, 32-38	1	
349	9301059	Hose, ø25xØ33	1,5mtr	
350	9314070	Splash guard	1	
351	9314117	Suspension, pumps	1	
359	9191136	Pipe brush	1	
360	9308010	Water filtration system		
361	9301073	Replacement filter cartridge		
362	9301070	Filter head		
363	9301071	Hose 3/8"x 3/4" x 1,5 Mtr		
364	9301061	Reducing ring 3/4" x 3/8”		
365	9301074	Carbonate hardness test kit		
375	9344054	Grease cover LDR8ac	4	
379	9340134	Filter screen LDR8ac	2	

LDR-8 S AC, SHEET METAL



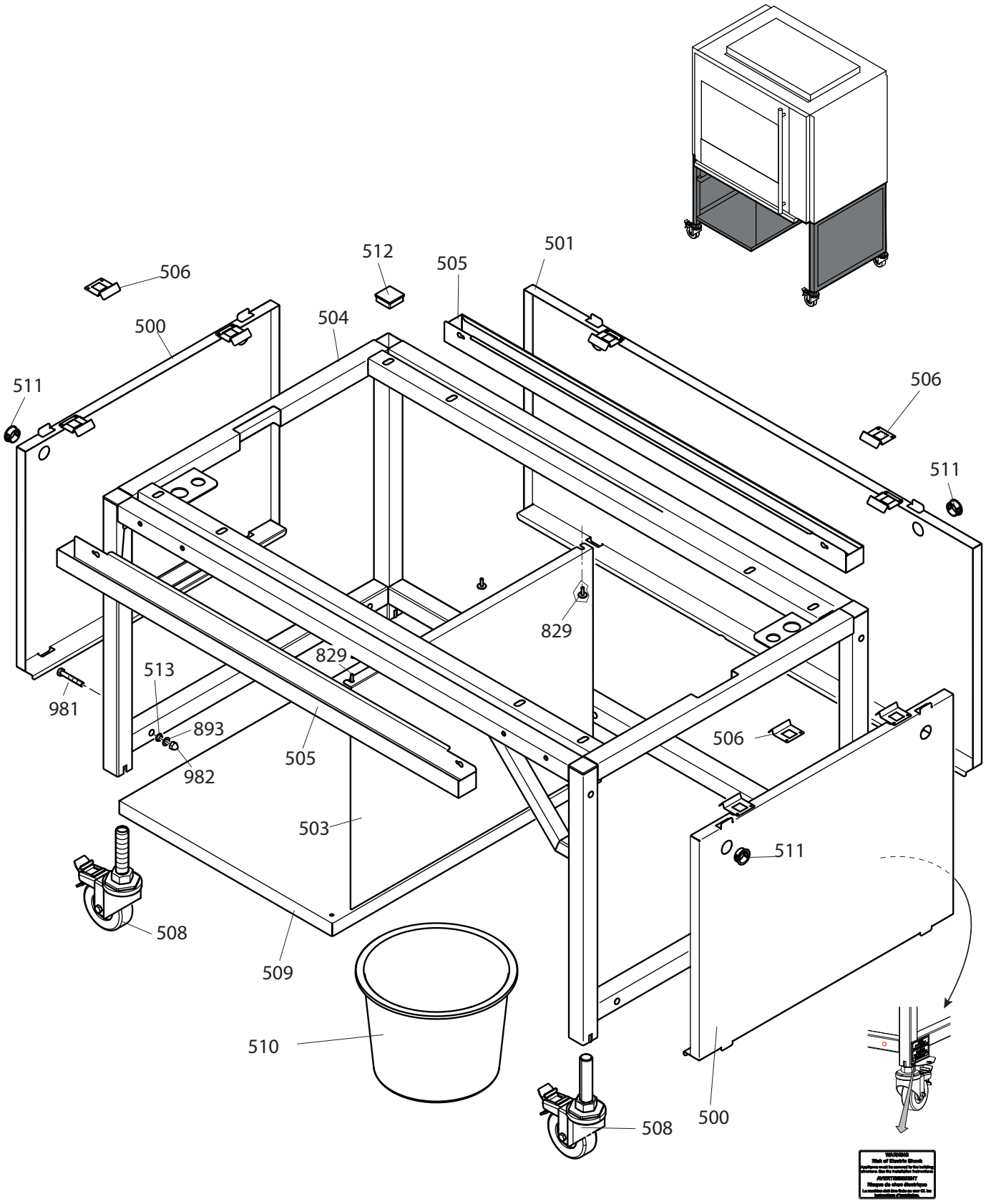




LDR-8 S AC, PARTSLIST SHEET METAL

Pos	Part nr.	Description	Qty	Priority	Comment
23	3500020	Reed switch	2	2	
401	9344090	Side panel L/R	2		
402	9344182	Cover, fan	1		
404	9344181	Top panel	1		
408	9314482	Reinforcement R top	1		
409	9314484	Reinforcement R	1		
410	9314166	Magnet profile	2		
411	9344180	Machine room	1		
412	9314486	Air guide rotor motor	1		
414	9310442	Support casco, rear	1		
415	9310441	Support casco, front	1		
416	9340408	Suspension, doors	1		
417	9344015	Reinforcement L	1		
418	9344175	Reinforcement L top	1		
419	9314188	Strip, insulation	2		
425	9171015	Grommet Ø 33 mm	2		
426	9082211	Grommet Ø 11 mm	1		
450	9313003	Insulation L	1		
451	9313007	Insulation L front	1		
452	9313005	Insulation L middle	1		
453	9313008	Insulation L rear	1		
454	9343010	Insulation top front/rear	2		
455	9343013	Insulation top middle vertical	2		
457	9343011	Insulation top middle	2		
458	9343043	Insulation R rear	1		
459	9343042	Insulation R middle	1		
460	9343041	Insulation R front	1		
461	9343040	Insulation R	1		

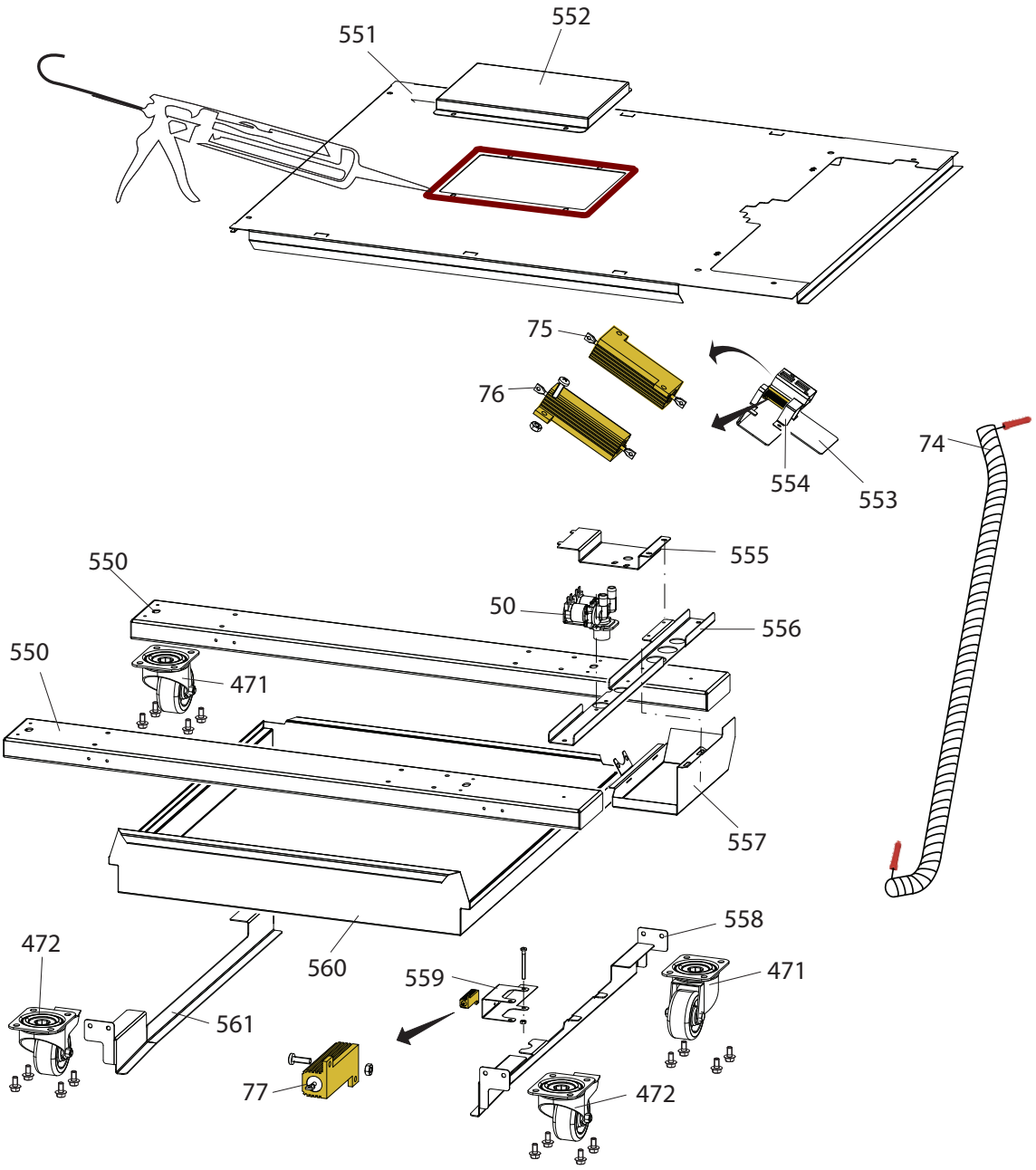
LDR-8 S AC, UNDER FRAME



LDR-8 S AC, PARTSLIST UNDER FRAME

Pos	Part nr.	Description	Qty	Priority	Comment
500	9314603s	Side panel L	2		
501	9344114s	Rear panel	1		
503	9344117	Panel, box	1		
504	9340430	Casco	1		
505	9344108	Driptray	2		
506	9314604	Spring	6		
508	9190177	Swivel castor with brake	4		
509	9344115	Bottom plate	1		
510	9191099	Bucket, plastic 11.3 ltr	1		
511	9070840	Grommet ø24xØ28	6		
512	2103244	Square plug 40mm	4		
513	9191102	Collar bearing	2		

LDR-8+8 S AC, (EXTRA)PARTS



LDR-8+8 S AC, (EXTRA)PARTS

Pos	Part nr.	Description	Qty	Priority	Comment
50	9312085	Solenoïd double valve 1/2" (reduced 9 ltr/ min)	1	1	
74	9313055s	Heated hose	1		
75	9311061	Resistor 2 ohm 50Watt	1		
76	9311063	Resistor 4 ohm 50Watt	1		
77	9311064	Resistor 39 ohm 50Watt	1		
471	9172065	Swivel castor	2		
472	9172066	Swivel castor with brake	2		
550	9344200	Construction beam	2		
551	9314456	Top plate stacked lower unit	1		
552	9314459	Top cover stacked lower unit	1		
553	9314562	Heating plate upper stacked unit	1		
554	9314561	Bracket	1		
555	9314464	Support, sewer pump lower unit	1		
556	9314467	Connection support	1		
557	9314479	Spark guard	1		
558	9314469	Tray guide R	1		
559	9314563	Heating plate lower stacked unit	1		
560	9340282s	Grease tray	1		
561	9314468	Tray guide L	1		

FASTENERS

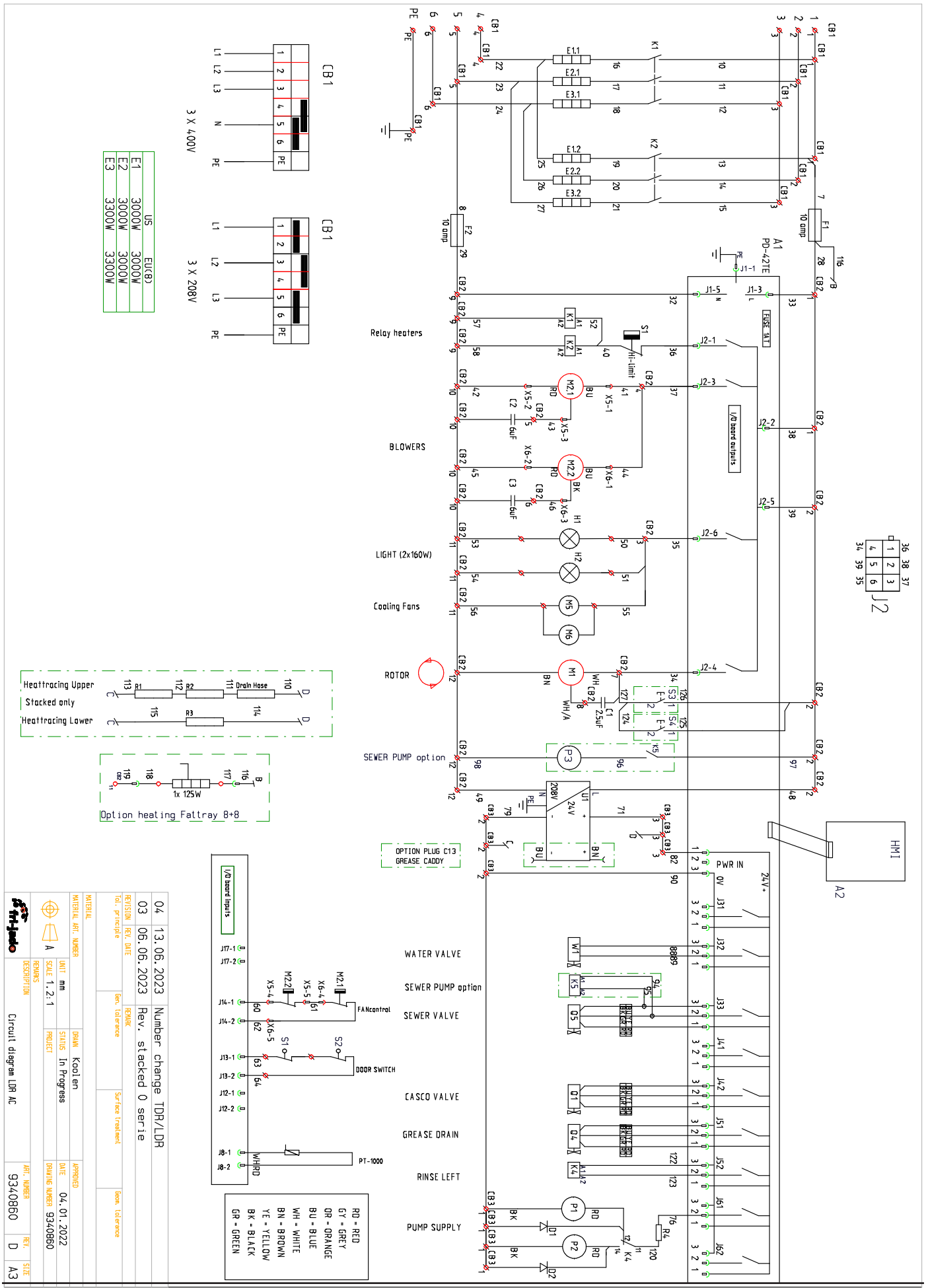
Pos	Part nr	Description
800	4280107	Bolt M6x20 ZP
801	4289559	Lockwasher M6, serrated ZP
802	4288321	Screw M5x16, SS socket button head.
804	4285092	Nut M6, black serrated
805	4288232	Screw M5x12, SS cross recess, wide button head
806	4286713	Bolt M6x16, ZP threadforming
810	4288325	Screw M5x12, SS socket, wide button head
812	9087570	Nut M5, black serrated
814	4289787	Bolt M6x30 ZP
817	4287549	Washer M8, ZP
819	0196673	Bolt M8x25, ZP
820	0141149	Screw M5x16, SS Cross recess pan head
822	0142315	Nut M5, SS hexagonal
824	9191050	Bolt, SS M5x18
825	0142103	Washer M5, SS
826	4280218	Screw M5x45, SS Cross recess pan head
827	4280208	Screw M4x8, SS Cross recess pan head
828	4280215	Screw M5x8, SS Cross recess pan head
829	4280558	Screw M5x16, SS Slotted wide head
830	9192065	Capnut M4, ZP
831	0142129	Washer M4, SS
832	4288231	Bolt M5x10, SS serrated
833	0142307	Nut M4, SS
834	4311110	Washer M5, SS ø5xØ15
835	0142111	Washer M6, SS
836	4285035	Nut M6, Brass
837	0195910	Capnut M6, BNP
838	4285076	Bolt M8x16, SS
841	0147017	Screw M2,5x16, SS Slotted pan head
842	0142293	Nut M2,5, SS hexagonal
843	9191130	starlock washer, 3mm black
845	0141081	Screw pan head, Philips M5x35, A2
846	4288323	Screw M5x20 mushroom head, with flange, 10 pcs
847	9070688	Bolt M8x12, SS
848	9008518	Lockwasher, M8 SS serrated
849	0142292	Nut M3
853	0141050	Screw M3x10, SS Cross recess pan head
854	0141076	Screw M3x20, SS Cross recess pan head
855	0141078	Screw M3x30, SS Cross recess pan head
856	0141035	Screw M3x5, SS Cross recess pan head
858	0141075	Screw M3x16, SS Cross recess pan head
859	4312810	Socket set screw M3x6, SS
861	4285151	starlock washer, 6mm

Pos	Part nr	Description
862	9191041	Circlips, E type for 6mm shaft
863	4287540	Screw M4x10, BNP
864	4285319	Screw 4,8x13, ZP Self drilling and tapping.
866	4287620	Screw 4,2x12, NP self tapping
868	4285078	Nut 1/4" bsw ZP
871	9191049	Set screw M5x5, black
872	4285010	Nut M3, ZP with lockwasher
873	3701248	Spacer 7mm, Ø3,2x6 NP
874	0149296	Spacer 10mm, Ø4,2x8 Nylon
875	9057347	Spacer 10mm, Ø5,2x10 Nylon
876	0141165	Screw M5x25, SS Cross recess pan head
877	4285135	Bolt M5x10, ZP thread forming
878	0137344	Screw M5x30, SS Cross recess pan head
879	4287610	Screw, ZP selftapping 3,5x13
880	9008178	Bolt M5x8, SS
881	0141246	Bolt M6x12, SS
882	0141117	Screw M4x45, SS Cross recess pan head
883	0142365	Locknut M6, ZP
885	4288324	Screw M4x8, SS Cross recess pan head
888	6962153	Washer M6, ZP ø6xØ25
889	6802013	Rivet nut, M5, ZP
890	9172053	Nut M5, for sheet metal
891	4288058	Bolt M5x20, ZP
892	0141521	Nut M6, SS
893	0146987	Washer M8, SS
894	0211520	Bolt M5x12, SS
895	0144359	Locknut M5, SS
896	4285408	Capnut M5, BNP
897	4288320	Screw M5x50, SS hexagonal
898	9073987	Washer M8, SS ø8xØ25
900	9008869	Bolt M8x50, ZP
902	4288319	Screw 6x20, ZP CR threadforming
903	4289402	Lockwasher M8, ZP
904	3701280	Lockwasher, starlock for 10mm shaft
905	0141393	Screw M4x10, SS countersunk
906	0141084	Screw M4x10, SS Cross recess pan head
907	4288327	Screw M5x25, SS Socket pan head
908	9006930	Lockwasher M4, countersunk SS serrated
909	0141092	Screw M4x12, SS Cross recess pan head
910	4287520	Washer M4, Brass
911	4285020	Nut M4, Brass
912	4280128	Bolt M4x12, SS
914	0144347	Locknut M4, ZP
915	8047381	Washer M6, SS ø6xØ25
920	0141547	Nut M8, SS

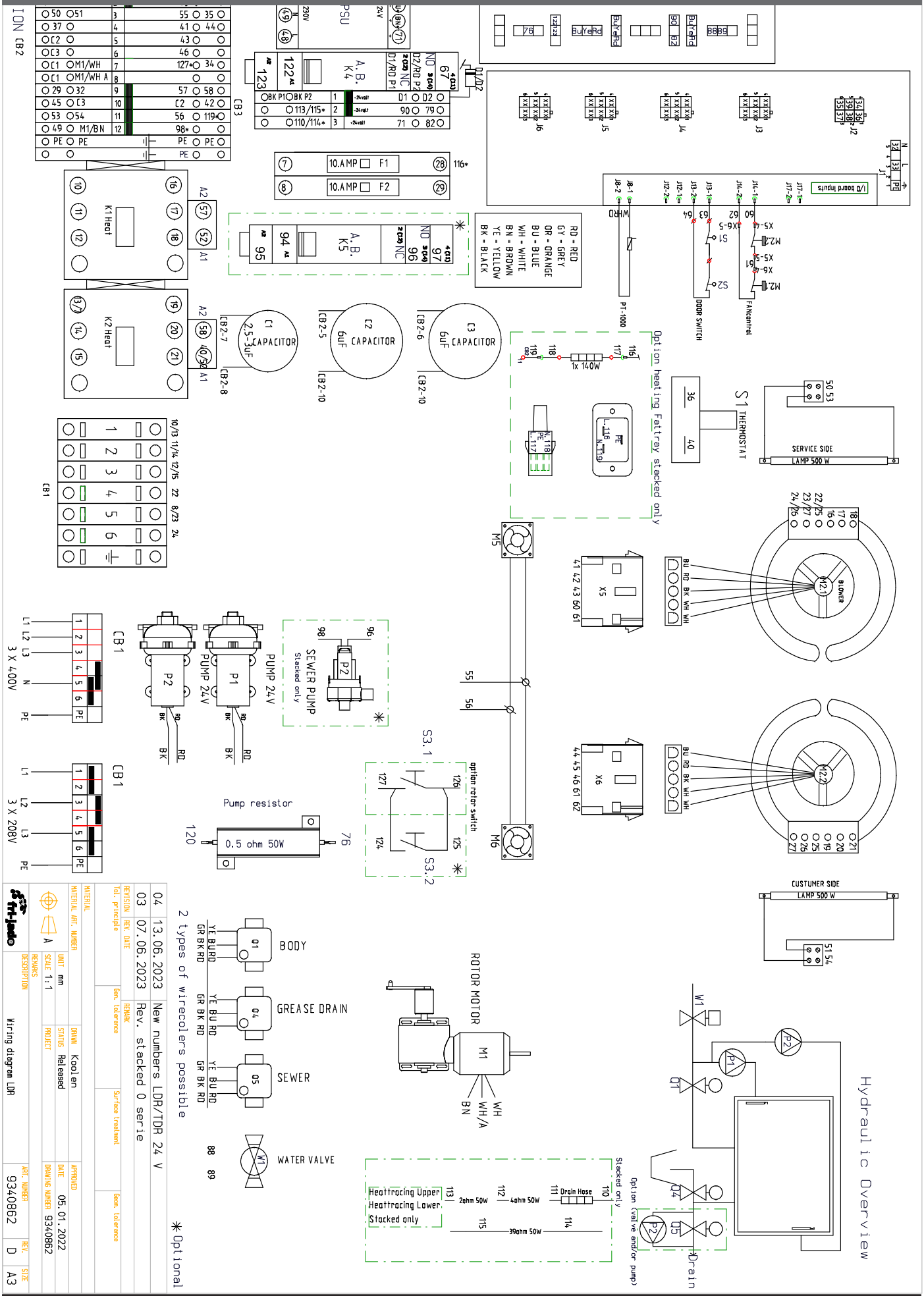
Pos	Part nr	Description
922	2800066	Connection nut M8x24, ZP
923	4285051	Connection nut M10x30, ZP
925	0195596	Bolt M8x10, ZP Socket head
926	9070793	Connection nut M6x18, ZP
929	0197378	Washer M12, Zp
930	9008056	Nut M12, ZP
931	0142056	Lockwasher M8, SS
933	9077004	Socket set screw M4x6, SS
934	9301049	Circlips external ø25
935	4287557	Washer M10
936	9073149	Wingnut M6, SS
937	2800082	Wingnut M6, Brass Nickle plated
939	4312027	Connection nut M5x15, ZP
940	4280540	Screw M5x6, SS countersunk
941	4311215	Screw , socket head M6 x 30
942	0141123	Screw pan head, Philips M5x10, SS
943	0149299	Spacer, Ø8xø4,2, H15, black
944	0139142	Screw hexagon head M6x40, SS
945	4285410	Capnut M12 SS low profile
946	4286728	Set screw M8x40, socket
947	4280239	Screw M12x20, hexagon ZP
948	0197380	Washer M12, SS
949	0142975	Screw socket head cap M6x20, A2
950	4285120	Screw M4x20, thread rolling
951	8071043	Nut M4, serrated ZP
952	6962187	Washer M8x1,5 ø8xØ30 ZP
953	0197807	Screw M4x30, slotted ZP
954	4285084	Screw 4,8x19, ZP Self drilling and tapping.
955	9008217	Blind rivet 4x8,6
956	9174680	Washer ø5,2xØ20x2mm
957	4285047	nut M8 hexagon, thin DIN 439B
958	0195783	Screw M10x30 sock button head
959	9191108	Wing screw M6x10 SS
960	0141204	Screw M4x16, Pan head SS
961	0149210	Screw M5x6, Pan head
962	0141539	Screw M5x10, SS countersunk
963	4288233	Screw M8x16, ZP serrated
965	4288330	Screw M8x12, SS button head, wide flange
966	4285414	Capnut, M4 ss
967	0149298	Spacer 10mm, Ø3,4x6 Nylon
968	0149299	Spacer 15mm, Ø4,2x8 Nylon
969	0251473	Washer M4, ZP ø4xØ16
970	9087575	Nut M5 hexagon, tensilock A4
971	4280555	Screw M6x16, Brass nickel plated

Pos	Part nr	Description
972	6390168	Rivet nut, M6 ss
973	9261029	Wing screw M5x10 SS
974	0141131	M5x12 kruiskop
975	9008543	Nut M12, SS
976	4280110	Bolt M6x20, SS hexagon head
977	4286723	Hex. screw M8x20 flange thread forming
978	0211521	Screw M5x16, SS hex. Head
979	4285041	Lock nut M5, SS
980	4280181	Screw M8x60, hexagon
981	4280187	Screw M8x55, hexagon, ss
982	4285045	Capnut, M8 ss
983	0141199	Screw M4x6, Pan head SS
990	4312353	Blind rivet large head 4x8,0mm - Elec. Galv. Steel
991	4286058	Blind rivet 4,0x8,0 - range 2,5 to 4,5mm - A2

CIRCUIT DIAGRAM LDRAC



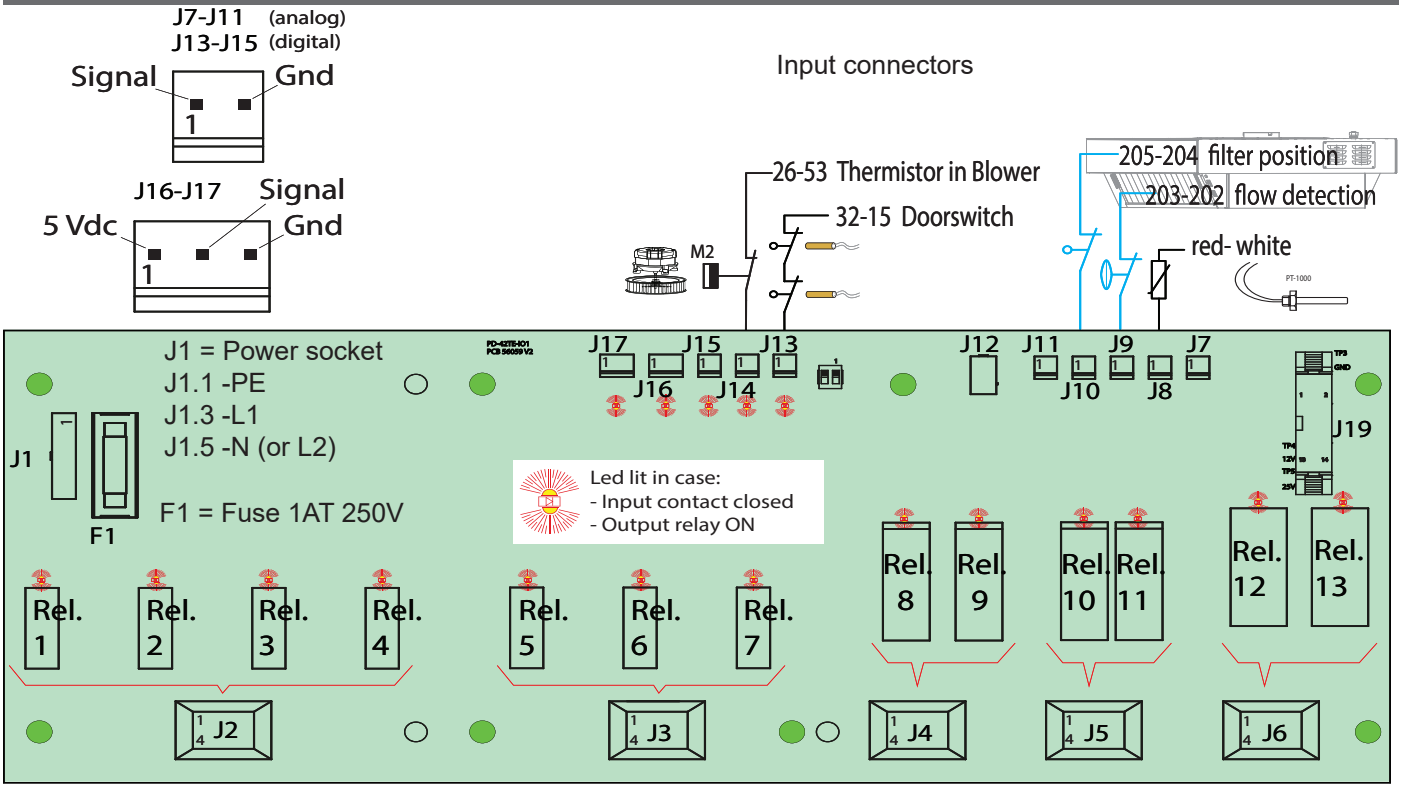
WIRING DIAGRAM LDRAC



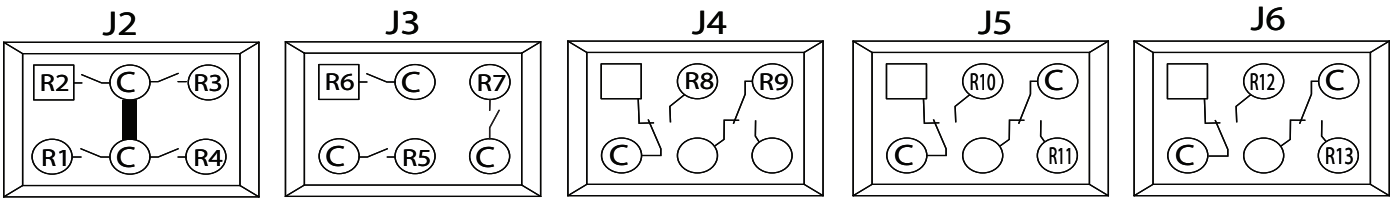
REVISION	REV. DATE	REMARK
04	13.06.2023	New numbers LDR/TDR 24 V
03	07.06.2023	Rev. stacked 0 serie

Tol. principle	
Gen. tolerance	
Surface treatment	
Deburr	
MATERIAL	
MATERIAL ART. NUMBER	
UNIT	mm
SCALE	1:1
PROJECT	
DRAWN	Koolen
STATUS	Released
APPROVED	
DATE	05.01.2022
DRAWING NUMBER	9340862
DESCRIPTION	Wiring diagram LDR
ART. NUMBER	9340862
REV.	D
SIZE	A3

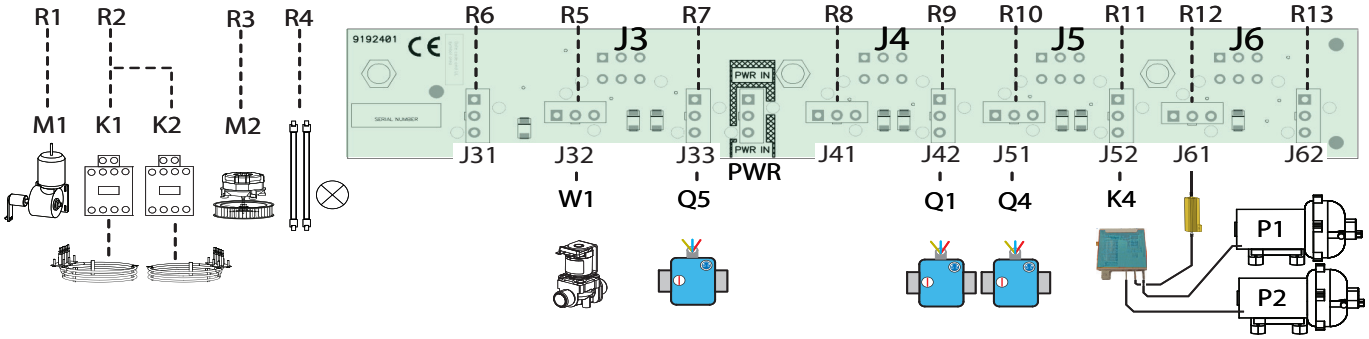
OVERVIEW OF I/O BOARD WITH INTERFACE BOARD (2 PUMPS)

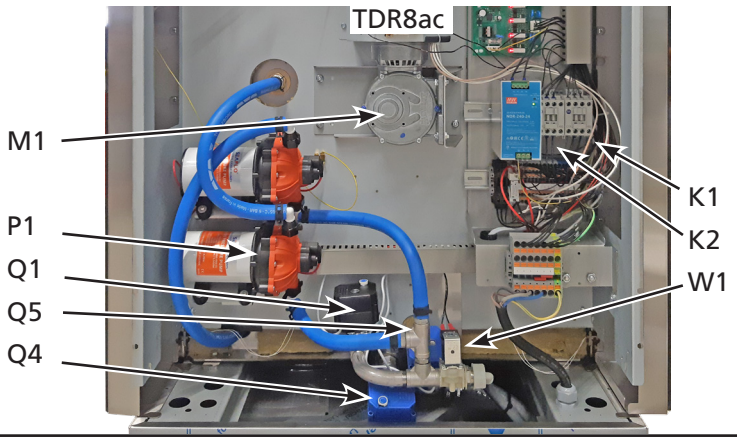


Output connectors



Overview of interface board (Jx to Jxx sockets)





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