

# Training manual

## Trouble Shooting

SCC Line  
Self Cooking Center - Combi Master



### General hints:



Isolate the appliance from mains supply before opening the appliance



When working with chemicals, i.e. aggressive cleaning materials always wear protective clothing, goggles and gloves!



After maintenance / repair the appliance must be checked for electric safety in accordance with your national, state and local requirements!



Whenever working on any gas component like:  
Gas valve, gas blower and / or changing connected type of gas a detailed flue gas analysis MUST be done using adequate CO and CO<sub>2</sub> measuring equipment! This shall ONLY be done by trained technicians!  
Always check appliance for possible gas leakages!

## **Trouble shooting**

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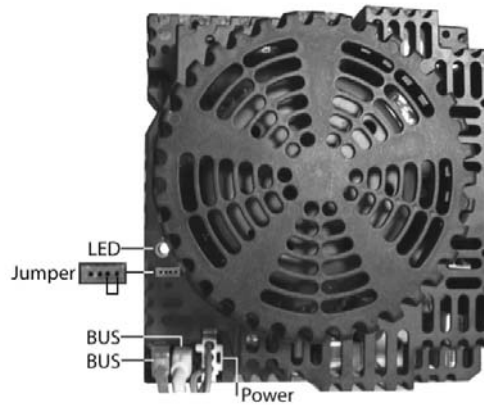
## Fan Motor SCC Line

<b>Fan Motor SCC Line</b>	<b>40.00.274</b>	<b>1NAC 100-240V</b>	<b>(L1, N, PE)</b>
	<b>40.00.276</b>	<b>3AC 400-480V</b>	<b>(L1, L2, L3, PE)</b>

### 1. Standard operation

The green LED shows when power is supplied from the secondary side main contactor.

The running signal is coming via BUS connection from the main PCB (CM) or I/O PCB (SCC). This signal also determines the speed of the motor. The motor speed differs depending on the unit size the motor is build in (examples):  
 CM: 1800 (450) rpm (all sizes)  
 SCC 61: 500 – 1900 rpm  
 SCC 202: 500 – 2200rp



The BUS cable (RJ45 connection) can be connected to either the left or right RJ45 socket.



The motor is shipped with the motor shaft gasket (22.00.083), an optional jumper (40.01.581) and a venting pipe conversion kit 87.00.325.

In floor models 201 and 202 two motors of the same kind are used. In this case the upper motor must get the jumper onto the right two pins as indicated.



### 2. Mounting sequence:

When mounting a new motor please observe the following mounting sequence:

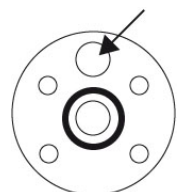
When fitting a new motor ALWAYS use a new motor shaft gasket (which is supplied with the motor)! Fix the motor bolts first hand-tight only, followed by the new gasket in its mounting ring very loose, now tighten the motor bolts: This allows the gasket in its bracket to center itself before you tighten the 4x flat 10mm nuts 1106.0220 of the gasket mounting ring.

Make sure the off-centered hole in the holding frame is mounted in 12 o'clock position.

Only with this sequence you assure that the motor shaft gasket is mounted centered.

The fan wheel screw must be tightened with torque 38 Nm.

NOTE: After mounting the motor and fan wheel the unit must be newly calibrated for humidity.



### 3. Possible fan motor problems

- Bus connection:  
 CM shows error code E12; cabinet temp. display shows 1 ST: Motor bottom short circuit  
 CM shows error code E12; cabinet temp. display shows 1 CO: Bus problem bottom motor  
 2 ST and 2 CO refer to the upper motor.

SCC shows Service 34.2 Bus problem bottom motor  
 SCC shows Service 34.4 Bus problem upper motor

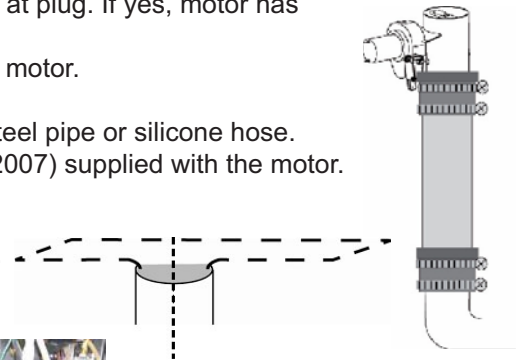
If bus connection problem is indicated, change RJ45 connection position first (left – right). If Indication changes from 1CO to 2CO or 34.2 to 34.4., change fan motor, otherwise change bus cable (40.00.472)

- Motor doesn't turn at all:  
 Green LED is not ON. Check secondary side of main contactor.  
 Note: LED is located at bottom left hand corner of motor behind the hose from the Self Clean pump.

- Power on main contactor ok, LED does not show.  
 Disconnect power plug from Motor and check if power is present at plug. If yes, motor has developed short circuit.  
 Most likely reason: Water caused by condensation dropped onto motor.

- Check if the venting pipe above the motor is made of stainless steel pipe or silicone hose.  
 If it is silicone hose replace by modification kit 87.00.325 (TI 12/2007) supplied with the motor.

- When mounting the venting pipe make sure to have it centered under the mounting hole in the unit cover to avoid water damage from this position.



- For bottom motor install collector plate 40.02.481.  
 This collector plate is used in all units since 09/2007.



- For top motor install protection plate 40.03.387 (refer to modification instruction MI0907).

- In case the plug of the power supply cable fan motor is damaged it can be replaced using the repair kits 40.02.611 (3 pole plug) or 40.02.612 (4pole plug)



- LED blinking code:  
 The LED might show in a blinking manner. Please refer to below table:

Reason	Remedy
1 Motor doesn't start, no signal from hallsensor	Check for motor blockage or change motor.
2 Voltage too low on motor pcb	Check supply voltage or change motor.
3 Voltage too high on motor pcb	Check supply voltage or change motor.
4 rpm measurement defective	Change motor.
5 Motor pcb temperature >105°C	Check cooling system (cooling fan, air filter), otherwise change motor
6 Supply voltage <80V	Check power supply (F1-F2)
7 Motor pcb defective	Change motor.
8 Motor pcb defective	Change motor.



# Humidity Control SCC / CM

## 1. Humidity control SCC

Humidity is permanently controlled inside the cabinet.

3 values are used for this control:

- Temperature of the cabinet is measured by thermocouple B4 (located behind motor mounting plate)
- Fan motor speed (controlled and measured by Bus cable from Motor to PCB)
- Voltage signal from pressure sensor P1

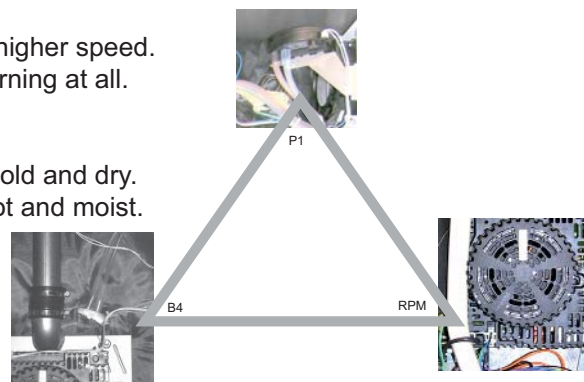
The voltage signal is higher when the fan motor is running at higher speed. There is no humidity control possible when the motor is not turning at all.

At any specific given fan motor speed:

The voltage signal of P1 is at its highest when the cabinet is cold and dry.  
The voltage signal of P1 is at its lowest when the cabinet is hot and moist.

An average voltage signal for a dry and cold climate (40°C) at standard fan speed (1800rpm) would be between 2,8 and 3,2 Volt.

This can be seen in Diagnostic mode 15 as output voltage.



In Steam Mode humidity is set to 100% and generated by the steam generator. Humidity can NOT be adjusted in Steam mode.

In Combi mode humidity is set default to 90% but can be manually changed between 0% and 100%. Humidity is generated by the steam generator and the food.

In Hot Air mode humidity is generated by the cooking food ONLY. This value is set default to 100% and can be limited to any value between 0% and 100%

## 2. Operational sequence (in general)

When the CPU detects that the actual humidity is above the set level, the steam heating elements will be de-energised. The clima valve will open. Dry air is sucked into the cabinet and displaces the moist air through the cabinet drain. After the humidity level falls under the set level the clima valve will close again and steam will be generated if needed.

## 3. Humidity calibration

SCC units with index G (produced since October 2008) will automatically run a self test when they are installed at the customer site. To run this self test the temperature of the unit (sensors B1, B2 and B4 must be below 40°C (104°F).

During this self test the humidity values for a cold and dry climate and the humidity values under steam condition will be evaluated in default fan speed (i.e. SCC 101: 1800 rpm). Values for other fan speeds and Combi mode are derived from these and can be identified in Diagnostic 16 by a value which can be divided by 100.

Units which are predominantly used for baking must be manually be calibrated at the customer site.

Manual calibration is done in service level, Basic settings 1.1

To start manual calibration the temperature of the unit must be below 40°C (104°F). The cabinet should be clean and dry. The cabinet space should be divided into 3 (floor units: 4) sections.

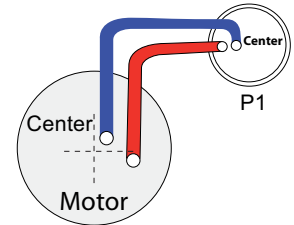
To do so use 20mm closed containers - no grids!- and place them upside down onto rack level 3 and 7 (floor unit: trolley level 3, 10 and 17)

Close the door and press start.

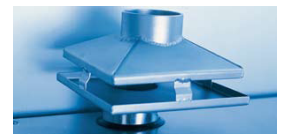
## 4. Possible humidity control problems

- General Humidity control problems:
  - Pipes and hoses from cabinet to Pressure sensor P1 might be blocked with fat or dirt particles.
  - Water might block the hoses leading to the pressure sensor P1;
  - Temperature of Quenching sensor B2 must react directly to cold water spray when quenching is active; if temperature remains high check positioning of quenching nozzle to quenching sensor. This can be checked by operating steam mode and observing the quenching sensor B2 in Diagnostic mode 2.

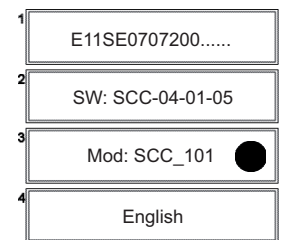
- The silicone hose connections to the pressure sensor are as follows:  
The hose connecting closer to the center of the motor shaft is connected closer to the center of pressure sensor P1.



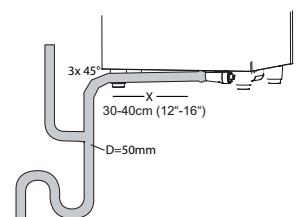
- Vent pipe might be extended locally to avoid steam condensation under ceiling. Such extension shall only be done when an air gap is provided. Use condensation breaker part number 8710.1309 for units 61, 101 and 62. At present there is no air break connection available for 102, 201 and 202.



- Unit is permanently quenching when in any steam mode  
Check clima valve for proper closed status. If clima valve leaks air into the cabinet unit will run into humidity emergency control. In this case the quenching sensor is responsible for humidity control (like in CM units). In this case you will find a ring or solid circle behind function key - Model type. This circle can also be visible in other cooking modes.



- Customer complains about steam not being visible inside the cabinet  
Check if temperature is above 110°C (230°F). At this temperature steam is invisible. Caution: Danger of scalding if door is opened.  
In an empty cabinet at 100°C steam will disappear because there will be no demand for humidity after some time.
- Some humidity values in Diagnostic mode 16 show „0“ or „85000“  
Unit must be manually calibrated
- When changing Thermocouple B4 (SP # 40.00.399) make sure the insulation is covering the mounting position again properly.
- Customer with baking application complains about uneven browning result  
Calibrate the unit manually.  
Make sure customer does not use grids while baking; only flat trays (aluminum baking tray) should be used to achieve proper results;  
Check if the customer is using the SCC baking process.  
Baking in manual mode (hot air without humidity control) does not achieve good results!
- Drain connection is extended over several meters before ending in an open floor drain or connected directly via P-trap  
Venting the drain pipe within 0,5 meter from drain connection might help the humidity control to maintain a set level.

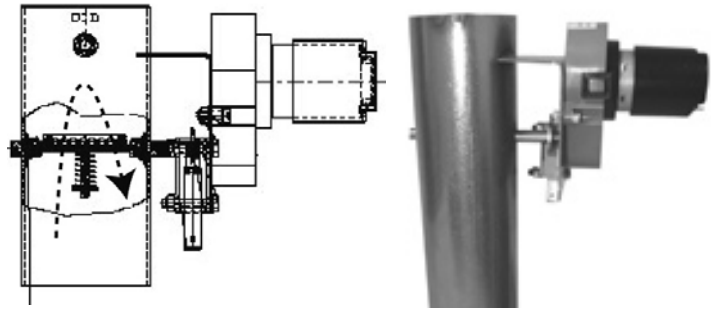


# Clima Valve SCC Line

<b>Clima Valve SCC Line</b>	22.00.568	SCC 61 / 62	(pipe 108 mm)
	22.00.576	SCC 101 / 102	(pipe 238 mm)
	22.00.577	SCC 201 / 202	(pipe 228mm)

## 1. Standard operation

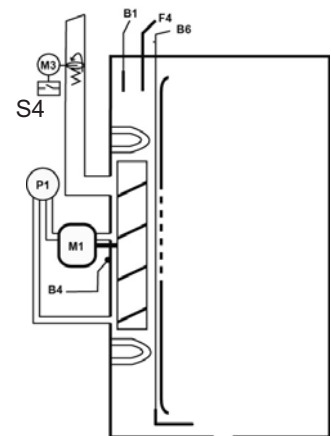
The clima valve is normally in closed position. When the door is opened the valve opens automatically.



The turning fan wheel (with the small fins on the rear side) creates a negative pressure (suction) below the closed clima valve. This negative pressure increases with increasing fan speed.

If too much humidity is detected inside the cabinet, the clima valve motor will turn the clima valve (time:  $\frac{3}{4}$  of cpl. turning time) for 270 degrees; The valve will now stand in vertical position allowing dry kitchen air to be sucked into the cabinet. This dry air will displace the humid air, which is now discharged through the cabinet drain into the quenching box. Humidity displacement is most effective when fan wheel is at high speed.

After the set humidity is reached, the clima valve motor will close again. Closed position is detected by the micro switch S4.



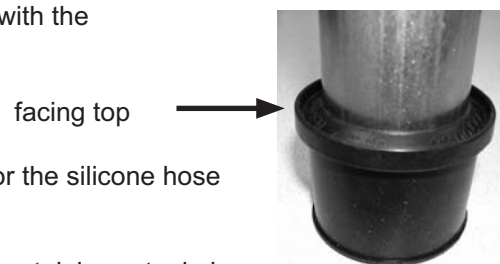
## 2. Mounting sequence

When mounting a new clima valve make sure the top end of the stainless steel pipe is positioned centrally under the top cover hole.

Secure this position with the spacer ring and vent cover.



The connection to the elbow pipe to the cabinet is done with the gasket 22.00.564 and 2x hose clamps. Please mount the gasket as shown here:



The combined clima valve and pipe (as a replacement for the silicone hose connection) is used in production since January 2008.

Units prior to this production date can be retrofitted with a stainless steel pipe (to replace the silicone hose) with conversion kit 87.00.325. This kit is shipped together each motor 40.00.274 and 40.00.276. (subject to change)



### 3. Possible Clima valve problems

- Unit does not reach steam temperature 100°C

Cooking time is longer than normal;

Humidity valve is permanently leaking fresh air to the inside of the cabinet causing displacement of steam;

To proof close the cabinet door to allow the clima valve to close. Run the unit on standard (high) speed in any mode. Remove the top vent cover on top of the unit.

Now place a light paper or a burning match (lighter) over the opening. Should the flame or paper be sucked downwards the fan wheel is sucking air through the clima valve.

- Customer complains about inconsistent cooking results

Customer is producing steaks / ribs at high temperatures; this application might result in excessive carbon build up on the valve and damage the valve gasket;

Please include a visual inspection of the clima valve in your scheduled maintenance routine.



- Humidity control faulty

If the clima valve does not find its end position the SCC will show "Service 21".

Also after each software update the clima valve will initialise itself automatically. Should this initialisation run not be successful the flap time (in Basic Settings 1.2) might show a time like -0.2 sec.

The normal running time of the clima valve is 18-21 sec. If the actual time indicated in Basic Settings 1.2 is not in that range, press "START" "FLAP" in order to re-initialise the clima valve.

CM:

For your record purposes only:

The safety valve pipe of the units Combi Master CM (without clima valve, but at the same position) have the following service part numbers:

22.00.578	CM 61 / 62	(pipe 108 mm)
22.00.579	CM 101 / 102	(pipe 238 mm)
22.00.580	CM 201 / 202	(pipe 228mm)

# CleanJet +Care

## 1. Standard operation

Cleanjet +Care is the cleaning and care function of SCC with index G produced since October 2008.

2 different chemicals are used for Cleanjet +Care:

Cleaner tabs:	part number 56.00.210	Bucket of 100 each
Care tabs:	part number 56.00.562	Bucket of 100 each tab packets

- The unit will prompt the user with a recommended Cleanjet +Care program. This program will be indicated in red color.  
The needed amount of chemicals will be indicated too.
- The cleaner tabs are taken out of the plastic wrapping and placed into the basket of the air baffle inside the cabinet
- The care tabs (1 tab portion is equivalent to the content of 1 bag = 6 pcs) are taken out of the plastic wrapping and placed into the care container next to the hand shower.
- Make sure the hinged racks and the air baffle in units 61-102 are placed properly in position and the trolley is standing vertically inside the cabinet in units 201-202.
- Close the cabinet door and the care container and start the recommended Cleanjet +Care program.

## 2. Operational sequence (in general)

### CleanJet:

- The unit will start with a functional self test. SC-Pump and the 3 solenoid valves (Y1-Y3-Y4) are operated for a short time to verify the functionality.
- The care solenoid will fill some water into the care container to start dissolving the care tabs.
- The drain valve will close, the quenching solenoid will fill water into the quenching box and the Cleanjet pump M6 pumps this water into the cabinet.
- The water jet must hit level 3-4 from top of the hinged rack / trolley in both table and floor units.
- The air flow inside the cabinet draws the water via the cleaner tabs in the air baffle basket onto the fan wheel. Now the cleaner tabs start dissolving.
- The sufficient water flow is detected by the speed of the fan motor. This speed will decrease when water hits the fan. The decreasing motor speed is sent to the processor via BUS connection.
- After some time the pump will stop and the drain valve will open to allow the dirty water to drain off.
- Depending on the program selected the above sequence will repeat one or more times (functional self test is not repeated).
- After completion of the cleaning cycle the steam generator will be pumped off.

### Care:

- The care container will be filled with water and pumped off into the empty steam generator. This is done 3 times.
- The drain valve will close;
- The filling solenoid will fill the steam generator with fresh water up to level electrode;
- Part of the care volume inside the steam generator is now pumped off into the quenching box with the SC pump and topped up by moistening valve Y3
- The filling solenoid will fill the steam generator with fresh water above the level electrode;
- The care volume inside the steam generator is heated to 80°C
- The Cleanjet pump M6 pumps the care volume of the quenching box through the cabinet to rinse it;
- The drain valve will open;
- The care container will be rinsed with water, at the same time the care pump will discharge the water from the care container in to the steam generator and the SC pump will pump off the steam generator.
- The steam generator is filled, pumped off and refilled again.
- Finally the cabinet is neutralized by steam

### 3. Possible CleanJet +Care problems

- Unit develops excessive foam  
The water hardness is too low for the amount of cleaner tablets used. If a water softener is installed, the supply water must be blended to minimum 5°dH, 9°f, 6°e, 90ppm, 5,2 gr/gal(US).  
Note: We strongly advise NOT to use sodium ion exchanger treatment systems (corrosion etc).  
To indicate less cleaner tabs switch unit to Softwater ON in Basic settings 26.
- Timer is counting up  
The fan motor detects the water flow rate during cleanjet. If the water jet from the cabinet ceiling does not hit level 3-4 on both table and floor model rack / trolley, the motor does not detect enough water flow and the quenching solenoid will refill the quenching box. This leads to timer counting up.  
Make sure no containers are left inside the cabinet, fix left rack properly in locating pins, trolley must be inside cabinet on floor units, align trolley vertically;  
Defective door gaskets can lead to water loss during cleanjet process resulting in the need to refill.
- Service 25  
Water flow recognition by rpm drop of main fan motor doesn't work  
Possible reasons:
  - Water tap closed
  - Cleanjet Pump defective
  - Foreign particle in pumping pipe is blocking water flow
  - Foreign particle at pipe end diverts water jet direction; water must hit level 3-4 of the rack or floor unit trolley
  - Drain valve does not close properly
  - Check running time of drain valve in Basic Settings 1.2; Times t0 - t1 should be appr. 9 / 27 sec (1:3)  
If necessary reinitialise drain valve in Basic Settings 1.2.
- Service 40  
Care pump does not supply enough care solution into steam generator
  - Care pump defective (check if pumping rate is sufficient, impeller damaged / blocked)
  - Hose from care pump to steam generator kinked;
- Service 41  
At the beginning of Cleanjet+Care process the moistening solenoid Y3 is tested automatically.
  - Solenoid Y3 defective, error is detected by CDS sensor; Change triple solenoid valve
- Service 42  
At the beginning of Cleanjet+Care process the care solenoid Y4 is tested automatically.
  - Solenoid Y4 defective, error is detected by CDS sensor; Change triple solenoid valve
- Service 43  
During the testing of solenoids Y1, Y3 and Y4 the CDS sensor detected that at least 1 of the three solenoid valves does not close after de-activation
  - Change triple solenoid valve
- Service 44  
During the water heating process in the steam generator at beginning of the Cleanjet+Care process the thermocouple B1 does not detect temperature rising.
  - Check B1, heating elements, SSR
- Service 110  
SC pump did not work properly when care chemical was inside steam generator.
  - Change / repair SC Pump.
- Service 120  
Level electrode does not detect water level after care chemical was pumped in and water was topped up.
  - Check Filling solenoid Y1 and level electrode - wiring and operation.

Reset of errors 40-43 is done after repair and successful completion of a CleanJet +Care program, rinse, program light, medium or strong;  
Reset of error 44, 110 and 120 after repair and completion of abort program;

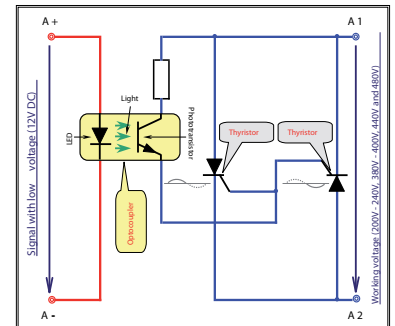
# Solid State Relay - SSR

## 1. General function

A solid state relay is an electronic circuit which acts as a relay.

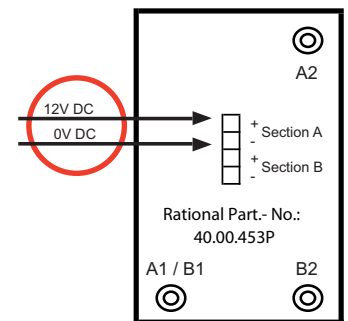
A 12V DC signal is used as control voltage for switching the working voltage of 200-277V AC

Should a solid state relay fail because of a secondary side short circuit it will fail most likely in closed position causing the connected load to be permanent on.



## 2. SSR connection

12V DC control voltage is supplied from I/O pcb terminal X24. Terminal A1 / B1 is the shared 200 - 277V input for the load supply. The I/O pcb supplies either section (channel) A or section (channel) B. Both channels are never switched on at the same time!



Depending which Section - A or B - is supplied with 12V DC the channel A1/B1 to A2 or A1/B1 to B2 is closed.

A2 connects always to steam elements, B2 connects always to Hot Air elements.

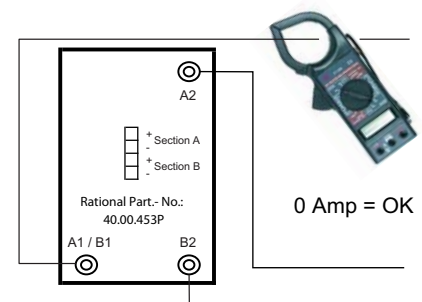
## 3. Measuring SSR

Solid state relay can NOT be tested with an Ohm meter!  
Solid state relay are either tested using a clamp meter or Volt meter!

To test a SSR power must be supplied to your equipment.  
Open the cabinet door to avoid control voltage supply from the I/O pcb.

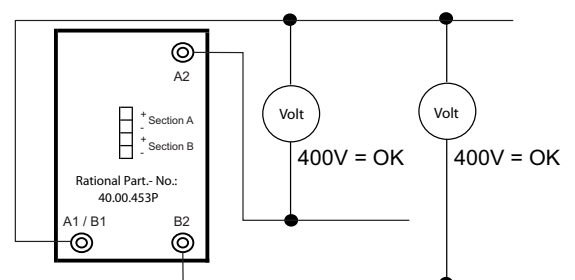
- Testing with clamp meter (cabinet door is open):  
Put your clamp meter around the wire to A1 / B1 of each SSR.  
Meter must read zero Amps at all times.

Should you measure any current the SSR is damaged and must be replaced!



- Testing with Volt meter (cabinet door is open):  
Put your volt meter across A1 / B1 and A2 or B2 of each SSR.  
Meter must read your system voltage, i.e. 400V in case your system supply is 3NAC 400V.

Should you measure less than your connected system voltage or even 0 Volt, the SSR is damaged and must be replaced!



## 4. Mounting of SSR

When mounting the SSR please make sure:

A stainless steel (silver) colour heat transfer foil is attached to the rear side of the SSR. Do not damage this foil during storage or mounting. Should the old SSR have been fixed with a red heat transfer foil, remove this prior to fixing the new SSR.

The 2 fixing screws must be tightened adequately to ensure equal pressure of the SSR base foil to the supporting surface.

Should the SSR be fixed on a perforated aluminum base (CPC units), clean the holes of the mounting base from any dirt and dust;

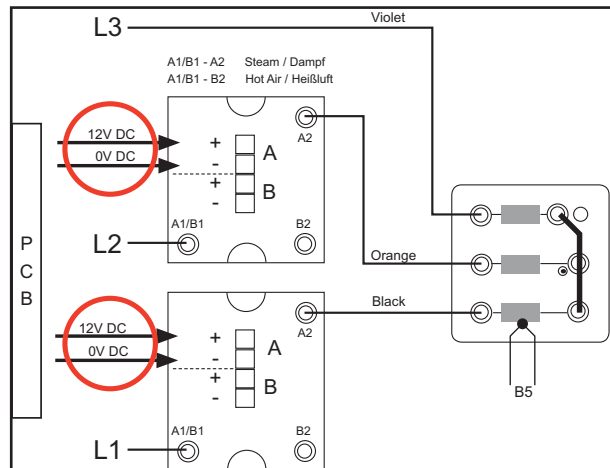
## 5. Typical SSR connections to heating elements

NOTE: The violet wire (L3) is connected directly to the main contactor and is NOT switched by SSR!

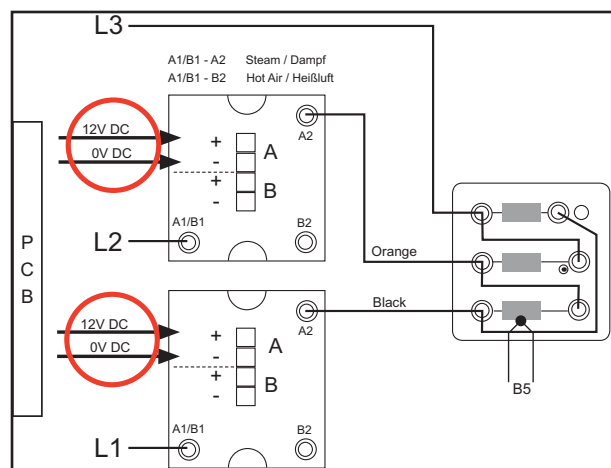
Below you find some samples of SSR circuits connecting to Steam elements (A2).

Note: If only 1 SSR is switched on, the unit is operating on partial load as 1 element is out of circuit.

3NAC 400-480V



3AC 200-240V





# SCC - Main Printed Circuit Board (PCB) 42.00.002

## 1. Standard operation

The SCC pcb 42.00.002 works together with the I/O pcb 42.00.064.

Power supply for the processor and information flow is via the Bus cable from the I/O pcb to the main pcb.

Connected to the main pcb is an external EEPROM which stores the unit specific data. This memory is copied on the main pcb. Data on the main pcb are updated once per hour to the external EEPROM.

The operation of the PCB is done mainly by touch pad, which is stuck onto the display and connected by a flat green cable.

The SRAM of the CPU is backed up by a battery. Should this battery be removed the SRAM will be reset.

NOTE: In this case the only information back up is the external EEPROM.

Should the EEPROM carry inconsistent data the unit will be out of function. In this case you must run the Software Repair program to bring the unit back to operation.

All DIP switches of the pcb must be set to OFF during normal operation. To enter into service mode set DIP switch 1 to ON. To exit service mode set DIP switch 1 to OFF or switch unit off and on again. (For details on service mode please refer to the training manual.)

## 2. Operational sequence (in general)

If the pcb is switched OFF the unit will automatically re-boot itself. As there is permanent power to the I/O pcb the necessary power for rebooting is coming via BUS cable from I/O pcb to main pcb. This booting process needs approx. 30 seconds. During this time the green LED is on and the red LED will blink once.

If now the pcb is switched on the display comes up at once and the clima valve and the drain valve will turn once.

If the pcb is switched OFF and immediately ON again the SCC display needs approximately 30 seconds to be operational again.

## 3. Software upgrade

Software upgrade can ONLY be done by using the Rational USB Software stick 87.00

Other type USB sticks are NOT capable to correspond with the pcb hard/software.

Connect the USB stick to USB interface at bottom left hand corner of control panel.

Make sure the USB stick is recognized by the pcb.

(Press Funktion key followed by USB key)



## 4. Possible PCB problems

- PCB does not recognize USB Stick  
Open control panel and connect USB stick directly to X54 using USB interface cable 40.00.470.  
Should the USB stick be recognized now replace interface cable.
- During software upgrade there is a 1 sec. on - off relais sound on the pcb; Software upgrade does not work  
The USB stick is not formatted in FAT (16) mode. Safe the data on your computer and reformat USB stick to FAT (16)
- Touch pad does not react  
Disconnect flat green cable from terminal X102. Wipe end of cable clean. Reinsert into terminal X102;  
Should the touch pad still not respond change pcb;  
Experienced technicians can change this touch pad separately (SP number: 42.00.067).  
On PCBs from July 2009 this X102 connection is sealed with white silicone. Remove this silicone before reinserting the new touch pad connection.
- PCB display shows VFD after software upgrade  
Switch unit OFF and ON again and repeat software upgrade.  
Should re flashing software not help: PCB basic software is corrupt, change PCB
- PCB only shows „ON-PLEASE WAIT“ after software upgrade;  
There has been a communication interrupt during software upgrade; switch unit OFF and ON again and repeat Software upgrade.
- PCB does not function  
Check LED indication on pcb;  
green LED must be always on when unit is on.  
red LED must only blink once while rebooting and must be off all other times.  
yellow LED must be off at all times.
- PCB shows water marking from condensation
  - Check air filter,
  - Avoid steam intake from drain installation,
  - Make sure the vent pipe is properly installed to top cover and no water can sip in,
  - All connections of heating elements, sensors and motor shaft are steam tight,
  - Door gaskets are not damaged,
  - Interior light seal is ok,
  - Unit is not installed in cold rooms where humidity condensates on cold surfaces.
- PCB loses programs  
SRAM backup battery has low power; replace by TR 2032 3V Li cell.
- Only SCC key, hot air and steam key are illuminated, display is dark, but touch pad is reacting  
Check 2,5-0-2,5V supply from transformer to PCB terminal X110
- PCB display shows: “Change Air filter” or “Service 29”  
Cooling of left side panel is insufficient. Change air filter is shown when PCB is 75°C hot, Service 29 is shown when PCB is 85°C hot.  
Check cooling fan, external heat sources, install left side heat shield if necessary;

# SCC - Software

## 1. Software upgrade:

Software upgrade can ONLY be done using the Rational USB Software stick 87.00.01  
This USB stick is formatted in FAT.

Other type of USB sticks are NOT capable to correspond with the pcb hard/software.  
Connect the USB stick to USB interface at bottom left hand corner of control panel.

Make sure the USB stick is recognized by the pcb.

(Press Function key followed by USB key)

When the stick is recognised swith the unit OFF and ON again  
to start the update.

After successful update check the software version and the  
serial number.



The blue colour USB stick can be used on units with any  
software version. The grey colour USB stick is only recognised by units which have at least software version  
01\_07\_11 (since May 2006). Units with software prior to this must be upgraded using the blue USB stick.

If the USB stick is not recognised connect the USB stick directly to X54 using the USB interface cable  
40.00.470 and replace original interface cable if needed.

## 2. Software download onto the USB stick

On the original Rational USB Software stick 87.00.010 you find a file "update.exe". Connect your computer to  
the internet, connect the USB stick and double click the file "update.exe" in the explorer. The integrated soft-  
ware will automatically connect to the Rational server. Press "Check for updates". You will be prompted if a new  
firmware is detected. Follow the online instructions.

## 3. Software structure

The standard Rational software has the following structure:

Make sure ONLY the software files are existing on your  
software update USB stick.

Make sure the files are not zipped on your USB stick

Do NOT store other data on this memory stick!

readme	2 KB	Textdokument
VFD.img	32 KB	IMG-Datei
SCC-04-01-03.version.img	1 KB	IMG-Datei
prepare.img	3 KB	IMG-Datei
preinst.img	1 KB	IMG-Datei
postinst.img	2 KB	IMG-Datei
postfw.img	1 KB	IMG-Datei
kernel_10.img	793 KB	IMG-Datei
kernel_01.img	765 KB	IMG-Datei
kernel.img	765 KB	IMG-Datei
firmware.img	207 KB	IMG-Datei
firmw_10.img	223 KB	IMG-Datei
firmw_01.img	207 KB	IMG-Datei
app.img	4,949 KB	IMG-Datei
Cp2stick	1 KB	Datei
update	86 KB	Application

## 4. Software structure chain account / OEM

Software for chain accounts has the following structure:

Note: The folder script must stay as a folder on the USB stick.

Make sure there is no zip file on the USB stick.

If the entire software package is sent to you as a zip file,  
unpack the content onto your USB stick.

The chain software can not be updated on the web.

There is no "update.exe" file existing.

New software versions are ONLY available directly from Rational.

script	1 KB	SID-Datei
VFD.img	32 KB	IMG-Datei
prepare.img	3 KB	IMG-Datei
preinst.img	1 KB	IMG-Datei
postinst.img	2 KB	IMG-Datei
kernel.img	765 KB	IMG-Datei
firmware.img	209 KB	IMG-Datei
app.img	5,201 KB	IMG-Datei
Cp2stick	1 KB	Datei
script		File Folder

## 5. Additional software information

Software can only be upgraded to a newer version.

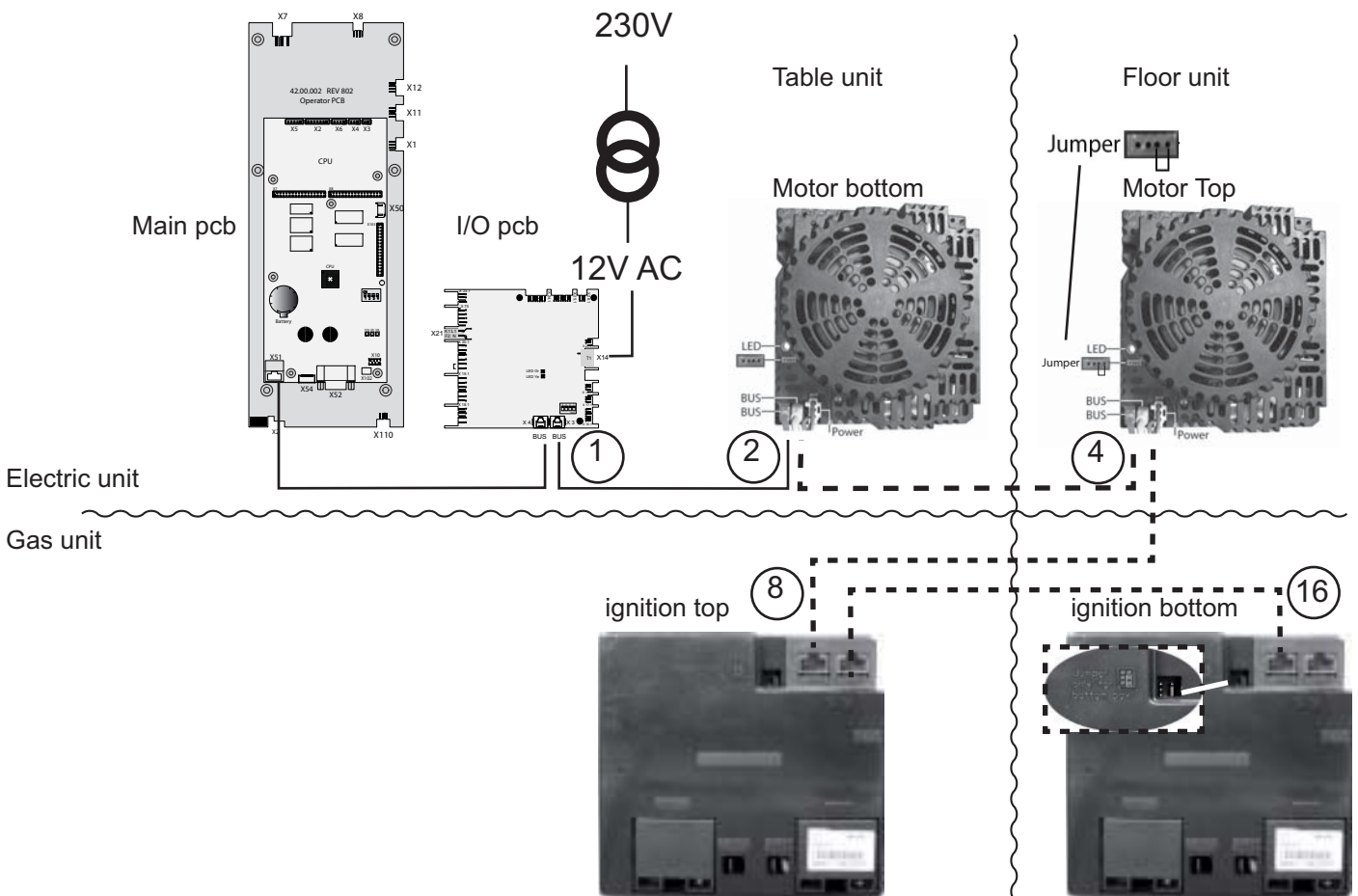
- Standard Rational software:  
During software update the following display will be shown in sequence:
  - All 4 windows: UPDATE (if shown only for a few seconds the software on the pcb is latest version already)
  - Window 3: ON please wait;
  - SCC display will show for 1 second;
  - Window 3: Please don't touch (during this time the drain valve and clima valve will initialise)
  - Unit will switch OFF and ON again automatically;
  - UPDATE will show again;
  - ON please wait;
  - Unit will switch OFF and ON again automatically;
  - ON please wait;
  - After re booting of the pcb the SCC display will show and the steam generator will be automatically flushed; (disconnect the USB stick now)
- Chain account software:  
During software update the following display will be shown in sequence:
  - All 4 windows: UPDATE
  - please wait;
  - All 4 windows: script (during this time the drain valve and clima valve will initialise)
  - unplug stick (disconnect the USB stick now)
  - ON please wait;
  - Units will switch OFF and ON again automatically;
  - ON please wait;After re booting of the pcb is finished the chain display will show;
- Software update does not delete any information which was entered by the customer before.  
All information as entered in Basic Setting will remain valid;
- If during software upgrade VFD is shown, leave the USB stick connected and switch the unit OFF and ON again. If VFD remains on the display, the internal software structure on the PCB is corrupt and the PCB must be changed.
- Unit without function after SW upgrade
  - External EEPROM corrupt, contact Rational for EEPROM repair
- Should there be a 1 sec. on - off relais sound on the pcb during software upgrade and Software upgrade does not work:  
The USB stick is not formatted in FAT (16) mode. Safe the data on your computer and reformat USB stick to FAT (16);

# Bus Control

## 1. Bus layout

The main electronic components are connected by a bus cable. This bus connects:

- I/O PCB
- Main PCB
- Main fan motor (201-202 units: 2x, top motor with jumper)
- Ignition box on gas units (201-202 units: 2x, bottom ignition box with jumper)
- Ultravent (optional)



## 2. Sequence of connection (RJ 45 terminal)

One bus cable connects the I/O PCB to the main pcb.

The second bus connects from the I/O pcb to the main fan motor, on floor units from the bottom fan motor to the top fan motor, on gas units it continues to the ignition boxes.

The top fan motor needs a jumper on the right pair of pins for identification:

On gas units the bottom ignition box needs a jumper as identification (ref. oval insert)

I/O pcb, motor and ignition box have 2 bus terminals each. Both connections are identical and bus connection can be done to either terminal.

The sequence of connection can be chosen freely, i.e. the bus cable can also be routed from the I/O pcb to the top motor first before the bottom motor or on gas units it may be connected to the ignition box first.



### 3. General function

The transformer supplies 12VAC power to the I/O pcb. The power supply for the processor on the main pcb is generated on the I/O pcb and sent via bus from the I/O pcb to the main pcb.

All information from the main PCB to the I/O pcb, fan motor(s) and ignition box(es) is sent via this bus system. As each component has its own unique address, the information can be routed correctly.

Address of Components:

- 1 - I/O pcb;
- 2 - Fan motor (table unit), Fan motor bottom (floor unit)
- 4 - Fan motor top (floor unit); NOTE: Jumper must be set!
- 8 - Ignition box (Table unit), Ignition box top (floor unit)
- 16 - Ignition box bottom (floor unit); NOTE: Jumper must be set!

### 4. Fault finding

Error code 34.1	Bus I/O pcb;	change point of RJ45 connection
Error code 34.2	Bus fan motor bottom;	Check if green LED on fan motor is on (100-240V connected to motor?; check main contactor); Connect bus to second terminal
Error code 34.3	Bus I/O pcb <u>AND</u> fan motor bottom;	Check if green LED on fan motor is on (100-240V connected to motor?; check main contactor); Connect bus to second terminal Check all bus connections;
Error code 34.4	Bus fan motor top;	Check all bus connections, motor LED and main contactor
Error code 34.5	(1+4) Bus I/O pcb <u>AND</u> fan motor top of the floor unit;	Check all bus connections, motor LED and main contactor
Error code 34.6	(2+4) Bus at both fan motor of the floor unit;	Check all bus connections, motor LED and main contactor
Error code 34.7	(1+2+4)	etc.
Error code 34.8	Ignition box table unit	Check all bus connections
Error code 34.9	(1+8)	etc.
etc		

- When any error code is present, try to connect the bus cable to the second bus terminal of the component. Should the error code change, the individual bus connection is defective;
- When any error code is present, try to change the bus cable (40.00.472) in between the components to locate defective cables and exclude any open circuit.

**NOTE:** Do not allow the bus cable to touch ANY hot surface, i.e. Steam heating elements.  
The insulation of the single wire strands inside the black bus cable might melt and wires can short circuit.

**Attention:** A short circuit on the bus can damaged the main pcb, I/O pcb, fan motor and ignition box **at the same time!**

# Gas

## 1. Standard operation

NOTE: The gas components and ignition sequence are identical for SCC and CM units.

A blower motor starts on "Start speed" and purges possible remaining gas from the gas heat exchanger with fresh air.

Ignition starts for 5 seconds. During this time the gas valve will open.

If the flame establishes and is recognised by the ignition and monitoring electrode and the ignition box, the gas blower speed may rev up to MAX rpm or MIN rpm depending on the amount of energy needed.

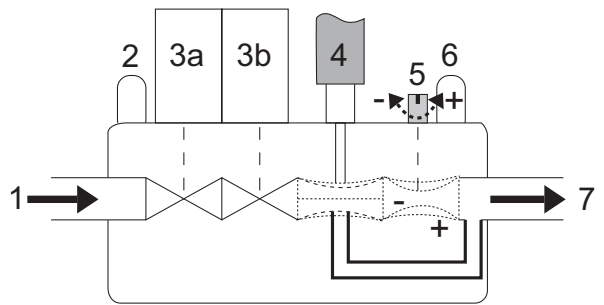
Flame current is visible in Function test 14-16 and should be between 5,0 and 5,75µA.

Should the flame recognition fail (below 3,5µA), the heat exchanger will be purged again and the ignition sequence will repeat. After 5 unsuccessful ignition restarts the unit will show RESET (CM - reS)

## 2. Component / connection identification

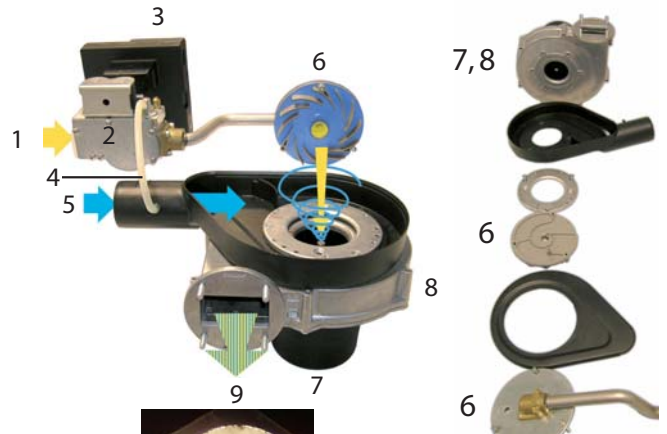
Gas valve:

1. Gas supply pipe
2. Test nozzle for dynamic input pressure
- 3a / 3b. Electric solenoid
4. Pressure compensation hose
5. CO<sub>2</sub> screw
6. Output pressure nozzle (not used in practice)
7. Valve outlet to blower premix chamber



Gas blower:

1. Gas supply pipe
2. Gas valve
3. Ignition box
4. Pressure compensation hose
5. Air supply
6. Whirlwind (stationary)
7. Blower motor
8. Blower impeller housing
9. Discharge of gas / air mix to heat exchanger
10. Burner



Make sure the gas compensation hose (hot air and steam) is not kinked and is properly fixed in its position.



## 3. Media flow

Blower (7) and gas valve (2) are controlled by the ignition box (3).

Blower (7) pulls air through air supply (5) and purges heat exchanger. Now ignition box (3) starts ignition at the burner head and opens gas valve (2).

The pulled air is brought into rotation and mixed with the supplied gas in the stationary whirlwind disc. The fully premixed gas / air mixture is discharged through opening (9) into the burner.

## 4. Flue gas analysis

Flue gas analysis is only done in „Function Test“.

SCC: FT 14: Steam, FT 15: Hot air top, FT 16: Hot air bottom

Adjustment of CO<sub>2</sub> with the CO<sub>2</sub> screw on the gas valve is only done in FT 14 in max rpm Steam, FT 15 in max rpm hot air top and FT 16 in max rpm hot air bottom,

In the respective MIN rpm the CO<sub>2</sub> is only checked for correct value, but NOT adjusted!

CM: F 19-21: Steam, F22-24: Hot air top, F25-27: Hot air bottom (ref. CM module page 23)

Adjustment of CO<sub>2</sub> with the CO<sub>2</sub> screw on the gas valve is only done in F 21 (max rpm Steam), F24 (max rpm Hot air top), F 27 (max rpm Hot air bottom)

CO<sub>2</sub> Screw: Turning clockwise decreases the CO<sub>2</sub> value, turning anti clockwise increases the CO<sub>2</sub> value.  
Adjust the value always from low to high!

## 5. Possible gas problems

Unit shows reset

1. Check if gas supply is open
2. Dynamic gas pressure has to be measured with all other gas consumers on high flame.
3. Gas supply pipe in the kitchen must cater for combined gas load of all gas consuming appliances, minimum gas diameter for SCC / CM is 3/4“.
4. If reset only happens in the morning when unit is cold: check flue gas analysis. CO<sub>2</sub> Values in MAX rpm might be too low, air gas mixture is too lean; adjust if necessary;
5. If reset only happens during cooking when unit is warm: check flue gas analysis. CO<sub>2</sub> Values in MAX and MIN rpm might be too low, air gas mixture is too lean; if CO<sub>2</sub> in MAX and in MIN rpm are 0.5% below standard set value, burner surface might be blocked by foreign particles. (Gas error code 19, 29, 22, 32)

Clean burner head with compressed air from outside to inside or wash in dishwasher and blow dry after that (refer to TI 03/2007). Also clean the flexible air supply hoses from any dirt and dust / fat particles.

After rebuilding burner flue gas analysis must be performed to confirm proper burning and adjustment must be done if needed.

Should reset happen more than 3x a year despite having cleaned the burner, install external supply air filter. Make sure no source of dust and fat is located next to the fresh air intake of the unit.

6. Check flue ducting inside the unit and inside ventilation hood.

Unit makes popping sound when starting

1. Install gas valve with date stamp 0848 or later (applies to hot air gas valve only)
2. Check hot air ignition electrode. Replace by electrode with non-gloss finish.
3. Make sure no welding spots are directly under the ignition electrode location. Change burner if needed.

Unit makes growling / whistling sound when in operation

1. Please check if the correct type of gas is set in Basic Settings 2. Check gas type with delivery note / invoice of local gas supply company.
2. Fresh air supply for burner is inadequate. Air supply can be altered by freeing the existing holes in the black whirl wind housing from dust / fat particles
3. Make sure the compensation hose is not kinked and located on the black stud of the whirl wind housing, Do NOT connect to the grey colour stud.

External exhaust pipes shall only be connected to the original draft diverter ex factory.

Make sure there is sufficient fresh air supply in the kitchen and no negative pressure is existing (open kitchen door without air resistance).

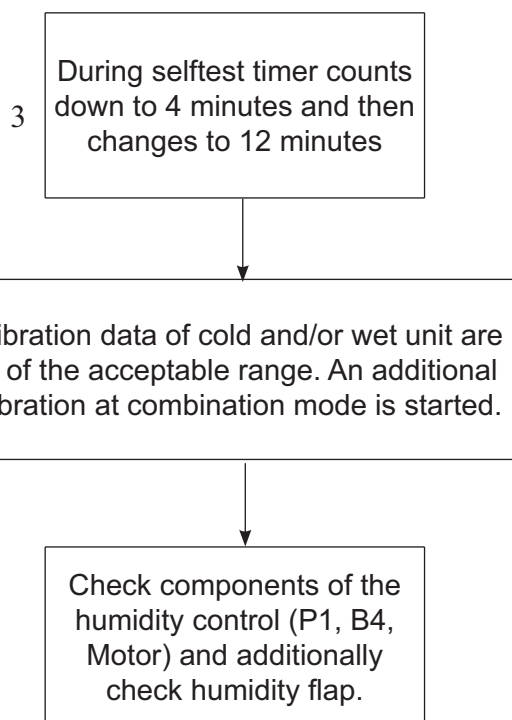
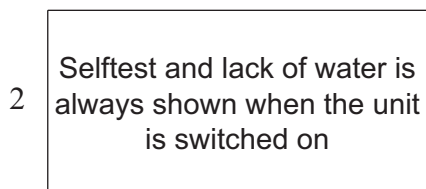
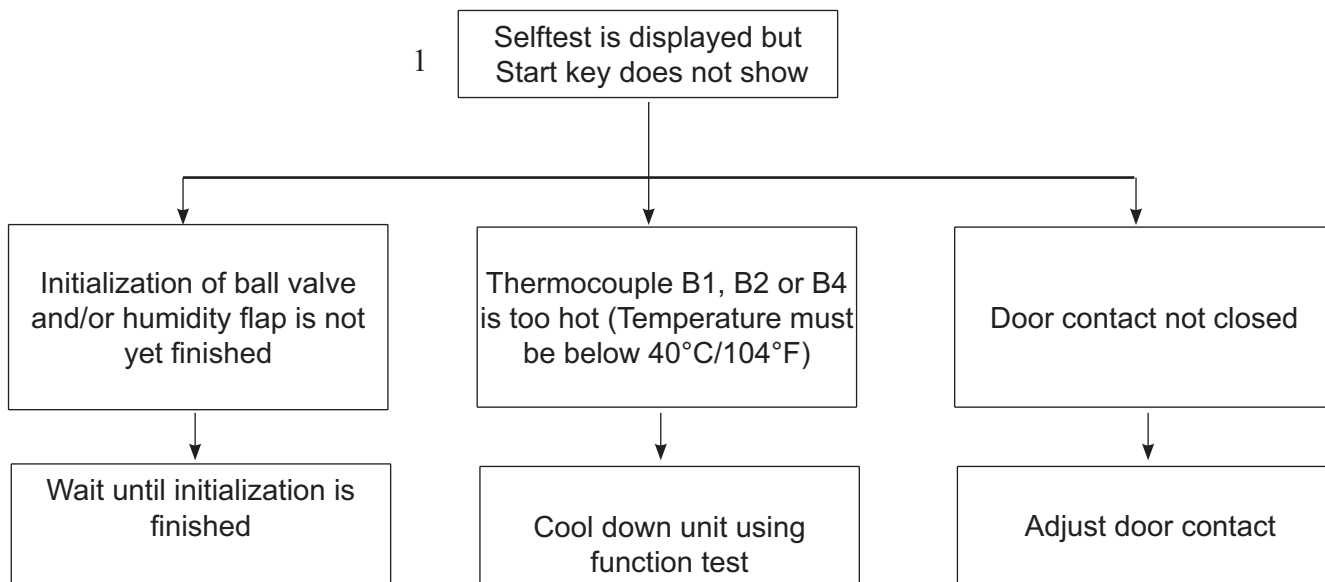
If any gas error code other than 19, 29, 22, 32 is shown in gas error history frequently:  
refer to Training manual page: Download Service Data / Gas Error List

## Selftest



After initial installation of a SCC the „Selftest“ program will start. During „Selftest“ the humidity values of the actual installation altitude are evaluated.

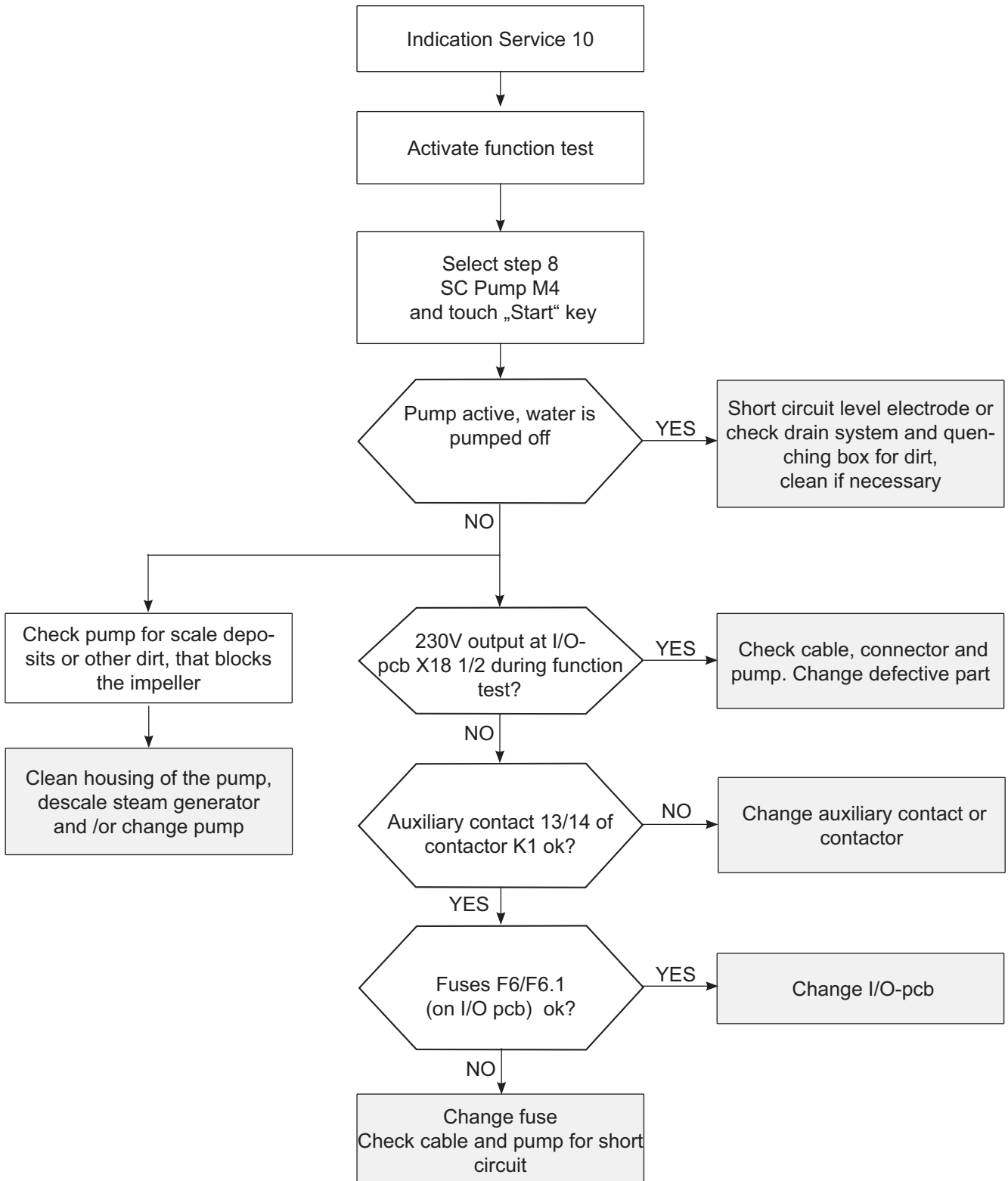
Some basic conditions apply to start „Selftest“:



## Service 10 (SC Pump)



Level electrode of the steam generator did not recognise a reduction of the water level during last SC-Automatic

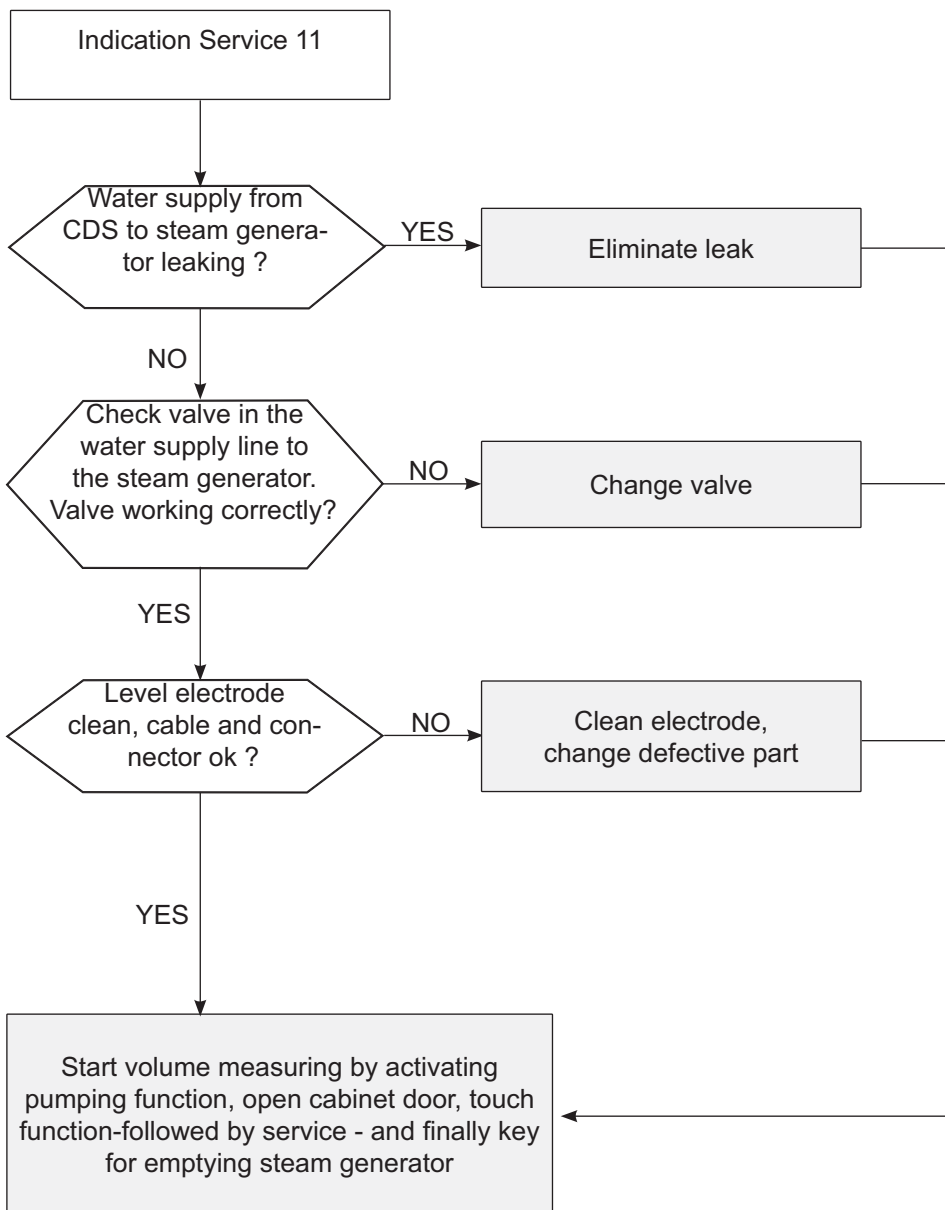




## Service 11 (CDS Sensor)



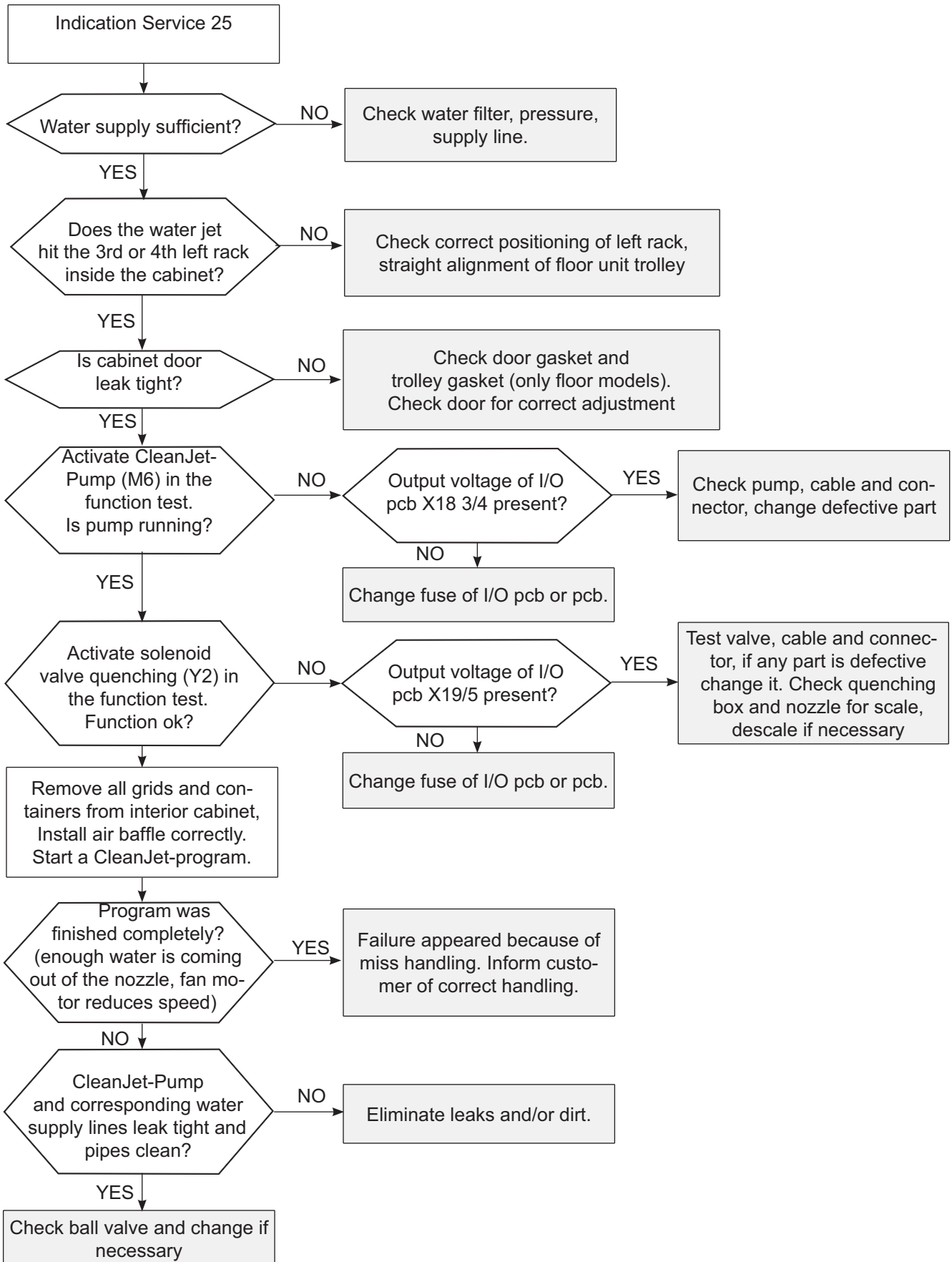
Actual measured filling volume above reference volume of steam generator



## Service 25 (Cleanjet Pump)



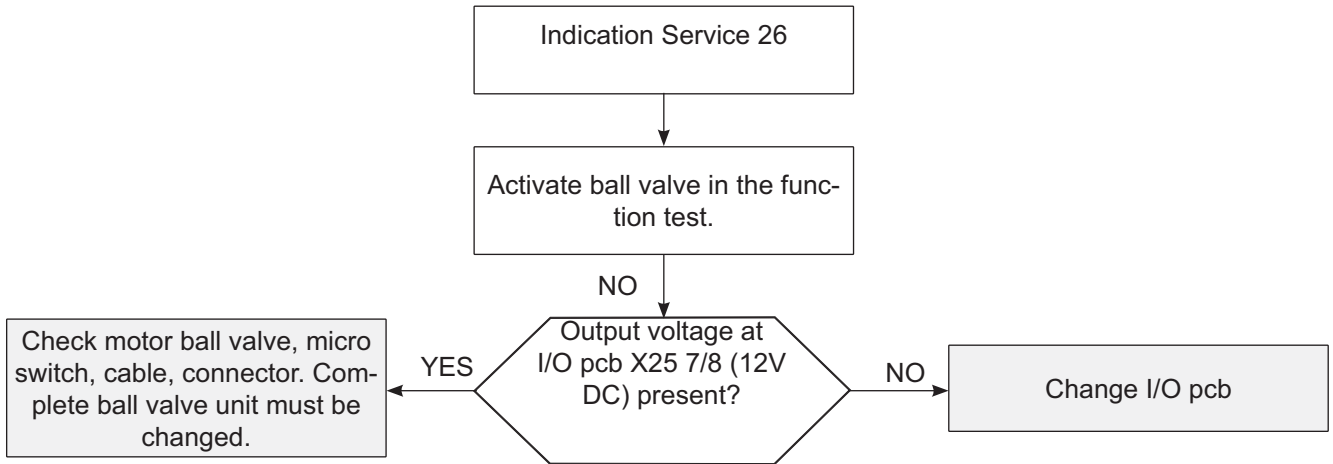
CleanJet does not deliver enough water to the fan wheel of the motor.  
 Typical indication: The running time of the program will be exceeded.  
 Check correct position of left rack and / or floor unit trolley!



## Service 26 (Drain Valve)



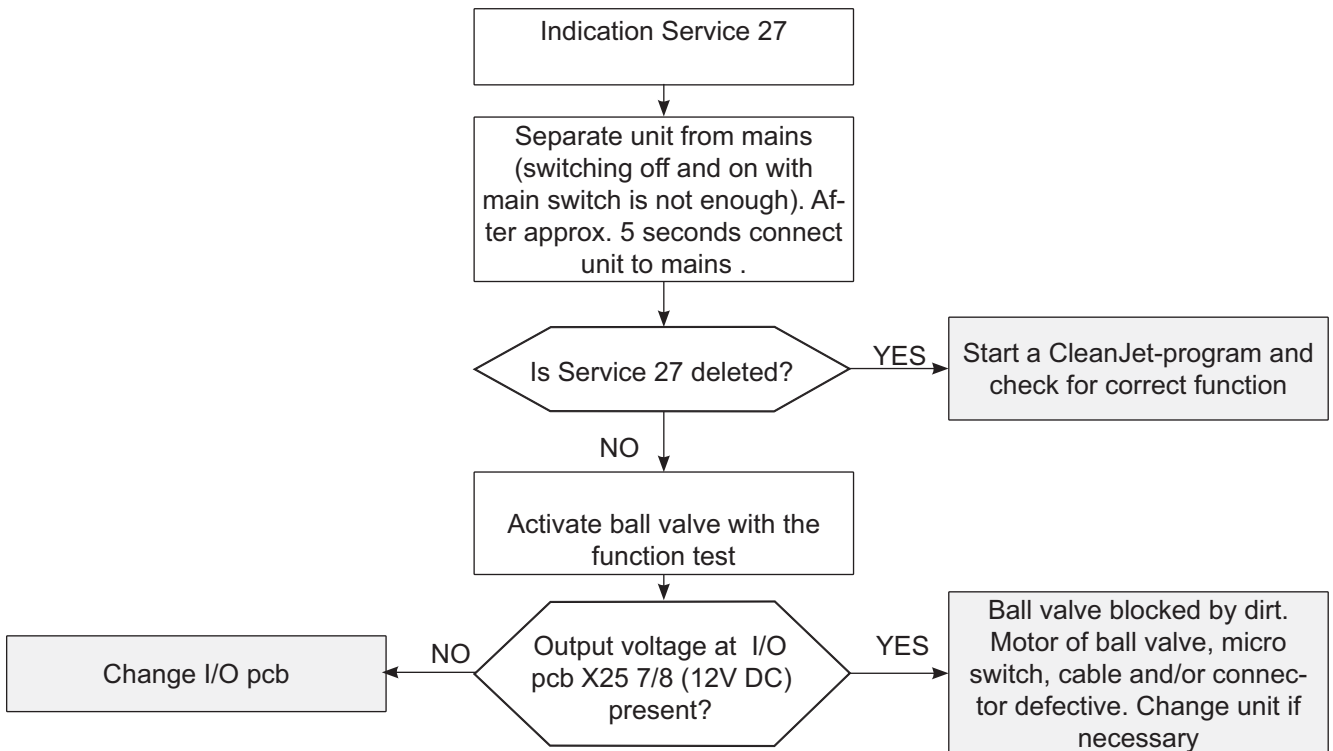
Micro switch ball valve in permanent closed position.  
Unit out of order



## Service 27 (Drain Valve)



Micro switch ball valve in permanent open position.  
CleanJet can not be used

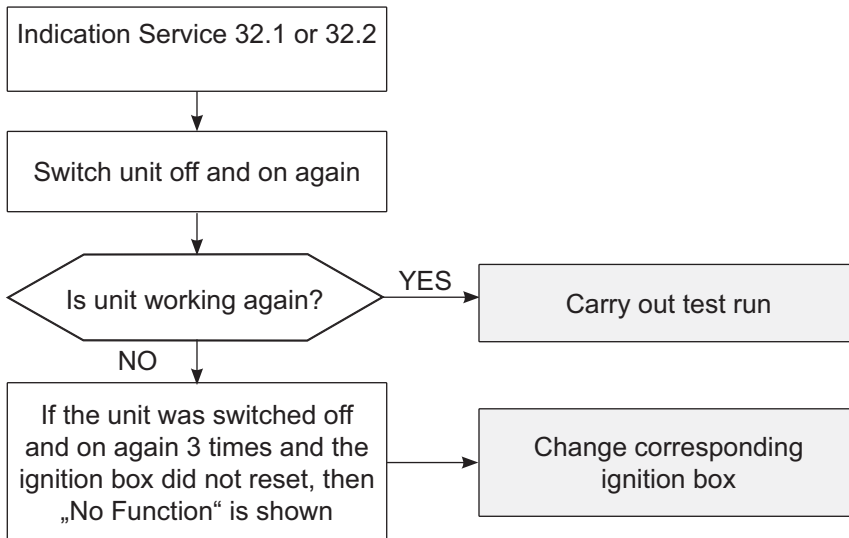


Should Service 27 appear more often and I/O-pcb with revision status 402 respec. 403 is installed, change I/O-pcb

## Service 32 (only gas unit)



Internal fault of ignition box  
 Service 32.1 Table models and floor models upper box  
 Service 32.2 Floor models lower box

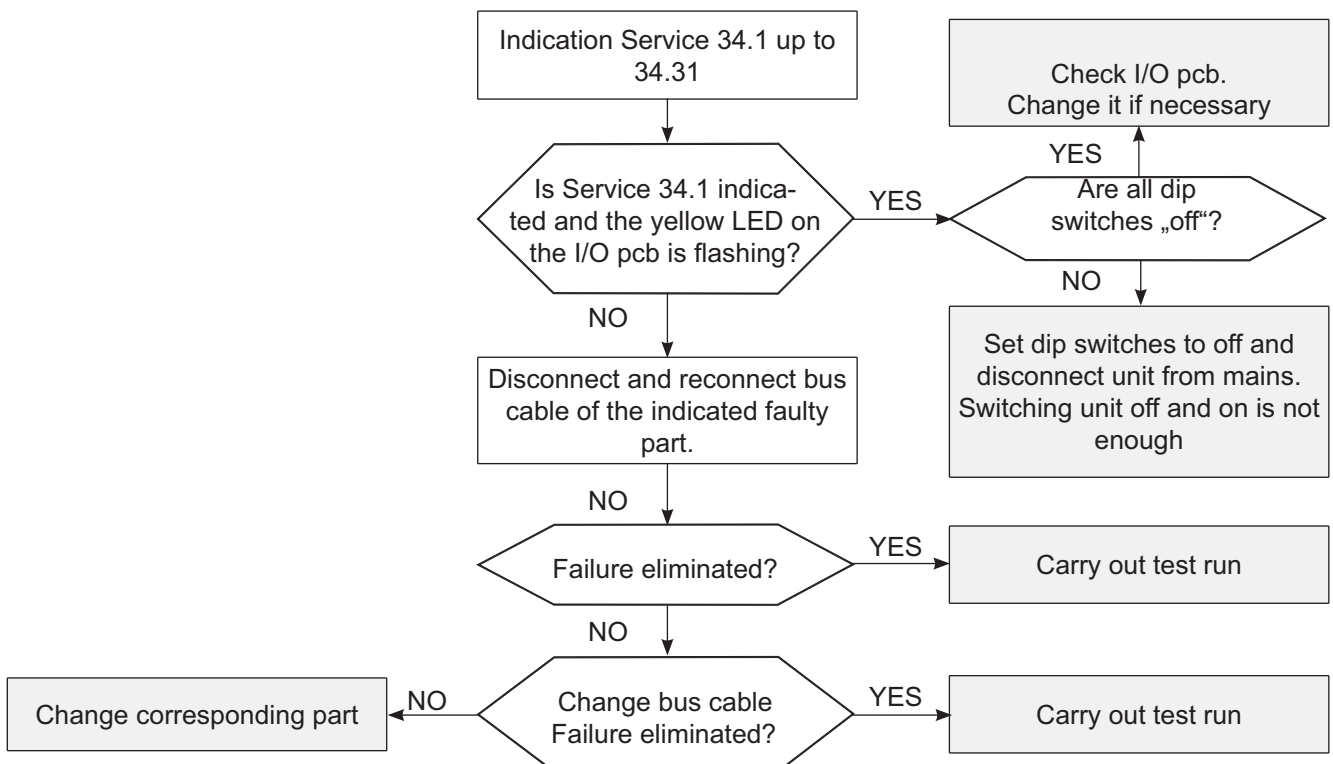


## Service 34 (Bus)

Bus failure - Indication of the faulty knot with the following code (combination of different faults possible):



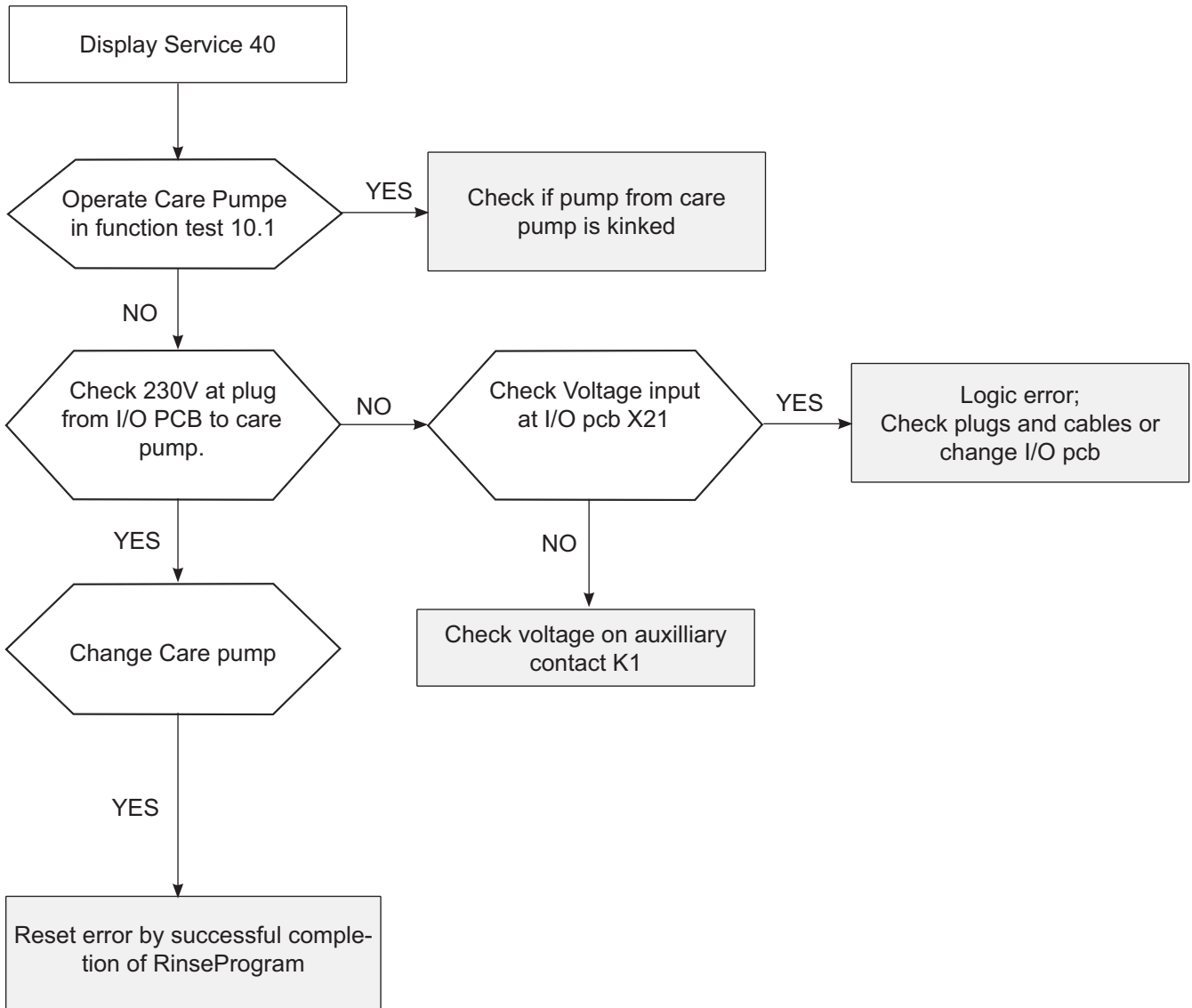
- 1: I/O pcb
- 2: Bottom motor
- 4: Top motor
- 8: Top ignition box
- 16: Bottom ignition box



## Service 40 (Care Pump)



Care Pumpe defective respectively does not pump enough care solution into steam generator

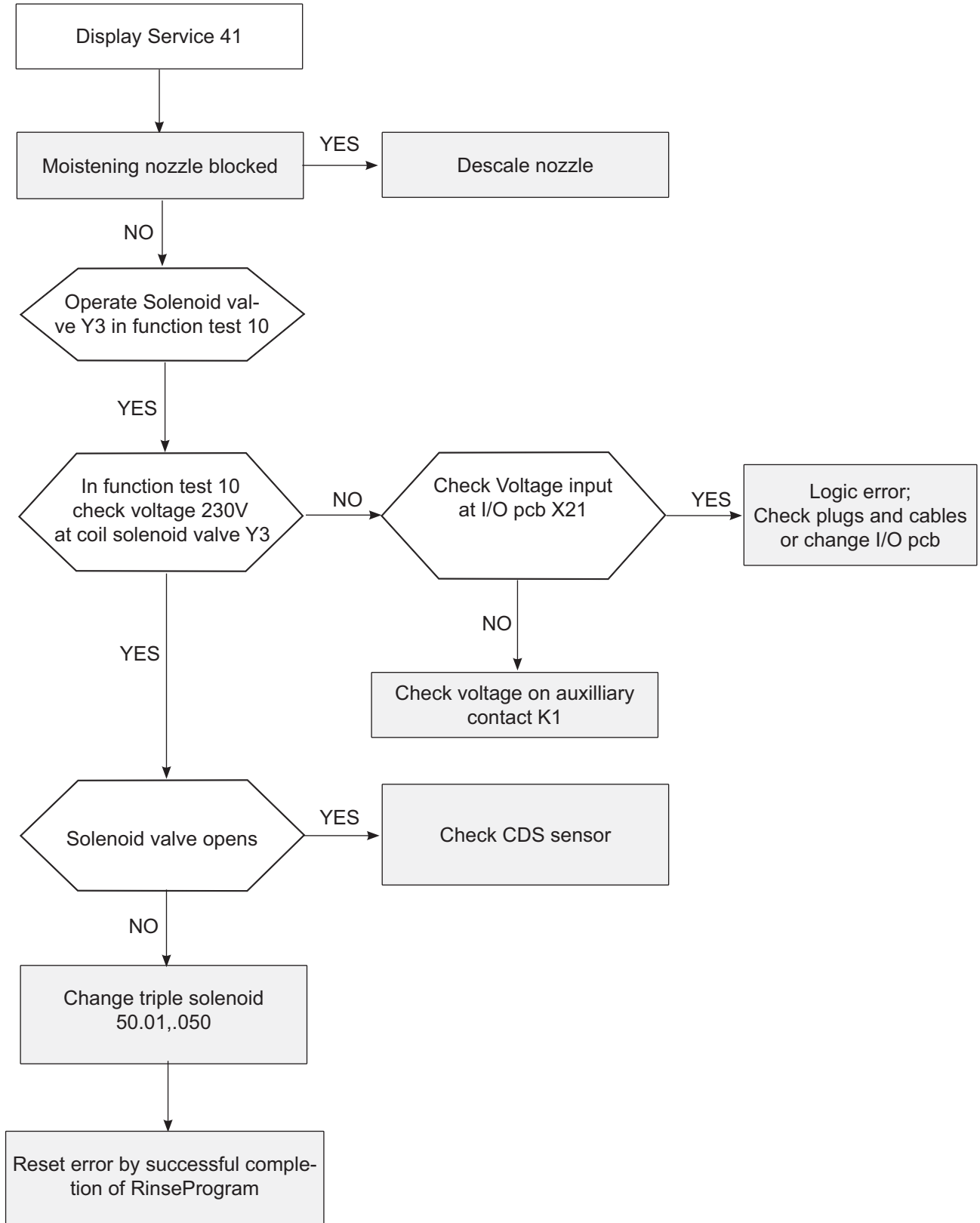


## Service 41 (Y3 Moistening solenoid)



Solenoid valve Y3 defective or moistening nozzle blocked;  
CDS does not send any pulses;

First time display: Descale moistening nozzle, Second time display: Service 41

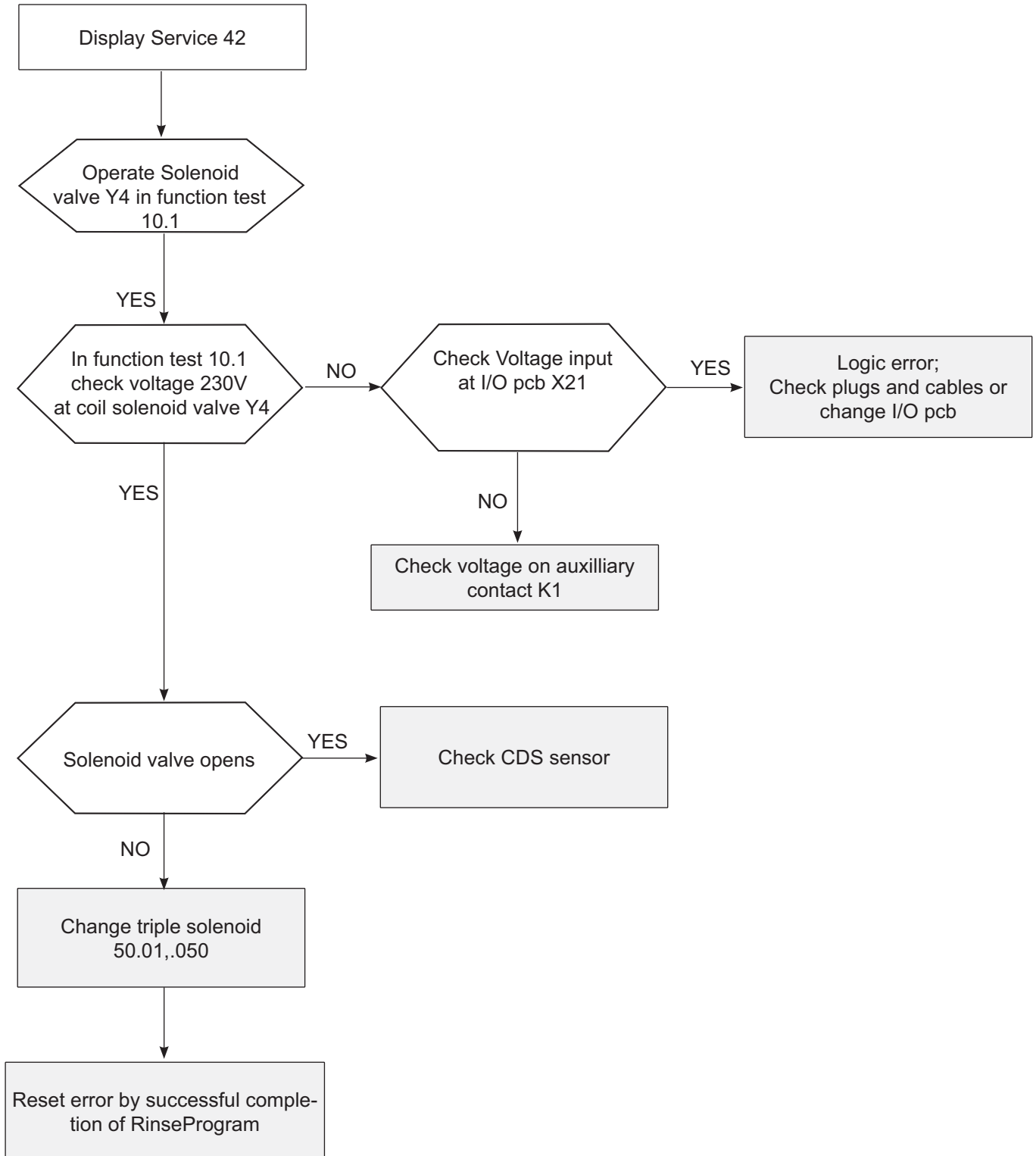




## Service 42 (Y4 Care solenoid)



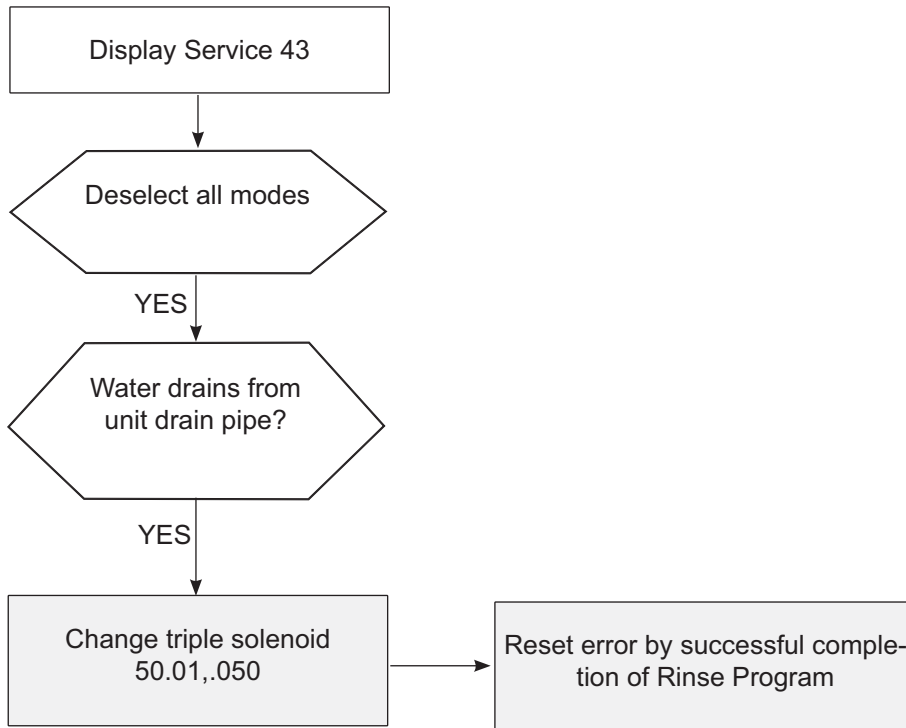
Solenoid valve Y4 defective or feeding hose to care container blocked  
CDS does not send any pulses



## Service 43 (triple solenoid valve)



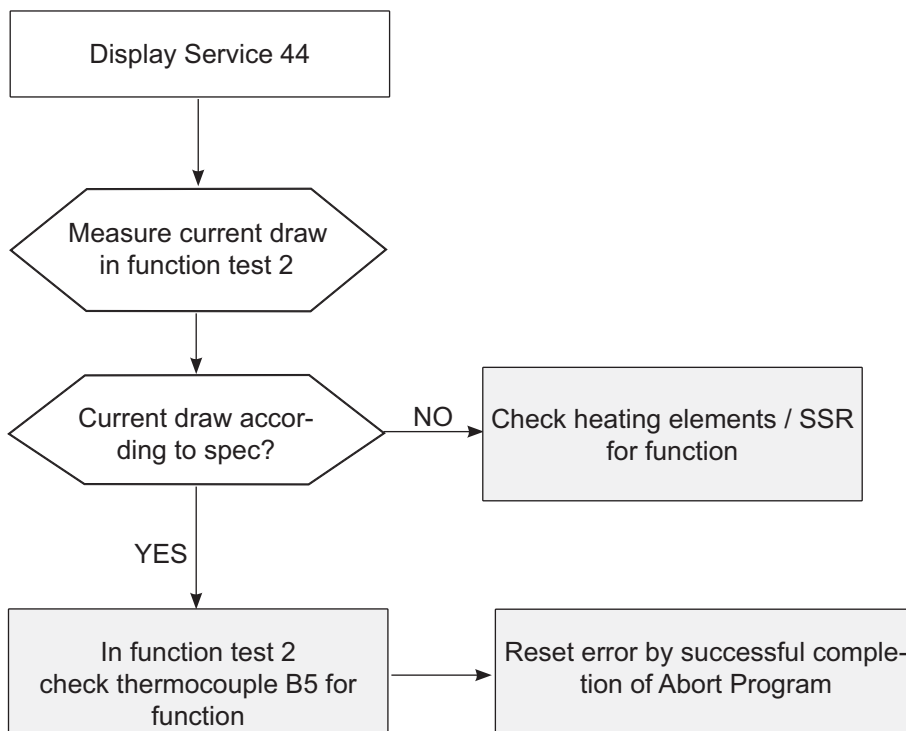
CDS Sensor sends permanent pulses during start of Care process



## Service 44 (Steam Heating)



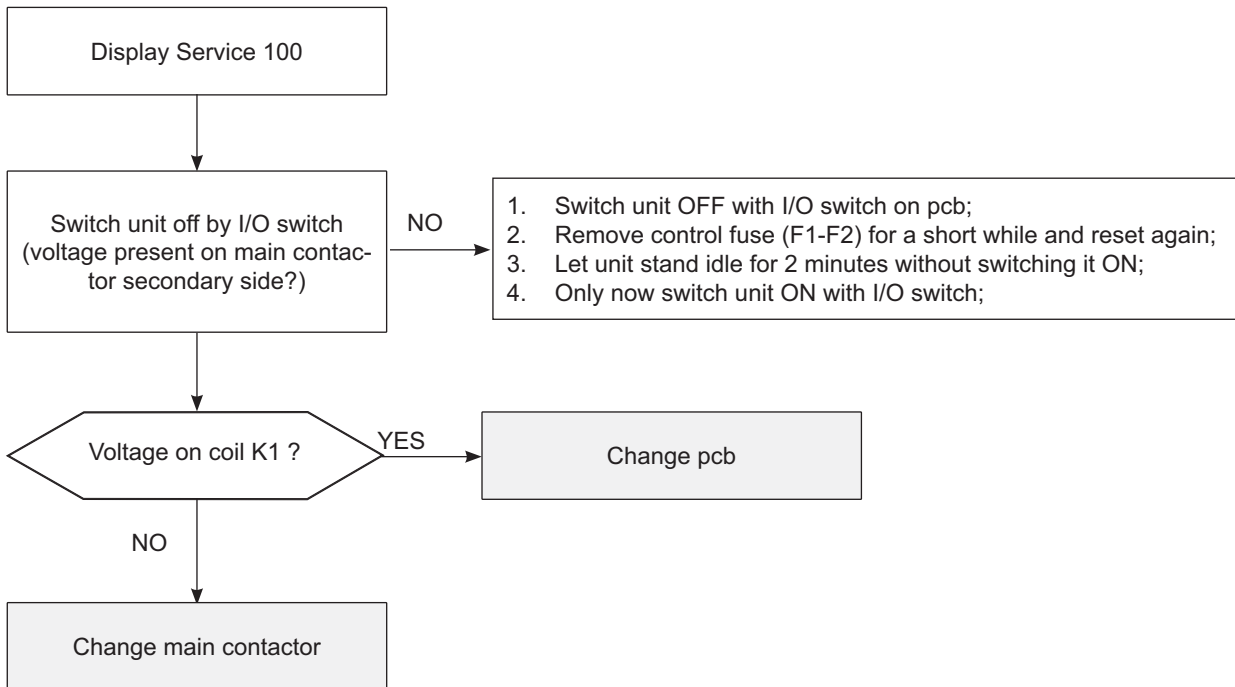
No steam heating during Care Phase



## Service 100 (Main Contactor)



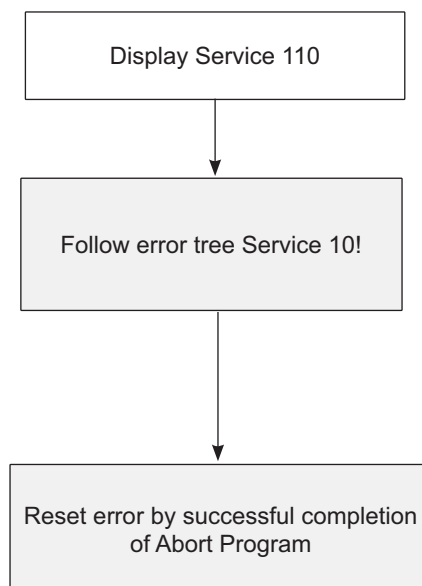
Reason: Main contactor didn't disengage during last switch off or main switch on pcb defective



## Service 110 (SC-Pump)



SC pump not functioning during the time when there is care solution inside the steam generator; Care solution could not be pumped off; unit without function;

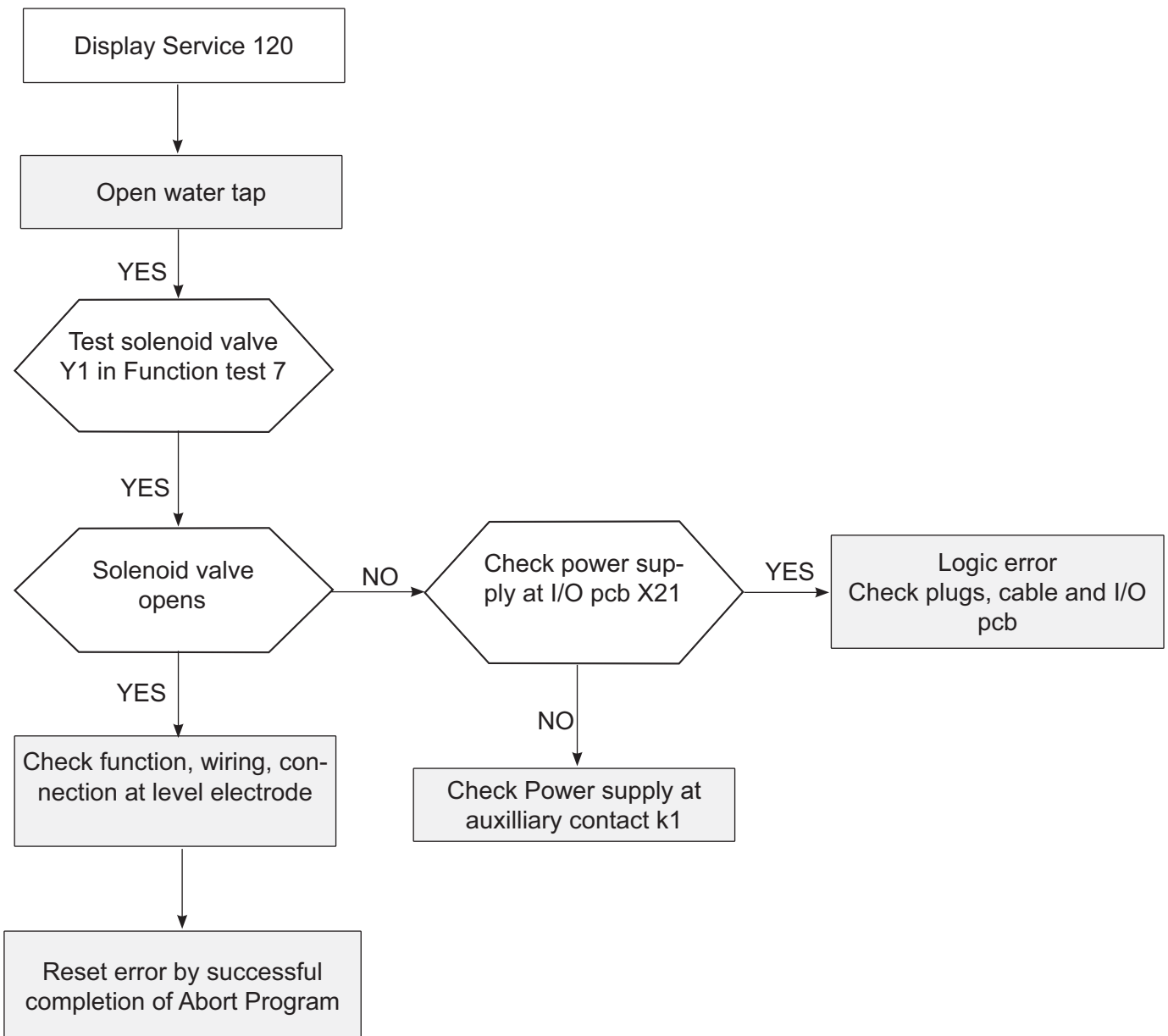


## Service 120 (Y1 Filling solenoid, Level electrode)

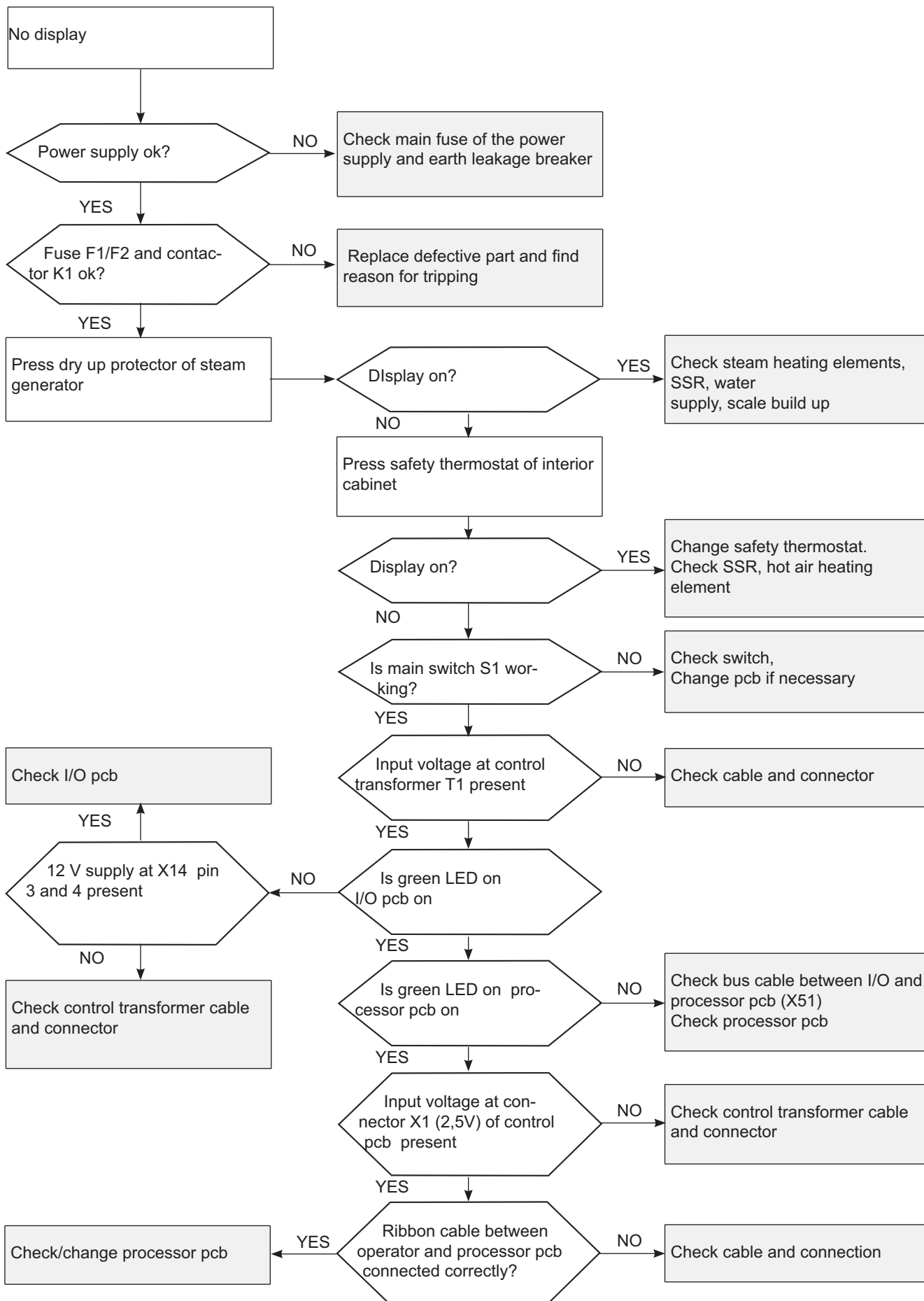


After Filling steam generator via M12 the steam generator does not fill with water via the filling solenoid.

Detection: level electrode does not get contact with water;  
Steam generator can not be flushed; unit is without function.



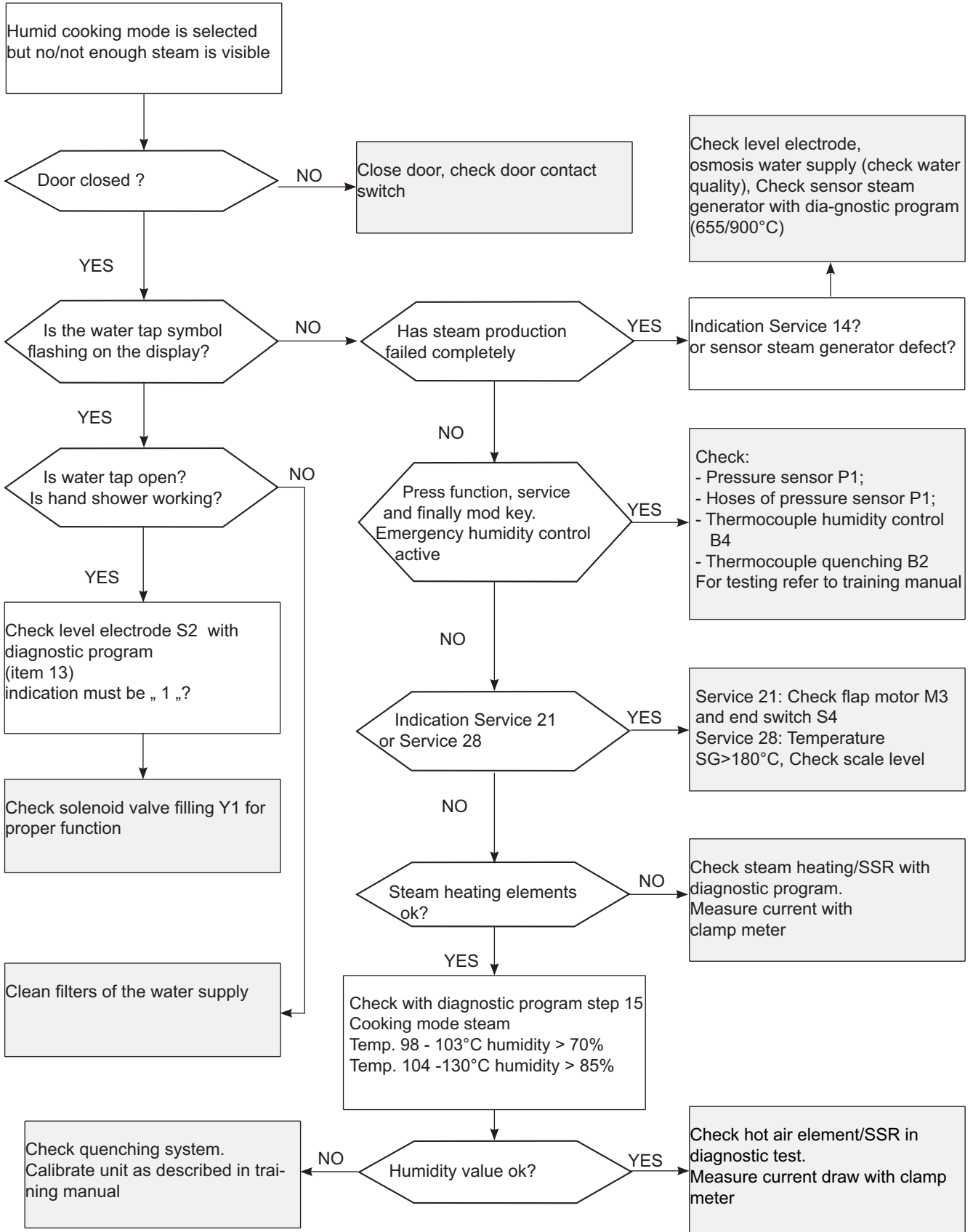
## No display - safety chain - SCC



## No or too low steam production - SCC



Steam above 110°C is not visible, it does not condensate on the cabinet door!

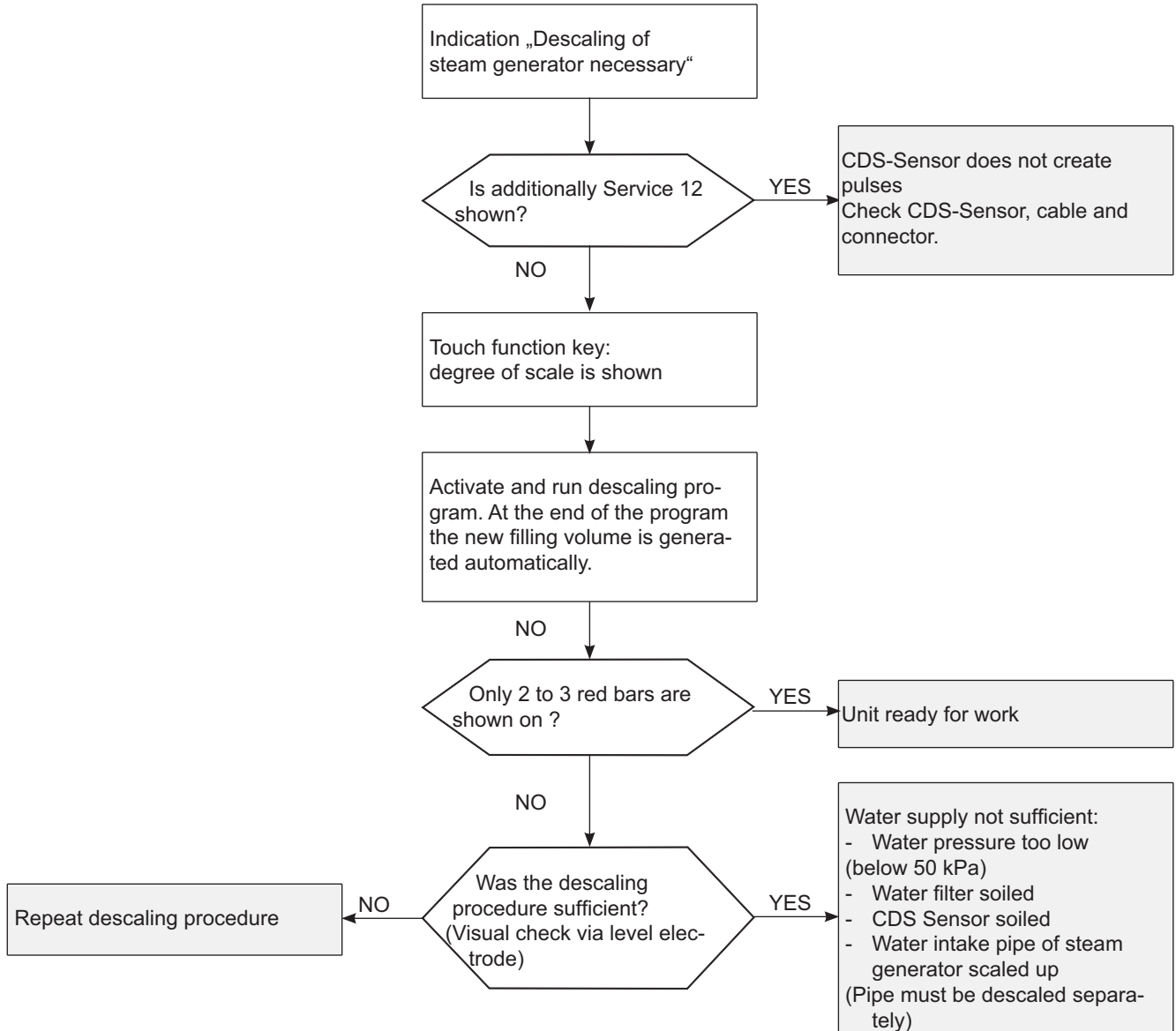




## Service 12 / Indication descaling - SCC



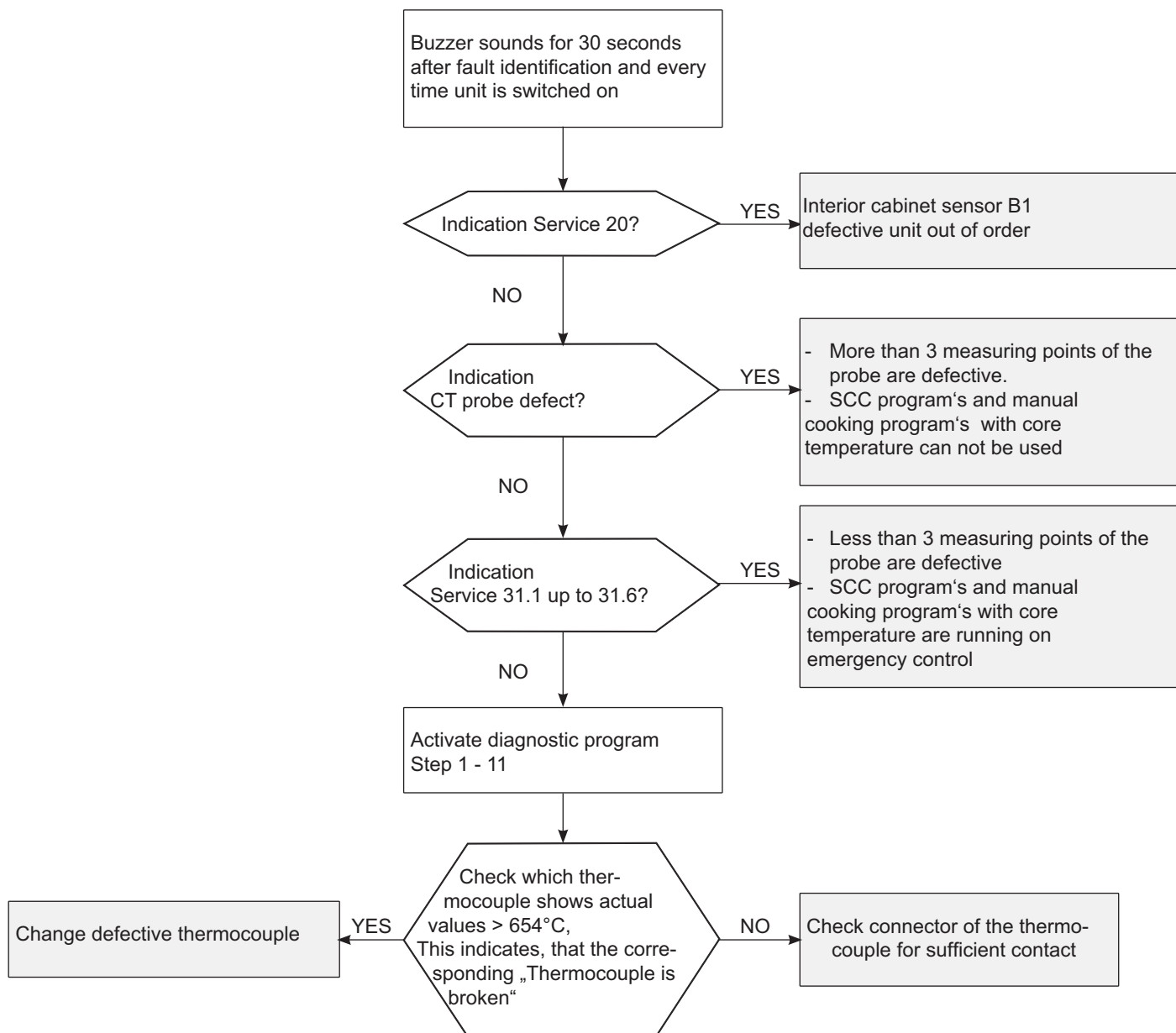
Steam generator scaled up; CDS display shows 9 red bars



## Buzzer sounds - SCC



Reason: Any thermocouple is defective  
Different buzzer intervals depending which thermocouple is defective



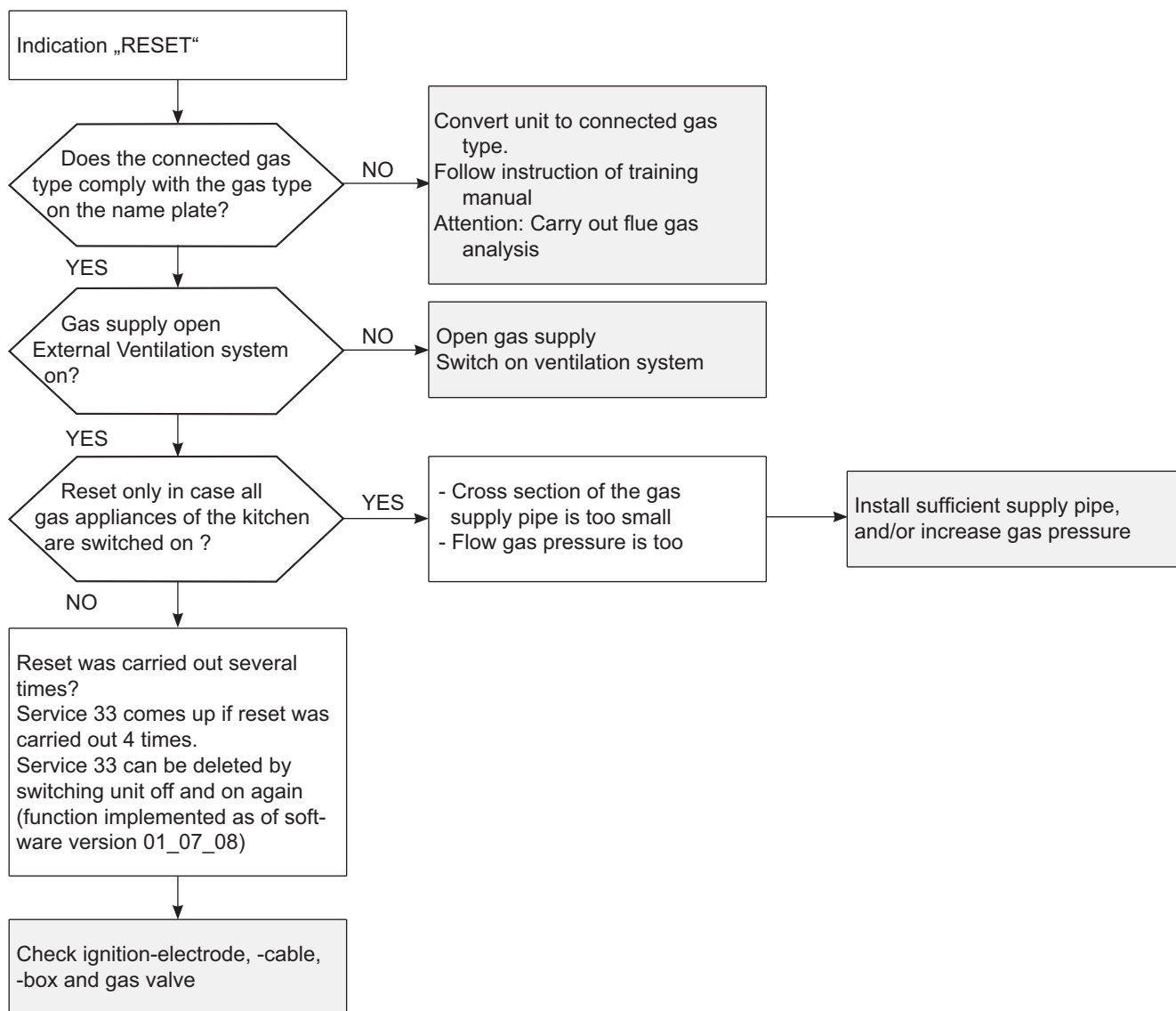
### Buzzer frequency by failure of thermocouple (counting in 5 sec.)

B1	12	in 5 sec.
B2	6	in 5 sec.
B4	5	in 5 sec.
B5	8	in 5 sec.
Core temperature sensor	20	in 5 sec.

## „RESET“ indication (Gas units) - SCC



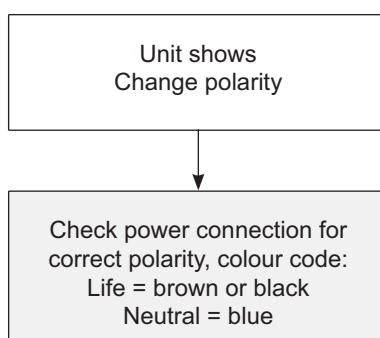
Reason:  
Flame monitoring does not work after ignition



## Change polarity (Gas units) - SCC



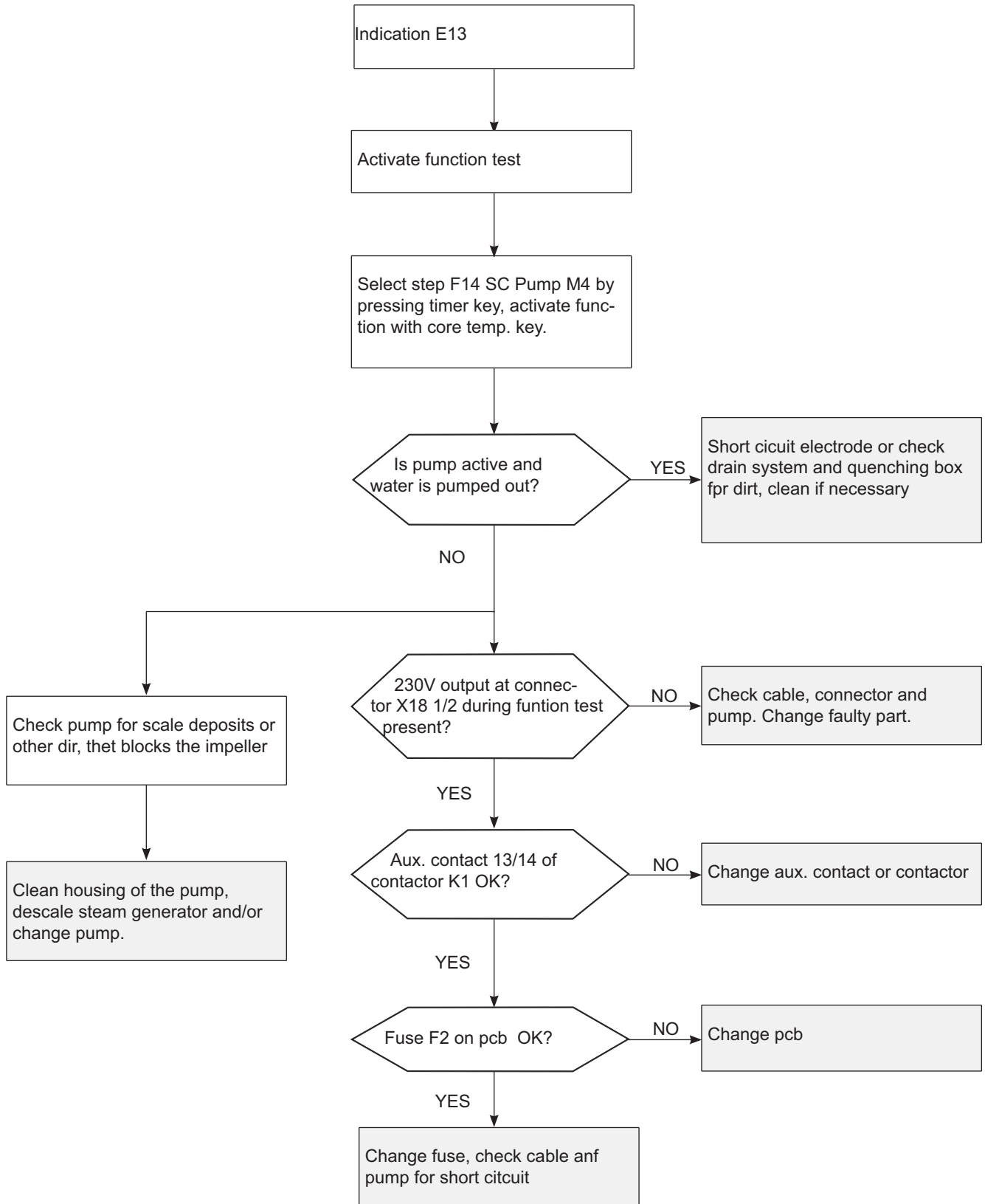
For flame monitoring mains must be connected with correct polarity



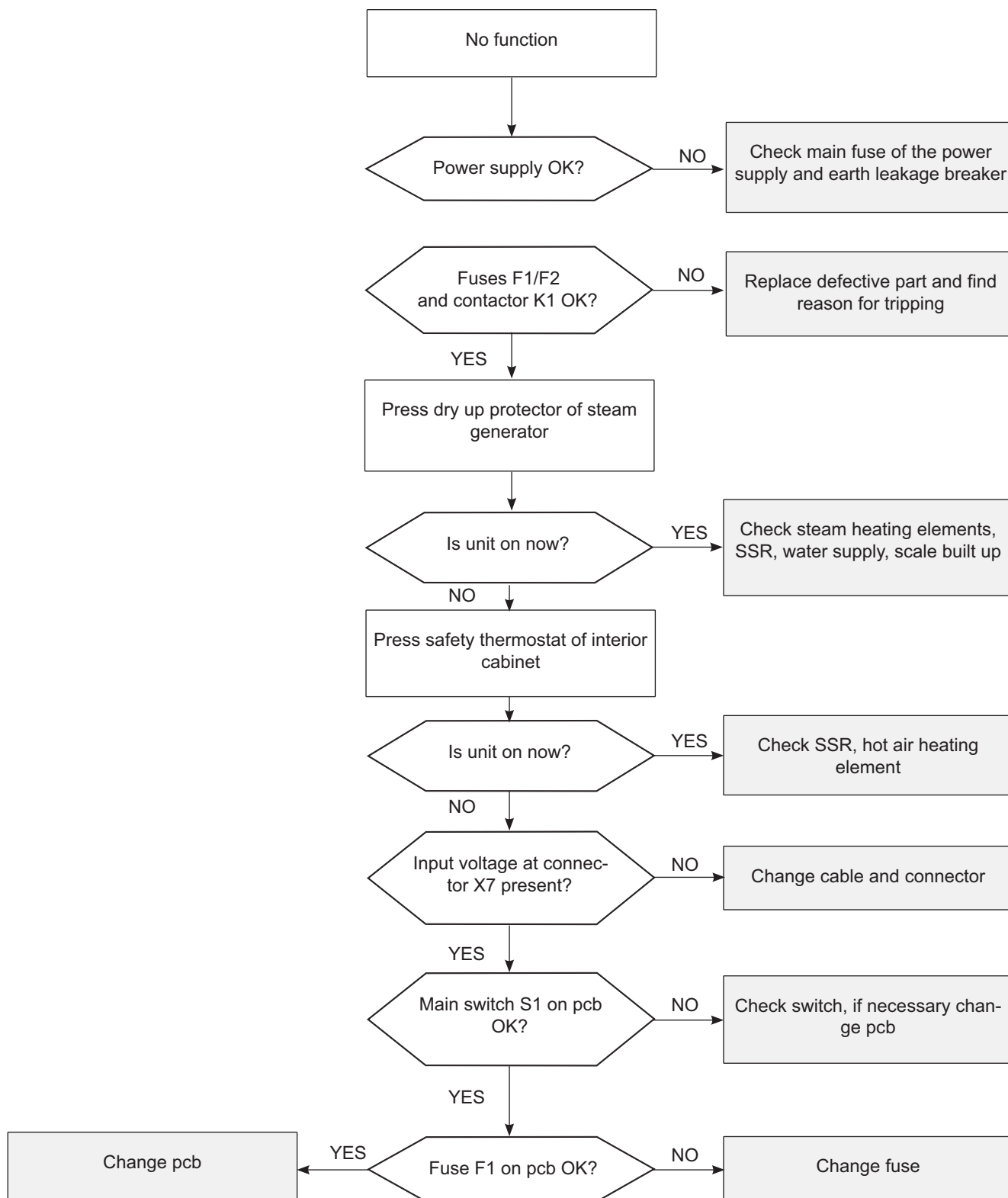
## Indication „E13“ (SC-Automatic) - CM



Level electrode of the steam generator did not recognise a reduction of the water level during last SC-automatc



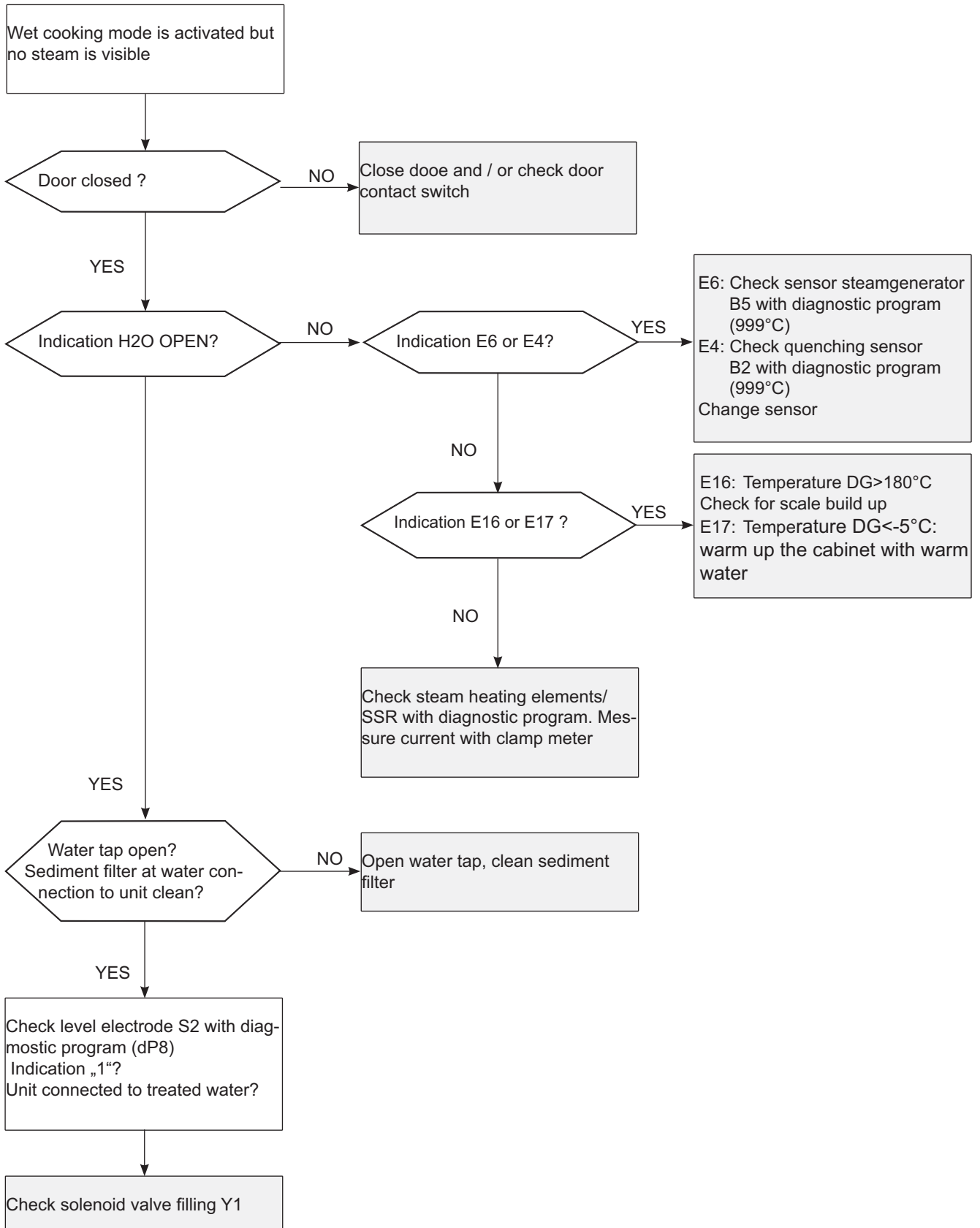
## No function- safety circuit - CM



## No Steam - CM



Attention: Steam above 110°C is not visible, it does not condensate on the cabinet door!

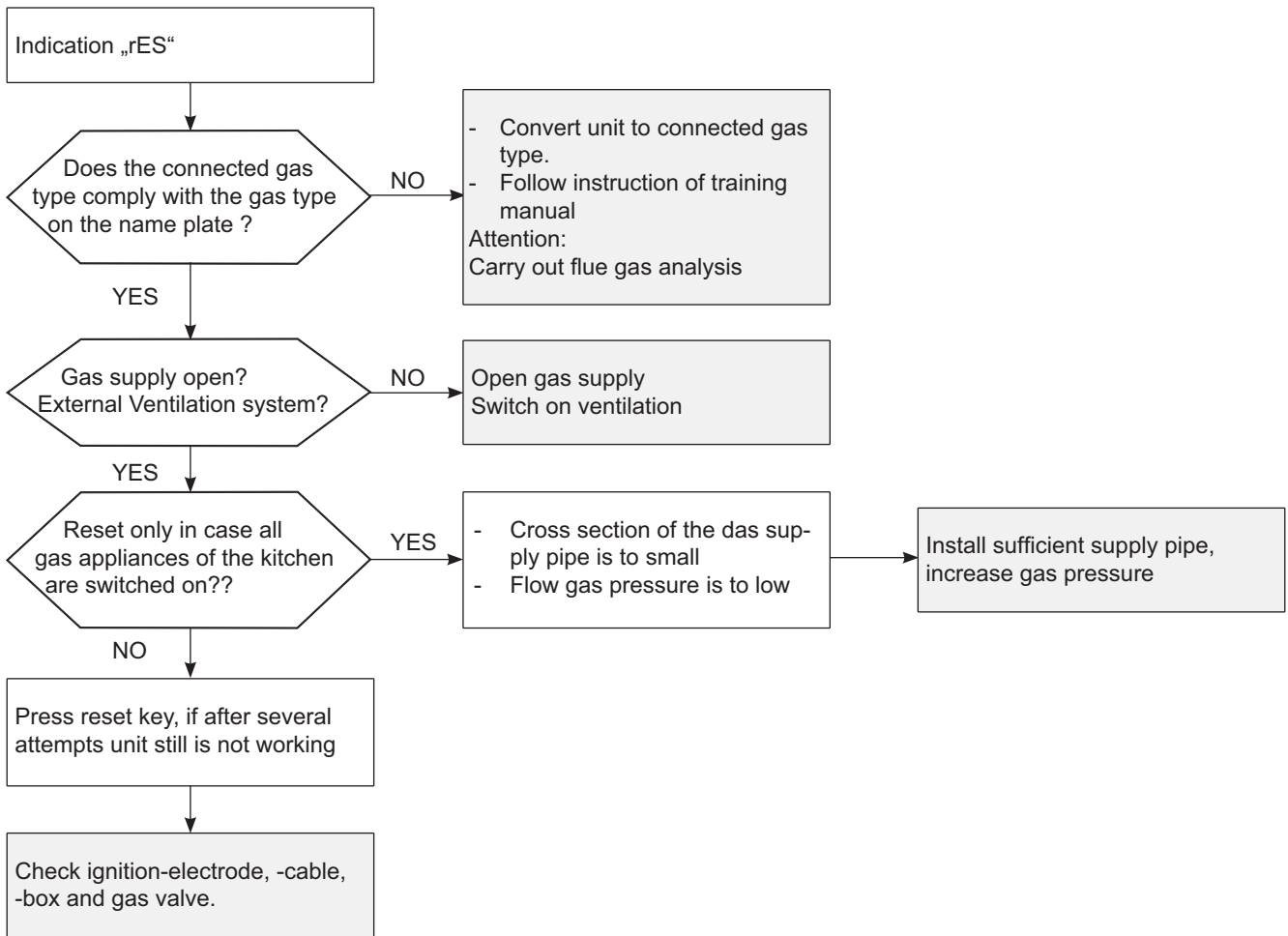




## Indication „rES“ (=reset) - CM



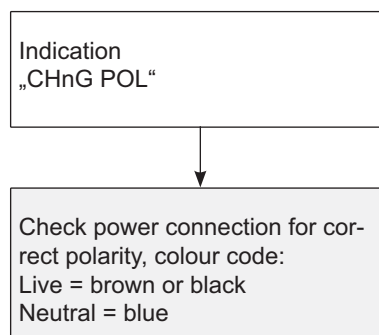
Reason:  
No flame sensing after ignition



## CHnG POL (change polarity) - CM



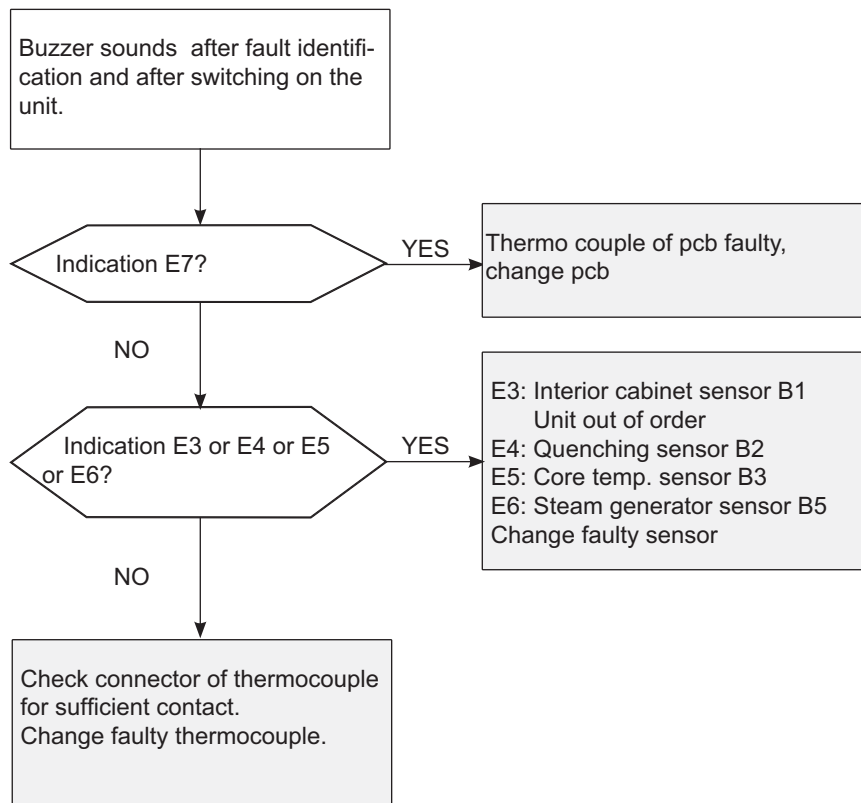
For flame monitoring L1 mains must be connected with correct polarity



## Buzzer sounds - CM



Reason of fault: Any thermocouple is faulty



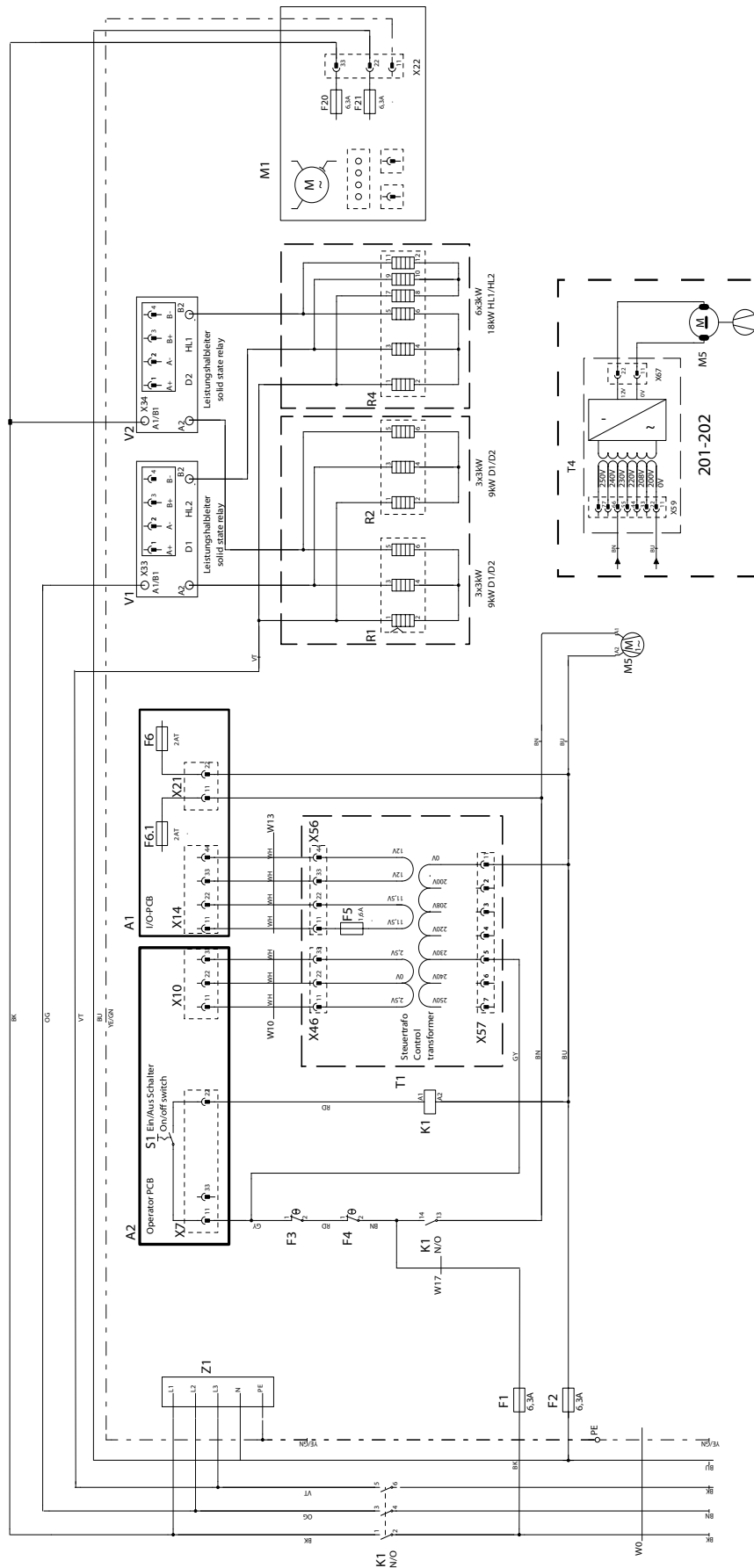


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# Wiring diagram Power Circuit

- Rational SCC-Linie: Leistungsteil
- Rational SCC-Linie: Power circuit
- Rational Linea SCC: Circuito di alimentazione
- Rational SCC-Linie: Circuit de puissance
- Rational Linea SCC: Circuito de la energía

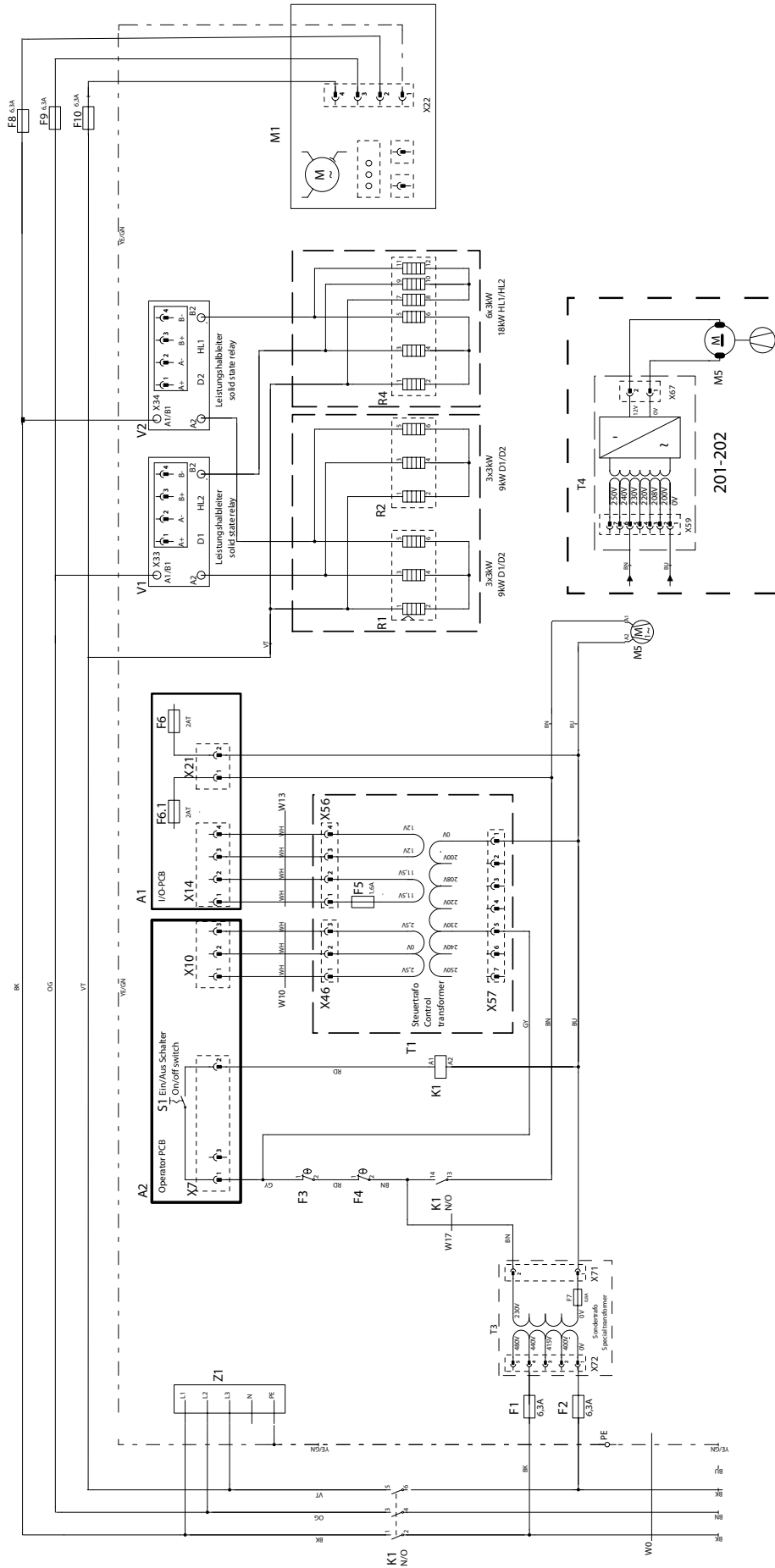
3NAC 400 - 415V





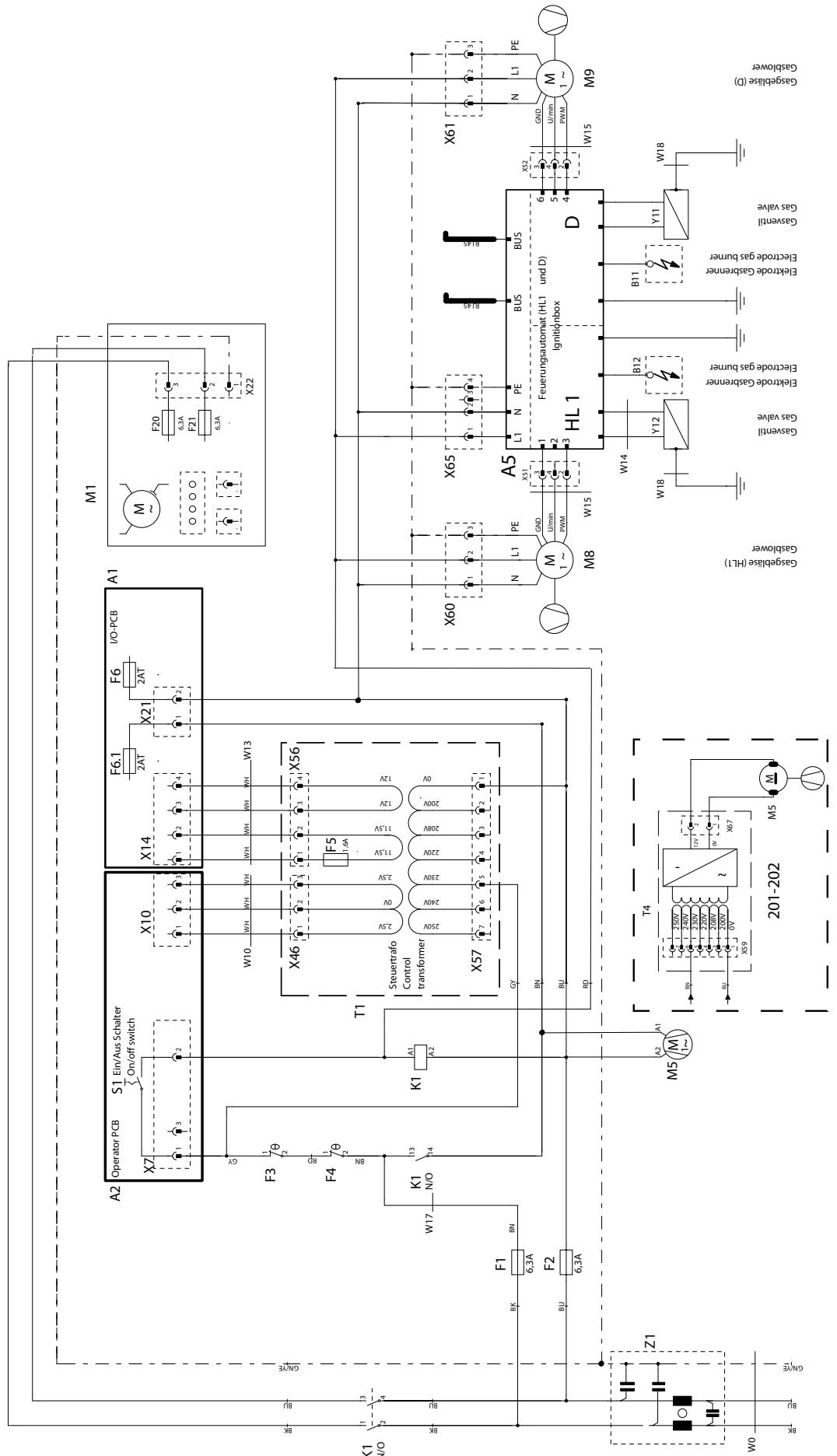
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- Rational SCC-Line: Power circuit
- Rational Linea SCC: Circuito di alimentazione
- Rational SCC-Line: Circuit de puissance
- Rational Linea SCC: Circuito de la energía

3AC 400-480V



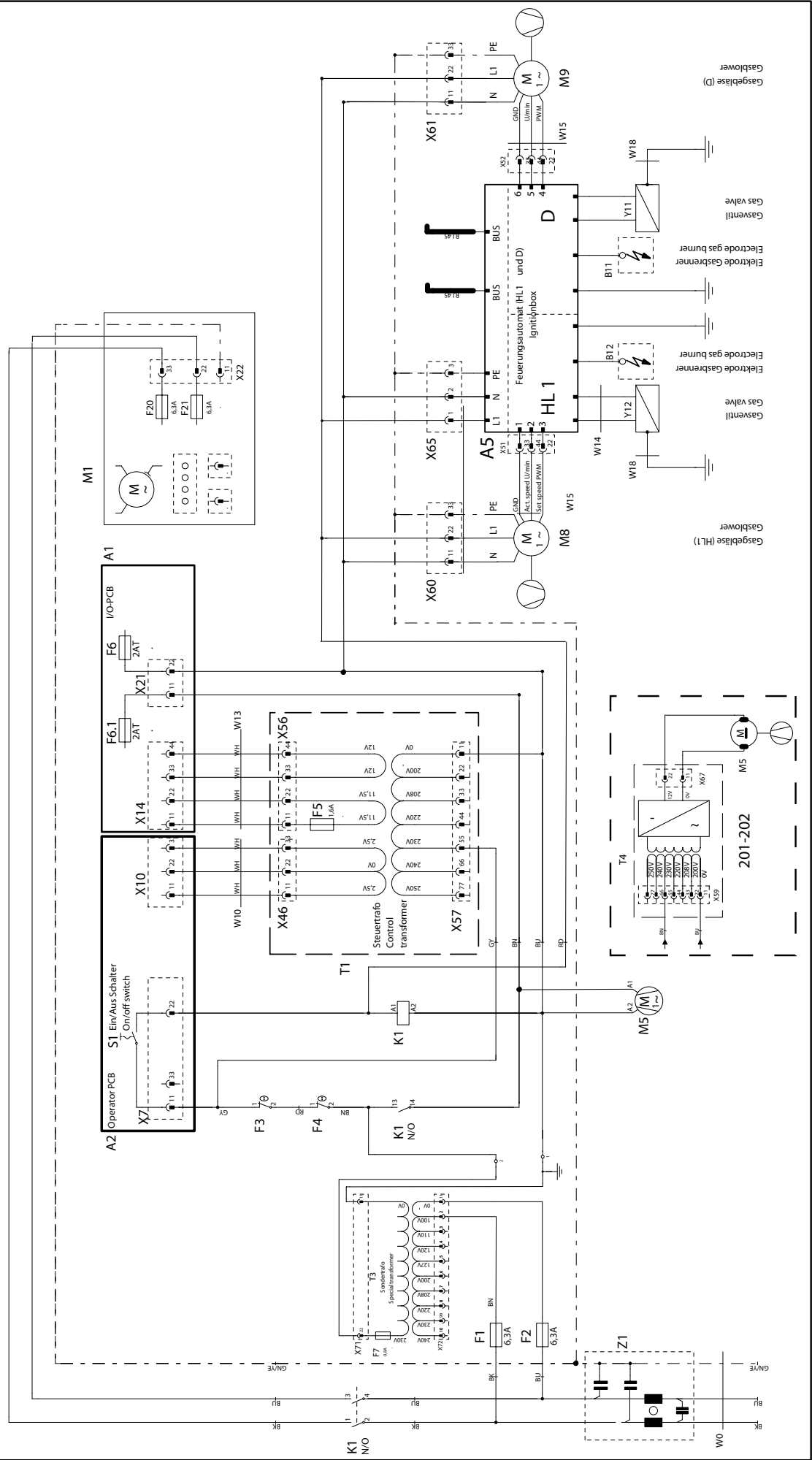
- Rational SCC-Linie: Leistungsteil
- Rational SCC-Linie: Power circuit
- Rational Linea SCC: Circuito di alimentazione
- Rational SCC-Linie: Circuit de puissance
- Rational Linea SCC: Circuito de la energía

1 NAC 230V - Gas



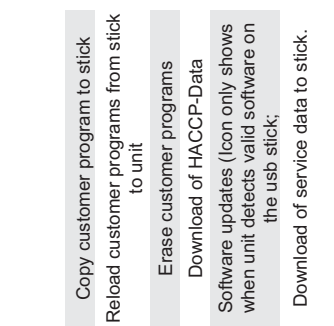
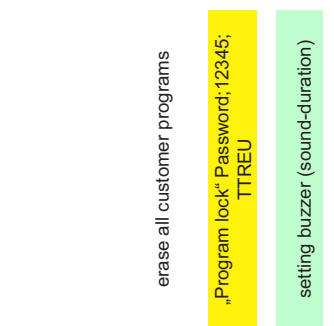
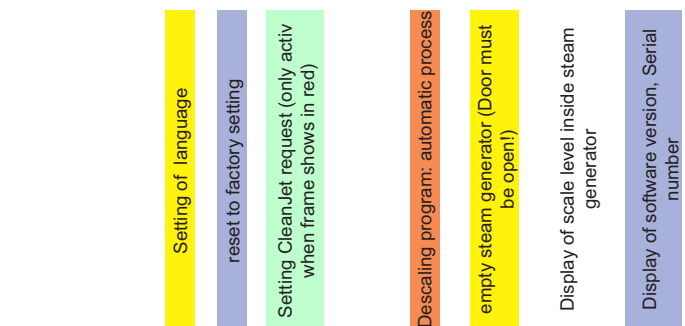
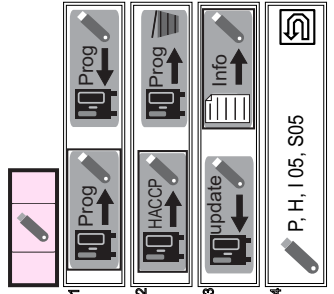
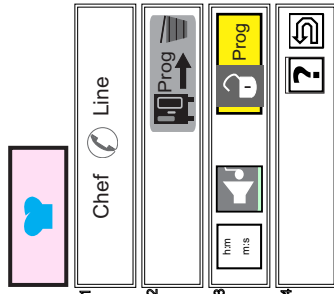
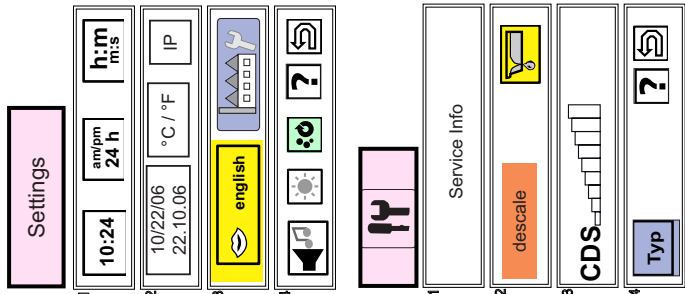
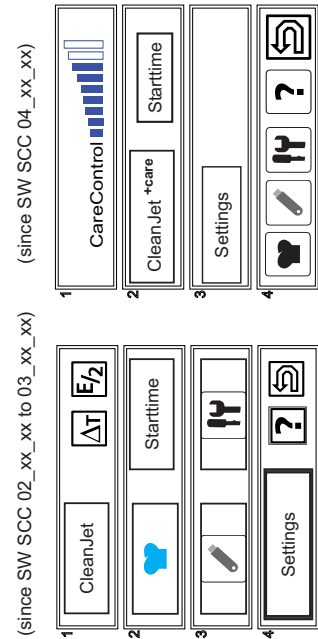
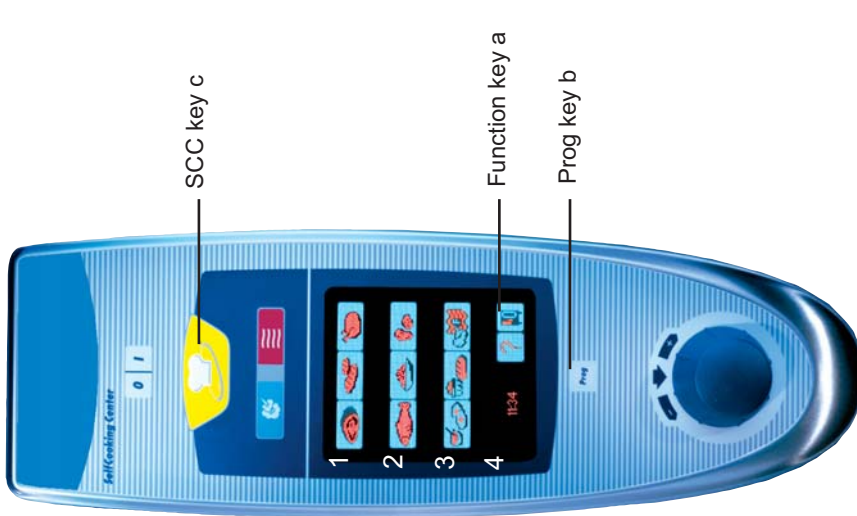
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- Rational Linea SCC: Circuito de la energía

1NAC 100 - 127V, 1NAC 240V, 2AC 200 - 240V - Gas





# SCC Service Reference



<b>Enter Service level</b>	ON
set dip switch „1“ on pcb to ON position	1 2 3 4
Diagnostic	
RunningTimes	
Function Test	
Basic Settings	

<b>Abort CleanJet</b>	
switch unit off and on again	

<b>Abort de-scaling program</b>	-
before filling de-scaling liquid - use „BACK“ arrow	
after filling de-scaler into steam generator	
- switch unit off and on again	
- press ABORT key - remaining time will be adjusted automatically	
- switch unit off and on again	
- press ABORT key - time will be adjusted automatically 2x	
- use steam mode for 15 min. and rinse interior cabinet	

<b>Show Mode - switch off or on</b>	
ON	press function key „a“ followed by program key „b“ and SCC key „c“ for 10 seconds until - acoustic signal - Beep and door handle in icon function key „a“ shows in red
OFF	press function key „a“ followed by program key „b“ and SCC key „c“ for 10 seconds until - acoustic signal - Beep and door handle in icon function key „a“ shows in blue

Setting of language

reset to factory setting

Setting CleanJet request (only active when frame shows in red)

Descaling program: automatic process empty steam generator (Door must be open!)

Display of scale level inside steam generator

Display of software version, Serial number

erase all customer programs

„Program lock“ Password: 12345; TTREU

setting buzzer (sound-duration)

Copy customer program to stick Reload customer programs from stick to unit

Erase customer programs Download of HACCP-Data

Software updates (Icon only shows when unit detects valid software on the usb stick; Download of service data to stick.

## Calibration SCC

Service error code:	
Service 40	Cleanjet not possible, Care pump faulty
Service 41	CDS does not send any pulses; solenoid valve Y3 defective or moistening valve blocked;
Service 42	CDS does not send any pulses; Solenoid Y4 Care defective or hose to care container blocked up or kinked;
Service 43	CDS sensor sends always pulses; Solenoid Y1, Y3 or Y4 is passing water
Service 44	Steam heating or SSR faulty
Service 100	Main contactor - pcb on off switch
Service 110	SC pump faulty or level electrode calcifies
Service 120	Care Pump M12 or level electrode defective

Service error code:	
Service 10	SC-Pump without Function
Service 11	level electrode (Osmosis water) or check valve above steam generator for leakage
Service 12	CDS sensor no output signal
Service 13	change level electrode
Service 14	Level electrode (Osmosis water)
Service 16	since 01-07-09, flash new software version first
Service 17	external EEPROM faulty
Service 20	thermocouple B1 faulty
Service 21	micro switch clima control faulty
Service 22	
Service 23	SSR steam short circuit
Service 24	SSR hot air short circuit
Service 25	CleanJet water circulation faulty - water doesn't hit fan wheel - check pump, foreign bodies in water pipe, racks / trolley must be inside cabinet
Service 26	drain valve closed
Service 27	drain valve doesn't close, CleanJet without function
Service 28	B5 in steam generator above 180°C (356°F), de-scale steam generator
Service 29	pcb temperature too high (above 85°C / 185°F); change air filter
Service 30	humidity control faulty
Service 31.X	core probe faulty
Service 32.X	ignition box faulty, change ignition box 0-top; 1-bottom; 2-both
Service 33.X	4x Reset without function, change ignition box; 1-top; 2-bottom
Service 34.X	BUS signal error 1-I/O pcb, 2-motor bottom; 4-motor top; 8-ignition box top; 16-ignition box bottom

### Calibration at the customers site must be done under the following conditions: Changing of:

- 1 Pressure sensor P1,
- 2 B4 humidity sensor,
- 3 fan motor,
- 4 pcb,
- 5 external EEPROM,
- 6 detaching of the fan wheel,
- 7 replacing the air baffle or divider plate between the 2 fan motors of a floor model,
- 8 installation of the appliance above 1000m (3000ft) above sea level or below sea level (dead sea), installing with Ultraviolet of venting extension or as a Combi Duo
- 9 Usage of a different standard rack
- 10 Customer complaint for uneven cooking results

### Basic condition Temperatures:

Cabinet sensor	Quench. sensor	Humidity sensor
B1 <40°C	B2 <45°C	B4 < 40°C

### Basic condition Hardware:

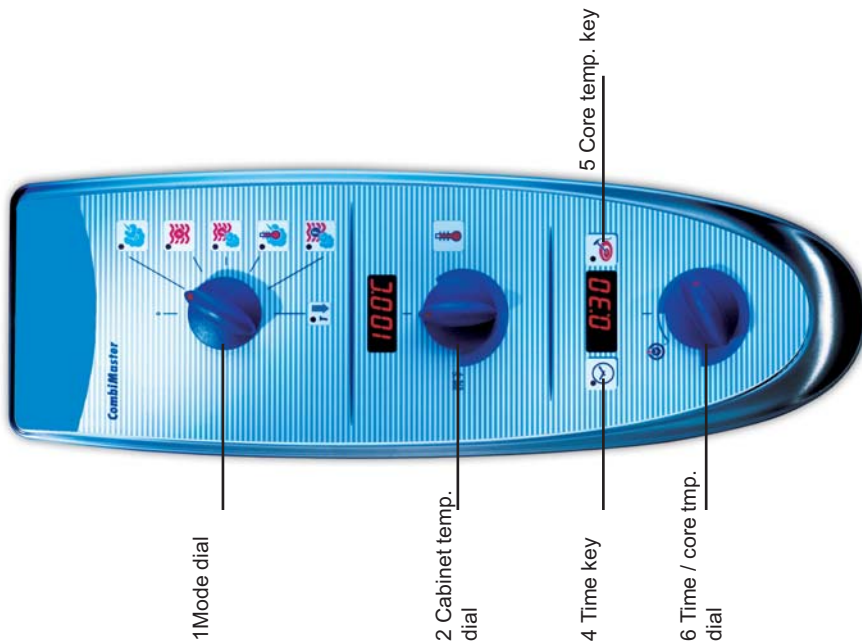
Heating: OFF Fan motor: OFF Humidity flap: Closed  
Side panel must be fitted; Unit must be clean, but may be wet  
In order to achieve the best possible calibration values, insert 2 GN-container 20 or 40 mm deep with the opening facing downwards  
in 61 and 62 units into rail 2 and 5  
in 101 and 102 units into rail 3 and 7  
in 201 and 202 units 3 GN container into rail 3, 10 and 17

**To start calibration: Set DIP switch 1 in on pcb, Select: Basic Settings, Pkt. 1: 1: START**

Gas-settings - values	
Dyn. pressure LPG	27-57 mbar; 2,7-5,7 kPa
Dyn. pressure natural gas	18-25 mbar; 1,8-2,5 kPa
CO2 max LPG (G30) 3BP	10,4% +/- 0,2% for type 61-202
CO2 max LPG (G31) 3P	11,1% +/- 0,2% for type 61-202
CO2 max natural gas H (G20)	9,4% +/- 0,2% for type 61-201 9,5% +/- 0,2% for type 202
CO2 max natural gas L (G25)	9,3% +/- 0,2% for type 61-201 9,4% +/- 0,2% for type 202

# CM Service Reference

SCC Line



1 Mode dial

2 Cabinet temp. dial

4 Time key

5 Core temp. key

6 Time / core tmp. dial

**Enter Service level (Diagnostic, Settings, Running times)**  
Set dip switch 1 on pcb to „ON“ position



**Enter function test**  
Set dip switch 3 on pcb to „ON“ position



Key code CM (SCC line)	
	<b>Cleaning program</b> select Cool Down with „1“ press key „5“ for 10 sec. „CLEn“ is shown in temperature display press key „4“ 1x; 
	<b>De-scaling program</b> select Cool Down with „1“ press key „5“ for 10 sec. „CLEn“ is shown in temperature display select „CALC“ with „2“ press key „4“ 1x; 
	<b>empty steam generator</b> select Cool Down with „1“ press key „5“ for 10 sec. „CLEn“ is shown in temperature display select „SC“ with „2“; open door, press key „4“ 1x; 
	<b>select °C - °F</b> select any cooking mode press key „4“ and „5“ for 10 seconds 

Error code	
<b>Time display</b>	<b>Cabinet display</b>
<b>E 01</b>	<b>H2o</b> open water tap
<b>E 02</b>	<b>[KnoG]</b> change polarity of mains supply
<b>E 03</b>	External EEPROM data error
<b>E 04</b>	heating blocked by energy optimising
<b>E 05</b>	B1 cabinet sensor defective
<b>E 06</b>	B2 quenching sensor defective
<b>E 07</b>	B3 core probe sensor defective
<b>E 08</b>	B5 steam generator sensor defective
<b>E 09</b>	Thermo sensor on pcb defective
<b>E 10</b>	potentiometer cabinet temp. defective
<b>E 11</b>	potentiometer time / core probe defective
<b>E 12</b>	External EEPROM defective
<b>E 13</b>	mode switch defective
<b>E 14</b>	fan motor bottom Bus error (LED shows?)
<b>E 15</b>	fan motor top Bus error (LED shows?)
<b>E 16</b>	fan motor bottom defective
<b>E 17</b>	fan motor top defective
<b>E 18</b>	M4 SC-pump defective or blocked
<b>E 19</b>	filling solenoid defective / sieve blocked
<b>E 20</b>	pcb temp. above >85°C (185°F), change air filter
<b>E 21</b>	B5 steam generator sensor above 180°C (356°F), de-scale steam generator
<b>E 22</b>	B5 steam gen. sensor below -5°C (23°F)
<b>E 23</b>	B1 cab. sensor above 340°C (640°F) (SSR?)
<b>E 24</b>	Ignition box top bus error Ignition box bottom bus error
<b>E 25</b>	1xx - Steam, 2xx - Hot air top 3xx - Hot air bottom Ignition box defective - change box
<b>E 26</b>	1xx - Steam, 2xx - Hot air top 3xx - Hot air bottom Ignition electrode, Ignition box, cable
<b>E 27</b>	flash new software first

Diagnostic program	
<b>DP 1</b>	Software version
<b>DP 2</b>	B1 cabinet sensor
<b>DP 3</b>	B2 quenching sensor
<b>DP 4</b>	B3 core probe sensor
<b>DP 5</b>	B5 sensor steam generator
<b>DP 6</b>	PCB temperature
	must be below 75°C (167°F)
<b>DP 7</b>	S3 door contact
	0 - open; 1 - closed
<b>DP 8</b>	S2 level electrode
	0 - no water; 1 - ok
<b>DP 9</b>	steam element energised
	0 ; 1=50%; 2=100%
<b>DP 10</b>	hot air element energised
	0 ; 1=50%; 2=100%
<b>DP 11</b>	rpm fan motor bottom
<b>DP 12</b>	rpm fan motor top
<b>DP 13</b>	Sicotron energy optimising
<b>DP 14</b>	
<b>DP 15</b>	Unit type and size
<b>DP 16</b>	Gas - Flame current steam
	normal: 4,5 - 5,5µA
<b>DP 17</b>	Gas - Flame current hot air top
	normal: 4,5 - 5,5µA
<b>DP 18</b>	Gas - Flame current hot air bottom
	normal: 4,5 - 5,5µA

SE - Basic Settings	
<b>SE 1</b>	Steam heating time since last SC-Automatic
<b>SE 2</b>	Preset Steam heating time until SC-Automatic
<b>SE 3</b>	Flushing time SC-Automatic
<b>SE 4</b>	Operation steam generator pump
<b>SE 5</b>	Show mode
<b>SE 6</b>	Setting new gas type
<b>SE 7</b>	Presetting of CO2 screw in mm
<b>SE 8</b>	installation altitude above sea level
<b>SE 9</b>	rpm blower motor steam MIN
<b>SE 10</b>	rpm blower motor steam Start
<b>SE 11</b>	rpm blower motor steam MAX
<b>SE 12</b>	rpm blower motor hot air top MIN
<b>SE 13</b>	rpm blower motor hot air top Start
<b>SE 14</b>	rpm blower motor hot air top MAX
<b>SE 15</b>	rpm blower motor hot air bottom MIN
<b>SE 16</b>	rpm blower motor hot air bottom Start
<b>SE 17</b>	rpm blower motor hot air bottom MAX

RT - Running Times	
<b>RT 1</b>	S3 door openings
<b>RT 2</b>	Total time Y1 valve filling
<b>RT 3</b>	Total time Y2 valve quenching
<b>RT 4</b>	Total time M4 SC-pump
<b>RT 5</b>	Total time steam heating time
<b>RT 6</b>	Total time hot air heating time
<b>RT 7</b>	Total time steam mode
<b>RT 8</b>	Total time hot air mode
<b>RT 9</b>	Total time combination mode
<b>RT 10</b>	Total time vario steam mode
<b>RT 11</b>	Total time finishing mode
<b>RT 12</b>	Total time cleaning program
<b>RT 13</b>	Total running time unit

F -- Function test Set DIP switch 3 to „ON“ position!  
In Function test components are NOT protected against overload!

	Function	Cabinet display	Time display
<b>F 1</b>	Steam 50%, Electric unit	act. temp.B5 steam generator	1 / 0
<b>F 2</b>	Steam 100%, Electric unit	act. temp.B5 steam generator	1 / 0
<b>F 3</b>	Hot air 50%, Electric unit	act. temp.B1 cabinet	1 / 0
<b>F 4</b>	Hot air 100%, Electric unit	act. temp.B1 cabinet	1 / 0
<b>F 5</b>	Steam Gas unit	act. temp.B5 steam generator	1 / 0
<b>F 6</b>	Hot air top, Gas unit	act. temp.B1 cabinet	1 / 0
<b>F 7</b>	Hot air bottom, Gas unit	act. temp.B1 cabinet	1 / 0
<b>F 8</b>	Bottom Motor MAX rpm	Set rpm	act. rpm
<b>F 9</b>	Bottom Motor MIN rpm	Set rpm	act. rpm
<b>F 10</b>	Top Motor MAX rpm	Set rpm	act. rpm
<b>F 11</b>	Top Motor MIN rpm	Set rpm	act. rpm
<b>F 12</b>	Solenoid valve quenching	actual temp. B2 quenching	Y2 1 / 0
<b>F 13</b>	Solenoid valve filling	Level electrode S2, 1 / 0	Y1 1 / 0
<b>F 14</b>	SC Pump	Level electrode S2, 1 / 0	M4 1 / 0
<b>F 15</b>	Buzzer		1 / 0
<b>F 16</b>	All Displays / LED		
<b>F 17</b>	Relais Ultravent (door open / close)		1 / 0
<b>F 18</b>	no function		
<b>F 19</b>	Gas blower Steam MIN rpm	actual rpm	Set CO <sub>2</sub>
<b>F 20</b>	Gas blower Steam Start rpm	actual rpm	
<b>F 21</b>	Gas blower Steam MAX rpm	actual rpm	Set CO <sub>2</sub>
<b>F 22</b>	Gas blower Hot air top MIN rpm	actual rpm	Set CO <sub>2</sub>
<b>F 23</b>	Gas blower Hot air top Start rpm	actual rpm	
<b>F 24</b>	Gas blower Hot air top MAX rpm	actual rpm	Set CO <sub>2</sub>
<b>F 25</b>	Gas blower Hot air bottom MIN rpm	actual rpm	Set CO <sub>2</sub>
<b>F 26</b>	Gas blower Hot air bottom Start rpm	actual rpm	
<b>F 27</b>	Gas blower Hot air bottom MAX rpm	actual rpm	Set CO <sub>2</sub>



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