MERRYCHEF®

conneX®12e

Service & repair manual

Microwave combination oven

Read instructions before use.

Part number: 32Z9262

Models: **50Hz & 60Hz**

Language: **ENGLISH**

Expanding your Opportunities

1.1 Declaration of conformity.

Manufacturer

Authorised representative (brand headquarters).
Welbilt UK Limited
Ashbourne House, The Guildway,
Old Portsmouth Road
Guildford GU3 1LR
United Kingdom

Factory.

Welbilt (Foshan) Foodservice Co., Ltd.

Chuang Ye Road, Song Gang Song Xia Industrial Park,

Nanhai District, Foshan Guangdong,

China 528234

Factory
Welbilt UK Limited
Provincial Park,
Nether Lane,
Sheffield, S35 9ZX
United Kingdom

Equipment details.

Model number conneX®12e
Description Commercial combination microwave oven.

Declaration of conformity with directives and standards.

The manufacturer hereby declares that this commercial combination microwave oven complies with the required directives and standards. Please see the Installation and User Manual for further details.

Quality and environmental management.

Welbilt UK Limited (Sheffield) employs a quality management system and a certified environmental management system. Please see the Installation and User Manual for further details.

1.2 Environmental protection.

Statement of principles.

Our customers' expectations, the legal regulations and standards and our company's own reputation set the quality and service for all our products.

We have an environmental management policy that not only ensures compliance with all environmental regulations and laws, but also commits us to continuous improvement of our green credentials.

We have developed a quality and environmental management system to guarantee the continued manufacture of high quality products and to be sure of meeting our environmental targets.

Environmental protection procedures.

We observe the following procedures:

- Use of RoHS2-compliant products.
- REACH chemical law.
- Recycling of electronic waste.
- Environmentally friendly disposal of old appliances via the manufacturer.

Join us in our commitment to protect the environment.

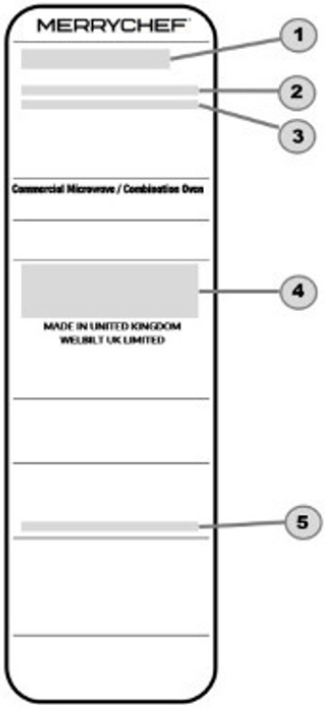
1.3 Important information.

Users are cautioned that maintenance and repairs should be performed by a Merrychef® authorised service agent using genuine Merrychef replacement parts. Merrychef will have no obligation with respect to any product that has been improperly installed, adjusted, operated or not maintained in accordance with national and local codes or installation instructions provided with the product, or any product that has its serial number defaced, obliterated or removed, or which has been modified or repaired using unauthorised parts or by unauthorised service agents. For a list of authorised service agents please refer to your distributor.

1.4 Identifying your microwave combination oven.

Position of data plate.

The data plate is located on the rear of your microwave combination oven.



1 Model number conneX®12e

2 Item Number

Elements of the item	Label	Meaning
Model	X12e	
Power output convection	D	2200W
Power output microwave	X	800W
Voltage	MV5	220-230V / 50Hz
	MV6	208-240V / 60Hz
	00	200V
	20	220V
Frequency	5	50Hz
	6	60Hz
Lead	A - Z	Examples: A= L+N+E (1.5mm)
		B = L1+L2+L3+N+E (2.5mm)
		G = L1+L2+L3+N+E (4mm)
		H = L+N+E (4mm)
Plug	A - Z	Examples: A = UK 13A 3-
		pinC = 32A 3ph
		D = 16A 3ph (90º)
		E = 32A 1ph
Communication	L	USB + LAN + Wi-Fi
Version	A, B	A, B (pre-production)
	1, 2, ...	1, 2, ... (serial production)
Accessory / Customer	BK	“Carbon Black” exterior
	TL	"Stainless Steel" exterior
	WW	Specific customer
Region / Country	EU	Europe
	US	United Sates of America

3 Serial Number

Elements of the serial number	Label	Meaning
Year of manufacture	21	2021
	22, ...	2022, ...
Month of manufacture	01	January
	02, ...	February, ...
Place of manufacture	2130	Sheffield (UK)
	0757	Foshan (China)
Production number	12345	

4 Technical data

5 Manufacturer addresses

1.5 About this service and repair manual.

Purpose.

This service and repair manual is intended for all trained Merrychef service technicians who work with the microwave combination oven and provides them with the necessary information for carrying out servicing and repair work properly and safely.

Who should read the service and repair manual?

Name of target group: Merrychef trained service technicians.
Tasks: All servicing and repair work.

Parts of this document that must be read without fail.

If you do not follow the information in this document, you risk potentially fatal injury and property damage.
To guarantee safety, all people who work with the microwave combination oven must have read and understood the following parts of this document before starting any work:

- Section 2 'For your safety'
- The sections that describe the activity to be carried out.

Safety alert symbol.

Symbol	Meaning
	Warns of potential injuries. Heed all the warning notices that appear after this symbol to avoid potential injuries or death.

Form of warning notices.

The warning notices are categorized according to the following hazard levels:

Hazard level	Consequences	Likelihood
DANGER	Death / serious injury (irreversible)	Immediate risk
WARNING	Death / serious injury (irreversible)	Potential risk
CAUTION	Minor injury (reversible)	Potential risk
NOTICE	Damage to property	Potential risk

Standards.

This service and repair manual has been written and produced in the UK, following UK and EU standards. Any additional local country standards, outside of the UK, must be understood and adhered to.

2 For your safety.

Purpose.

This chapter provides you with all the information you need in order to work with the microwave combination oven safely without putting yourself or others at risk.
This is a particularly important chapter that you must read through carefully.

IMPORTANT:
This manual provides technical guidance for technicians who have successfully undertaken a recognized product familiarization and training course run by Merrychef to carry out service/repair tasks to the appliance/s shown on the front cover of this manual which must not be used for any other make or model of appliance.
Please remember that it is wiser not to attempt a service task if you are unsure of being able to complete it competently, quickly, and above all safely.
To avoid injury to yourself or others and to protect the appliance from possible damage, ensure you have read and understand all the relevant instructions and ALWAYS follow the safety codes when servicing an oven.

1. Ensure the electrical supply is locked-off to prevent the oven from being inadvertently powered up.
2. Do not leave the oven unattended without the oven panels fitted and keep within sight of other personnel when testing the oven, ensuring persons other than trained engineers are denied access.
3. The minimum number of panels should be removed, and the high voltage capacitors must be discharged before working on the oven using a suitable capacitor discharge tool (see section 2.15).
4. Temporary insulation should be used to prevent accidental contact with dangerous conductors.
5. Do not touch any internal wiring or connectors within the oven, whether you believe it is live or not and avoid touching the metalwork (casing, panels, etc) of the oven with your body.
6. Only use electrically rated screwdrivers for adjusting 'pots' etc., ensuring the tool touches nothing else.
7. Ensure the test equipment is set correctly before use.
8. Test equipment such as meter test leads or clamps must be fitted and removed whilst the unit is dead, for each time a test is required.
9. Do not undertake functional magnetron testing with the panels of the casing removed.
10. Avoid touching the test equipment, unless necessary for the operation.
11. Upon completion of a service follow the steps for commissioning the oven under the 'Commissioning the appliance' section of this manual.

2.1 Basic safety code.

Object of the safety code.

This safety code aims to ensure that all persons who operate, install, service and repair the microwave combination oven have a thorough knowledge of the hazards and safety precautions, and that they follow the warning notices given in the conneX Installation and User manual, this Service manual and on the appliance. If you do not follow this safety code, you risk potentially fatal injury and property damage.

Referring to the conneX® Installation and User manual included in the customer documentation.

- Read in full this chapter 'For your safety' and the chapters that relate to your work.
- The end user should keep the manuals included in the customer documentation for reference.
- Pass on the user manuals included in the customer documentation with the microwave combination oven if it changes ownership.

⚠ CAUTION
Warning to service technicians:
Precautions to be observed before and during servicing to avoid possible exposure to excessive microwave energy.

1. Do not operate or allow the oven to be operated with the door open.
2. Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   - Interlock operation.
   - Proper door closing.
   - Seal and sealing surfaces (arcing, wear, and other damage).
   - Damage to or loosening of hinges and latches.
   - Evidence of dropping or abuse.

3. Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity and connections.
4. Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
5. A microwave leakage check should be performed on each oven prior to release to the owner.

2.2 Requirements to be met by personnel and working positions.

Requirements to be met by operating personnel.

Personnel	Qualifications	Tasks
Service technician.	Must be from a factory authorized service agent (FAS) and has had the relevant technical training and knows the regulations associated with handling heavy loads.	All servicing and repair work including work covered by warranty.

Working positions during servicing and repairs

The service area for staff during servicing and repair work is the area around the appliance.
If it is not possible to obtain full access to all sides of the appliance move it to a better location following all manual handling recommendations.

2.3 Personal protective equipment. (PPE).

Moving and setting up the appliance.

Activity	Materials used	Personal protective equipment
Conveying within the establishment and setting up the appliance on a work surface, stand or in a stacking trolley. Setting up the appliance in the installation location.	Suitable lifting equipment. Forklift truck or pallet truck.	Protective gloves & Safety boots. Hard hat (e.g., when heavy loads are being lifted, working overhead).

Installation, preparing for first-time use and taking out of service.

Activity	Materials used	Personal protective equipment
Installing and removing the electrical connection.	Tools and equipment depending on the task.	Work wear and personal protective equipment depending on the job that needs doing as specified in the national regulations for your country.
Preparing the appliance for first-time use – commissioning the equipment. Operational training for the end user to include how the oven functions and how to clean the equipment correctly.	Tools and equipment depending on the task.	Workwear as specified in country-specific standards and directives for kitchen work. Heat protective gloves (compliant with EN 407 in European Union). Safety boots.

Dismantling the appliance (taking out of operation), decommissioning.	Suitable lifting equipment. Forklift truck or pallet truck.	Protective gloves and safety boots. Hard hat (e.g., when heavy loads are being lifted, working overhead).

Operation.

Activity	Materials used	Personal protective equipment
Loading and removal of food.	Cook paddle and food trays sanitary gloves.	Workwear as specified in country-specific standards and directives for kitchen work. Protective clothing. Heat protective gloves (compliant with EN 407 in European Union). Safety boots.
Removal and installation of original equipment manufacturer (OEM) parts.	Tools and equipment depending on the task.	Workwear as specified in country-specific standards and directives for kitchen work. Protective clothing. Heat protective gloves (compliant with EN 407 in European Union) Safety boots.

Cleaning.

Activity	Materials used	Personal protective equipment
Cleaning the cavity by hand Handling spray bottles and chemicals.	Cleaning chemicals approved by the manufacturer. Protective chemicals approved by the manufacturer.	Items of protection equipment, depending on cleaning chemical being used. Protective clothing/apron. Suitable face mask. Suitable eyewear and gloves. The EC safety datasheet for the relevant cleaning chemical contains a more precise specification of these items. An up-to-date copy can be obtained from the manufacturer. Refer to the label on the cleaning chemical concerned.
Cleaning components and accessories according to relevant instructions.	Common household detergent: mild on skin, alkali-free, pH-neutral and odourless.	Follow the instructions listed on the safety data sheet for the cleaning chemical.
Cleaning the outside of the appliance.	Common household stainless steel cleaner or hard surface cleaner.	Follow the instructions listed on the safety data sheet for the cleaning chemical.

Repairs.

Activity	Personal protective equipment (PPE)
All repairs.	Work wear and approved PPE depending on the job that is required as specified in national regulations (country specific).

2.4 Intended use of the microwave combination oven.

The microwave combination oven must only be used for the purposes specified below:

- The microwave combination oven is designed and built solely for cooking different foodstuffs in containers approved by the manufacturer. Microwave, convection and impingement are used for this purpose.
- The microwave combination oven is intended solely for professional, commercial use.

Restrictions on use.

Some materials are not allowed to be heated in the microwave combination oven:

- No dry powder or granulated material.
- No highly flammable objects with a flash point of or below 260°C / 500°F, such as highly flammable oils, fats or cloths (kitchen cloths).
- No food in sealed tins or jars.

Requirements to be met by personnel.

- The microwave combination oven must only be operated and installed by personnel who satisfy specific requirements. Please refer to section 2.2 'Requirements to be met by personnel and working positions' for the training and qualifications requirements.
- Personnel must be aware of the risks and regulations associated with handling heavy loads.

Requirements relating to the operating condition of the microwave combination oven.

Do not operate the microwave combination oven unless it has been properly transported, set up, installed and placed into operation as indicated in section 6 of the conneX Installation and User manual and the person responsible for placing it into operation has confirmed this.

- The microwave combination oven must only be operated when all safety devices and protective equipment are fitted, in working order and fixed properly in place.
- The manufacturer's regulations for operation and servicing of the microwave combination oven must be observed.

Requirements relating to the operating environment of the microwave combination oven.

Specified operating environment for the microwave combination oven:

- The ambient temperature lies between +4°C / 40°F and +35°C / 95°F.
- Not a toxic or potentially explosive atmosphere.
- Dry kitchen floor to reduce the risk of accidents.

Specified properties of the installation location:

- No fire alarm, no sprinkler system directly above the appliance.
- No flammable materials, gases, or liquids above, on, under or in the vicinity of the appliance.
- It must be possible to set up the microwave combination oven in the installation position so that it cannot tip over or slide about. The supporting surface must comply with these requirements.

Mandatory restrictions on use:

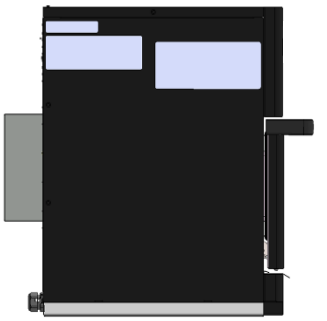
- The appliance must not be operated outdoors and not be shifted or moved during use.

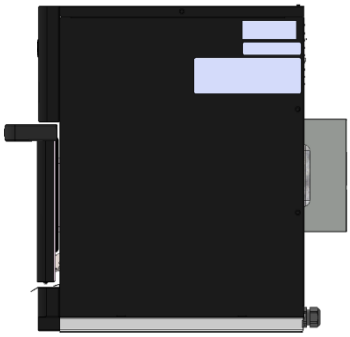
Cleaning requirements.

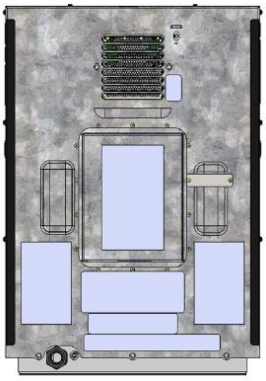
- Use only cleaning chemicals that have been approved by the manufacturer.
- High-pressure cleaners or water jets must not be used for cleaning.
- The appliance must not be treated with alkali or acid solutions6 or exposed to acid fumes.

2.5 Warning signs on the microwave combination oven.

Warning and safety signs.







Symbol	Descriptions
	**Microwave warning.** There is a risk of external and internal burns of body parts following excessive exposure to microwave energy.
	**Electric shock warning (LOTO).** There is a risk of electric shock if the appliance is serviced without disconnecting the electrical supply.
	**Fire warning.** There is a risk of fire if the appliance is operated without respecting the minimum clearances and environment.
	**Hot surface warning.** There is a risk of burns from high temperatures inside the cavity and on the inside of the appliance door.
	**Equipotential bonding.** There is a risk of electric shock if the electrical power is not connected to a properly grounded outlet.
	**Manual handling.** Risk of injury from overstressing your body.
	**Sensitive electronics & static.** Risk of electronic component damage.

Mandatory warning signs.

The warning signs must be attached to the microwave combination oven and optional accessories.

Safety symbols.

The safety symbols be attached to the microwave combination oven.

2.6 Safety devices.

Meaning.

The microwave combination oven has several safety devices to protect the user from hazards. It is essential that all safety devices are fitted and in working order when operating the appliance.

Item	Safety device	Function	Check
1	Panels can only be removed using a tool.	Prevents live parts from being touched accidentally. Prevents access to the moving fan from the wiring compartment.	Check that the covers are in place and secured.
2	Operating panel can only be removed using a tool.	Prevents live parts from being touched accidentally.	Ensure that the operating panel is in place and secured.
3	Door seal. “Consumable Item”	Protects the user and outside environment from steam leaking from the cavity.	Check the door seal regularly for damage and replace it if required.
4	Appliance door.	Protects the user and the environment from hot steam and microwave energy.	Check the door and hinges regularly for damage.
5 (no picture)	Door interlocks.	Ensures that the microwave system cannot be powered on when the dooris open.	Check door switches: Open the appliance door fully during pre-heat or when the oven is at temperature. The Door Open message is displayed.
6 (no picture)	Disconnection device.	Installed by the customer close to the appliance; easily visible and accessible, 1- or 3-pole action, installed per regional specifications. Used to disconnect the appliance from the power supply in case of danger.	Trip the disconnection device. If a breaker is installed refer to the manual for the correct specification. Type D required.
7 (no picture)	Internal fuses.	Prevent faulty components from drawing too much current and causing a potential fire hazard.	Ensure that the internal fuses are correctly rated.
8 (no picture)	Internal high temperature thermostats	Prevent faulty components from generating too much heat and causing potential fire hazard.	Ensure correct operation.

2.7 Summary of hazards.

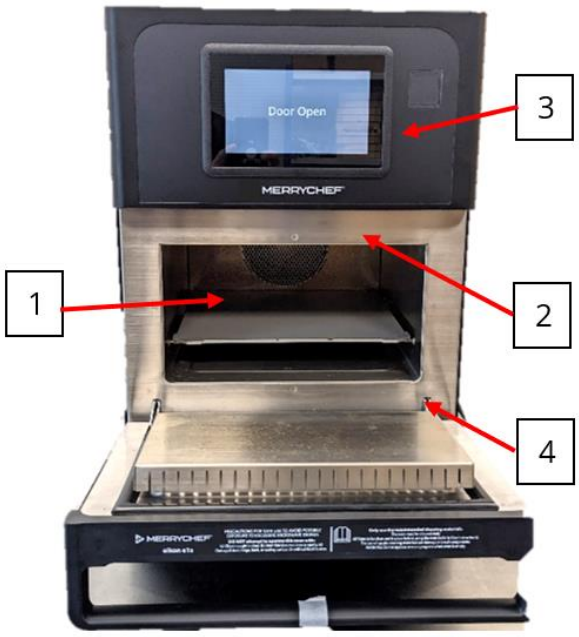
General rules for dealing with hazards and safety precautions.

The microwave combination oven is designed to protect the user from all hazards that can reasonably be avoided by design measures.
The actual purpose of the microwave combination oven, however, means that there are still residual risks; you must therefore take precautions to avoid them. A safety device can provide you with a certain degree of protection against some of these hazards. You must ensure, however, that these safety devices are in place and in working order.
The nature of these residual risks and what effect they have are described below.

Hazard points.

The following illustration shows a Merrychef conneX® microwave combination oven:

Excessive microwave energy
The microwave combination oven generates microwave energy.
An operation with an open or damaged door or cavity can result in external and internal burns of body parts following exposure to microwave energy.



Heat generation (1)
The microwave combination oven becomes hot inside the cavity and on the inside of the appliance door. This poses a risk of burns on hot surfaces inside the microwave combination oven, and on hot appliance parts, food containers and other accessories used for cooking.

Hot steam / vapour/ liquids (2)
When cooking food, the microwave combination oven may generate hot steam and vapour which escapes when the appliance door is opened, and which is removed through the air vents on the rear of the microwave combination oven when the appliance door is closed. This poses a risk of scalding from hot steam when the appliance door is opened. The operator must take particular care when opening the appliance door if the top door edge is below their field of vision.

Foodstuffs may also be liquid, or liquify during cooking. This poses a risk of scalding from hot liquids, which may be spilled if not handled properly.

Live components (3)
The microwave combination oven contains live parts. This means a risk from live parts if the cover is not in place.

Parts moving against each other (4)
For various actions, such as opening/shutting the appliance door or cleaning the appliance door, there is the risk that you will crush or cut your hand.

Contact with cleaning chemicals.
The microwave combination oven must be cleaned using special cleaning chemicals. This poses a risk from cleaning chemicals, some of which can cause skin burns.

2.8 Hazards and safety precautions when setting up the appliance, during installation, preparing the appliance for use and cleaning.

Please see the detailed information in section 3 'For your safety' in the conneX Installation and User manual.

2.9 Safe working when working on the appliance.

For your safety1.

Before starting work, familiarize yourself with the hazards described in section 3 ‘For your safety’ in the conneX Installation and User manual.

Eligibility of personnel for working on the appliance.

Only qualified Merrychef trained personnel from a factory authorized service company (FAS) are permitted to set up and work on the appliance.

Regulations for working on the appliance.

Local and national standards and regulations relating to workplaces in catering kitchens must be observed.
The rules and regulations of the local authorities and supply companies that apply to the installation location concerned must be observed.

Personal protective equipment.

Wear the personal protective equipment specified in section 2.3 'Personal protective equipment'.

Moving heavy loads.

⚠WARNING
Risk of injury from lifting incorrectly

- Use a forklift truck or pallet truck to place the appliance in the installation position or to move it to a new position.
- When shifting the appliance into the correct position, use enough people for the weight of the appliance when lifting it (value depending on age and gender), 2 people are recommended for Merrychef equipment.
- Wear personal protective equipment, (PPE).

Unsuitable supporting surface.

⚠WARNING
Risk of crushing if the appliance tips over or falls off.
Body parts can be crushed if the appliance tips over or falls from height.
Make sure that the appliance is never placed on an unsuitable supporting surface.

2.10 Hazards and safety precautions during servicing and repair.

Safety hazard: heat.

Danger	Where or in what situations does the hazard arise?	Preventative action
A risk of burns. 	From hot surfaces such as; Racks Containers, baking sheets, shelf grills etc. Inside the entire cavity, including all parts that are or were inside during cooking. On the inside of the appliance door.	Before starting cleaning tasks, use the cool down function to cool the cavity. (Blue thermometer). The cavity must cool to below 50°C / 122°F before cleaning commences.
		Wear specified protective clothing, in particular protective gloves.

Safety hazard: electrical power.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
A risk of electric shock 	Live parts: Under any covers that contain electrical wires and parts such as motors and magnetrons. On the appliance outer panel work and on adjacent metal surfaces if not earth bonded correctly and insulated according to local regulations.	Work on the electrical system must only be performed by qualified electricians from an authorized customer service company, (FAS).
		Before removing the covers: Switch off all connections to the power supply. (LOTO). Take protective measures at every power switch to ensure that the power cannot be switched on again. Wait 15 minutes to allow the VFD bus capacitors to discharge.
		Make sure that the electrical connections are intact and fixed securely before plugging the appliance back into the power supply.
		Before putting the appliance back into use, make sure that the appliance, including all metallic accessories have been connected to an equipotential bonding system.

Dead working should be the normal method of carrying out work on electrical equipment or circuits. Live working should only be carried out in circumstances where it is unreasonable to work dead.

No person shall be engaged in any work activity on or so near any live conductor (other than one suitably covered with insulating material to prevent danger) that danger may arise unless -

a) It is unreasonable in all the circumstances for it to be dead; and
b) It is reasonable in all the circumstances for the service technician to be at work on or near it while it is live; and
c) Suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury.

When working on the oven it is important that the earthing of the power supply to the equipment is adequate and efficient. In customers' premises this is likely to be unknown, so it is important to carry out a test to demonstrate the efficacy of the earthing. The safe way to do this is to measure the earth loop impedance of the power supply using an instrument designed for that purpose. If the test indicates an inadequate earth, the customer must be informed that the work cannot continue until it has been rectified.

Simple 'Go/No go' plug-in testers will in general only provide a polarity check and an indication that an earth may be present, but not its effectiveness.

Safety hazard: mechanical parts of the appliance.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
Risk of cuts from sharp edges (PPE).	During servicing work. When handling sheet-metal parts.	Exercise caution when performing this action. Wear personal protective equipment.
Risk of body parts being crushed if the appliance tips over or falls.	When the appliance is being moved e.g., to gain better access to the connections.	Always observe the requirements for the supporting surface.

Safety hazard: moving heavy weights.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
Risk of injury from overstressing your body. 	When moving the appliance.	Use a forklift truck or pallet truck to place the appliance in the installation position or to move it to a new position. Always use the correct number of persons and observe the limits specified for lifting and carrying when adjusting the appliance position. Observe the local occupational safety regulations. Wear personal protective equipment.

Safety hazard: moving appliances supported on a wheeled base.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
Risk of crushing of body parts.	While appliances are being moved on a wheeled platform.	When servicing, engage the parking brake on the wheels.
Risk of hands and feet being pinched.		
Risk of electric shock from live parts.	While appliances are being moved on a wheeled platform.	Disconnect the appliance from the electrical supply before moving it.

Safety hazard: smoke or fire.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
Risk of fire or smoke from defective electrical components. 	If one of the electrical components is defect, for example due to a short circuit, or if the internal wiring is refitted incorrectly when servicing/repairing the oven.	Never use electrical spare components which failed in a dedicated test, or which bear visible damage. Carefully refit electrical connections using the wiring diagrams provided in this manual.

Safety hazard: electronic component damage.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
Risk of electronic component damage. 	The human body can store enough static electricity to damage the electronics within the oven, especially the UI & IO boards.	When working on the UI, or IO, and associated wiring, anti-static precautions must be taken, such as wearing an ESD wrist strap. IMPORTANT - oven power supply and all capacitors must be proved dead first.

2.11 Hazards and safety precautions when taking the appliance out of service.

Safety hazard: electrical power.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
A risk of electric shock. 	From live supply	Work on the electrical system must only be performed by qualified electricians from an authorized customer service company.

Safety hazard: moving heavy weights.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
Risk of injury from lifting incorrectly. 	When moving the appliance.	▪ Use a forklift truck or pallet truck. ▪ Do not exceed safety limits for lifting and carrying. ▪ Wear appropriate PPE.

Safety hazard: mechanical parts of the appliance.

⚠ Danger	Where or in what situations does the hazard arise?	Preventative action
Risk of body parts being crushed if the appliance falls from height.	When the appliance is being moved e.g., to gain better access to the connections.	Ensure the oven is level and stable and always observe the requirements for the supporting surface when taking the appliance out of service.
Risk of slipping. 	In front of the appliance.	Ensure that the floor around the appliance is always dry.

2.12 Safe working during electrical installation.

For your safety.

Before starting work, familiarize yourself with the hazards described in section 3 'For your safety' in the conneX Installation and User manual.

Eligibility of personnel for the electrical installation.

Only electricians qualified under the terms of EN 50110-1 and from an authorized service company are permitted to perform work on electrical equipment.

Regulations for the electrical installation.

Observe the following requirement to prevent hazards caused by faulty electrical connections:

- The electrical supply must be connected in accordance with applicable local and national regulations and regulations of the professional associations and of the relevant power supply company.

Personal protective equipment (PPE).

Wear appropriate PPE specified in section 2.3 'Personal protective equipment.

Live components.

⚠ DANGER

Risk of electric shock from live parts

When the appliance is not connected to an equipotential bonding system, there is a risk of electric shock from touching live parts.

- Make sure that any work on the electrical system is performed solely by a qualified electrician from an authorized service company.
- Make sure that the electrical connections are intact and connected securely before putting the appliance into use.
- Before preparing the appliance for use, make sure that the appliance, including all metallic accessories, is connected to an equipotential bonding system.

Residual-current device (RCD).	The installation regulations require protection by a residual-current device (RCD). Suitable residual-current devices meeting the relevant national regulations must be used. Type D or C rated.
Disconnection device.	Install an easily accessible disconnection device. The disconnection device is used to disconnect the appliance from the electrical supply. Install within the guidelines of the regional electrical regulations for the country you are in.

Fitted frequency-converter.

The appliance is fitted with one frequency converter (FC) and EMC mains input filters.
These devices may result in a leakage current of more than 3.5 mA per FC drive. Use a suitable RCD for the rated voltage.

Properties of the residual-current device (RCD). – TYPE D or C

The RCD must have the following properties:

- Filter for filtering out RF currents.
- "Time delayed" trip characteristic for RCD devices with trip threshold of 30mA*: prevents RCD being tripped by charging currents of capacitors and parasitic capacitances when appliance is switched on.
- "Leakage current protection, type SI" trip characteristic for RCD devices with trip threshold of 30mA*: insensitive to nuisance tripping.
- *Local national regulations may require lower trip ratings, such as in North America. In which case these lower trip threshold ratings must be adopted, ensuring the dedicated device has a high immunity to nuisance tripping.

Note. Residual Current Devices (RCDs) are also known by other terms, such as Earth Leakage Circuit Breakers (ELCBs), Safety Switches, Ground Fault Interrupters (GFIs) and Ground Fault Circuit Interrupters (GFCIs). These should not be confused with over current protection.

2.13 Electrical installation requirements.

Circuit Breakers (MCB ~ Miniature Circuit Breakers).

For over current protection, a Type 'D' circuit breaker (designed specifically for this type of equipment) must be fitted, as a recommend alternative a higher rated type 'C' type breaker can be used (see below). Establishments with standard (Type 'B') circuit breakers are sensitive to 'surges' which occur on switching on freezers, refrigerators, and other catering equipment, including microwave combination ovens. An individual, suitably rated over current circuit breaker should be fitted for each appliance installed, along with a separate dedicated Residual Current Device (Ground Fault Circuit Interrupter).

Model	Recommended Circuit Breaker (Per phase)	Alternative Recommended Circuit Breaker (per phase)
conneX 12e standard power	D16	C20

Residual Current Device (RCD)

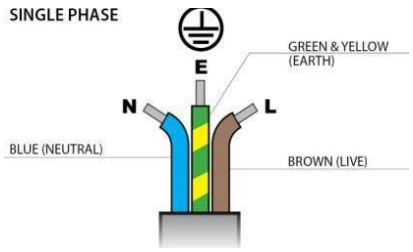
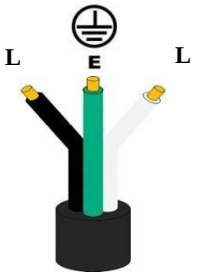
The installation regulations require protection by a Residual Current Device (Ground Fault Circuit Interrupter). Suitable residual current devices, with a high immunity to nuisance tripping, meeting the relevant national regulations must be used. As long cable runs can be a factor in nuisance tripping, they should be avoided.

If the installation includes more than one appliance, one residual current (GFCI) device must be provided for each appliance.

Low impedance electrical supply.

This commercial combination microwave oven complies with EN 61000-3-11. However, when connecting sensitive equipment to the same supply as the appliance, the user should determine in consultation with the supply authority, if necessary, that a low impedance supply is used.

Electrical supply.

Illustration	Phase	Meaning
	Single phase	UK 13A models are fitted with a moulded plug to BS1363, fused at 13A. EU 16A models are fitted with a moulded plug to CEE 7/7 (Type F Schuko) rated at 16A – "Commando style plug".
	Single phase 60Hz (Two pole)	Single phase models, utilising L1 & L2 split phase supply (240V) or L1 & L2 from a three-phase supply (208V). Neutral is not used. ROW 13 A models are fitted with country specific 15/16 A plugs.
Please refer to electrical installation data for other country specific models.		

Equipotential bonding.

An equipotential bonding point is provided on the rear panel of the appliance for independent earth (not fitted to US models).

(GND) connection for safe working when testing components.

For your safety when testing oven components.

Before testing it is essential that you familiarize yourself with the rules and hazard warnings in this chapter andfollow the instructions given.

Eligibility of personnel for testing oven components.

Only qualified personnel from an authorized service company are permitted to test components of the microwave combination oven.

Moving heavy loads.

⚠WARNING

Risk of injury from lifting incorrectly

When lifting the appliance, the weight of the appliance may lead to injuries, especially in the area of the torso.

- Use a forklift truck or pallet truck to place the appliance in the installation position or to move it to a new position.
- When shifting the appliance into the correct position, use enough people for the weight of the appliance when lifting it (value depending on age and gender). Observe the local occupational safety regulations.
- Wear personal protective equipment.

Sharp-edged sheet-metal parts.

⚠WARNING

Risk of cuts from sharp-edged sheet-metal parts

Working with or behind sharp-edged sheet-metal parts may result in cuts to hands.

- Exercise caution.
- Wear personal protective equipment.

Hot surfaces.

⚠WARNING

Risk of burns from high temperatures inside the cavity and on the inside of the appliance door

- You may get burnt if you touch any of the interior parts of the cooking chamber, the inside of the appliance door or any parts that were inside the oven during cooking.
- Before starting servicing and repair work, wait until the cooking chamber has cooled to below 50°C / 122°F or use the ‘Cool-down' function to cool the cooking chamber.
- Wear personal protective equipment.

Live components.

⚠ DANGER

Risk of electric shock from live parts

When the appliance is not connected to an equipotential bonding system, there is a risk of electric shock from touching live parts. When the covers of the microwave combination oven are removed, there is a risk of electric shock from touching live parts.

- Make sure that any work on the electrical system is performed solely by a qualified electrician from an authorized customer service office.

Before removing the covers:

- Switch the appliance off and disconnect the plug from the wall socket.
- Turn off the isolator switch to disconnect fixed wired appliances and lock-off.
- Take protective measures at every power switch to ensure that the power cannot be switched on again.
- Always discharge the high voltage capacitors before working on the appliance using a suitable Capacitor Discharge Tool, see section 2.15 ‘Process for discharging the capacitor.
- Make sure that the appliance is de-energized.
- Make sure that the electrical connections are intact, secure and all equipment panels are re-fitted before you reconnect the appliance to the power supply.
- Before putting the appliance back into operation, make sure that the appliance, including all metallic accessories, is connected to an equipotential bonding system.

- Microwave emissions.

⚠ WARNING

Risk of burns from microwave emissions

- Do not become exposed to emissions from the microwave generator or parts conducting microwave energy.
- Never operate an appliance that has failed the "Microwave leakage test".

- Fire / smoke in the appliance.

⚠ WARNING

Risk of fire and smoke

Flames and/or smoke may come out of the oven when switching it on after service/repair. This can be caused by a defective electrical component or electrical connections (wiring) that have been refitted incorrectly.

- Switch off the oven.
- Disconnect/isolate the oven from the electrical supply.
- Keep the oven door closed to stifle any flames.

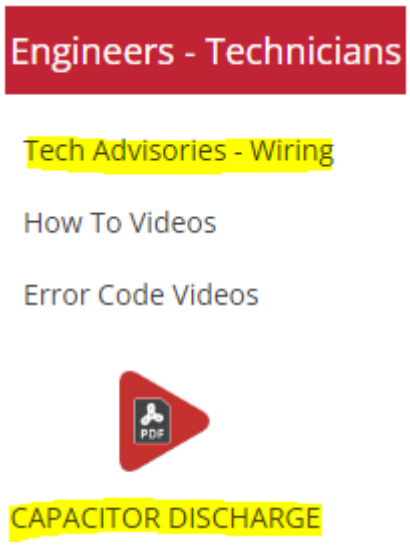
2.14 Process for discharging the capacitors.

- Tools required. (LOTO) – lock off kit.

An approved capacitor discharge tool like the Merrychef recommended tool P/N 30Z5027
Approved electrical class 1 insulted gloves rated to a minimum of 5000 Volts.
Approved voltage tester and voltage proving device.

- For detailed instructions go to the below website.

https://www.merrycheftechnical.com



2.15 Safe working when replacing appliance parts.

Visit https://www.merrycheftechnical.com for the specific models parts list.

Before starting any work, it is essential that you familiarize yourself with the rules and hazard warning in this chapter and follow the instructions given.

Eligibility of personnel for removal / fitting of appliance parts.

Only qualified personnel from an authorized service company are permitted to remove and fit components of the microwave combination oven, (FAS).

Rules for setting up the appliance safely.

To prevent hazards that arise from the installation site and environment of the appliances, the rules for setting up the appliance safely must always be observed; see section 5 ‘Setting up the appliance' in the conneX Installation and User manual.

⚠ DANGER

Risk of electric shock from live parts. 

When the appliance is not connected to an equipotential bonding system, there is a risk of electric shock from touching live parts. When the covers of the microwave combination oven are removed, there is a risk of electric shock from touching live parts.

- Make sure that any work on the electrical system is performed solely by a qualified electrician from an authorized service company.
- Before removing the covers:
  Switch the appliance off and disconnect the plug from the wall socket.
  Turn off the isolator switch to disconnect fixed wired appliances and lock-off.
  Take protective measures at every power switch to ensure that the power cannot be switched on again.
  Always discharge the high voltage capacitors before working on the appliance using a suitable capacitor discharge tool. See how to discharge the conneX oven in section 2.15 ‘Process for discharging the capacitor.
- Make sure that the electrical connections are intact and connected securely before putting the appliance into use.
- Before preparing the appliance for use, make sure that the appliance, including all metallic accessories, is connected to an equipotential bonding system.

Moving heavy loads. 

⚠ WARNING

Risk of injury from lifting incorrectly.

- Use a forklift truck or pallet truck to place the appliance in the installation position or to move it to a new position.
- When shifting the appliance into the correct position, use enough people for the weight of the appliance when lifting it, recommended 2-person lift.
- Wear appropriate PPE.

Sharp-edged sheet-metal parts.

⚠ WARNING

Risk of cuts from sharp-edged sheet-metal parts.

Working with or behind sharp-edged sheet-metal parts may result in cuts to hands.

- Exercise caution.
- Wear personal protective equipment.

Hot surfaces. 

⚠ WARNING

Risk of burns from high temperatures inside the cavity and on the inside of the appliance door.

- You may get burnt if you touch any of the interior parts of the cooking chamber, the inside of the appliance door or any parts that were inside the oven during cooking.
- Before starting servicing and repair work, wait until the cooking chamber has cooled to below 50°C / 122°F or use the ‘Cool-down' function to cool the cooking chamber.
- Wear personal protective equipment.

Microwave emissions.

⚠ WARNING

Risk of burns from microwave emissions.

- Do not become exposed to emissions from the microwave generator or parts conducting microwave energy.
- Never operate an appliance that has failed the "Microwave leakage test", Merrychef require working as close to zero emissions as possible.
- NOTE – the conneX 12e Model is only available with a single magnetron low power specification, the magnetron is centrally located at the top of the oven under the top panel.

Fire / smoke in the appliance.

⚠ WARNING

Risk of fire and/or smoke.

Flames and/or smoke may come out of the oven when switching it on after service/repair. This can be caused by a defective electrical component or electrical connections or wiring that have been fitted incorrectly.

- Switch off the oven.
- Disconnect and isolate the oven from the electrical supply.
- Keep the oven door closed to stifle any flames.
- Allow the oven to cool before investigating further.

3 Technical data.

3.1 Technical data charts.

Dimensions and weights.

Width				
conneX®12e including packaging	530	[mm]	20.9	[in]
Appliance (conneX®12e) without packaging	406.4	[mm]	16.0	[in]
Height				
conneX®12e including packaging	850	[mm]	33.5	[in]
Appliance (conneX®12e) without packaging	619	[mm]	24.4	[in]
Depth				
conneX®12e including packaging	880	[mm]	34.6	[in]
Appliance (conneX®12e) without packaging, door closed	636.5	[mm]	25.06	[in]
Weight				
conneX®12e standard power version, including packaging	60	[kg]	133	[lbs]
conneX®12e standard power version, excluding packaging	46.0	[kg]	101	[lbs]
Safety clearances				
Right / Left	0	[mm]	0	[in]
Top / Rear (for ventilation)	50	[mm]	2	[in]

Electrical connected load ratings – conneX®12e.

Electrical supply		1N~ 220-230V 50Hz	1N~ 220V 60Hz
Connections used		L + N + E	L + N + E
Arrangement		Single phase	Single phase
Max power input	[W]	2500	2500
Rated current per phase	[A]	13	13
Power output convection motor	[W]	2200	2200
Power output for magnetron (IEC 705) 100%	[W]	800	800
Rated power output combination mode (convected heat + microwave)	[W]	900 + 800	900 + 800

Regulatory standards compliance.

Degree of protection	IPX3 – Protected from water sprays of up to a 60° angle
Noise emission	max. 65 [dBA]
Approval marks	
Tested safety	UKCA, CE, CB (IEC), UL
Hygiene	UL-EPH (NSF/ANSI 4)

Technical data, checks and verification.

Description	Features	Function	Rating	Trouble shooting
Fuses	Ceramic Time Delay	Supplies voltage from the VFD to the convection fan motor.	3 x 6.3 Amp	Check continuity through fuse. Check fuse holder for cracks. Check for line potential on both terminals of fuse holder. Door Open message displayed when F5 or F6 has failed open circuit. No functionality when F1 or F2 has failed open circuit.
Fuse F1 & F2	Ceramic BS1362	Control Circuit supplies voltage to the LV transformer and auxiliary components.	2 x 13 Amp *(12 Amp see note 1)*	
Fuse F3 & F4	Ceramic Time Delay	Heater Circuit, supplies voltage to the IO for the heating elements.	2 x 20 Amp	
Fuse F5 & F6	Ceramic Time Delay	Microwave Circuit, supplies voltage to the IO Board and HV components through the interlock switches.	2 x 20 Amp	
Fuse F7	Ceramic BS1362	Switched Mode Power Supply (SMPS) Protection.	3 Amp	
Door Interlock Switches	Common, Normally Open and Normally Closed terminals; RHS SW1 Monitor (outer, C to NC) RHS SW2 Secondary (inner, C to NO) LHS SW3 Primary (C to NO) Door Open message displayed when SW3 is open.	Door switches are for safety, and they prove the oven door is physically closed or open. The microwave circuit will not be energized if the door is open. Live runs .through these switches. See correct switch sequence below.	SW1 & SW2: 250VAC 22A SW3: 250VAC 20A (up to 75A inrush)	Check operation in Diagnostic View Check F5 & F6 Check for continuity. Check for proper wiring Check for proper adjustments. Check for physical damage such as bent activating tabs (see section 6.5 'Adjusting the door microswitches') Check IO Board connections X400, X401, X402 and X412 Check IO LED 6. Check for line potential on SW3 NO.
EMI Filters (Mains Filters) These filters extract any unwanted current conducted through wiring or cables.	Filters unwanted frequency noise from interfering with various circuits and components in the oven.	For use on the main supply feeding all branch circuits.	115/250VAC 50/60Hz 20A @ 40°C Line (L&N) or Load (L'&N') = 330kΩ L1 (L&L') or L2 (N&N') = 0Ω Ground (G&L), (G&N), (G&L'), (G&N') = open	Check for signs of overheating or dis-colouration. Check for shorts to ground from all Live and Neutral terminals. Check for steady voltage (Live & Neutral) to the filter. Check for steady voltage (Live & Neutral) out of the filter.
Switch Mode Power Supply (SMPS). Low voltage supply to the main PCB, (IO Board).	M3.5 screw connections. Pre-set output voltage adjustment. LED self-test indicator.	Provides a stepped down rectified voltage of 12VDC to the IO for controller operation.	Input Voltage 100 - 240VAC 50/60Hz 2.1A Output Voltage 12VDC / 8.5A @ 50°C.	Check LED 1 Check IO +12V LED Check PSM connections. Check IO Board connections X100, X101 and X500. Check input voltage. Check output voltage.

Description	Features	Function	Rating	Trouble shooting
Cooling Fan.	Supplies fresh air into the component chamber to cool down the electrical components. The fan should run counter clockwise (looking down from above). The fan will continue to run until the oven is switched off after cleaning cycle. Motor has internal Thermal Overload Protection on the Live.	Supplies fresh air into the component chamber to keep the electrical components cool. Fan should run counter clockwise. Draws air in through the filter under the door and out the rear of the oven.	230VAC, 0.39A @ 50Hz / 0.49 A @ 60Hz Resistance: 198 - 222Ω (222Ω across connection terminals). Capacitor 2.5μF	Check operation in Diagnostic View Check for opens, shorts or grounds. Check for locked rotor (Power Off) Check IO connection X110. Check IO LED28 Check for Live supply potential on fan connection. Check Event Log for IO & UI temperatures and E103 events.
Cooling Fan Capacitor.	Connects to the cooling fan at the connection plug.	Stores and discharges voltage to start and run the cooling fan motor.	400V, -25/70°C, 2.5μF ±5%	Check for correct voltage and capacitance values. Check for opens, shorts, or grounds. Warning: Capacitor may have a stored charge, discharge before testing.
Stirrer Motor(s).	Mounts directly on the wave guide above the cavity, supply voltage connected directly from the IO Board. Driving the stirrer antennae in the horn area of the microwave launch on the cavity, through the gear assembly.	Drives a stirrer antenna to evenly distribute microwaves into the oven's cavity.	230VAC 2.7W. Resistance 7 – 8kΩ	Check for opens, shorts or grounds. Check for locked rotor (Power Off) Check IO Board spade connections X112 Check IO LED27 Check for Live supply potential at IO X112 pins 1-2 & 3-4
VFD Variable frequency drive to control the convection fan. (Motor Speed Controller).	Takes 1PH AC supply voltage and produces a 3PH DC square wave frequency output. 3ph fan supply protected individually by 3x 5A ceramic on board fuses.	Provides an DC, 3-phase switched mode drive to the AC convection motor and is controlled by a 0-10 VDC signal from the relay board (IO). The frequency output allows the Main Blower Motor to run at variable speeds.	1ph power supply. Control Signal Voltage 10VDC output to the IO Board, 2-10VDC return to determine speed percentage of convection fan motor (2-7.5VDC on 16A/13A ovens). Output 3ph DC square wave frequency voltage.	Check electrical connection Check IO Board connections X113 & X519 Check IO LED29 Check VFD LED sequence. Check for 10VDC at pins P2 (Green) & P3 (Blue). Check for 1-10VDC at pins P1 (Red) & P3 (Blue) Check Live supply potential on VFD Check for consistent output voltage between each phase between Blue (U), Red (V) & Yellow (W) (Digital multi-meter should be set to VAC to conduct this check).

Description	Features	Function	Rating	Trouble shooting
Convection Motor.	The convection motor is a 3-phase AC motor that runs at variable speeds and is powered by a motor speed controller (VFD). The windings are thermally protected (two grey wires). The fan will continue to run until the oven is switched off (Idle fan speed reduces to 30% once cooled down to 100°C.	Provides variable percentages of airflow that is heated into the oven cavity used for accelerated cooking. This is the convection and impingement process.	Supply Voltage: DC square wave frequency that simulates 3ph voltages up to 220V at 100% Resistance: 7.5Ω ±10% across windings.	Check for open circuits or shorts to ground. Check for locked rotor (Power Off) Follow VFD Drive Trouble shooting checks.
Convection Motor IP.	Thermal Switch within the Convection Motor. Two black wires. Normally Closed, monitors convection fan motor internal temperature. Opens when the motor gets too hot.	Breaks connection between wires 82 & 83 for the relay coil on the on the VFD Drive Live supply, which in turn stops the voltage supply to the convection fan motor.	Switched Voltage; 12VDC. Resistance if open O.L., if closed = 0Ω Opens at 160°C (320°F)	Check continuity through switch. Check convection fan motor IP connections on Safety Relay. Follow Convection Motor Trouble shooting checks.
Convection Fan Safety Relay.	Controlled by the thermal switch (IP) within the convection fan motor.	Switches the power supply, wires 80 (64) to 84, on to the VFD (Motor Speed Controller) when the convection fan motor temperature is within normal operating limits (IP closed circuit).	Coil Voltage; 12VDC, Resistance 295Ω. Switched Voltage 230VAC, Resistance if open O.L., if closed = 0Ω	Check SMPS connections 81 & 82. Check convection fan motor IP continuity and connections.
Overheat Thermostat (Over Temp Stat / Cavity Stat).	Manual reset, capillary tube, normally closed, monitors cavity temperature. Opens when the cavity temperature gets too hot.	Breaks control safety circuit control voltage signalling the IO Board to de-energise heating and microwave circuits based on the temperature inside oven cavity. The oven shuts down and displays E104.	Switched Voltage; 12VDC. Resistance if open O.L., if closed = 0Ω. Opens at ≈300°C (570°F)	Check continuity through switch. Check for 12VDC on both sides of switch. Terminals are normally closed, if open, reset thermostat and test oven for proper operation Check IO X512 Check IO LEDs LD14 to LD18.

Description	Features	Function	Rating	Trouble shooting
Magnetron Limit Stat(s)	Automatic reset. Monitors surface temperature. Normally Closed, opens when the magnetron surface temperate gets too hot.	Breaks control safety circuit control voltage signalling the IO Board to de-energise heating and microwave circuits based on the temperature of the magnetron case. The oven shuts down and displays E117, E118.	Switched Voltage; 12VDC. Resistance if open O.L., if closed = 0Ω. Opens at 125°C (257°F), automatically closes once magnetron case temperature drops to 80°C (177°F).	Check continuity through switch(es). Check for 12VDC on both sides of switch(es). Allow magnetron to cool before testing. A dirty air filter is a major root cause of this failure. Check IO connections & plugs on X513 & X514 Check IO LEDs LD16 & LD18.
Heating Element(s).	conneX 12e – Single sheath resistive heating element sealed terminal ends. Heating element(s) remain on for 30 secs after opening the door.	Provides heat for the oven cavity. When air passes over the surface, heat is transferred into the air.	Supply Voltage 230VAC pulsed from the IO Board to control power (wattage). conneX 12e – Resistance: 19Ω between terminals. Maximum power 2200W.	Check F3 & F4 Check Neutral connections, EMI Filter. Check resistance ratings. Check IO terminal connections X200 & X210. Check for opens, shorts & grounds. Check IO LEDs LD1 & LD25 Check Live supply potential at heater terminals. Check Error Log for E102 & E116 events.
Magnetron(s).	One Magnetron fitted as standard.	Provides microwave energy, 0 to 100%, through the waveguide(s) into the oven cavity for accelerated cooking. At 50% power the microwave circuit cycles 20 seconds on / 20 seconds off.	conneX 12e - 800W per magnetron, 7-8A at 230VAC. See HV Components in Section 5.8 for further rating information. (NOT TO BE TESTED LIVE).	Follow all test procedures in Section 5.8. Check for opens, shorts & grounds. Check IO Board connections X400, X401, X403, X410, X411 & X412. Check IO LEDs LD4, LD5 & LD21 Check Error Log for E101 & E113 events.

Description	Features	Function	Rating	Trouble shooting
HV Transformer(s).	One HV Transformer fitted as standard.	Provides both the stepped down and stepped-up Voltages for the for the Magnetron(s).	Primary winding: 200 / 230 VAC. Secondary winding to Magnetron Filament = ELV, and approximately 1:10 stepped up High Voltage for microwave circuit (NOT TO BE TESTED LIVE). See HV Components in Section 5.8 for further rating information. *(208 / 240 VAC see note2).	Follow all test procedures in Section 5.8. Check for opens, shorts & grounds. Check IO Board connections X403, X410, X411 & X412. Check IO LED 3 & 4 Check Error Log for E101 & E113 events.
HV Capacitor(s).	One HV Capacitor fitted as standard. Internal discharge resistor.	In conjunction with the HV Diode(s) to double the stepped-up voltage from the HV Transformer(s).	2,500 VAC, 0.95μF±3% for 50Hz, 0.75μF ±3% for 60Hz. See HV Components in Section 5.8 for further rating information (NOT TO BE TESTED LIVE).	Follow all test procedures in Section 5.8 Check for open circuits or shorts to ground. Check IO Board connections X403, X410, X411 & X412. Check IO LED 3 & 4. Check Error Log for E101 & E113 events.
HV Diode(s).	One HV Diode fitted as standard.	In conjunction with the HV Transformer(s) to double the stepped-up voltage from the HV Transformer(s), for the Magnetron DC supply.	See HV Components in Section 5.8 for further rating information (NOT TO BE TESTED LIVE) 16kV, 750mA (up to 50A surge) -20°C to +135°C	Follow all test procedures in Section 5.8 Check for open circuits or shorts to ground. Check IO Board connections X403, X410, X411 & X412. Check IO LED 3 & 4. Check Error Log for E101 & E113 events.
Thermocouple.	Provides DCmV to the IO Board (Relay Board) that represents the cavity temperature.	Two dis-similar metals connected at the tip that produce different repeatable millivolts while exposed to different temperatures. Green is positive, and White is negative.	See chart below for reference. E111 error when opencircuit fault exists.	Check resistance, a low resistance of 3 to 5Ω is OK. Check for opens, shorts to ground.

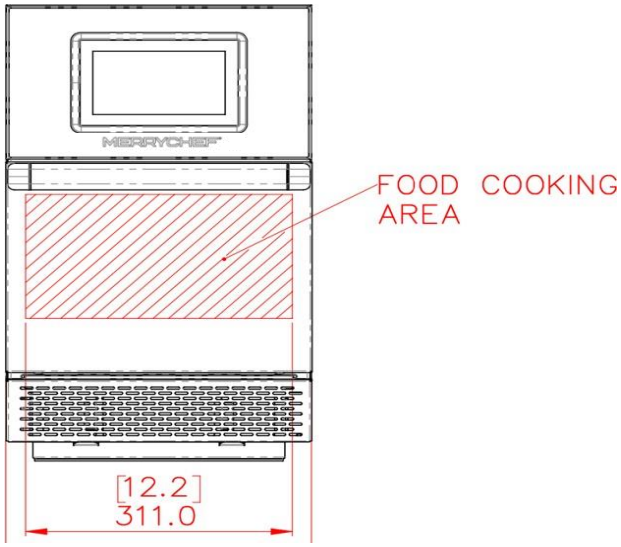
**Note 1: 12A fuse (F3) used in Americas*
**Note 2: 208/240 HV Transformers used in most 60Hz applications*

Always review country specific service parts lists for required replacements. Never use non-approved alternatives.See section 6.18 for the Technical Data Summary Sheet.

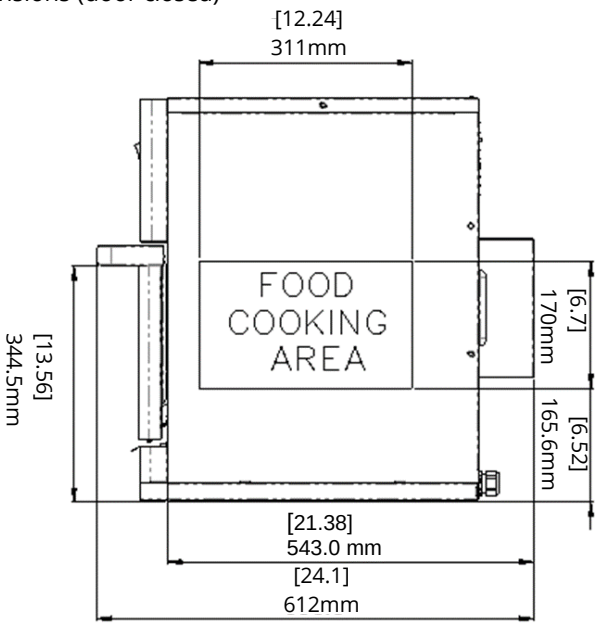
3.2 Dimensional drawings

conneX®12e

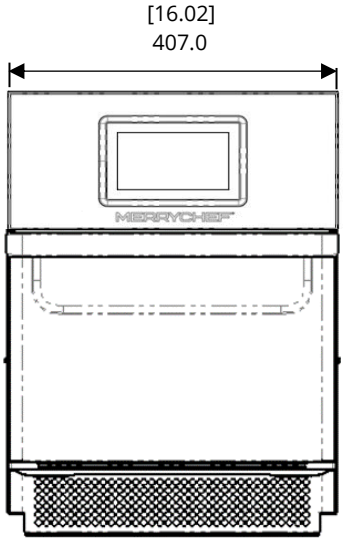
Front view (door closed)



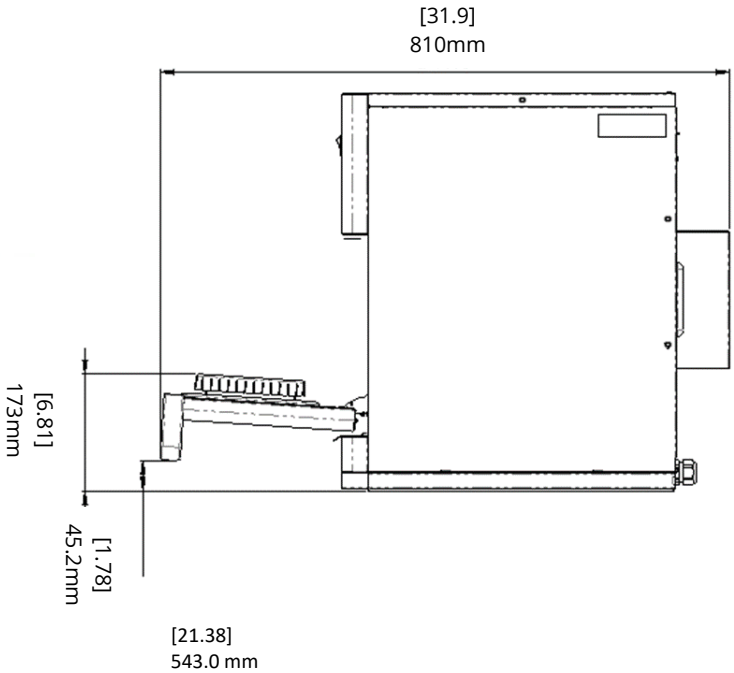
Cavity dimensions (door closed)



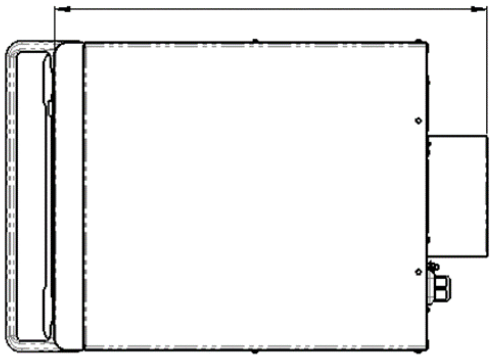
Front view (door closed)



Cavity dimensions (door open)



View from the top (door closed)



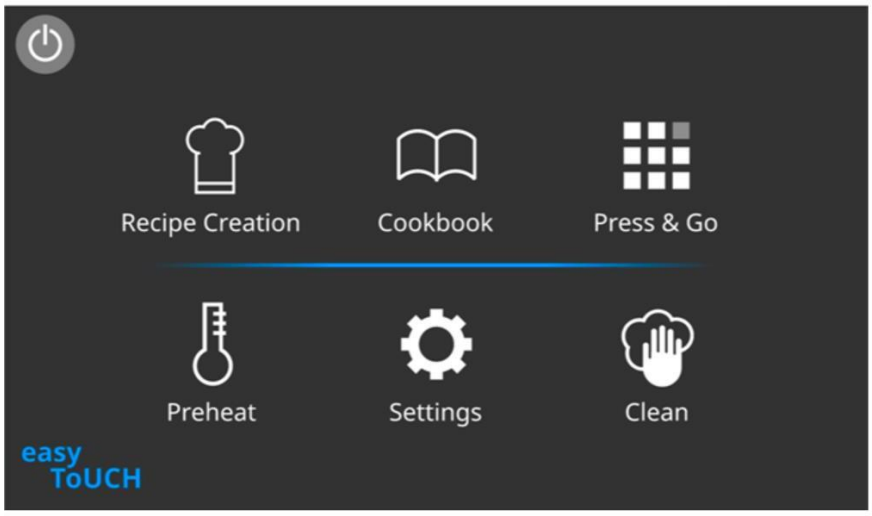
4 Accessing the Universal Controller. (U/I)

Purpose.

Instruct the user regarding all safety-related functions and devices.
Instruct the user in how to operate the appliance.

4.1 Main menu screen.

Appearance.



The buttons and what they do.

Button	Meaning	Function
	Recipe creation Development Mode	'Recipe creation' enables multistage cooking profiles to be developed, then stored under a name and icon for reuse.
	Cookbook	'Cookbook' contains the cooking profiles stored in the memory of the appliance. It displays favourites, cooking profile groups and a complete listing of all cooking. profiles available.
	Press&Go	'Press&Go' allows quick access to use the cooking profiles that are already stored.
	Preheat	'Preheat' is used to control the appliance operating temperature, up to six preheats can be stored on the appliance.
	Settings	'Settings' is used to control the appliance settings and functions including time and language, loading cooking profiles and for service and maintenance purposes.
	Cleaning	'Cleaning ' allows the appliance to be prepared for cleaning with fully guided and customisable assistance during the cleaning process.

The Universal Controller (U/I) display.

The Universal Controller (U/I) display, layout and icons shown herein are for guidance purposes only and are not intended to bean exact representation of those supplied with the appliance.

Full operational details can be found in the Installation and User Manual.

4.2 The keyboard screen.

Appearance

The buttons and their functions

Button	Meaning	Function
	Keyboard screen	The keyboard screen is used to enter an authorised password to enter data for programmes and may restrict operator access to some functions.
	Clear screen	Select the 'clear screen' key to delete all text from the keyboard screen.
	Keyboard	Type in text using the keyboard.
123	Keyboard scroll	Select the up/down arrows to scroll the keyboard screen, for lowercase, numbers, etc.
	Enter / OK	Select the green tick to confirm settings and continue.
	Previous screen	Select the 'backspace' key to return to a previous screen.
	Accent Marks	Press and hold the relevant letters to select diacritical/accent marks
	International Keyboard	Select the bottom globe icon to change to a Chinese keyboard (Pinyin), select again for Korean, Arabic and Russian.

Character length.

For names of cooking profiles, names of cooking profile groups and passwords use 1-20 characters in 2 lines max. For stage instructions of individual cooking profiles use 1-52 characters in 5 lines max.

Full operational details can be found in the Installation and User Manual.

4.3 Cleaning procedures.

⚠ IMPORTANT
Cool down the oven before

You will need.

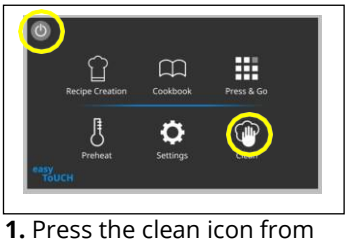
PPE:

- heat proof gloves
- protective rubber gloves
- eye protection

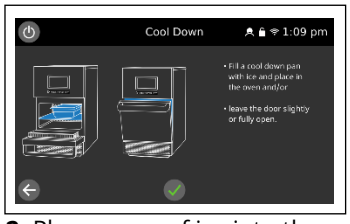
Cleaning materials:

- non-abrasive nylon scrub pad
- cleaning cloths
- Merrychef® oven cleaner (or Merrychef® approved cleaning chemicals)
- Merrychef oven protector

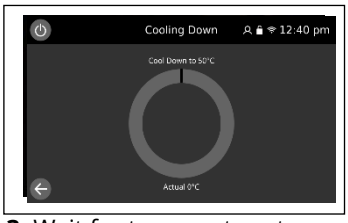
Cool down the oven.



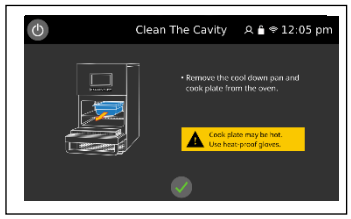
1. Press the clean icon from the main menu (full serve mode) or the on/off button on any screen.



2. Place a pan of ice into the oven to speed up the cool down process (if instructed) or leave the door slightly open. Press the green tick to continue at each stage.



3. Wait for temperature to reduce to 50°C or 122°F. This can take up to approximately 20 mins.



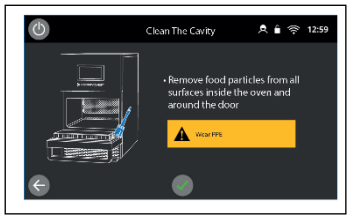
4. Once the cooling process is complete, remove the cook plate and pan of water if used. Then follow the screen instructions - the oven is now ready for cleaning.

⚠ Do not leave the pan of water in the oven overnight.

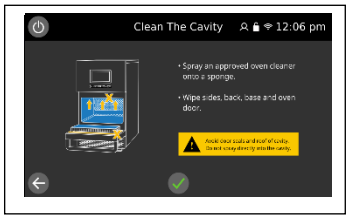
⚠ Pan and water may be hot. Use heat proof gloves.

Clean the cold oven.

⚠ Wear PPE

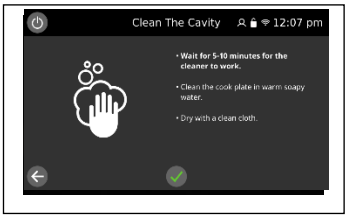


5. Use a dry clean brush to remove any food particles from between the cavity floor and the inside of the front door.



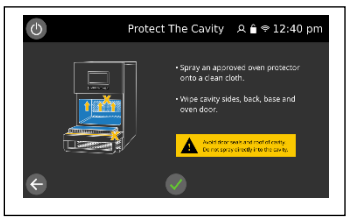
6. Spray Merrychef® approved cleaner onto a sponge and wipe onto the sides of the inside of the oven, the back, the base and the oven door. Avoid the roof and door seal.

⚠ Do not spray directly into the cavity. Avoid the roof and door seal.

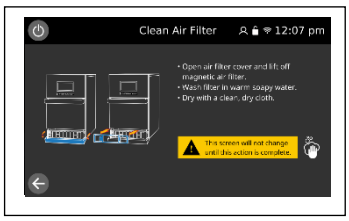


7. Wait 5 -10 minutes for the cleaner to work and clean the cook plate.

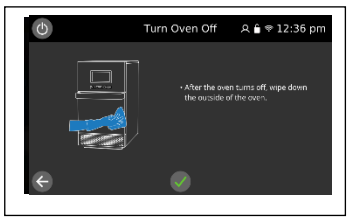
8. Clean the cavity with a non-abrasive sponge. Wipe off the cleaner with a wet cloth, ensuring all cleaning chemicals and debris are removed. The cavity roof and door seal can also be gently wiped, if necessary, to removefood debris. Dry with a clean dry cloth.



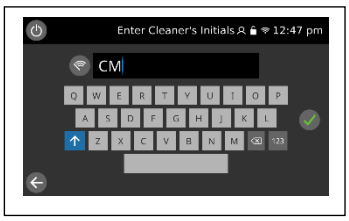
9. If instructed spray Merrychef approved protector onto a clean cloth and wipe cavity side, back and oven door. Refit the cook plate.



10. Remove the air filter and wipe it clean or wash in soapy water. Dry and replace.



11. After the oven switches off. Wipe the outside of the oven with a clean sanitisedcloth.



12. If instructed enter the cleaners' initials. The oven will switch off on completion.

WARNING: Do not use the oven without a clean filter in place. Do not use caustic cleaners in the oven cavity as they cause permanent damage to the catalytic converters. Do not use tools, sharp implements, or harsh abrasives on any part of the oven.

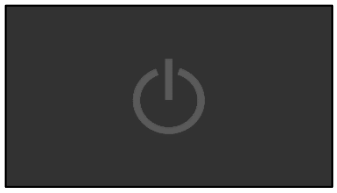
4.4 Using a USB stick.

Port location.

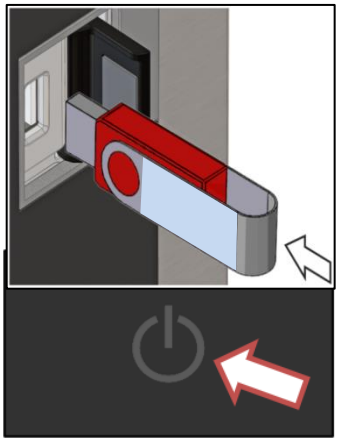
The USB port is located behind a cover to the right of user interface. (UI)
The USB cover protects the USB port so that no water vapour can get into the control electronics during cooking or cleaning.
During cooking and cleaning, there must not be a USB stick inserted and the USB port must be closed.

USB menu downloads & instructions go to [Merrychef - Merrychef conneX®12]

Uploading a new recipe file from a USB will overwrite all the existing programs in the memory.



1. With the appliance switched OFF.



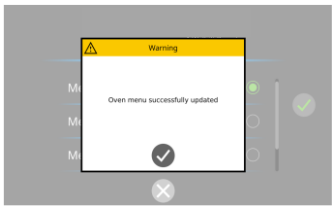
2. Open the cover to access the USB port.

3. Plug in the USB.

4. Switch the appliance ON.

5. After the Welbilt start-up screens, the oven will display the menu, or choices of menus that can be selected of the USB.

6. Select menu file and then the green tick.



7. Select the tick on completion to end.

8. Unplug the USB memory stick.

5A. After the Welbilt start-up screens, the oven will display the menu, or choices of menus that can be selected of the USB.

Menus can also be downloaded onto the oven through settings / updates, without the need to turn off the oven first.

Load only the correct complete menu file onto the USB memory stick and not a single cook menu.

4.5 Firmware updates.

Important note:

Procedures for accessing the latest firmware and loading instructions can be found by going to the below website.

The menu upload guide can be found under the guides tab.

https://www.merrycheftechnical.com

UI Micro-SD card & IO PM replacement.

The UI contains the main operating firmware, serial number, temperature calibration, eventlog, communication profiles, cooking profiles, application icons and the recipe images.

NOTE – You must transfer the original PM module or SD card when replacing either the IO or UI assembly.

NOTE – See the website for the latest firmware instructions by following the link -

See section 6.11 for replacing components.

SD card location on the UI screen.

PM module location on the IO board.

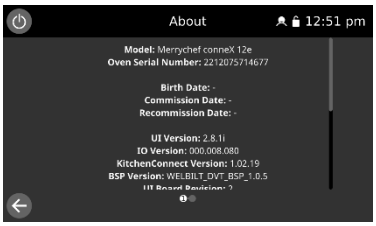
IO firmware update.

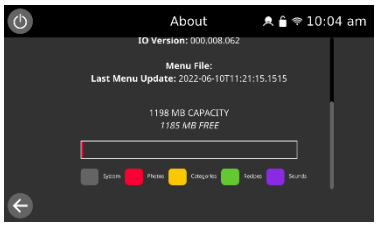
NOTE - IO firmware updates will only be recommended by a service technician under their direct supervision.

1. To update the IO Firmware, select the 'Update IO Firmware' tab.

2.Select the appropriate IO file and then the green tick. The IO firmware will then start updating.

Confirming the firmware updates.





After an update of the appliance firmware check to ensure the latest firmware has been successfully loaded on to the oven. Once the oven is switched back on select the power symbol and then select the information 'i' button.

Review the data displayed. Select the back arrow to return to the previous screen, the information can also be selected from the main screen/ settings.

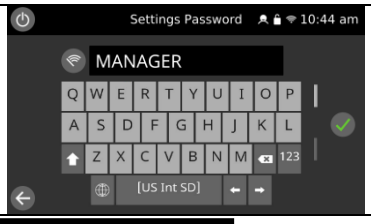
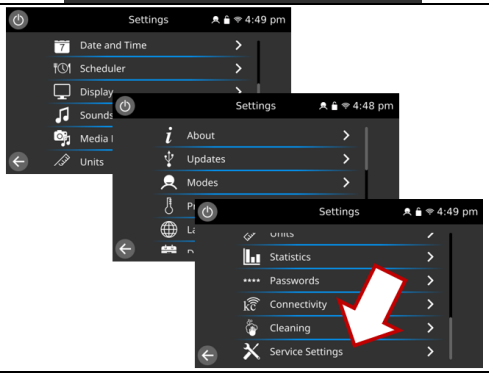
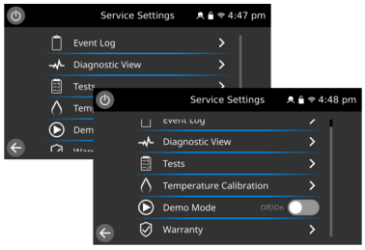
5 Service information.

5.1 Service procedure.

Servicing procedure:

1. Disconnect and isolate the appliance from the power supply, (LOTO).
2. Check the appliance is correctly installed as described in the service manual.
3. Visually check the cleanliness & condition of the power supply cable, casing, cavity and door of the appliance for signs of wear, damage, distortion etc, if required, refer to the “Replacing components" section of this manual (section 6).
4. Complete an "Earth/Insulation test" (see section 5.6 of this manual) on the appliance before switching on.
5. Check the display for error messages, if an error is shown, refer to the “Fault Finding” within section 5.3 of this manual.
6. If a firmware update is required refer to page 35.

Enter service mode.

	1. Switch on the oven and wait until the Merrychef screen is displayed then select the settings icon.
	2. Enter the user password "MANAGER" on the keypad or the full serial number if the password is not recognised.
	3. Scroll down and select service Settings.
	4. Enter the service password “SERVICE” on the keypad or the full serial number if the password is not recognised then select OK (green tick) to display the service menu.
	5. Select the relevant tab to access the following - ▪ Event log. ▪ Diagnostic view. ▪ Tests. ▪ Temperature calibration screen. ▪ Demonstration mode.
	Select the back arrow at any point to return to the previous screen, or to exit the Service Settings.

Functions of the service settings

Event Log
Check the Event Log for error log information and error codes.

Diagnostic View
Check the operational of the ovens main components by selecting the component on the screen.
NOTE – Always ensure there is a load inside the cavity when running the magnetrons.
Check the supply voltage & frequency and ambient temperatures.

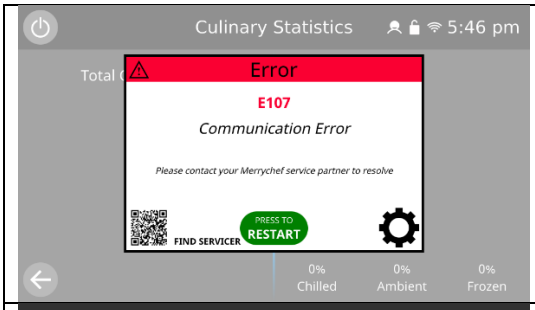
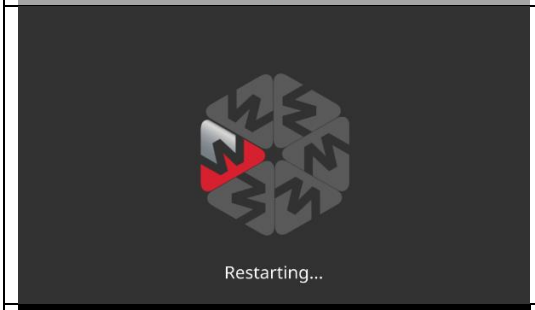
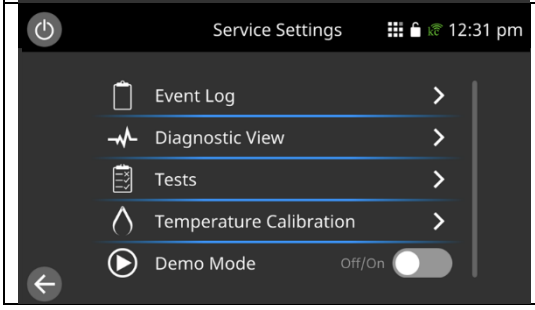
Tests
Tests the functions of your microwave combination oven as described in the "Testing selected components", see section 5.6 of this manual.
If required, refer to the "Replacing components" section 6 for any repairs needed before continuing with the tests, follow the procedures in the recommissioning test before using the appliance for use, these tests should be completed before and after all repair and maintenance procedures.

Temperature Calibration
To enter the oven cavity temperature calibration mode – Password is (tcomp).

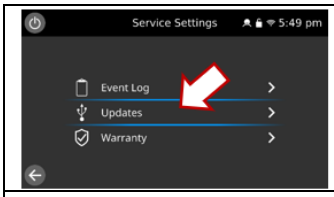
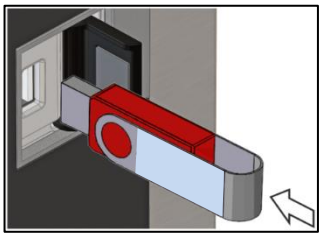
Demo Mode
Directly selectable using the slide 'on/off' button to place the oven in demonstration mode. In demonstration mode the appliance operates normally but does not engage the microwave or heater circuits.

5.2 Errors and diagnostics.

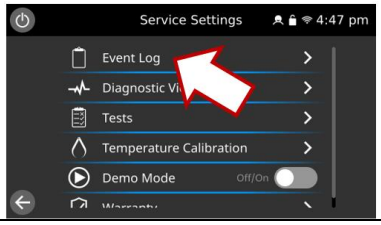
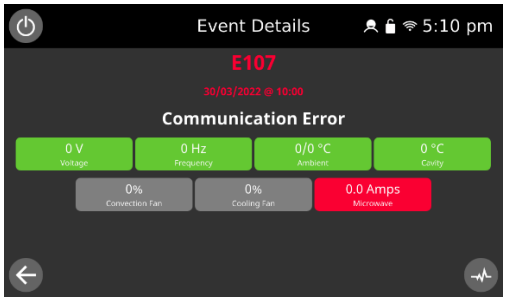
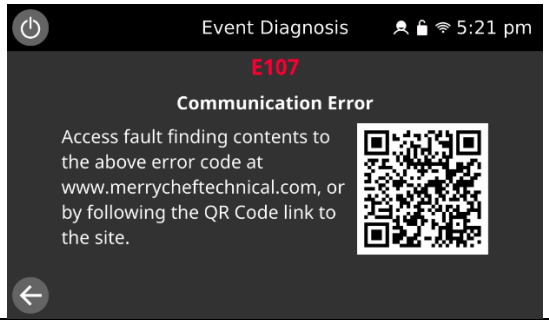
Error messages.

	A code number and description of the type of error is shown. Refer to the error codes ("Fault finding" within section 5.3 of this manual) for more details. The displayed QR code can be scanned with a smart phone to access the Merrychef technical support website.
	The 'Restart' button can be selected to 'reboot' the appliance. If the fault remains, the appliance will display the error again and prevent operation of the oven.
	Service settings screen. ▪ Event Log ▪ Diagnostic View. ▪ Tests. ▪ Temperature calibration – Password (tcomp). ▪ Demo mode.

Copying the event log to USB.

 	1. Enter Settings and select 'Updates'.
	2. Open the USB cover and insert the USB into the USB port.
	3. Select 'Download to USB' on the Updates/Downloads screen.
	4. A pop up screen confirms completion of the download. Select the grey tick and remove the USB from the appliance.
	5. Return to the main menu using the back key on the bottom left-hand corner of the screen.

Event log.

	1. Enter the Service Settings and select 'Event Log' to display a listing of oven component errors & events.
	2. The Log can be displayed by Day, Week, Month or Year as selected.
	3. Selecting 'Details' shows more information pertaining to the entry. ▪ Event code. ▪ Time and date of the entry. ▪ Event description. ▪ Supply voltage. ▪ Supply frequency. ▪ UI & IO board ambient temperatures. ▪ Cavity temperature. ▪ Convection fan speed (%). ▪ Cooling fan speed (%). ▪ Magnetron(s) current draw.
	The diagnostics view screen can be accessed by selecting the button in the bottom right of the screen. 4. Selecting 'Diagnose' provides a QR code to access further assistance online.

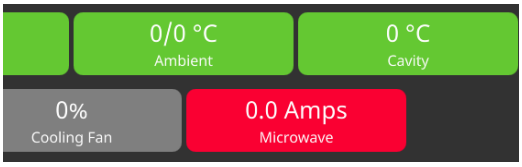
ing

Further details can be read by copying the event log to a USB and opening the files on a computer.

Name	Date Modified	Size	Kind
welbilt	Yesterday at 09:29	--	Folder
firmware	Yesterday at 09:29	--	Folder
iofirmware	Yesterday at 18:08	--	Folder
menu	Yesterday at 09:29	--	Folder
service	Today at 07:31	--	Folder
errorlogs	Today at 08:51	--	Folder
2020-11-08_to_2020-11-16_events	Today at 07:31	1 KB	Unix Ex...able File
2021-02-28_to_2021-03-08_events	Today at 07:31	50 bytes	Unix Ex...able File
2021-05-23_to_2021-05-31_events	Today at 07:31	702 bytes	Unix Ex...able File
2021-06-06_to_2021-06-14_events	Today at 07:31	652 bytes	Unix Ex...able File
2021-06-13_to_2021-06-21_events	Today at 07:31	166 bytes	Unix Ex...able File
2021-06-20_to_2021-06-28_events	Today at 07:31	154 bytes	Unix Ex...able File
2021-07-18_to_2021-07-26_events	Today at 07:31	699 bytes	Unix Ex...able File
2021-07-25_to_2021-08-02_events	Today at 07:31	565 bytes	Unix Ex...able File
2021-08-08_to_2021-08-16_events	Today at 07:31	51 bytes	Unix Ex...able File
2021-08-15_to_2021-08-23_events	Today at 07:31	51 bytes	Unix Ex...able File
2021-08-22_to_2021-08-30_events	Today at 07:31	166 bytes	Unix Ex...able File
2021-09-05_to_2021-09-13_events	Today at 07:31	620 bytes	Unix Ex...able File
2021-10-10_to_2021-10-18_events	Today at 07:31	862 bytes	Unix Ex...able File
2021-10-17_to_2021-10-25_events	Today at 07:31	231 bytes	Unix Ex...able File
2021-10-17_to_2021-10-25_events.csv	Today at 07:31	180 bytes	CSV Document
errors	Today at 07:31	2 KB	Unix Ex...able File

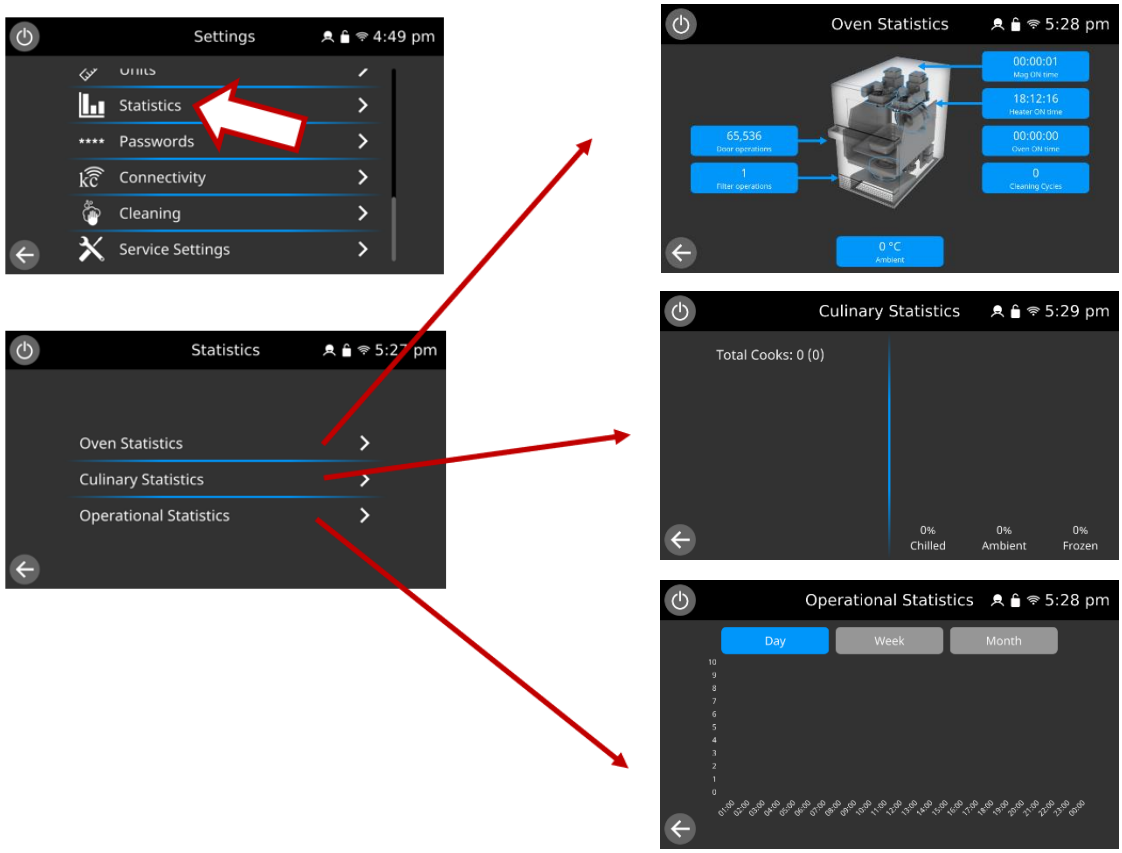
Display colour codes.

Grey = Normal operation / standby
Green = On / OK
Blue = Off / OK / Selected
Yellow = Warning, out of normal range
Red = Warning, switched off



Operational statistics.

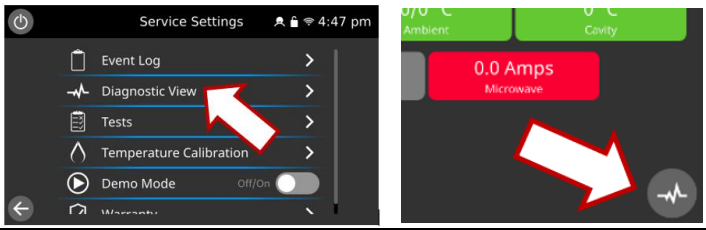
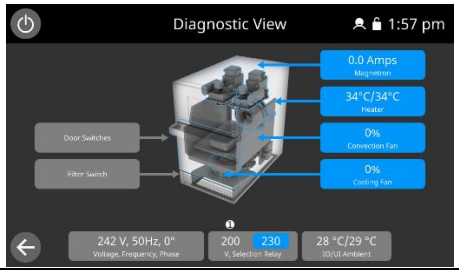
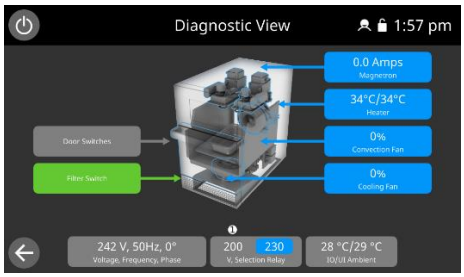
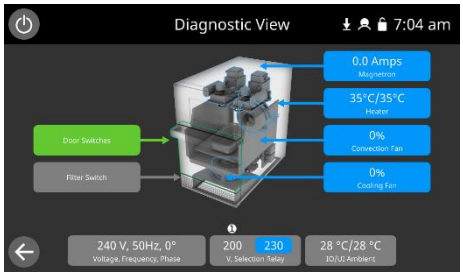
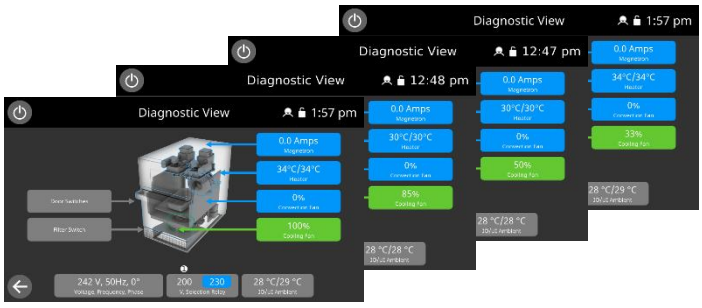
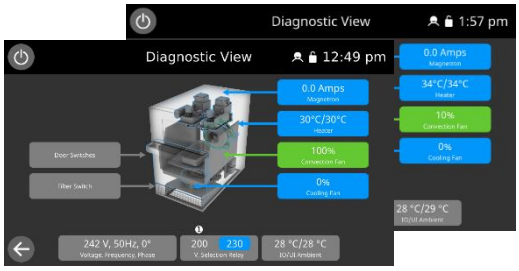
Additional detail from the oven statistics may provide further information for in-depth fault diagnosis.

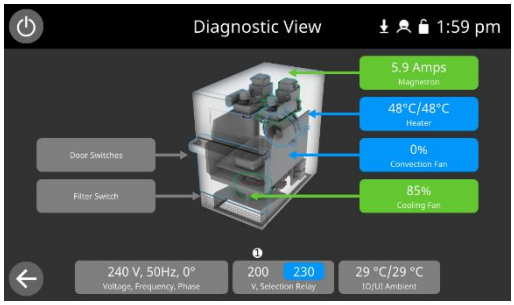


Details.

- Magnetron operating hours.
- Number of door openings.
- Number of times the filter is removed.
- Heating element(s) operating hours.
- Total oven time in hours.
- Number of completed cleaning cycles.
- Ambient temperature around the control circuitry.
- Number of individual recipe cook cycles.
- Percentage of ambient, chilled & frozen food products cooked.
- Time breakdown of oven operation by day, week or month.

Diagnostic view.

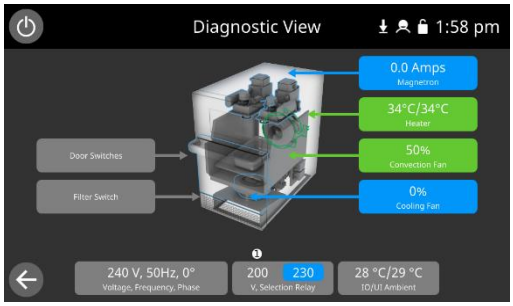
	1. Select 'diagnostic view' from the service settings to check the main components of the appliance. Diagnostic view can also be selected from the 'Event Details' screen in the Event Log.
	2. Select a component symbol to switch on (green). Select again to increase the level (remains green) or turn off (blue).
	3. Remove the air filter at the front of the oven. The colour of the air filter symbol on the display should change from grey to green indicating that the microswitch circuit for the air filter is operating correctly. Replace the air filter and the colour should change back to grey.
	4. Open the oven door. Check the colour of the door symbol changes from grey to green on the display to check that the door microswitch / interlock circuit is operating. Place door spacers onto the oven door (refer to "Adjusting the door microswitches / interlocks" in the "Replacing components" within section 6.5 for details), to confirm the door switches are adjusted correctly. Close the door and check the colour of the door symbol on the display.
	5. Select the cooling fan and check if it is operating correctly. Repeated presses will increase the fan speed, noticed by an increase in the fan noise and volume of air flow through the filter (off / 33%, 50%, 85% / 100% / off).
	6. Select the convection fan and check if it is operating correctly. When increasing the fan power gradually, in 10% increments, to 100% the fan noise should become louder.



7. Place a microwave safe container of water into the cavity and close the oven door.
Select a magnetron to test operation and display the current draw at maximum output. This will time-out after 30 seconds (the cooling fan will automatically run during the test).

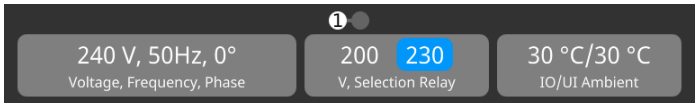
Individual magnetron test:
If during the magnetron test the displayed current is 0 A and the E101 error occurs, then the failure can be found in the 230V circuit. Refer to the schematics to find the fault for repair (IO Board, connections, HV primary winding).
If during the magnetron test a low current draw is seen (around 3A) and the E101 error occurs, then the failure can be found in the high voltage circuit. Isolate the power supply and test the high voltage components (HV transformer, diode, capacitor, magnetron and connections) to find the fault for repair. Never measure the high voltage circuit live. See "Replacing components" within section 6 of this manual.

Note: The operating magnetron will be displayed green.



8. Select the heater. The heating element runs for 5 minutes. Selecting the heater again will turn it off. The convection fan automatically runs at 50% by default (the fan speed can be manually altered up to 100%).

Check the cavity temperatures are correct. Both displayed temperatures (thermocouple reading & calculated cavity temperature) should be similar.



9. Further diagnostic information can be found below the oven picture:

- Mains supply Voltage & Frequency.
- The IO voltage selection for the HV transformer. The selection is highlighted in blue.
- The ambient air temperature around the IO & UI boards.

Information at the top of the screen indicates:

- Demo mode (if selected)
- Mode of operation
- Cooking programs (changes) locked or unlocked.
- Wi-Fi connectivity (displayed red when unable to connect)
- Current time

5.3 Fault finding.

Hardware control components.

Operations communication:

1. The oven has two main controlling parts, being the User Interface 'UI' assembly (keyboard, screen, logic) and the Inputs & Outputs 'IO' Board (to switch and monitor the required operation).
2. The UI is the master of the oven and instructs the IO what to do, in turn the IO communicates information on the operation back to the UI.
3. The UI and IO have their own Personality Module (PM) fitted with the respective software to be able to communicate and work with each other.
4. The power provision to the UI and the communication between UI and IO is enabled via ONE cable with a multipin (12 pin X523) connector fitted.

Start-up sequence

Once the mains power is switched ON, the UI & IO boards boot up. The screen displays 'Loading...' during this process. The screen then goes blank before the on switch appears in the centre of the screen. When the oven switch is switched ON, by tapping the centre of the screen, the display scrolls through the Welbilt brands before settling on the Merrychef Screen. The safety relays energise and then the auxiliary components start running – microwave Stirrer Motor(s), Cooling Fan & Convection Fan. From here the oven information can be viewed and the oven settings can also be accessed by pressing the appropriate button. If the oven information or settings buttons are not selected, after 5 seconds the oven then preheats or displays a preheat temperature choice when more than one is configured on the oven. Once preheated the oven displays the main menu if in "Full-service mode", a recipe selection if in "Quick service mode", a recipe selection if in "Press & Go mode" or a "manual mode" dependant on the oven configuration.

Shutting down sequence

When the oven is switched OFF the oven enters the cooling mode and the microwave and heater safety relays de-energise. As part of the cleaning process, the cooling fan and convection fan operate until the cabinet temperature has been sufficiently reduced to a cavity temperature of 50°C (122°F). On completion of the cleaning process the screen will return to the on-switch display. The UI & IO boards remain active whilst a mains power supply is present.

Reboot

At any point the oven can be 'rebooted' by pressing and holding the off button in the top left-hand corner of the screen.

Exchanging data via USB interface.

Loading menus/firmware from a USB memory stick and downloading the menu/recipe counters/error log to a USB memory stick is covered in sections 4.4 & 4.5 within this service & repair manual.

Error codes & fault-finding tips.

Please adhere to all best safety practices by Merrychef and ensure the High Voltage circuitry has been successfully discharged before attempting any works on or around the Merrychef unit while the panels are off. Further information can be found at: **https://www.merrycheftechnical.com/**
If in doubt, please contact your Merrychef/Welbilt® technical support team for support.

Note: The event log can be accessed directly during an error condition, without switching the oven off and on, by selecting the settings icon.

Error	Problem	Solution
E88: SUPPLY VOLTAGE ERROR UI displays; *E088 Supply voltage out of range. Please contact your Merrychef service partner to resolve.*	Mains supply voltage <180VAC or >264VAC mains supply	Check mains supply voltage and compare with displayed voltage in diagnostic view. If similar the fault lies within the kitchen mains supply. If significantly different, check all connections from the mains supply to the IO board. If correct, replace IO board.
E101: Magnetron system failed on request. UI displays: *E101 Microwave not responding. Please contact your Merrychef service partner to resolve.*	The oven asked for microwave power, but the dynamic measurement of microwave percentage power is too low. (The ampere values during microwave operation help determine where the fault is located).	Use Diagnostic View in the service mode for testing the magnetron. 5.5 – 6 Amps. Zero amps (0A) indicates a fault in the primary circuit (wiring from the IO board to the and including the HV Transformer). A current draw lower than 5A indicates a fault in the secondary circuit (wiring and components after and including the HV transformer). Isolate the power supply and test the high voltage components HV transformer, diode, capacitor, magnetron and connections to find the fault for repair. DO NOT SUSPECT IT'S THE MAGNETRON AT FAULT FIRST Go to the event logs, is the mains voltage normal at time of fault? (Note that the current draw detailed in the event log is the sum of all magnetrons fitted, test one at a time). Voltage too low, <10% of nominal voltage; There may not be enough voltage to start the magnetron. If the above did not resolve the issue, check all the LV connections are tightly fitted, from the incoming power supply through the Filter, Fuses F5 & F6, Door Switches, IO board and from the IO board to the HV transformer. The connections on the HV side from the HV Transformer through the Capacitor, HV Diode and Magnetron. Also check the HV Transformer is firmly bolted down (the body of the transformer forms part of the HV circuit). There are many connections so each of them is important to be tightly connected and checked. Most important connection: "the loose one" (ensure all connections are solid and in good working condition).
E102: HEATER FAILED UI displays; *E102 heater on without request. Please contact your Merrychef service partner to resolve.*	The cavity reaches 75°C above setpoint for >30 minutes or above 300°C	The heating element has energised even though the controller hasn't asked for heating. This typically happens when the output Triac has short circuited. Check temperature probe is reading a reasonable temperature. Check temperature probe connections IO X530 Change the UI board and check carefully all related circuitry including loose wiring and connections. Ensure the oven cabinet is clean and there are no leaks from the cavity.

E103: Ambient Overheat 3 different error states, see solution 'UI displays:'	The ambient temperature around the UI & IO boards are >65°C, insufficient cooling of the components. Frequently observed when the customer forgets to clean the front filter.	The Air Filter must be cleaned daily. Check that the oven is not installed near to a heat source enabling the cooling fan to draw in hot or grease laden air via the Front Filter. Check that the Cooling Fan is operating correctly: Inspect and ensure that the cooling fan is running freely and that the speed is correct. If the speed is very slow and running freely replace the cooling fan capacitor. The wiring of the capacitor is sensitive, ensure you connect the wiring like for like, otherwise the fan will rotate in the opposite direction. The fan should run counter clockwise (looking down from above) drawing air from the centre of the fan into the component interior of the oven, creating a positive cabinet air pressure. That's why the panels should all be correctly installed as it is part of the design to ensure proper air flow and cooling. The error will remain until the board temperatures drop below 65°C. Check the board temperatures in the event log and in visual view (in service mode). UI temperatures significantly higher than the IO can indicate a poor door seal. UI displays: • Message 1 if Ambient >70°C, Pre air filter removal. *"Ambient overheat detected, please remove, replace and clean the air filter located below the door".* • Message 2 if Ambient >70°C for <2mins air filter removed and replaced, *"Oven cooling please wait".* if Ambient <70°C for <2mins air filter removed and replaced, Oven power cycles, returns to normal operation. • Message 3 if Ambient >70°C >2Mins, air filter removed and replaced. *"E103 ambient overheat.* *Please contact your Merrychef service partner to resolve".* Restart button displayed.
E104: cavity overheat stat released. UI displays: *E104 Cavity Overheat stat triggered. Please contact your Merrychef service partner to resolve.*	The safety thermostat circuit (12vdc) is open circuit - IO connections X512.	Manually reset the cavity overheat thermostat at the rear of the oven. Check the connections on the cavity overheat thermostat and IO board X512. Check the continuity of cavity overheat thermostat. Check Cavity overheat thermostat LED14 on the IO board. Check temperature probe is readings a reasonable temperature. The cavity overheat thermostat typically trips if the mains power is disconnected at the end of service without allowing the cavity to sufficiently cool down first. Noticed by the E104 error occurring at the beginning of service the next day.
E105: Mains Supply Frequency Issue. UI displays; *E105 Mains Supply Frequency Issue. Please contact your Merrychef service provider to resolve.*	Mains supply frequency is ±2Hz from nominal.	Mains supply frequency is ±2Hz from nominal or interference e.g., an internal microwave leak? Most of the issues found here are related to an unstable power supply of the building, i.e., Generators. It is recommended to check the supply and/or analyse the error log on a computer. Ensure there are no microwave leaks by inspecting the unit with a suitable microwave leak detector. Ensure there is a bowl (suitable for microwaves) of water (250ml cold) and activate a microwave leak test in the service screen mode. Check around the door seals front and rear of the unit. If microwave leaks are observed (if a level of 5mW/cm^2 or higher is observed the oven must not be used until repaired) unplug from the mains and investigate. Note: there should be no microwave leakage and corrections should be made if any leakage is detected above 0.5mW/cm^2. Check for damaged cavity thermocouple.

E106: Cavity overheat. UI displays: *E106 cavity overheat detected. Please contact your Merrychef service partner to resolve.*	The cavity reaches 75ºC above setpoint or above 300ºC during a cook cycle.	See E102. Check for possible signs of a product fire in. the cavity.
E107: Comm Error. UI displays; *E107 UI – IO Communication failure. Please contact your Merrychef service partner to resolve.*	E107 observed in the event log	Ensure cable connections are secure, especially the X523 connected cable between the IO and the UI boards. Replace the Communication cable between the UI and IO boards as required.
E108: UI Micro-SD FAILED. UI displays; *E108 UI SD card error. Please contact your Merrychef service partner to resolve.*	Missing or corrupt Micro-SD card.	Check the Micro-SD card is correctly in place on the UI board.Replace Micro-SD card. Ensure the correct Micro-SD has been inserted to the UI, an easy mistake to make if theUI is replaced, don't forget to transfer the Micro-SD from the old UI to the new UI. Loading of new up to date firmware is a must.
E109: IO PM Error. UI displays; E109 IO PM error. *Please contact your Merrychef service partner to resolve.*	The PM code is incorrect for the IO board.	Check the PM chip is correctly in place on the IO board. Replace PM chip. The UI has a dedicated part number on the PM chip, which is unique for UI board. Ensure the correct PM chip has been inserted to the IO board, an easy mistake to if the IO board is replaced, don't forget to transfer the PM from the old IO to the new Io board if replaced. Loading of new up to date firmware is a must.
E110: IO VERSION CONFLICT UI displays; *E110 IO firmware error. Please contact your Merrychef service partner to resolve.*	Incompatible firmware versions on the IO & UI boards. Can occur on replacement of either boards or during incorrect loading of firmware.	Download the up-to-date firmware from https://www.merrycheftechnical.com Load the latest firmware on to the oven. Do not switch off or interrupt until the loading process of all files has completed. In the event of a continued issue, replace both the IO PM and reload the firmware. Ensure there are no microwave leaks present around the control boards.

E111: Cavity Sensor Failure UI displays; *E111 Cavity Sensor Failure. Please contact your Merrychef service partner to resolve.*	Cavity thermocouple damaged or unplugged (open circuit).	Check that the thermocouple is correctly fitted and secure on to the IO board connection X530. If the thermocouple generates erratic values, or is more than 25ºC out of range, it will need to be replaced if the connection is in good condition and intact. If the fault reoccurs after replacing the thermocouple, replace the IO board. Check the error log. If the cavity temp reads 328ºC the sensor was open circuit or not connected. A closed circuit will register the IO board temperature and will not generate the E111 error.
E112: IO BOARD TEMP SENSOR UI displays; *E112 IO Board Temperature sensor failure. Please contact your Merrychef service partner to resolve.*	Ambient temperature sensor failure on the IO board.	IO board failure. Replace IO board (Don't forget to remove the old PM chip and insert into the new IO board). Download the up to date firmware from **merrycheftechnical.com** and load on to the oven if required.
E113: MAGNETRON ON WITHOUT REQUEST. UI displays; *E113 Microwave on Without Request. Please contact your Merrychef service partner to resolve.*	A current draw >1A detected on the IO board when the microwave circuit is switched off.	IO board failure. Replace IO board (Don't forget to remove the old PM chip andinsert into the new IO board). Download the up-to-date firmware from https://www.merrycheftechnical.com and load on to the oven.
E116: Heater Not Responding UI displays: *E116 Heater not responding. Please contact your Merrychef service partner to resolve.*	The oven asked for heating but did not reach 100ºC within 30 minutes.	Check all the connections are in good condition and secure, from the incoming power supply through the Filter, Fuses F3 & F4, IO board and the heating element. The heater element rarely fails, checking all the connections first is imperative. Ensure you counter hold the rear bolt of the element connections before tightening the front nut on the element. Lastly replace IO board.

E117: Magnetron overheat. 3 different error states, see solution 'UI displays:	The safety thermostat circuit (12vdc) is open circuit - IO connections X513.	Check the connections on the cavity overheat thermostat and IO board X513. Check the continuity of magnetron overheat thermostat. Check magnetron overheat thermostat LED16 on the IO board. The magnetron overheat thermostat should automatically reset once it has cooled down. A magnetron overheat is typically caused by a lack of cooling. Check the board temperatures in the event log to determine the cabinet air temperature at the time of the failure. Check the magnetron cooling fins (heat sink) are clean and free from dust, debris and grease build up, clean as required. Sufficient cooling is required, please ensure all panels are fitted correctly and do not have any cooling leakages from around the panel work. Check the cooling fan operation. Check / clean the air filter. Check the air curtain at the front of the unit for sufficient cooling. NOTE: If the magnetrons are tested without the ovens panels in place, which is **NOT RECOMMENDED**, the lack of air flow will cause the magnetron(s) to overheat and cause the magnetron overheat thermostat(s) to open circuit. The panels are designed to guide the cooling air sufficiently through the cooling fins in a forced airflow manner. UI displays: • Message 1 if Mag stat >125°C, open circuit, Pre air filter removal *"E117 Magnetron overheat detected. Please remove and clean the air filter located below the door".* • Message 2 if Mag stat >125°C, open circuit, <2minutes, post air filter removal *"Magnetron overheat recovery, Oven Cooling, please wait".* if Mag stat <125°C, closed circuit, <2minutes, post air filter removal the oven power cycles and returns to normal operation. • Message 3 if Mag stat >125°C, open circuit, >2minutes, post air filter removal *"E117 Magnetron overheat " recovery unsuccessful, please contact your Merrychef service partner to resolve."* Restart button displayed
E-1 Unknown Error	Internal error.	Download the up-to-date firmware from https://www.merrycheftechnical.com and load on tothe oven.
E0: X510 jumper is missing. UI displays: *E-1 Insert X510 jumper into the correct position*	Jumper missing on replacement of new IO board.	Install a jumper across the front two pins of connection X510 on the IO board. If fault remains, new IO board required.

Warning Event / Error Codes generated during operations:

Error	Problem	Solution
E84: Invalid date. *Event log only.*	Invalid date detected at start-up.	Enter correct date and time in settings. For repeated events, download the latest firmware from **merrycheftechnical.com** and load on to the oven.
E98: Incomplete cleaning. *Event log only.*	Cleaning sequence not completed by Operator.	Complete cleaning process as instructed.
E99: Air Filter Override. *Event log only (for display see solution).*	Operator selected continue when filter was removed (filter microswitch was open circuit).	Check filter magnet, filter microswitch & connections. Operator warning message = "**Air filter removed**. Please replace the air filter to continue. *(By selecting cancel and overriding the air filter monitoring this will be logged.)*".

Information Event Codes:

Error	Problem	Solution
E81: Firmware updated. *Event log only.*	UI or IO Firmware has been updated.	Solution not required
E82: menu updated. *Event log only.*	Menu file has been updated.	Solution not required
E86: Soft Power On. *Event log only.*	U/I on switch used.	Solution not required if events correspond with normal operation.
E87: Completed Cleaning Sequence. *Event log only.*	Cleaning sequence completed.	Solution not required if events correspond with normal operation.
E100: Main Power On *Event log only*	IO board supplied with 12V once mains power is switched on.	Solution not required if events correspond with normal operation.

Error Codes generated during recommission test:

E89: Recommission Cooling Test Failed — User input 'X' (to confirm not working) or timed out
E90: Recommission Convection Fan Test Failed — User input 'X' (to confirm not working) or timed out
E92: Recommission Heater Test Failed — <10°C cavity temperature rise within 90 seconds
E93: Recommission Magnetron Test Failed — <1.25A current draw recorded on magnetron.
E94: Recommission Filter in Test Failed — No user action registered within 10 seconds. Filter microswitch signal remained open circuit, check filter microswitch & connections.
E95: Recommission Filter Out Failed — No user action registered within 10 seconds. Filter microswitch signal remained closed circuit, check filter microswitch & connections.
E96: Recommission Door Close Failed — No user action registered within 10 seconds. Door switch circuit remained. open circuit, check door switches & connections
E97: Recommission Door Open Failed — No user action registered within 10 seconds. Door switch circuit remained. closed circuit, check door switches & connections

Additional Errors / Faults

Error	Problem	Solution
Door open	Door open continuously displayed when the door is closed	Check fuses F5 & F6, if blown replace door switches Check door switches are adjusted correctly. Check oven door hinges are fitted / working correctly Check all wiring and connections. Check L1 is present on twin phase ovens
No USB Memory detected	Unable to read inserted USB Memory	Incorrectly formatted USB Memory. Re-format and re-load files. Slow key, or large file, allow further time for oven to read USB Memory.
Components not operating correctly	Components not operating correctly in diagnostic view	Check shunts are correctly fitted in X515 & X516 on the IO Board.

5.4 Safe working when testing components.

For your safety when testing oven components.

Before starting oven tests, familiarize yourself with the rules and hazard warnings in section 2 'For your safety', specifically section 2.14 'Safe working when testing components'.

5.5 Requirements.

Equipment required for testing the appliance.

HV Capacitor discharge tool. Portable Appliance Tester (P.A.T.). Digital Multi-Meter (D.M.M.). Proprietary voltage detector Electrical lock out tools & equipment Megger / similar 500 V d. c. Insulation tester. Microwave detection / leakage meter (calibrated). Temperature reader (calibrated) Microwave safe 600 ml glass beaker Microwave safe 2 litre container	5.5 mm socket Torque wrench Door Spacer Kit 4mm / 2mm 1000 volt rated general hand tools 1000-volt proof insulted rubber gloves. PPE

5.6 Testing selected components (casing mounted).

Technical advisory notice: PAT testing of Merrychef® ovens.

While testing with a Portable Appliance Tester (PAT) is not an automatic requirement for the Merrychef commercial combination microwave oven models, the following notice is to advise on this testing in addition to the following instructions as deemed necessary.
If the customer requires PAT testing of the Merrychef equipment, we suggest this is limited to a) earth continuity and b) insulation resistance (measured at ~ 500 V DC). All Merrychef commercial combination microwave ovens are classified as CLASS 1 for the purpose of testing.
Should it still be deemed necessary by the customer to perform an Earth Leakage test, the following advice should be adhered to. Note that not all PATs are capable of just measuring the leakage or allow you to set a pass limit and therefore may not be appropriate for this test.

⚠ WARNIG
High leakage current.
Merrychef appliances are fitted with radio interference filters and inverter circuits which cause an increase in leakage current. The PAT may indicate an erroneous failure condition depending on its internal "pass"/"fail" settings. Please refer to the revised limits which apply to the specific Merrychef oven model.

Model	Model maximum limit applied with radio interference filter fitted
conneX®12e	10 mA

⚠ WARNING

Never touch the component under test while tests are being carried through.

- Call a trained authorized Merrychef service agent if the oven under test still fails in order to check all earth connections and disconnect the radio interference filters before repeating the test if required.

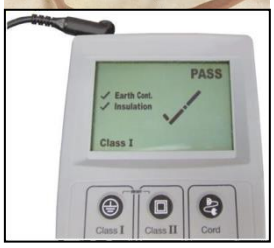
Earth/insulation test.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.

1. Connect the mains lead from the appliance to a portable appliance tester.

2. Connect the earth from the portable appliance tester to the equipotential bonding point on the oven.



3. Place the portable appliance tester in an open area, such as the floor, away from any persons.

.

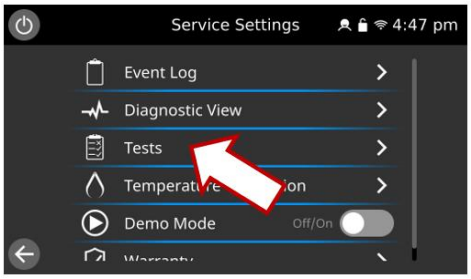
Perform a Class 1 test in accordance with tester instructions.

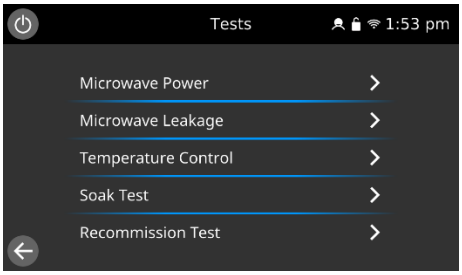
- A PASS indicates the oven earthing circuit is functioning correctly.
- If a FAIL is indicated (i.e., unit exceeds maximum limit), remove the casing of the appliance and check ALL earth connections. Then repeat the Class 1 test.

⚠ WARNING

Never operate an appliance that has failed this test as it could be potentially dangerous.

Service settings: Tests.



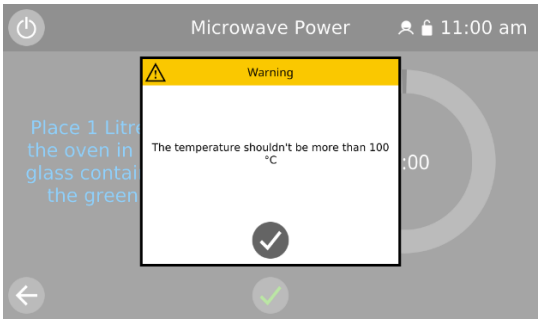


Enter Service Settings screen and select 'Tests'. For details see "Accessing the service information" section 5.1. Select the required individual test for the appliance to perform.

Microwave power test: measuring the microwave power output of the magnetron.

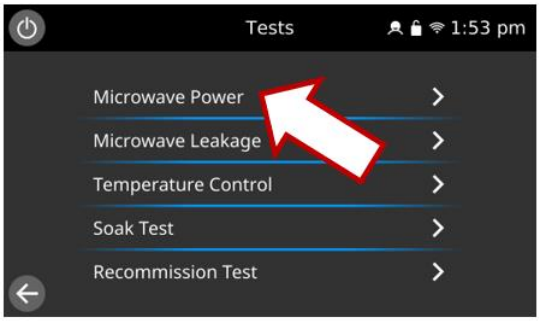
Check that the following requirements have been met:

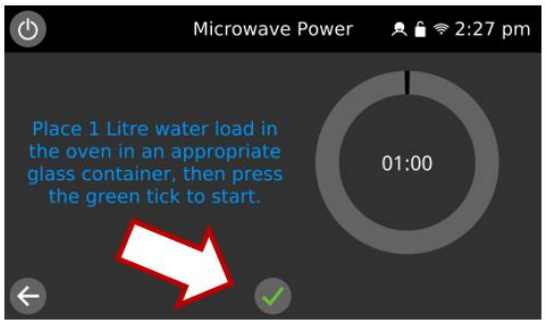
- The appliance is cool. This test will not operate at a cavity temperature of 100ºC or above.



NOTE:
The power output is established under IEC 705 standard method which is only workable in laboratory-controlled conditions. The power output is also affected by line voltage under load, so this test is an approximation only.

1. Ensure the cavity is close to ambient temperature.
2. Enter the Service Settings / Tests.
3. Fill a microwave safe container (glass or plastic) with one litre (1.76 pints) of cool tap water, ideally at 10°C (50°F).
4. Measure and record the water temperature in the container using a thermometer capable of reading ±0.1ºC increments.
5. Place the container centrally into the cavity.
6. Select 'Microwave Power' from the service settings tests (microwave power 100% for 60 seconds, convection fan at 10%).





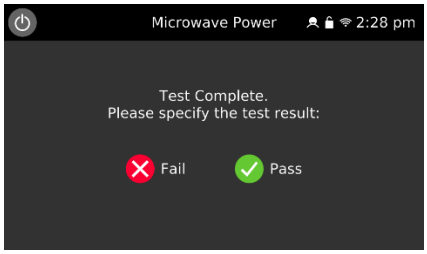
1. When the countdown has finished, remove the container from the cavity. Immediately stir with a plastic implement and measure the water temperature.

2. Calculate the temperature rise of the water (end temperature minus the start temperature).

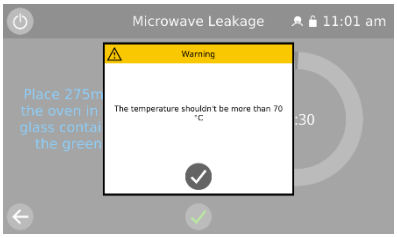
- The temperature rise should be 11.4°C (52.52°F) ±10% for the 800W variant.
- If the temperature rise is outside these limits repeat test and/or check the microwave circuit and components. A low reading could be caused by the water container absorbing the energy, in which case an alternative container should be used.
- Replace the faulty HV component if required (see High voltage components in section 5.8).

Note: Opening the door during the test will stop the test. Reselect the test to run again.

3. On completion of the test, specify the result by selecting 'Pass' or 'Fail'.



Microwave leakage test.



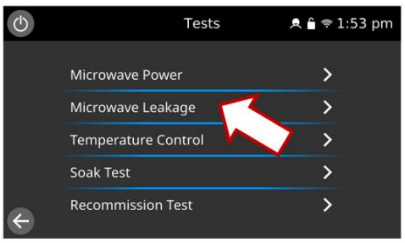
Check that the following requirements have been met:

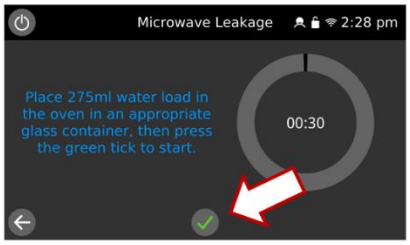
- The appliance is cool.
- This test will not operate at a cavity temperature of 70°C or above.

Follow these instructions when measuring:

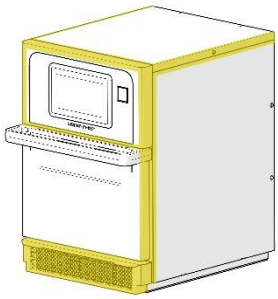
- Make sure that the survey meter you are using has been calibrated and is suitable for measuring frequencies of 2,460 MHz.
- Do not exceed meter full scale deflection. The leakage meter should initially be set to the highest scale, then adjusted down as necessary to ensure that low readings are measured on the most sensitive range.
- To prevent false readings, hold the probe on the grip provided and move at 2.5 cm/second.
- Always hold the probe at right angles to the oven and point of measurement, ensuring the probe sensor is reading 50 mm from the test area.
- The leakage should not exceed 0.5 mW/cm².

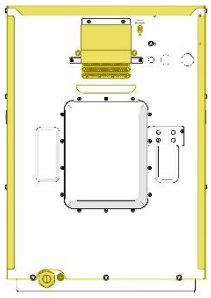
1. Add 275 ml of cold water into a 600 ml microwave safe container.
2. Place the 600 ml container in the centre of the cavity and close the door.
3. Enter Service Settings / Tests and select 'Microwave leakage' from the appliance tests (microwave power 100% for 30 seconds, convection fan at 10%).





4. Set the leakage meter to the appropriate scale/range.
5. Move the survey meter probe across all casework joins and vent areas including those marked in yellow, shown opposite.





6. When the microwave leakage test stops after 30 seconds, change the water, and re-select the test to continue.

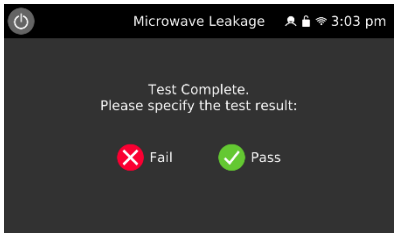
7. Select the return arrow on the display to stop the test at any time.

8. Readings must be below 0.5mW/cm², ideally zero, readings above this level will cause issues on the oven.

⚠ **CAUTION:**
If a level greater than 5mW/cm² is observed, don't use the appliance until repaired by law.

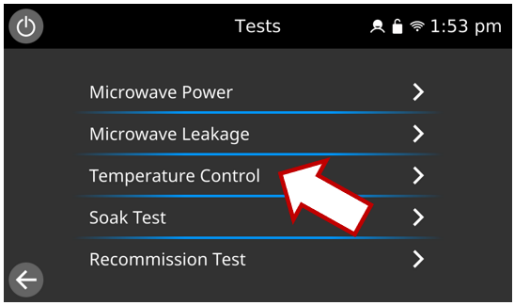
9. Note any leakage that is observed in terms of the level and position on the appliance. Keep this information with the service documentation.
10. On completion of the test, specify the result by selecting 'Pass' or 'Fail'.

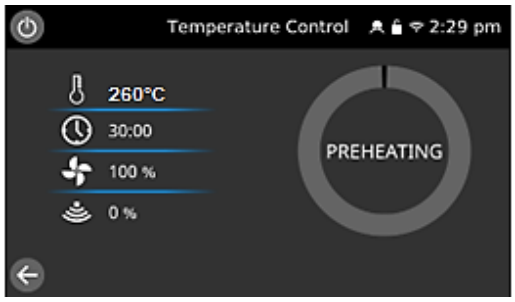
Note: Opening the door during the test will stop the test. Reselect the test to run again.



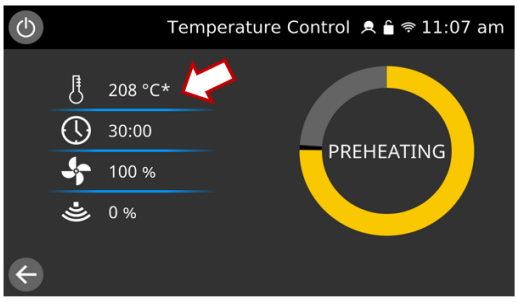
Temperature control test.

1. Place a calibrated temperature probe in the centre of the cavity.
2. When selected the oven heats up to 260ºC.

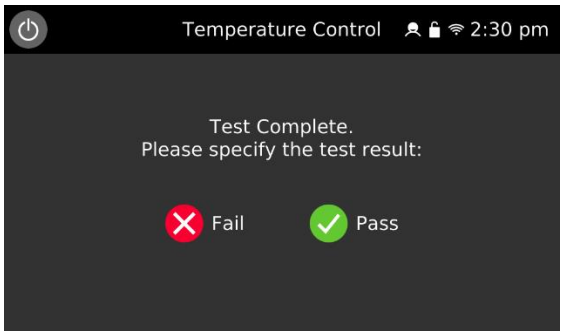




3. The preheat status can be viewed by selecting temperature.



4. Once the oven reaches temperature, select the green tick to start. The oven will run on heat only, convection fan at 100%, for 30 minutes cycling around the maximum cavity temperature of 275ºC.
5. Independently monitor the cavity temperature.
6. On completion of the test, specify the result by selecting 'Pass' or 'Fail'.

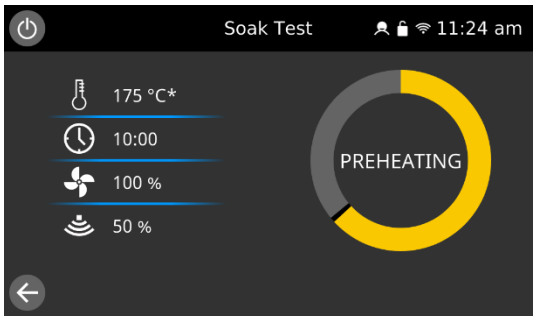


Note: Opening the door during the test will stop the test. Reselect the test to run again.

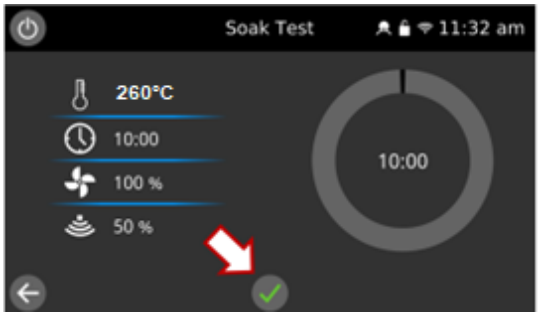
This test only generally recommended for workshop activities.

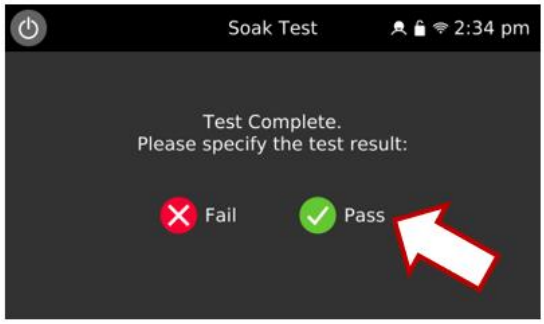
Soak test: checking the cavity integrity.

1. When selected, the oven heats up to 260ºC.



2. Once the oven reaches temperature (>255 ºC), add 1 litre of water in an appropriate covered glass container.
3. Select the green tick to start. The oven will run for 10 minutes cycling around a cavity temperature of 260ºC, 50% microwave power and 100% convection fan.





4. During the test carefully check the appliance casing, joints, and door seal for signs of steam or water escaping from the cavity. If necessary, rectify any leaks and repeat the test.
5. On completion of the test, specify the result by selecting 'Pass' or 'Fail'.
6. Safely remove the container of water from the cavity.

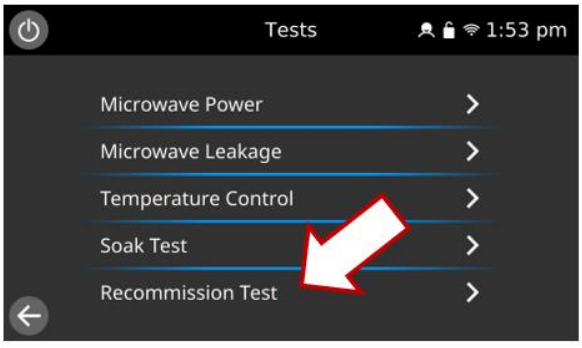
Note: Opening the door during the test will stop the test. Reselect the test to run again.

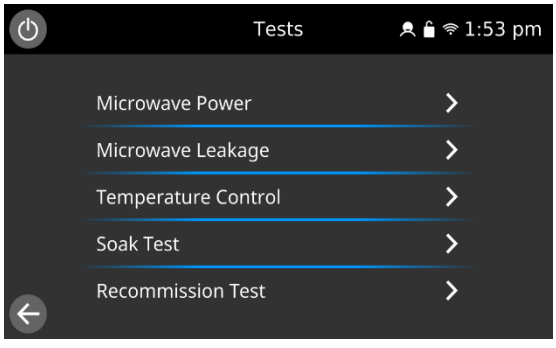
This test is only generally recommended for workshop activities.

Recommissioning test: checking the appliance operation.

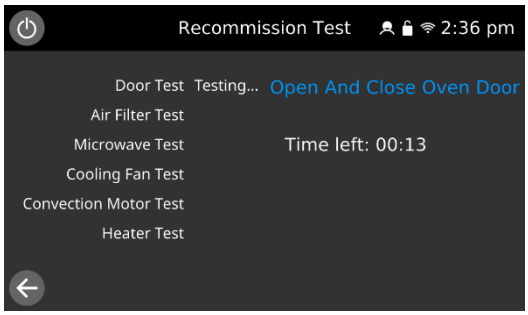
The recommission tests are performed following the completion of a planned maintenance visit, or repair to ensure that the appliance is working correctly before handing back to the customer.
Some of the tests have a countdown timer, where failing to carry out a test within the time limit will cause a test failure and the recommission test will have to be restarted.

If the 'recommission test' tab is greyed out, the oven is above 100°C and will not allow to the test to commence until the oven is cooled down.





1. Ensure the cavity is close to ambient temperature.
2. Enter the Service Settings / Tests and select 'Recommission Test' from the appliance tests.

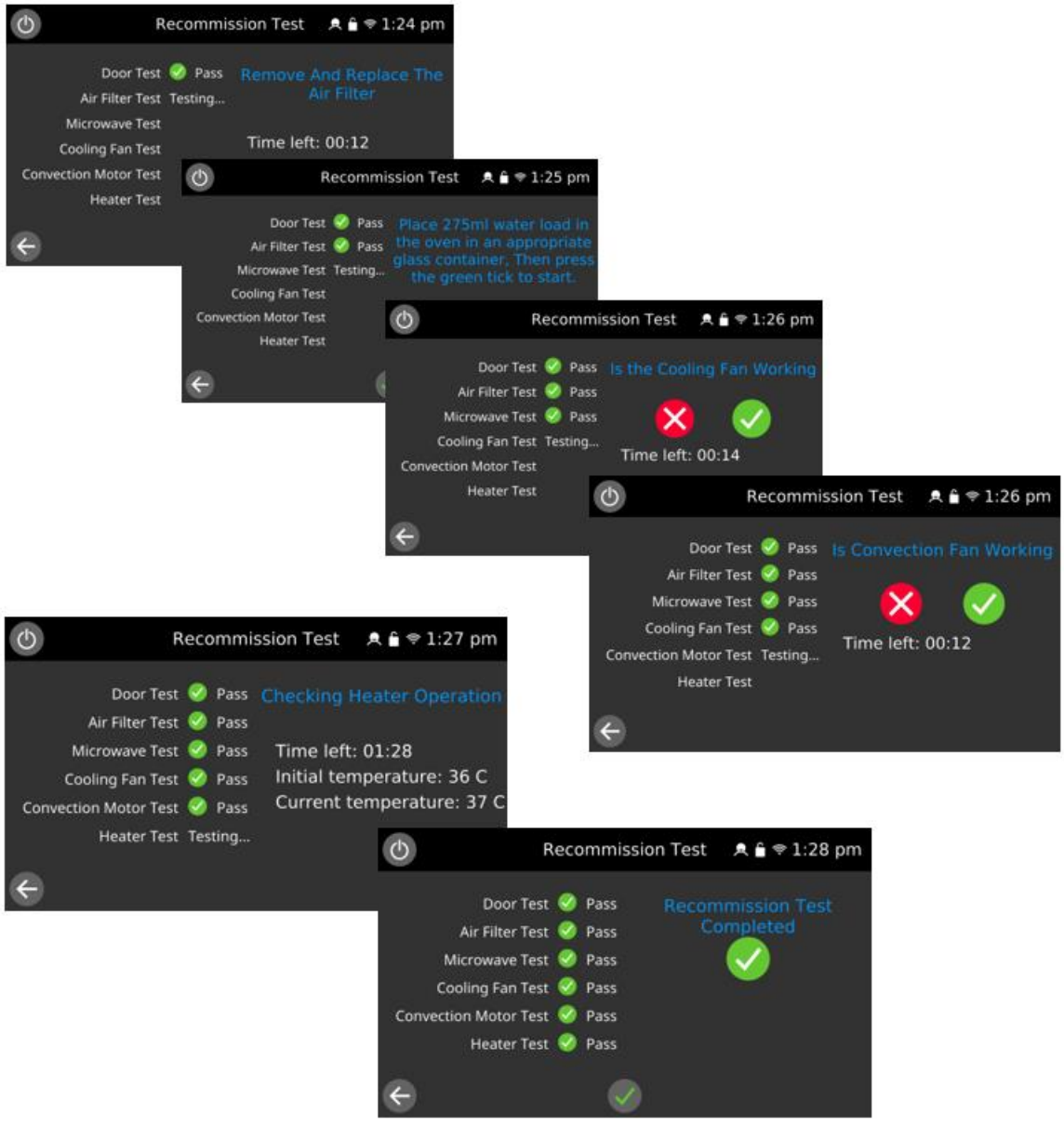


The test will check the appliance in the following order:

- Door switch operation.
- Filter switch operation.
- Microwave circuits.
- Cooling fan operation.
- Convection fan operation.
- Heater circuit.

The test will stop at any point a failure is detected.

After a test has successfully passed, when requested select the green check mark to continue. Selecting the red check mark as a result of a failure will terminate the recommission test sequence.



Note: If the door is opened during the microwave circuit test, the process will stop and record a failure.

3. When all the tests have been successfully performed the display shows the recommission test has passed. Select the lower green check mark to confirm.
4. In the event of a recommission test failure, the detail will be recorded in the Error Log. Rectify any error and repeat the recommission test.

Commissioning the oven after service/repair/testing.

Before finishing a service call, recheck the following points:

1. Run the recommission tests to ensure the oven is functioning correctly and the U/I is working.
2. Microwave emissions are below the permissible limit of 5mW/cm², ideally <0.5mW/cm² or zero.
3. The power output of the oven is checked in accordance with the procedure.
4. Earth leakage is within permissible limits.
5. The oven has a correct air gap of 50 mm / 2 inches above. Air flow should not be restricted at the front, top or rear of the oven.
6. Complete the service report.

Complete the following checks after the oven has been serviced/repaired/tested before connecting to the mains electricity power supply:

1. All internal electrical connections are correct (see "Electrical circuit diagrams" in section 7).
2. All wiring insulation is correct and is not touching any sharp edges.
3. All grounding connections are electrically and mechanically secure.
4. Any removed heat tape or cable ties are refitted/replaced.
5. All door safety interlocks are secure and mechanically sound.
6. The door activates all the door interlock switches and in the correct order.
7. The door operation is smooth.
8. The door seal is in good condition and seals against the cavity.
9. The casing is securely refitted with no trapped wires and all the fixing bolts are refitted.

Service Settings: Temperature Calibration Check / Recalibration.

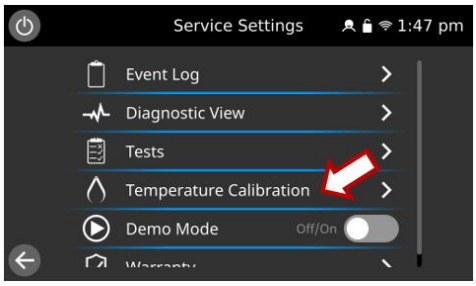
Tools required:
1 x Calibrated digital thermometer.
1 x Temperature probe on a heat sink.

1. Place temperature probe in the centre of cavity.
2. Ensure the oven is in 'Full Serve Mode'.
3. Select 250ºC oven temperature. If there is no preheat temp programmed appropriate for the oven test, a new temperature must be programmed into a spare location (250°C).
4. Wait for the oven to reach the preheat temperature of 250ºC.
5. Once the preheat temperature has been achieved, press the chef's hat 'recipe creation' on the easy-U/I.
6. Select 10 minutes run time, 100% convection fan and 0% microwave.

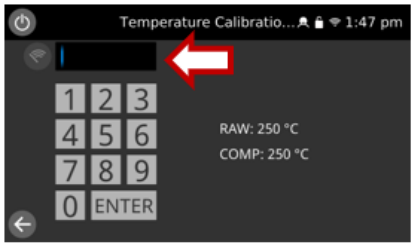
7. Press the play button at the bottom of the screen.
8. When the timer has 30 seconds remaining press the temp icon the temperature the oven sensor thinks the cavity has reached will be displayed prefixed with *
9. Compare the displayed temperature with the actual temperature shown on the digital thermometer. Recalibration will be required, and should be carried out swiftly, if the readings are outside the following guidelines.

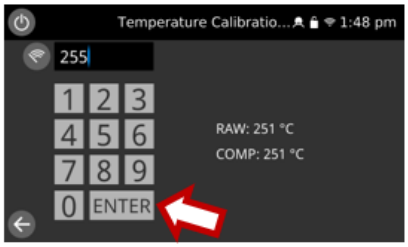
Model	Preheat	Display	Thermometer	Action
conneX®12e	250°C	*255°C	251°C or higher	Recalibrate
			244°C or lower	Recalibrate
			245°C to 250°C	No action required

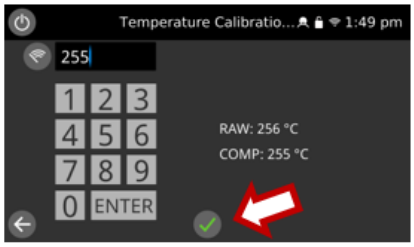
10. To recalibrate, promptly access ‘Temperature Calibration’ in the Service Settings.

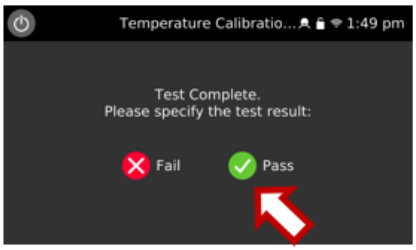


11. Enter the temperature on the keypad as displayed on the calibrated digital thermometer and press the enter.
12. The compensated temperature should now read the same as the entry.
13. Monitor the ‘RAW’ oven temperature and compare to the calibrated digital thermometer. Repeat steps 11 & 12 if the calibration is requiring further adjustment.
14. Once the calibrated digital thermometer reading is in alignment with the RAW temperature, select the green check mark at the bottom of the screen and then pass on the test complete screen.
15. Repeat the calibration check, points 5 to 9. Retesting to check that the cavity temperature reading is now within the recommended guidelines.









If the temperature reading is unstable and not calibrating correctly:

1. Disconnect and isolate the appliance from the electricity supply and lock off, see section 2.14 ‘Safe working when testing components.
2. Take protective measures to ensure the power cannot be switched on again.
3. Allow the appliance to cool down.
4. Remove the side and top panels of the casing.
5. Discharge the capacitors and prove dead.
6. Check the cavity temperature sensor wire and connections.
7. If the wire and connections are correct and in good condition, replace the cavity temperature sensor (see Section 6.17. – Overview - further components).
8. Refit the panels of the casing.
9. Switch ON the appliance and repeat the test procedure as described above.
10. If the temperature is still unstable repeat steps to make safe and replace the IO board (see Section 6.10 Replacing the IO board).
11. Refit the panels of the casing.
12. Switch ON the appliance and repeat the test procedure as described above.

5.7 High voltage components (casing removed).

High voltage transformer test.

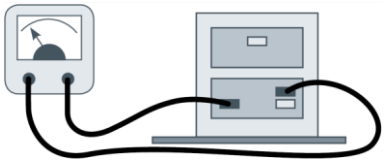
Ensure the following requirements have been met before starting the test:

1. The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
2. The appliance is cool.
3. The high voltage capacitors are discharged before commencing work.
   See section 2.15 'How to discharge the conneX® HV'.
4. The casing of the appliance has been removed.

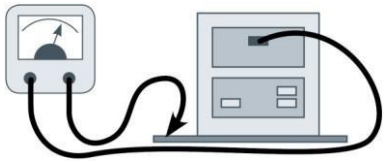
⚠ **DANGER**
High voltages and significant currents are present at the high voltage capacitor and HV Circuit.
It is very dangerous to work near this part when the oven is on.
NEVER make any electrical measurements on the high voltage circuits, including the magnetron filament, whilst the oven is connected to the mains power supply.

1. Remove all connections from the transformer.
2. Using a Digital Multi-Meter (DMM), check the resistance of the windings.
Results should be as follows:

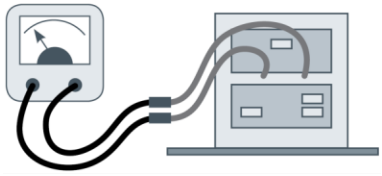
- 200 – 230V Transformer



3. Mains winding between tags, approx.;
0 to 230; 0.6 Ω
0 to 200; 0.5 Ω
200 to 230; 0.1 Ω

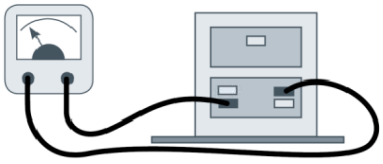


4. High Voltage winding, approx. 57 Ω.



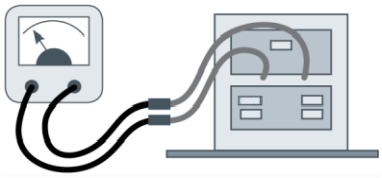
5. Filament winding between terminals, less than 1 Ω.

- 208 – 240V Transformer



3. Mains winding between tags, approx.
0 to 200/208; 0.5 Ω
0 to 220; 0.6 Ω
0 to 240; 0.6 Ω
208/208 to 220; 0.1 Ω
208/208 to 240; 0.1 Ω
220 to 240; 0.1 Ω

4. High Voltage winding, approx. 47 Ω.



5. Filament winding between terminals, less than 1 Ω.

6. Using a megger/insulation tester, test the insulation resistance between:
Primary winding and chassis. Pass if reading is over 10 MΩ
Filament winding and chassis. Pass if reading is over 10 MΩ
NOTE: One end of the high voltage (secondary) winding is connected to the chassis, so this is not tested.

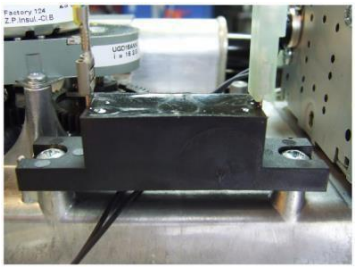
High voltage diode test.

Ensure the following requirements have been met before starting the test:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The high voltage capacitors are discharged before commencing work.
  See section 2.15 'How to discharge the conneX HV'.
- The casing of the appliance has been removed.

⚠ DANGER
High voltages and significant currents are present at the high voltage capacitor and HV Circuit.

It is very dangerous to work near this part when the oven is on.
NEVER make any electrical measurements on the high voltage circuits, including the magnetron filament, whilst the oven is connected to the mains power supply.



1. Remove both connections from the high voltage diode.
2. Using a megger/insulation tester, test for continuity in both directions.
Results should be as follows:
Open circuit both ways – FAIL.
Conducts one-way only - PASS
Short circuit both ways - FAIL.
Conducts one way, leaks the other – FAIL.

High voltage capacitor test.

Ensure the following requirements have been met before starting the test:

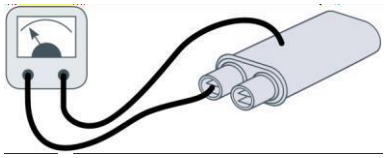
- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The high voltage capacitors are discharged before commencing work.
  See section 2.15 'How to discharge the conneX HV'.
- The casing of the appliance has been removed.

⚠ DANGER
High voltages and significant currents are present at the high voltage capacitor and HV Circuit.

It is very dangerous to work near this part when the oven is on.
NEVER make any electrical measurements on the high voltage circuits, including the magnetron filament, whilst the oven is connected to the mains power supply.

1. Remove all electric connections from the high voltage capacitor.
2. Using a Digital Multi-Meter (DMM), check for continuity.
Results should be as follows:

3. Connect the DMM to both terminals of the high voltage capacitor.
The test is passed if the DMM display reads approx. 10 MΩ.



4. Connect the DMM to one terminal and the metal outer case of the high voltage capacitor.
The test is passed if the DMM display reads "open circuit".
Repeat the test for the other terminal and the metal outer case.

5. Using a megger/insulation tester, test the insulation resistance between both terminals and the metal outer case of the high voltage capacitor.
The test is passed if the megger/insulation tester display reads over 100 MΩ.

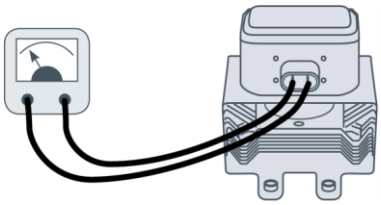
High voltage magnetron test.

Ensure the following requirements have been met before starting the test:

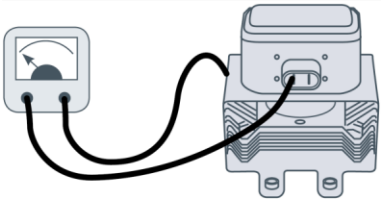
- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The high voltage capacitors are discharged before commencing work.
- The casing of the appliance has been removed.

⚠ **DANGER**
High voltages and significant currents are present at the high voltage capacitor and HV Circuit.
It is very dangerous to work near this part when the oven is on.
NEVER make any electrical measurements on the high voltage circuits, including the magnetron filament, whilst the oven is connected to the mains power supply.

1. Remove all electric connections from the magnetron.
2. Using a Digital Multi-Meter (DMM), check for continuity.
Result should be as follows:



3. Connect the DMM to both terminals of the magnetron.
The test is passed if the DMM display reads 1 Ω or less.



4. Using a megger/insulation tester connect to one terminal and the metal outer case of the magnetron. The test is passed if the megger/insulation tester display reads an infinite resistance, "open circuit". Repeat the test for the other filament terminal and the metal outer case.

5.8 Mains voltage components (casing removed).

Convection fan: motor.

The convection fan motor is a 3-phase AC motor having a maximum speed of approximately 5200 rpm.
The windings are thermally protected. In the event of a thermal fault, the trip inside the motor (IP) will open circuit and cause the VFD to enter a fault mode.

Convection fan: motor speed controller.

The convection motor speed controller provides a 3-phase AC switched mode drive to the convection motor and is controlled by a 0 to 10 Volt signal from the IO board (connection X519).

This allows the motor to be adjusted from approximately 1400 rpm to 5200 rpm in steps of 1%.

- Door open, Approx. 1400 rpm (10% @ 1V).
- Door open (cleaning cool down), >100ºC Approx. 5800 rpm (85% @ 8.5V). >50ºC Approx. 3500 rpm (50% @ 5V).
- Door closed (not cooking), Approx. 2500 rpm (30% @ 3V).
- Door closed (heating up), Approx. 3500 rpm (50% @ 5V).
- Door closed (cooking), speed as specified by program or setting up to a maximum of 5200 rpm (100% @ 10V).

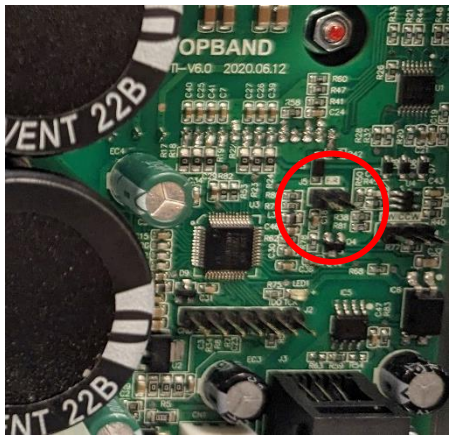
Convection fan: motor speed controller LED status display.

The VFD contains a diagnostic indicator (Red LED) to display the drives operational status.

LED Drive Status	Flash rate	Additional details	Recovery
Normal Operation (Run)	On Continuously	Fan motor operating normally	10s
Overload (Hardware Current >10A)	1	Fan motor off (switched off in less than 1ms)	10s
Overload (Software Current >3.5A)	2	Fan motor off (switched off after 5s)	10s
Output Phase Missing	3	Fan motor off (switched off after 2s)	10s
Lock Motor	3	Fan motor off (switched off after 2s)	10s
Over Voltage (>275VAC)	5	Fan motor running in safe mode (1000rpm)	10s
Under Voltage (<150VAC)	6	Fan motor running in safe mode (1000rpm)	10s
P1 – P2 link wire missing	7	Fan motor off (switched off in 100ms)	10s
Onboard Fuse Blown	2 then 3	Fan motor off (switched off after 55ms)	10s

Convection fan: motor speed controller control voltages & link positions.

Oven Variant	conneX 12e
Input %	Volts
10	2
20	2.8
30	3.5
40	4.3
50	5
60	6
70	7
80	8
90	9
100	10



Link positions are factory pre-set based on the model of convection fan used in the conneX ovens. The link positions must not be altered without express instruction from Merrychef.

Convection fan: motor and motor speed controller tests.

Ensure the following requirements have been met before starting the test:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The high voltage capacitors are discharged before commencing work.
- Anti-static precautions have been taken.
- The casing of the appliance has been removed.

Check the following:

1. All associated wiring and connections, from IO board X113 & X519 through the speed controller to the convection fan motor.
2. Convection fan motor thermal cut-out (IP), two black wires.
3. Convection fan motor rotates freely / not seized.
4. Convection fan motor winding resistances:

   Blue-red 7.5 Ω ±10%

   Red-yellow 7.5 Ω ±10%

   Yellow-blue 7.5 Ω ±10%

   Blue or red or yellow to earth (open circuit).
5. With the oven panels refitted and the oven re-connected to the power supply check the fan speeds using visual view in the service mode.

Finally, if all suitable precautions (including where necessary the provision of suitable protective equipment) have been taken to prevent injury.

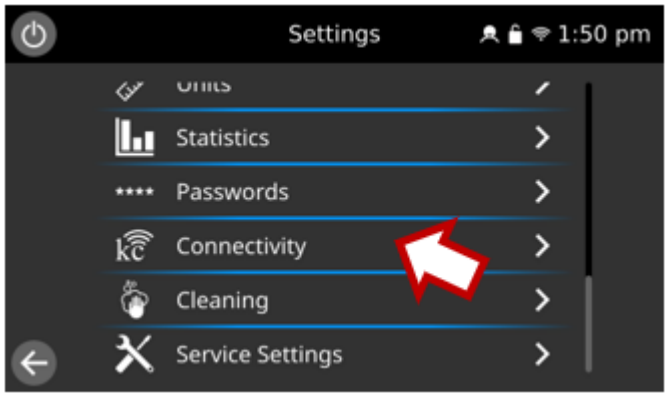
Check the following:

6. Speed controller LED status
7. Electrical supply to the speed controller

5.9 KitchenConnect® components.

KitchenConnect connections.

Optional Ethernet port between the UI ethernet loom connection (under the IO Board) and the rear panel lead socket. Wi-Fi connectivity built into the UI as standard.



Connection details can be accessed from the settings menu.

6 Replacing components.

6.1 Safe working when replacing appliance parts.

For your safety when replacing appliance parts.

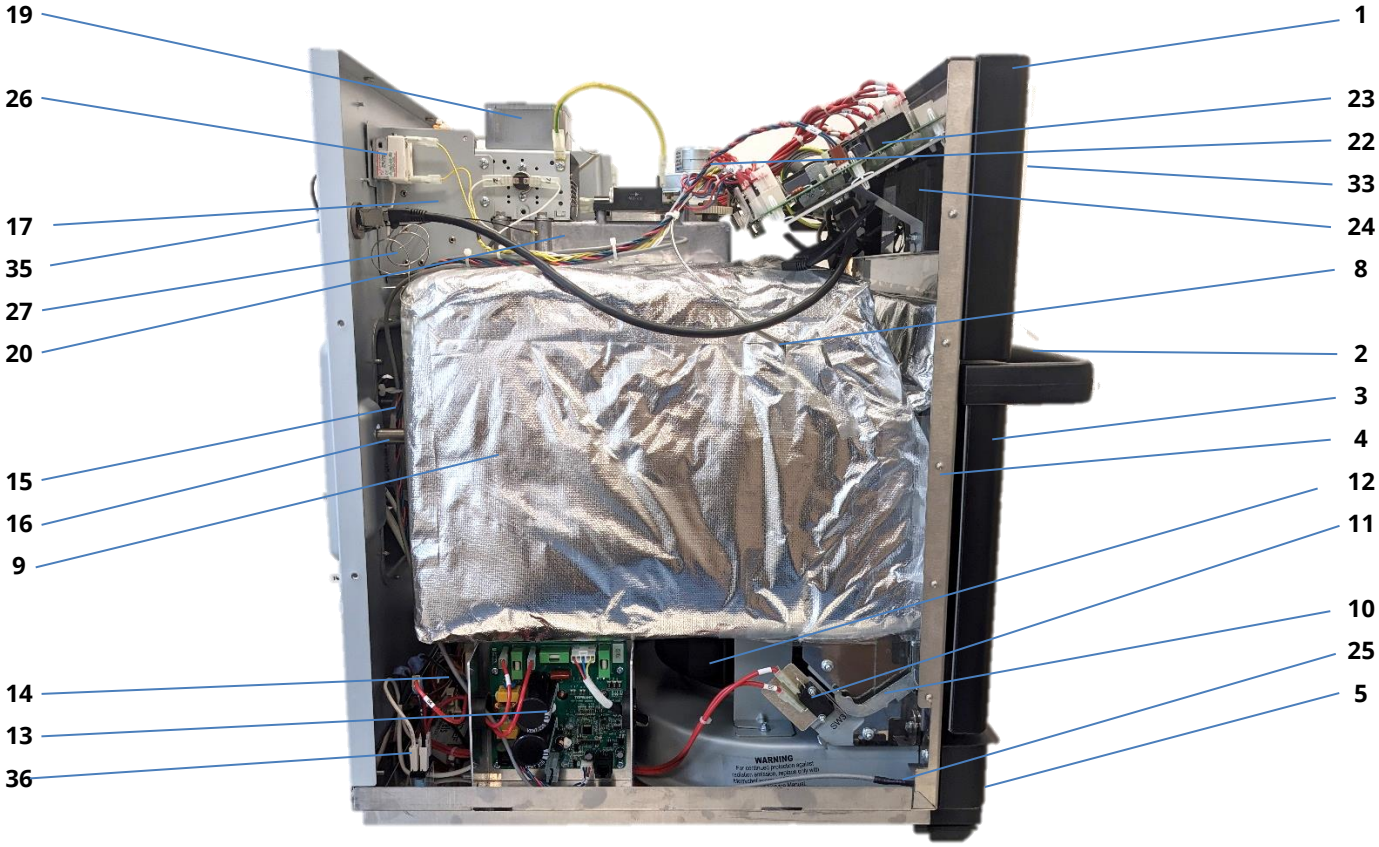
Before starting service work, it is essential that you familiarize yourself with the rules and hazard warnings specifiedin section 2 ‘For your safety’, specifically section 2.16 ‘Safe working when replacing appliance parts’.

Tools required.

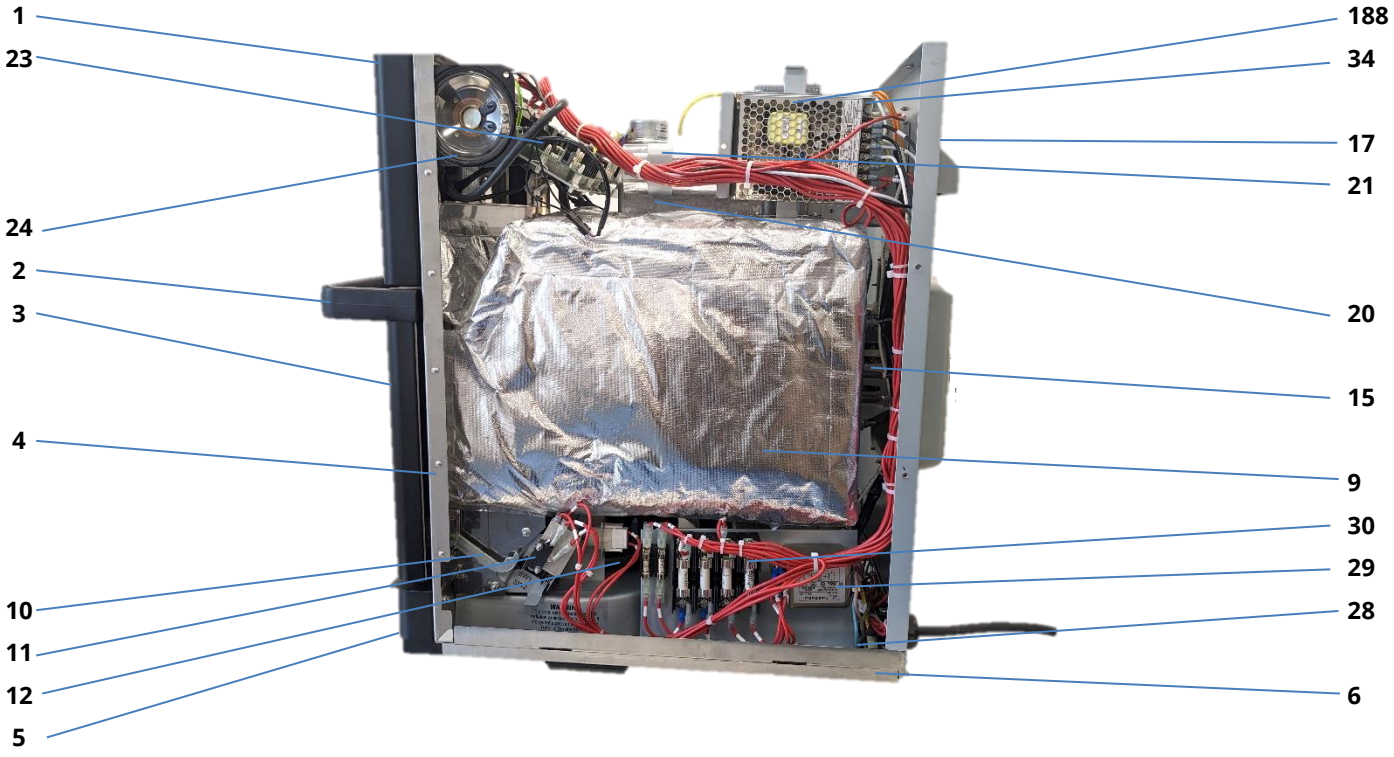
HV Capacitor discharge tool
Digital Multi-Meter (D.M.M.)
Proprietary voltage detector
Electrical lock out tools & equipment
Door spacer kit (2 x 4mm & 2mm Spacers)
M2 hex key socket
M5.5 hex socket wrench / nut runner
M5.5 hex open / ring spanner
M7 hex socket wrench / nut runner
M7 hex open / ring spanner
M8 hex socket wrench / nut runner
M10 hex socket wrench / nut runner
M14 hex socket wrench / spanner
Torque wrench
Stanley / retractable knife
Sealant gun
Pozidriv screwdriver PZ1
Pozidriv screwdriver PZ2
Flat screwdriver or lever
Pliers (or M14 ring spanner)
Two metal pins, 3mm diameter & 10mm long
Two metal pins, 2 to 3mm diameter & 40mm or longer in length
Hammer (for removing pressed screws from a spare magnetron)
M3 hex key socket

6.2 Overview.

View: left hand side – conneX®12e.



View: right hand side – conneX®12e.



Component list.

Item	Name	Function
1	Front panel	The front panel houses the touchscreen UI assembly
2	Door handle	Open the oven door using the door handle. Never use the door handle to lift the appliance.
3	Door cover panel	The door cover panel can be detached for accessing the door hinge arms.
4	Cavity Frame	The oven door and front panel are mounted on the cavity frame, with the top and side panels clipping on to the edges
5	Air filter faceplate	The faceplate can be tilted to access the air filter.
6	Base plate	The metal base plate carries all oven components.
7	Back panel	The back panel, fitted to the base plate & cooling duct, secures the oven top & side panels and provides ventilation of the oven interior.
8	Thermocouple	Provides the cavity temperature signal to the IO board
9	Cavity & Cavity Wrap	The insulated cavity (cooking chamber) for cooking food can be accessed by opening the oven door.
10	Door hinge assembly	The door hinges interact with the microswitches / interlocks.
11	Door microswitch(es) / interlock(s)	The microswitches / interlocks are connected to the door hinges and switch off the magnetron(s) when the oven door is opened.
12	Cooling fan	The cooling fan draws air through the air filter into the interior of the casing in order to cool the electrical components.
13	Convection (hot air) fan motor speed controller (VFD)	This component controls the speed of the convection fan motor depending on specific oven settings.
14	Transformer(s) (high voltage)	A high voltage transformer(s) feeds the HV microwave circuit.
15	Convection (hot air) fan motor	The convection fan motor is controlled by the speed controller and drives the convection fan for air flow within the oven cavity.
16	Exhaust pipe	The exhaust pipe leads excessive steam from the cavity to the cooling duct and the rear air outlet of the oven.
17	Cooling duct	The cooling duct directs heat generated by the magnetron(s) to the rear of the oven.
18	SMPS (low voltage - IO)	The low voltage (ELV) Switch Mode Power Supply module feeds the IO board.
19	Magnetron(s) (high voltage)	A magnetron generates microwaves.
20	Waveguide	A waveguide leads microwaves from a magnetron into the cavity. The HV Diode(s) is mounted on to the waveguide(s).
21	Capacitor(s) (high voltage)	The capacitor completes the magnetron circuit for required high voltage.
22	Stirrer motor(s)	A stirrer motor turns a stirrer distributing microwave energy in the cavity.
23	IO Board	The IO board controls all electrical oven components.
24	Loudspeaker	The loudspeaker produces sound signals (e.g., cooking process completed).
25	Intake Air Filter Microswitch	Closed circuit when the air filter is correctly installed
26	Cavity overheat thermostat (cavity overheat stat)	The thermostat continuously monitors the temperature in the cavity and prevents it from overheating.
27	Cavity overheat thermostat capillary	Connected to the side of the cavity, underneath the cavity wrap, for the cavity overheat thermostat temperature monitoring
28	Protective earth	Provides a chassis earthed point at the metal base plate of the oven.
29	Electromagnetic Compatibility (EMC) Filter	EMC filters reduce the transfer of electromagnetic noise to and from the mains power supply.
30	Mains supply fuses	The fuses protect the oven from excessive current draw.
31	Mains power supply cable	For connecting to the kitchen mains power supply.
32	Equipotential bonding connection	This is an electrical connection point to ensure that the frame of oven and any external conductive components are at an equal (or practically equal) potential when connected.
33	USB Port	USB socket for uploading and downloading firmware & files
34	VFD supply fuse	3A fuse VFD supply protection from excessive current draw
35	Ethernet port	Ethernet port for network connection
36	VFD safety relay	Convection fan motor IP switched relay supplying VFD power

6.3 Removing / fitting the casing.

Tools required.

M5.5 hex socket wrench

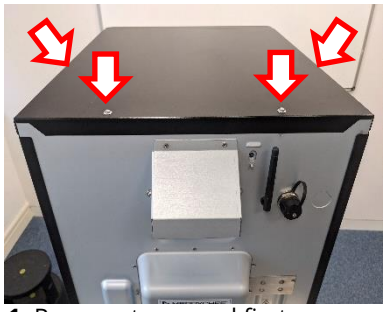
Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.

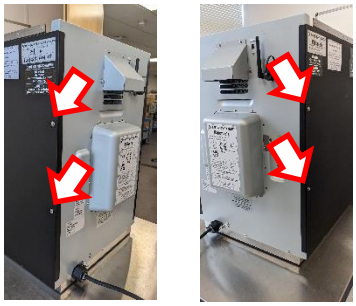
Removing the panels of the casing.

Overview of all M5.5 hex head flange bolts securing the panels of the casing.



1. Remove top panel first.

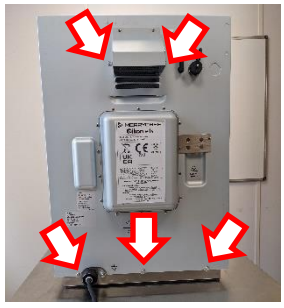
Unfasten the two M5.5 hex head flange bolts on the top rear top panel and the two M5.5 flange bolts on either side.
Lift the top panel at the rear and pull out from the front fixing to remove it.



2. Removing the side panels:

Unfasten the four M5.5 hex head flangebolts (two per side) side panels of the appliance attaching each side panel to the back panel.

Slide the panels towards the back of the appliance and out at the bottom to remove them.



3. Removing the back panel:

Unfasten the five M5.5 hex head flange bolts attaching the back panel to the cooling duct (two bolts) and the baseplate (three bolts) of the appliance.

Move the back panel up to remove it.

Important: If the optional ethernet cable is fitted, disconnect before removing the back panel.

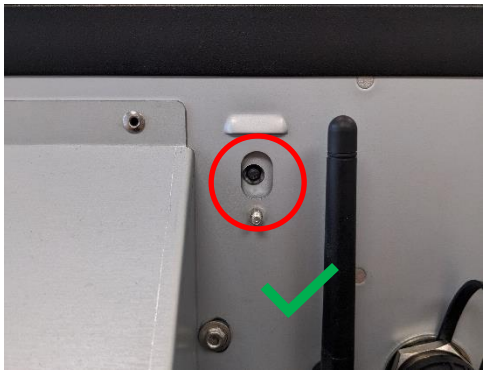
4. Ensure the high voltage capacitors are discharged before commencing any work.

Fitting the panels of the casing.

Follow the steps in the reverse order to fit the panels of the casing, ensuring all 5.5M bolts are refitted and;

1. The side panels have been correctly slotted into the front cavity and base plate.
2. The top panel has been correctly slotted into the front.
3. If fitted, ensure the ethernet lead is reconnected to socket.
4. No wires have been trapped.

Care must be taken when refitting the rear panel to ensure the cavity overheat thermostat re-set button lines up correctly with the access hole in the panel;



6.4 Removing / fitting the door assembly and hinges.

Component

Tools required.

Two locking pins

M5.5 hex socket wrench

M8 hex socket wrench

Torque wrench

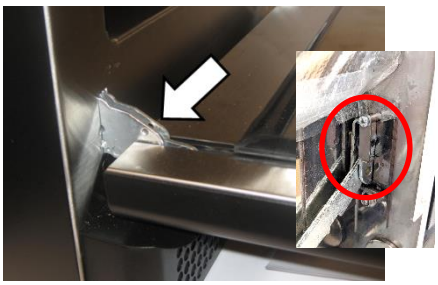
PZ1 Pozidriv screwdriver

Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- Additional PPE, Mask & Gloves for handling insulation material.
- Remove the top and side panels.
- Ensure the high voltage capacitors are discharged before commencing any work.

Removing the door assembly.



1. Remove the Hinge Retention Clip by unscrewing the Posidriv screw, (circled Red). **(The door cannot be removed with this in place**). Open the door fully and locate the holes positioned in the upper area of the hinges.

2. Push the two metal pins through the holes in each hinge.

3. Close the door onto the two metal pins and then free the door by pulling upward and forward. The door should now be fully removed.

4. The door choke is removed by unfastening the sixteen M8 hex nuts. On refitting the door choke, ensure the studs are positioned correctly in the centre of the hole and not resting on the shoulder of the stud. The nuts should be retightened diagonally in the following sequence to 2.1 Nm.

5. Wear gloves when removing or refitting insulation pads/mats in the door.

Refitting the door assembly.

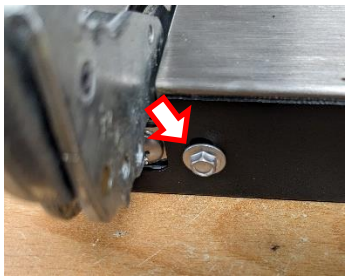
Follow the steps in the reverse order to refit the door to the oven.

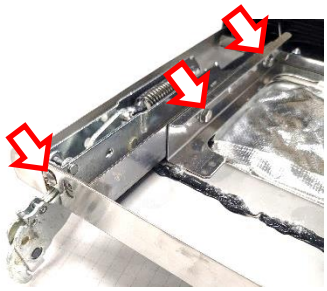
- Check that the door seal firmly meets the cavity frame all the way around once closed. A poor sealing door can cause issues with the oven's operation.
- Check the door switches are correctly adjusted and operating freely.

Removing the door hinge assemblies.

Firstly, follow the steps to remove the door from the oven as detailed previously.

1. Remove the door skin by removing the two M5.5 bolts from the base of the door and lifting the door skin from the base and pull downward.
2. Remove the two M5 Hex Head bolts and the Cross Head Self Tapping Screw that secure the hinge assembly to the door.
3. Ensure the locking pins are fitted to both door hinges.





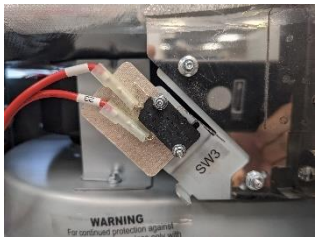
Refitting the door hinge assemblies.

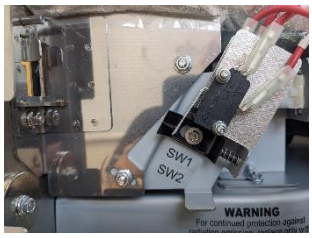
Follow the steps in the reverse order to refit the door hinge assemblies to the oven.

- The hinge assembly bolts should be torqued up to 3.5Nm.
- The switch assembly adjuster and fixing bolts should be torqued up to 2.1Nm.
- Refit the door as previously described.
- Set the door switch adjustment and ensure the operation is correct.

6.5 Adjusting the door microswitches/interlocks.

Component.





Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The high voltage capacitors are discharged before commencing work.

- Adjust the microswitches after refitting or replacing old with new door hinges.
- Adjust the microswitches after refitting the door or replacement of the door seal.
- Adjust the microswitches after refitting or replacing old with new door switches.
- Adjust the microswitches after determining incorrect operation during route service and maintenance.

Tools required.

M4 hex socket wrench

or 7mm nut runner.

Spacer kit

Discharge Tool

Adjusting the door microswitches.

Located on the door hinge brackets are 3 safety interlock microswitches, to prevent microwave emissions escaping when the oven door is opened:

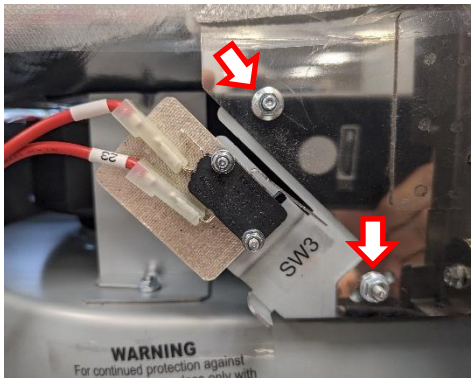
- The primary microswitch (SW3), located on the left-hand side of the oven, breaks the electrical supply circuit to the HV transformers.
- The secondary microswitch (SW2), located on the right-hand side of the oven (outer), breaks the microwave circuit if the primary (SW3) fails.
- The monitor microswitch (SW1), located on the right-hand side of the oven (inner), will short out the microwave circuit, blowing the F5 / F6 fuse, if the secondary microswitch (SW2) fails closed circuit.

IMPORTANT:

If the monitor switch (SW1) causes the microwave circuit F6 / F7 fuse to blow, the secondary (SW2) and monitor (SW1) microswitches must be replaced due to exposure to high short-circuit currents.

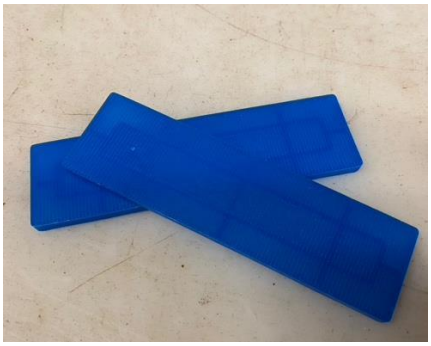
The purpose of the following adjustment procedure is to set the interlock to switch off the microwave circuit when the door is opened more than 5 mm and for the microwave circuit to operate when the door is closed, and the door seal expands.

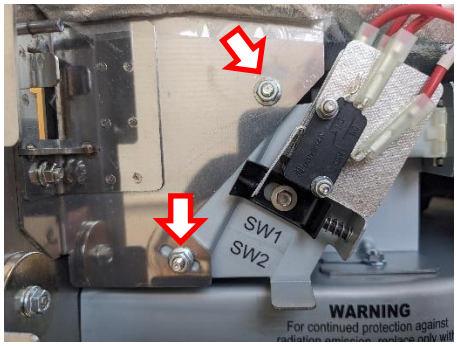
1. Open the appliance door and position the two 3mm spacers over the top corners of the door seal. Then carefully close the door ensuring the spacers are still in position.



2. Loosen the left interlock adjuster nuts, SW3 (Arrowed).
3. The switch bracket can now be rotated around the top screw.
4. Move the microswitch bracket until it just operates the switch.
5. As soon as the primary door switch (SW3) closes, nip up the two flange head nuts to 2.1Nm.

6. Remove the 3mm spacers and replace with two 5mm spacers, again over the top corners of the door seal.Then carefully close the door ensuring the spacers are still in position.

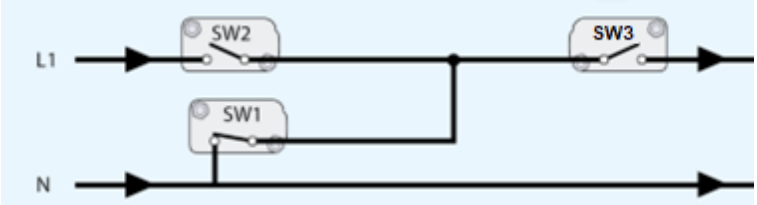




1. Loosen the left interlock adjuster nuts, SW1 and SW2 (Arrowed).
2. Loosen the two flange head screws just enough to let the microswitch bracket move.
3. The switch bracket can now be rotated around the top screw.
4. As soon as the secondary door switch (SW2) closes, nip up the two flange head nuts to 2.1Nm.
5. Remove the spacers, then open and close the appliance door a few times to validate the door switches operate in the correct sequence.
6. Once the panels have been refitted, conduct a microwave leakage test.

IMPORTANT:

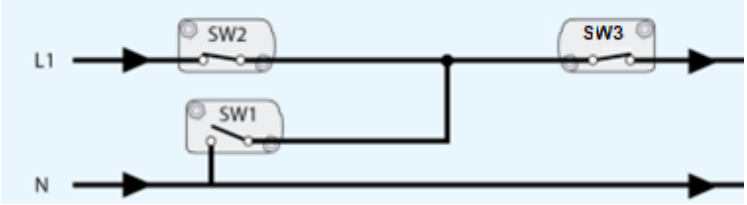
Check if the switches operate in the following sequence as microswitch SW3 must switch the load current.
Oven door open



Closing the door:

- SW1 opens first.
- SW2 closes second.
- SW3 closes third.

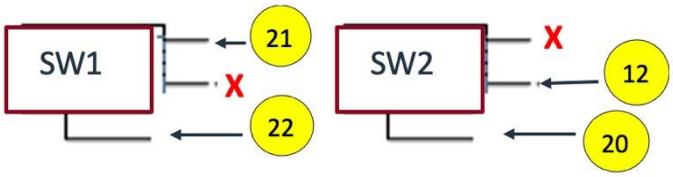
Oven door closed.



Opening the door:

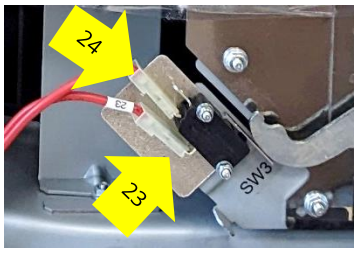
- SW3 opens first.
- SW2 opens second.
- SW1 closes third.

Right-Hand Side



Outer Switch **Inner Switch (closest to cooling fan)**

Left-Hand side



6.6 Replacing the door gasket.

Tools required.

Suitable gloves

Stanley / retractable knife

High temperature sealant

Cloth for wiping residue.

Requirements.

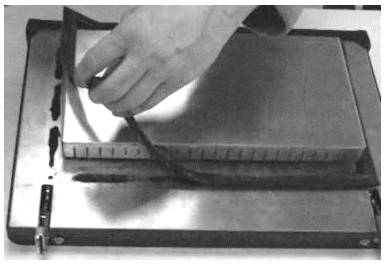
Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.

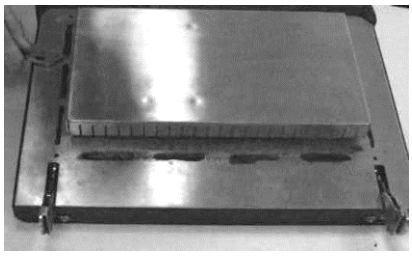
1. Place a Stanley / retractable knife blade underneath the door seal and go all the way to break the seal.

Ensure you do all four sides avoiding the metal clips on each corner.

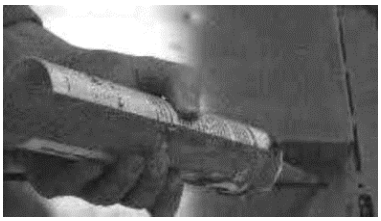
Please ensure all safety aspects are adhered to while working with a sharp knife.



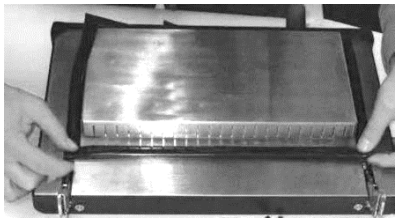
2. Gently pull the metal clip out of each corner and lift off the door seal.



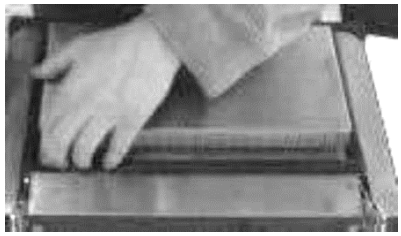
3. Remove remaining residue sealant using the knife or similar to make the surface is as flat and clean as possible.



4. Apply a continuous thin bead of Merrychef approved high temperature sealant around the existing door seal area. Ensure you do all four sides.

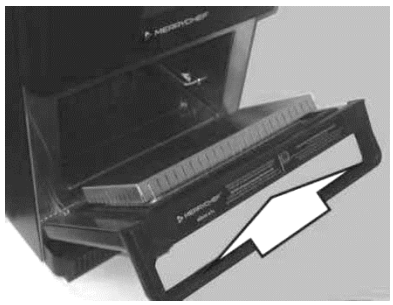


5. Place the new door seal over the door in the same place as the old one and insert the metal clips in each corner.



6. Press down firmly to tightly secure the door seal onto the door. Ensure it is level and square. Wipe off any excess sealant protruding for the door seal.

7. Leave to dry naturally. It will need 24 hours to dry but the heat of the oven can also be used to dry the sealant, speeding up the process.



8. Close the door, then open and close again to check the operation and ensure the seal does not move.

Leave the door closed and let thesealant cure.

Note: The door seal can be replaced without removing the door skin

Heating up the oven to dry the seal.

1. Switch the oven on and let it heat up to 250°C (482°F)
2. Keep the door shut for two hours.

The oven will be ready for usage again after 2 hours.

Note: This is a generic procedure for the complete range of Merrychef combination ovens.

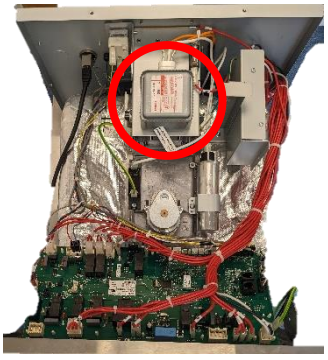
⚠ **WARNING**

Never use the oven without the door seal attached properly.

6.7 Replacing a magnetron.

Component.

The magnetron is located on top of the cavity and is fixed to the waveguide, which in turn are fixed to the top of the cavity. The conneX 12e comprise of a single magnetron & waveguide located on the top centre of the cavity.



Air from the cooling fan is forced across the cooling fins of the magnetron and into the cooling duct, which then vents the warmed air out of the back of the oven.

Tools required.

Hammer or similar tool

PZ2 Pozidriv screwdriver

M8 hex socket wrench

Torque wrench

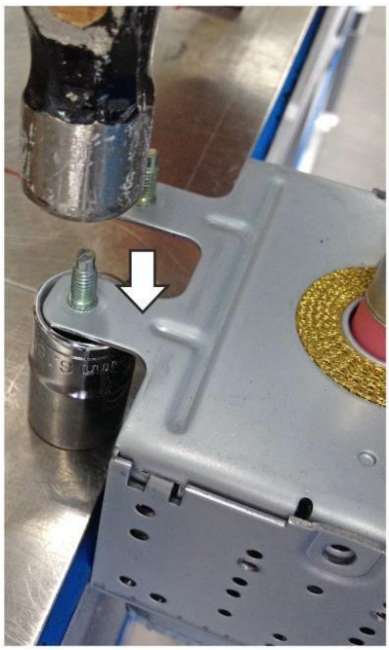
Discharge Tool

Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The top, rear, left and right panels of the casing of the appliance have been removed.
- The high voltage capacitors are discharged before commencing work.

Preparing a replacement magnetron.



1. The new magnetrons come with four pressed studs for fixing. These studs need to be removed before fitting the magnetron to the oven.

NOTE:

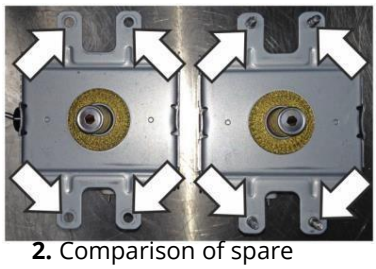
The studs can be removed by knocking them out of the tabs with a hammer.

Ensure the tabs are not bent during this process. Secure them by laying them upon a piece of tube while pushing out the studs.

⚠

CAUTION

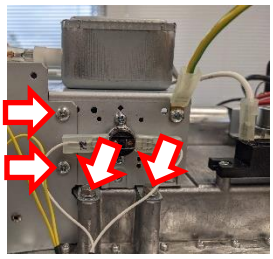
Wear personal protective equipment to protect your fingers when using the hammer.

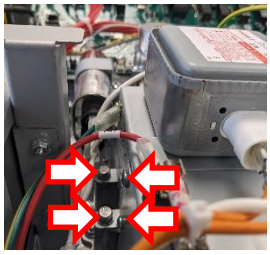


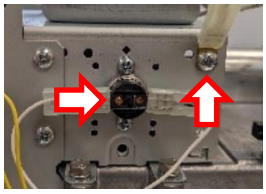
2. Comparison of spare magnetrons with (right) and without (left) pressed studs.

Removing a magnetron.

1. Carefully peal back the sealing tape on the cooling duct (keep for reuse).
2. Unfasten the two M3 x 4 CSK Philips SS Screws and flat washers to disconnect the Cavity Overheat Thermostat from the cooling duct.
3. Unplug the magnetron high temperature thermostat and earth lead.
4. Unclip the wiring loom from the cooling duct.
5. Unfasten the four Pozidriv screws on the outside of the cooling duct.







7. Disconnect the wiring from the magnetron.
8. Unfasten the four M8 hex cap bolts to remove the magnetron. There is one pair of bolts on each side of the magnetron.
9. Lift the magnetron out of the waveguide.
10. Remove the magnetron overheat thermostat and earth tab, for refitment on to the replacement magnetron.

Fitting a magnetron.

- Follow the steps in the reverse order to fit a replacement magnetron. Use new self-tapping screws for the overheat stat and earth tab.
- Ensure the magnetron overheat thermostat is refitted in the same location to ensure correct operation.
- Ensure the RF (Radio Frequency) gasket is correctly seated.
- Fit all the M8 bolts loosely, then tighten in a cross pattern to ensure the magnetron seats evenly. Torque to 2.1 Nm.
- Refit the cooling duct, ensuring the high temperature tape is reapplied on the top meeting faces between the duct and magnetron. Refit the cavity overheat thermostat, torquing the screws up to 1Nm.

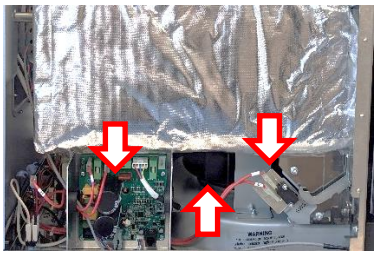
⚠ WARNING
Ensure nothing has become trapped under the magnetron mounting points (e. g. insulation material) while fitting the magnetron. This can lead to microwave leakage.

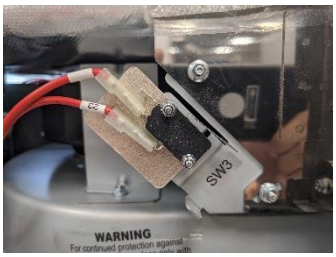
NOTICE:

If the electric connections have not been restored properly this may lead to malfunction/damage of the oven.

6.8 Replacing the cooling fan.

Component.





The cooling fan is located under cavity and can be accessed by moving the convection fan motor speed controller. Moving the door switch (SW3) bracket.

Tools required.

M7 hex socket wrench

M5.5 hex socket wrench

7mm open spanner

Spacer kit

Discharge Tool

Torque Wrench

Requirements.

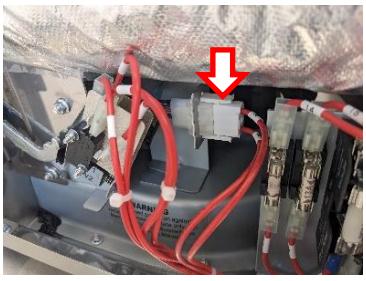
Check that the following requirements have been met:

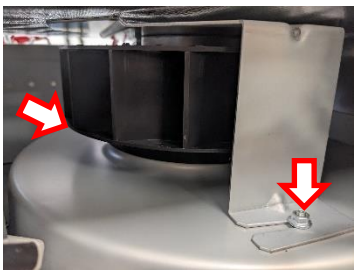
- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The top, left and right panels of the casing of the appliance have been removed.
- The high voltage capacitors are discharged before commencing work.
- Discharge cooling capacitor with discharge tool across the Molex connector.

Removing the cooling fan.

Remove the SW3 bracket from the left-hand door hinge assembly, as detailed in section 6.8 and swing out of the way.The wiring does not require disconnection.

Remove the convection motor speed controller (VFD) assembly and swing out of the way. The wiring does not require disconnection.





1. Unplug the electrical connection of the cooling fan on the right-hand side of the appliance**.**

2. Remove the two M7 hex nuts, each securing one arm of the sheet metal bracket which holds the cooling fan. Twist anti-clockwise and remove the cooling fan via the left-hand side of the oven (when looking at the oven from the front). Take care not to damage the cavity insulation on the base of the cavity.

Fitting the cooling fan.

Follow the steps in the reverse order to fit the cooling fan, torquing the cooling fan bracket nuts to 2.1Nm. Check to The door interlock switch operation as detailed in section 6.5.

NOTICE: If the electrical connections have not been restored properly this may lead to malfunction/damage of the oven.

6.9 Replacing the UI (User Interface) assembly.

Component.

The UI is attached to front panel of the oven, electrically connecting to the IO Board, Speaker and USB receptacle.

Tools required.

M5.5 hex socket wrench / nut runner

Posidrive PZ1 screwdriver

Discharge tool

Removing the UI assembly.

Requirements.

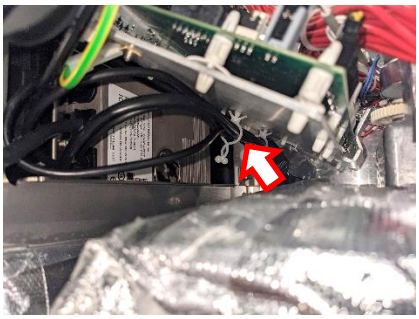
Check that the following requirements have been met:

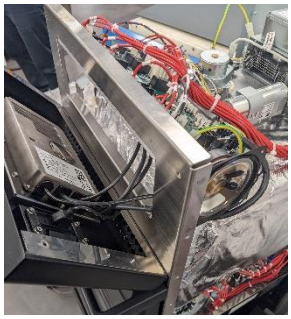
- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- Anti-static precautions have been taken.
- The top, left and right panels of the casing of the appliance have been removed.
- The high voltage capacitors are discharged before commencing work.

1. Unfasten the two M5.5 hex head flange bolt fixing the front panel to the cavity frame. Looking from the front, top right above the IO Board and bottom left.
2. Lift the front panel upwards and out to detach from the cavity frame.

4

3. Disconnect the electrical connections; X523 on the IO board, the USB, ethernet and speaker loom connectors.





4. Unfasten the three Posidrive screws at the bottom of the removed front panel and un-slot from the top of the panel to separate from the metalwork.

5. Unfasten the eight posidrive screws from the UI clamp to separate the UI from the glass panel.



Fitting the UI assembly.

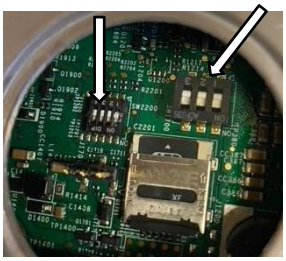
Follow the steps in the reverse order to replace the UI assembly.

- Ensure the UI is square in the facia panel and refit the clamp using the location pin as a guide.
- Do not overtighten the eight posidrive screws clamping the UI to the glass panel (0.7 Nm).
- Ensure the cables are not trapped when refitting the panel to the oven and reclip the loom to the underside of the IO board.

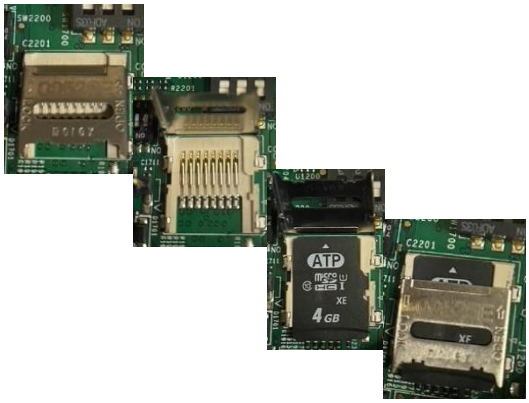
Replacing the UI assembly for new.

1. Ensure that the Micro-SD card is removed from the old UI and fitted to the new assembly. Check that the dip switches are in the off (0) position. Access the switches by prizing off the protective cap on the back of the UI assembly before fitting to the oven.

1 / 2 / 3 / 4
Off/Off/Off/Off - Off/Off/Off

Micro-SD Card replacement



2. Refit all oven panels, plug in the oven, and switch on.

NOTE- If the oven is to be connected to an external WIFI box then switch 4 should be switched over to the on position.

3. Run through the appliance setup to set / confirm.

    a. Language.
    b. date & time.
    c. Connectivity (WIFI / Ethernet / KitchenConnect).

3. Check the IO and UI versions are the latest release. If not, execute a firmware update using the latest versions. See section 4.5 for details.
4. Run a recommission test in the Service Settings.

6.10 Replacing the IO Board (Input Output Board).

Component.

The IO Board extends over the width of the oven behind the front panel, above the cavity. It is mounted to the cavity frame.

The IO board supplies the control voltages to the UI and switches the oven components as required.

Unused connections may require link connectors fitted, ensure positions are noted before removal of the board from the oven.

Tools required.

M7 hex socket wrench / spanner

Discharge Tool

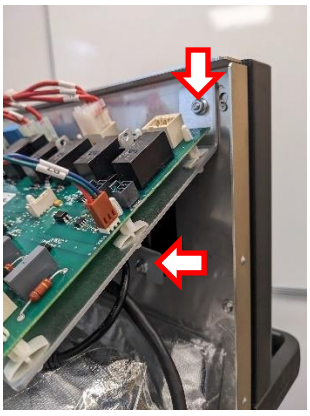
Requirements.

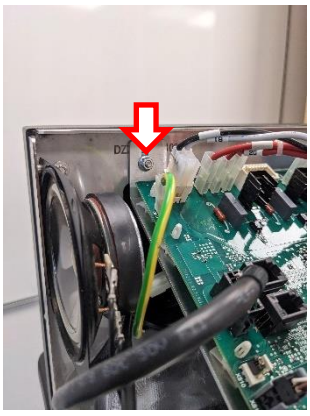
Check that the following requirements have been met:

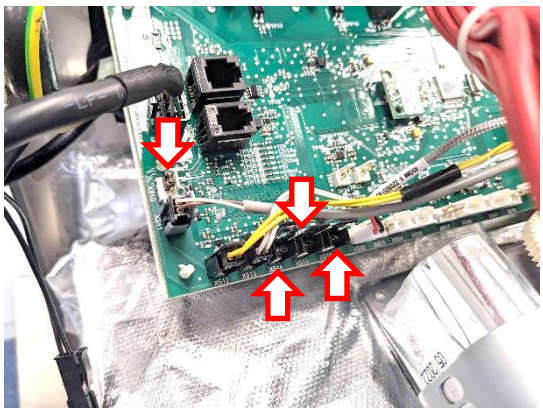
- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The side and top panels of the appliance have been removed.
- The high voltage capacitors are discharged before commencing work.
- Anti-static precautions have been taken.

Removing the IO Board.

1. Disconnect all the cables connecting the IO board to other components.
2. Loosen the two M7 hex nuts under the IO board on either side to remove the assembly from the frame of the cavity.
3. Remove the PM (Personality Module) from the IO Board and place safety aside to refit to the replacement IO.







Jumper Positions

NOTICE: Do not use tools to remove or refit the Personality Module.

Fitting the IO Board.

Follow the steps in the reverse order to fit the IO Board. For details see “IO Terminal Locations” in section 7.

Refit the Personality Module (PM) removed from the old IO Board to the new IO Board.

Reason: Replacement IO Boards come WITHOUT a Personality Module as the PMs store individual settings for the appliance.

Recommission the oven in the Service Settings.

NOTICE:

If the electric connections have not been restored properly this may lead to malfunction/damage of the oven.

6.11 PM (Personality Module) replacement.

Fitting the IO Board Personality Module (PM)

Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The side and top panels of the casing of the appliance have been removed.
- The high voltage capacitors are discharged before commencing work.
- Anti-static precautions have been taken.

The personality module on the IO Board contains the IO Board dedicated firmware.

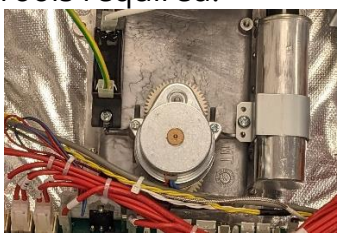
1. Unplug the old PM from IO Board and fit replacement PM (ensure part number is correct).
2. Refit all oven panels, plug in the oven, and switch on.
3. Follow the screen prompts to update the IO firmware if requested.

4. Check the IO and UI versions are the latest release. If not, execute a firmware update using the latest versions. See section 4.5 for details.
5. Recommission the oven in service settings.

6.12 Replacing the stirrer motor and stirrer assembly.

Component.

Tools required.



M5.5 hex socket wrench
M7 hex socket wrench
Discharge Tool
Pozidriv PZ1 screwdriver
Torque wrench

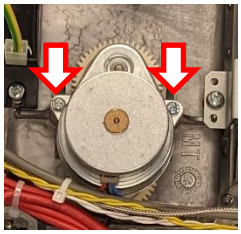
Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The top and side panels of the casing of the appliance have been removed.
- The high voltage capacitors are discharged before commencing work.

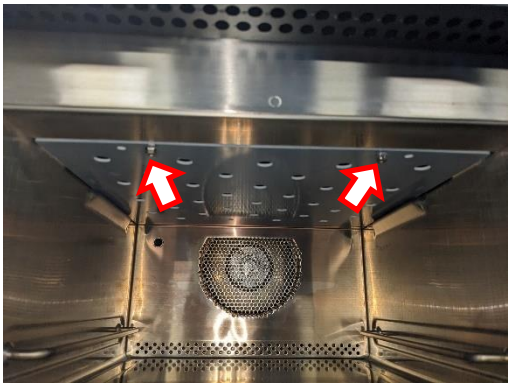
Removing the stirrer motor.

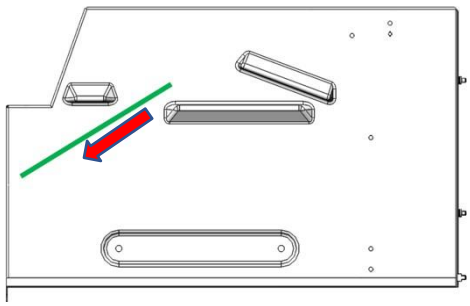
1. Unplug the stirrer motor from the IO Board, connection X112.
2. Unfasten the two M3 x 8 Poszi screws holding the motor to the waveguide and lift out.



Removing the microwave stirrer.

1. Unfasten the two M7 Hex screws at the front of the jet/impinger plate.
2. Drop down the jet/impinger plate slightly at the front and slide forward to release to two rear tabs.
3. The plate will then drop down and forward to remove.





4. Unfasten the nine M7 hex nuts.

5. Carefully remove the partition plate.
NOTE: The partition plate features a rubber gasket on the side pointing upwards (to the stirrer) when mounted. The rubber gasket prevents grease laden air from soiling the stirrers and needs to be intact.

6. The stirrer(s) is positioned inside the top of the oven cavity, above the partition plate.

7. To remove the stirrer from the spindle, turn anti-clockwise (looking up). Hold the stirrer cog located next to the motor cog to prevent the stirrer motor from rotating.

8. Remove any remains of the old gasket from the top of the cavity before fitting a new partition plate (comes with gasket) to ensure a good seal.

Fitting the stirrer motor and assembly.

Follow the steps in the reverse order to fit the stirrer motor and stirrer.

⚠ **IMPORTANT:**

Follow the steps in the reverse order to fit the stirrer.

When refitting the partition plate fasten the screws on opposite corners/sides in turns and do NOT proceed stringently clockwise or anti-clockwise.

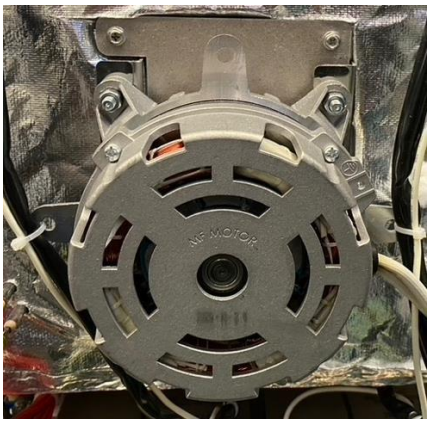
Tighten the partition plate screws to 2.1 Nm of torque.

Tighten the jet/impinger plate screws to NO more than 1.8 Nm of torque.

Tighten the stirrer motor pozidrive screws to 1Nm torque.

6.13 Replacing the convection fan motor.

Component.



Requirements.

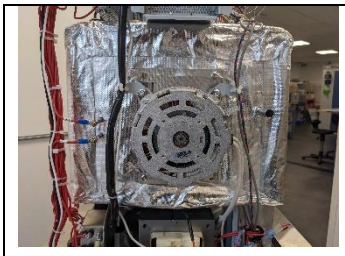
Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- All panels of the casing of the appliance have been removed.
- The high voltage capacitors are discharged before commencing work.
- Additional PPE, Mask & Gloves for handling insulation material.

Tools required.

M7 hex socket wrench
M7 hex spanner
Torque wrench
Heat tape
Discharge Tool
Stanley / retractable knife

Removing the convection fan motor.



1. Remove the tape from around the rear edge of the cavity.

2. Disconnect the convection fan wiring from the motor speed controller (VFD drive).

3. Disconnect the two heater wires (see section 6.16).

4. Locate the M7 hex nut and remove the steam vent pipe.

5. Remove the cable ties fixing the wiring to either side of the fan motor and move the wiring clear of the back of the oven.

6. Locate the ten nuts fixing the plate carrying the convection fan motor to the rear of the cavity. There are three nuts close to the horizontal edges and two nuts close to the vertical edges.

Unfasten the ten M7 hex nuts to remove the plate with the convection fan motor assembly, being careful of the wiring in the vicinity.

Note: Do not unfasten the four M13 bolts securing the convection fan motor to the plate.

Removing the convection fan motor assembly will also give access to the upper & lower catalytic converters and the heating element.

⚠ CAUTION: **Wear personal protective equipment to protect your fingers when using the knife.**

Fitting the convection fan motor.

Follow the steps in the reverse order to fit the convection fan motor assembly.

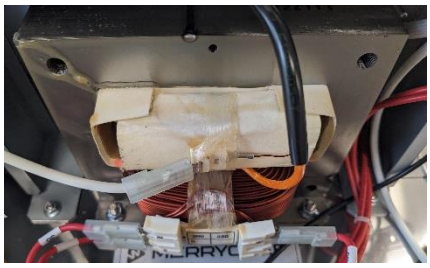
On replacement, ensure the rear plate is placed fully over the mounting points on the cavity before refitting and tightening the nuts, fitting new gaskets if required, when refitting the replacement motor assembly and vent pipe, ensuring the mating surfaces are clean.

Ensure the flange nuts holding the convection motor in place have been torqued to 2.1Nm and are torqued diagonally.

6.14 Replacing a transformer (high voltage).

Component

The conneX 12e has one HV transformer, at the rear of the oven, under the cavity.



Tools required.

M8 hex socket wrench

End cutters

Discharge Tool

Torque Wrench

⚠ **CAUTION:**

The transformers are heavy.

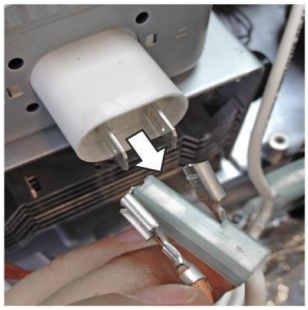
Wear safety shoes to protect your feet from a dropped transformer.

Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The casing of the appliance is removed.
- The high voltage capacitor is discharged before commencing work.

Removing a transformer (high voltage).



1. Unplug all the electrical connections on the transformer.
2. Disconnect the transformer from the magnetron by unplugging the orange filament cables at the magnetron.
3. Unfasten the two M5 flange nuts. The leading edge of the transformer is engaged under two tabs. To remove a transformer, lift the rear of the transformer whilst sliding towards the rear of the oven.

Fitting a transformer (high voltage).

Follow the steps in the reverse order to fit the high voltage transformer.

- The fixing nuts should be torqued down to 3.5Nm.
- Ensure the wiring is fixed back in the original orientation with new cable ties.

NOTICE:

It is imperative that the electrical connections are replaced correctly. If the electric connections have not been restored properly this may lead to malfunction/damage to the oven.

Wire Number	HV Transformer	
	50Hz	60Hz
31 ➔	0V	0V
35 ➔	200V	208V
36 ➔	230V	240V

6.15 Removing the convection fan motor speed controller (VFD).

Component.

Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- All casing of the appliance is removed.
- The high voltage capacitors are discharged before commencing work.
- Anti-static precautions have been taken.

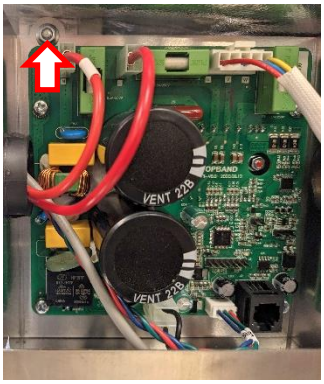
Tools required.

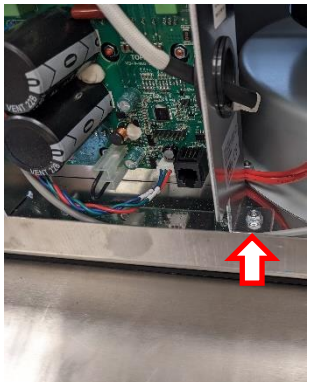
M7 hex socket wrench

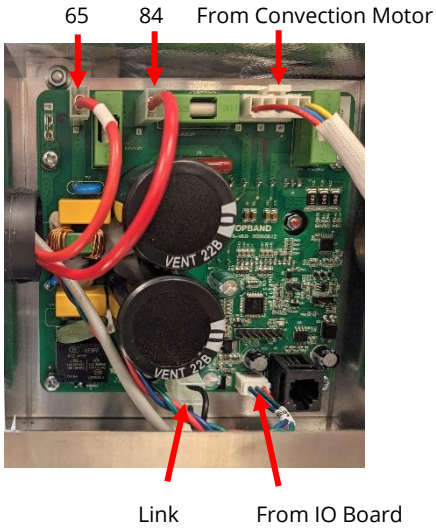
Torque wrench

Removing/fitting the convection fan motor speed controller.

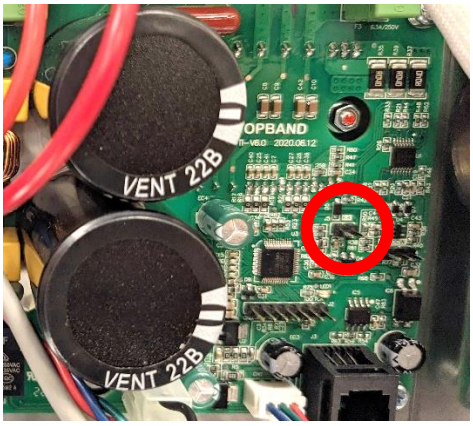
1. Unfasten the two M7 hex head flange nuts.
2. Unplug all the electric cables.
3. Refit in reverse order, reconnecting the cables to the convection fan motor speed controller and fixing the bracket to the base plate, torqued to 2.1Nm.
4. Ensure the wiring of the speed controller is in accordance with the diagram shown.







Note: Ensure the replacement board does **not** have a jumper (link) fitted to the J5 position.



6.16 Replacing the heating element.

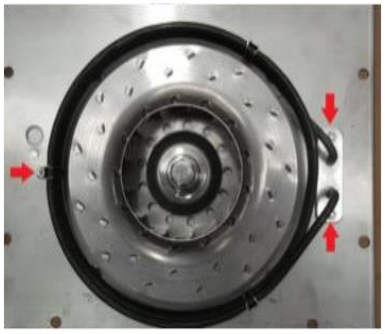
Requirements.

Check that the following requirements have been met:

- The appliance has been disconnected from the power supply and protective measures have been taken to ensure the power cannot be switched on again.
- The appliance is cool.
- The casing of the appliance is removed.
- The high voltage capacitors are discharged before commencing work.
- See section 6.13 for convection fan motor assembly removal to access the heating element.

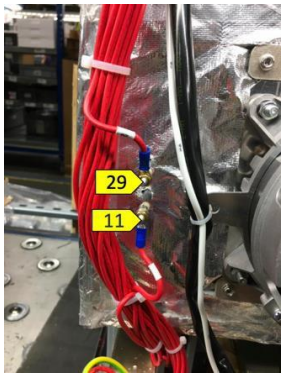
Additional Tools required.

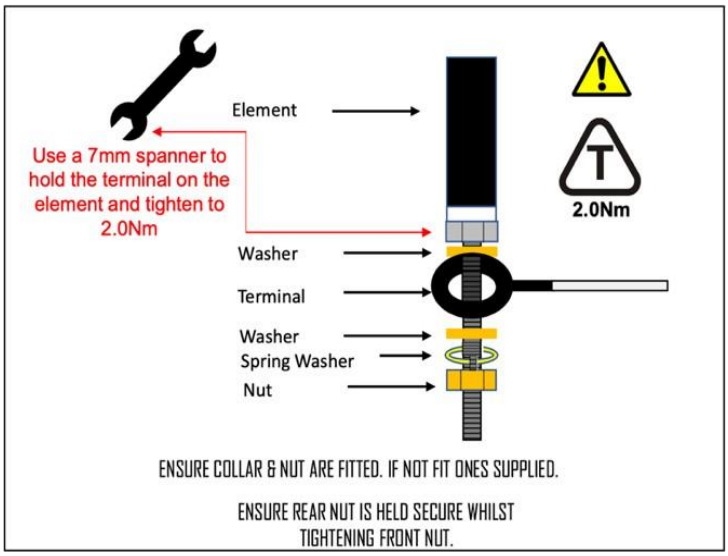
- 7mm open spanner
- Torque Wrench



The element is fixed using two M7 hex bolts, tightened to 2.1 Nm and supported with a single M5.5 hex flange, tightened to 1.7 Nm.

Use a 7mm spanner to hold the terminal on the element and loosen the M7 hex nut fixing the wiring connection. Follow the same procedure re-connecting the wiring and tighten to 2 Nm.

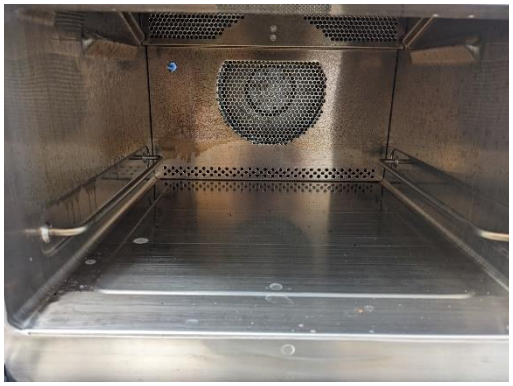




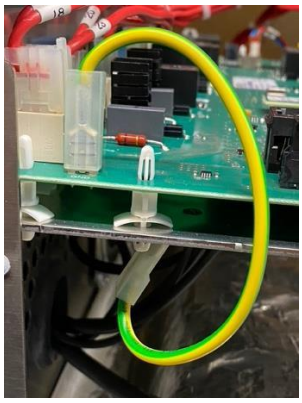
6.17 Overview – further components.

Shelf (Cook Plate).

There are two, metal bars in the cavity to support the cook plate.



Protective earth – connections to casing.

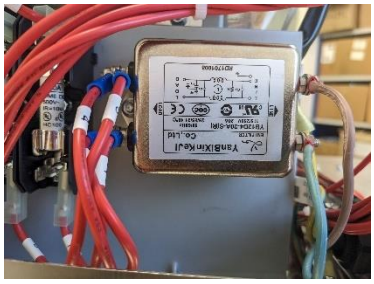


M8 nut

Equipotential bonding connection.

M8 nut (not fitted to some country specific versions)

Electromagnetic Compatibility (EMC) Filters.



Microwave Circuit, Heater & Control Circuits.

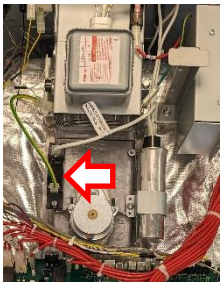
EMC filter to bracket by two M7 hex nuts.
EMC filter bracket to base plate by two M7 hex nuts, slotted in at the back.

Wiring connections by M7 hex head nuts, torqued to 1.2Nm.

Single phase oven supply is connected to the filter. Live on the top terminal, neutral on the bottom terminal.

US ovens, supply connected L1 on the top terminal, L2 on the bottom terminal.

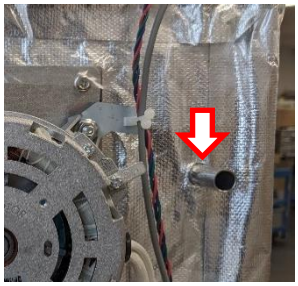
Diode (high voltage).



One high voltage diode

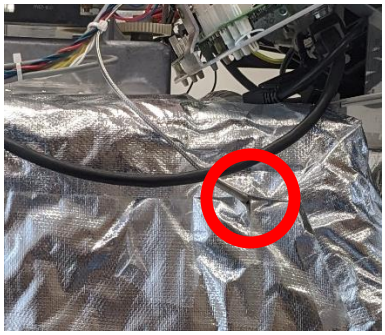
Fitted by two pozidrive (PZ2) screws to 1Nm.

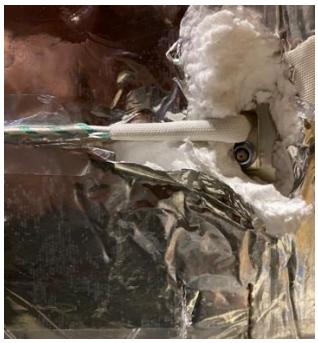
Steam Vent (Exhaust pipe).



The straight steam vent runs from the rear of the cavity directly out of the rear of the oven, secured by a single M4 flange nut and gasket torqued to 2.1Nm.

Cavity temperature sensor (thermocouple).





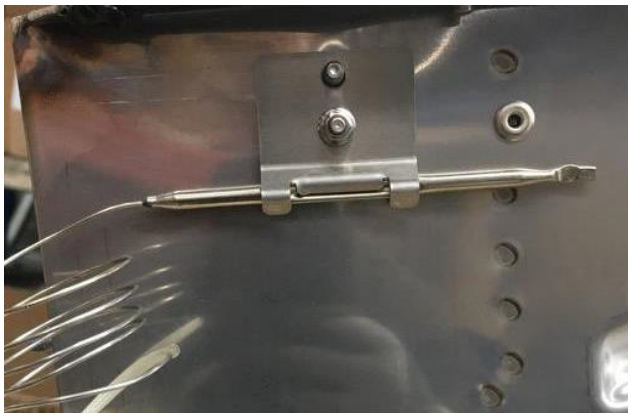
temperature sensor (thermocouple) connected to the IO Board.

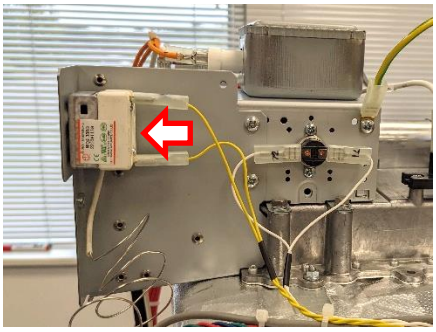
The thermocouple is fitted in front of the cavity from the left-hand side, sealed with a gasket and held in place by a M7 hex nut.

Cavity Overheat Thermostat.

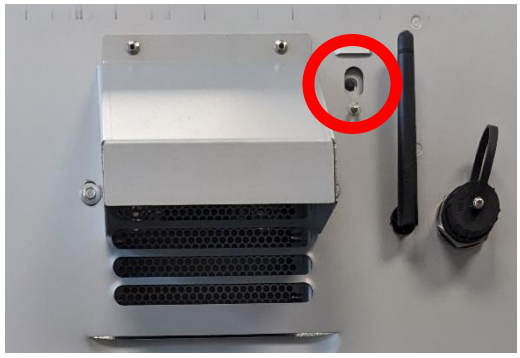
The thermostat probe is located on the left-hand side of the cavity. The probe has a self-locating pressing within the bulb, slotting into the locating bracket held on to the cavity with a single M3 flange nut torqued to 1.2Nm. Ensure when fitting that the probe is equal length on both sides within the fixing bracket.

The cavity overheat thermostat switch is located at the rear of the oven, mounted on the left-hand side of the magnetron air flow ductwork, fitted by two M3 x 4 CSK Philips SS Screws and flat washers torqued to 1Nm.

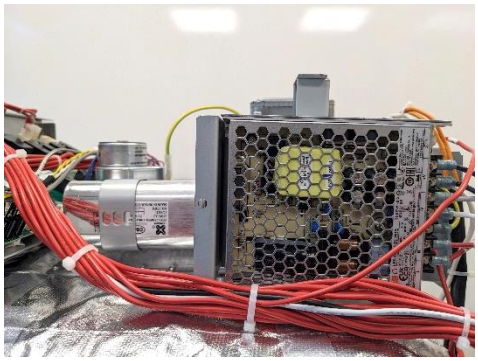




The manual reset button is now directly accessible from the rear of the oven.



Switch Mode Power Supply.



The Switch Mode Power Supply (ELV) is located.

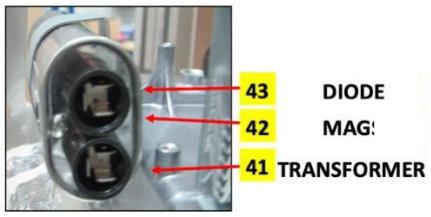
- On the top right of the cavity, towards the rear.

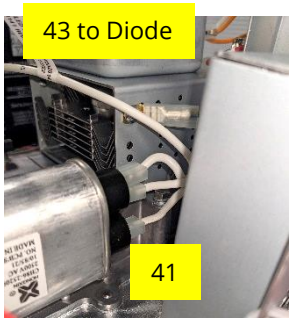
Providing the 12VDC supply to IO Board.

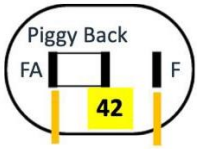
The 12VDC output voltage adjuster is factory pre-set and does not require adjustment.
The green LED is illuminated to show correct functionality.

Capacitor (high voltage).

The high voltage capacitor is located on top of the cavity and is fixed by a sheet metal bracket and a pozidriv (PZ2) screw.



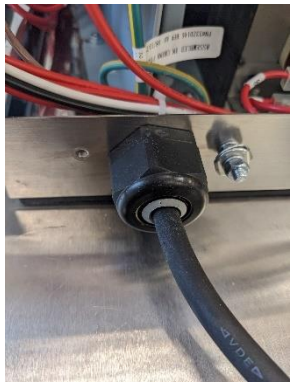




Insert HT wire 42 onto piggy back transformer wire

Mains Cable Entry.

The mains cable enters the oven through a PG21 / PG16 cable gland on the base plate at the rear right-hand side of the oven.

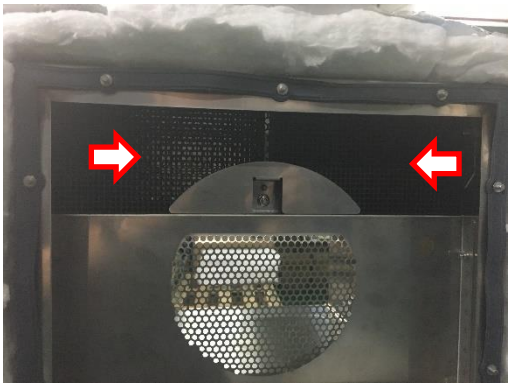


Catalytic Converters.

See section 6.13 for convection fan motor assembly removal to access the catalytic converters.

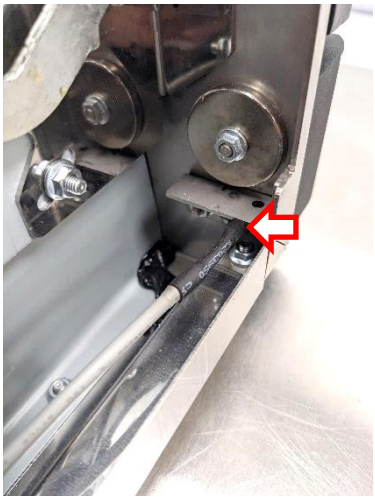
Once the fan motor assembly has been removed from the rear of the cavity, the four M7 hex nuts should be removed at the rear of the cavity (inside) to allow removal of the internal box and catalytic converters.

The upper catalyst is fitted using one M4 hex flange nut, tightened to 2.1 Nm.



Air Filter Microswitch.

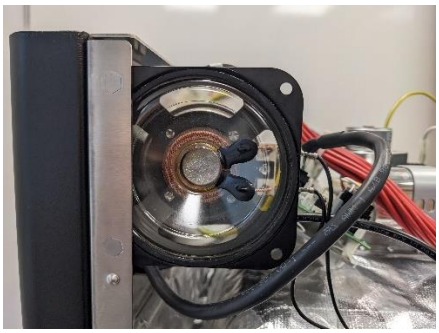
The air filter microswitch is located on the bottom front left-hand side of the cavity frame by a M5.5 hex nut and wired directly to the IO Board (X511).



USB Socket.

The USB socket is located on the front left-hand side of the user interface and connected directly to the UIloom on the underside of the IO Board.

Speaker.



The speaker is located on the right of the front panel, behind the UI, by two M7 hex nuts and connected directly to the UI loom.

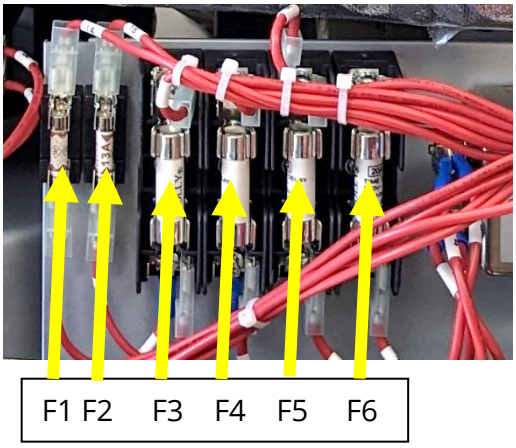
Air Filter Securing Magnet.

The air filter is secured in position by two magnets on the cavity assembly.

Fuses.

The fuse assembly (F1, F2, F3, F4, F5 & F6) is located to the front of the mains filter on the right-hand side of the oven.

Note: Specific fuse rating and function can be found detailed in the circuit diagrams (Section 7.2)



F7 Is located next to the SMPS on the magnetron duct.

Convection Fan Safety Relay.

The convection fan safety relay is located next to the DF on the cavity base.

Rear Panel Fixings.

Ethernet Port.

6.18 Technical Data Summary Sheet.

Fuse Ratings	
F1 – F4	20A
F5 – F6	13A (*12A)
F7	3A
VFD Board	6.3A

Overheat Thermostat settings	
Cavity Stat	300ºC
Mag Stat	125ºC
Fan IP	160ºC

Current Draws @ 230VAC	
Magnetron	5.5 - 6

Circuit Breaker Ratings	
conneX 12e	D16

Component Resistances	
EMI Filter L - N	330kΩ
Cooling Fan	220Ω
Stirrer Motor	7-8Ω
Convection Fan	7.5Ω ±10%
conneX 12e Heater Element	19Ω
Magnetron	<1Ω
HV Transformer Pri	0.6Ω*
HV Transformer Sec	570Ω*
Capacitor	10MΩ
Relay Coil	295Ω

Maximum Cavity Temperature
260ºC

Component Torque Settings (Nm)	
USB Assembly	2.1
Door Switches	1.0
Door Skin	2.1
Door Handle	2.1
Fuse Bracket	2.1
On/Off Switch PCB	1.0
Air Filter Assembly	1.0
Cavity to Base	2.1
Cooling Fan	2.1
Door Choke	2.3
Door Hinges	3.5
Mains Filter Bracket	2.1
Cavity Overheat Thermostat	0.7
Panels	2.1
Partition Plate	2.1
Stirrers	1.0
Impinger Plate	1.2
VFD Bracket	2.8
Waveguides	2.1
Heating Element Wiring	2.0
Mains Filter Wiring	1.2
Magnetron	2.1
Convection Fan Motor Assembly	2.1
Door Switch Bracket	2.8
UI to panel	0.8
IO Bracket	2.1
HV Transformer to Base	3.5
Voltage Selection Relay to Base	0.8
Speaker	2.1
Cavity Thermocouple	1.7
LV Transformer	2.1
Steam Vent Pipe	2.1
Front Panel	2.1
Mains Filter to Bracket	2.8
Fuse Holder	1.0
VFD to Bracket	2.8
Cook Plate Studs	8.0
Heating Element	2.1

Error Codes	
E81	Firmware updated
E82	Menu updated
E83	Incompatible IO version
E84	Date not set
E86	Oven switched on
E87	U/I held for 15 sec
E88	Supply voltage <180V
E89	Recommission test failure cooling fan
E90	Recommission test failure convection fan
E92	Recommission test failure heater(s)
E93	Recommission test failure magnetron(s)
E94	Recommission test failure air filter in
E95	Recommission test failure air filter out
E96	Recommission test failure door switches close
E97	Recommission test failure door switches open
E98	Incomplete cleaning cycle
E99	Filter override accepted
E100	Mains supply switched on
E101	Magnetron failed on request.
E102	Heater on without request.
E103	Ambient Overheat. UI or IO >70ºC
E104	Safety circuit open (Overheat Thermostats)
E105	Supply frequency out of range by ±2Hz
E106	Cavity 75ºC above setpoint or 300ºC
E107	Communication fault between UI & IO
E108	Missing or corrupt UI Micro-SD
E109	Missing or corrupt IO PM
E110	Incompatible IO firmware
E111	Cavity sensor open circuit
E112	IO temperature sensor failure
E113	Magnetron on without request. >1A
E116	Heater off on request.
E117	Mag Stat open circuit

** see section 3.1 'Technical data, checks and verification' for non-EU model specific readings where they differ.*

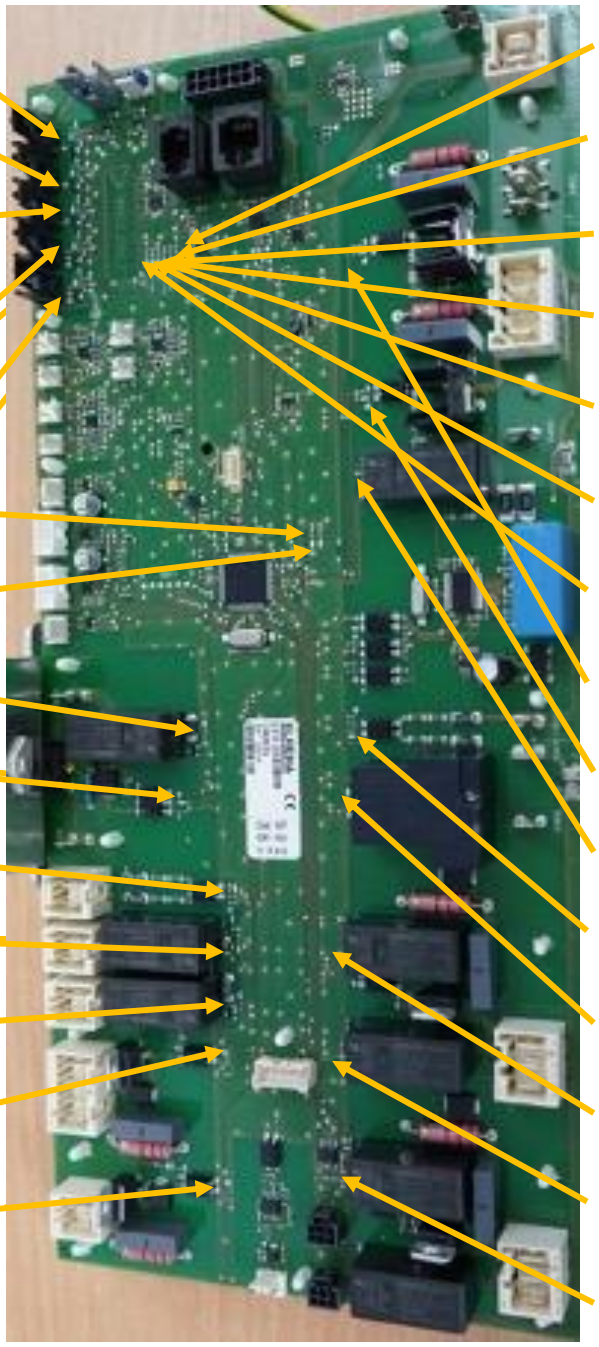
7 Circuit boards and diagrams.

7.1 IO circuit board.

IO LEDs

- P-Bus – irregular flashing, indicating data communication with UI.
- Run – Pulsing 1 second flash, indicating that the board has booted up.
- 12V, 5V & 3.3V – lit to show voltages from SMPS and onboard transformer.
- Relay and triac – lit to show that a signal has been sent to energise that component.
- Door switches – lit to show door closed.
- Overheat thermostats – lit to show portion of closed safety circuit.

LED positions ~



LD14 – Safety circuit. Cavity heat thermostat closed =yellow

LD16 – Safety circuit. RH Mag overheat thermostat closed = yellow

LD18 – Safety circuit. LH Mag overheat thermostat closed = yellow

LD15 – Safety circuit. Not used, linked out = yellow

LD17 – Safety circuit. Not used, linked out = yellow

LD19 – Run. Yellow on/off IO board functioning

LD20 – Status. Rapid yellow flashing, P-Bus communication with UI

LD25 – Heater safety relay, yellow = closed / OK

LD1 – Heater drive, pulsing yellow (varying with wattage)

LD26 – not used, yellow

LD24 – Aux safety relay, yellow

LD29 – VDF supply, yellow

LD27 – Stirrer motor(s), yellow

LD28 – Cooling Fan, on / pulsing yellow (varying with wattage)

LD9 – 12V supply from SMPS, green = OK

LD11 – 12V supply to UI, green = OK

LD10 – 12V supply to Aux circuits green = OK

LD12 – 12V buss supply, green = OK

LD30 – 5V supply from onboard transformer, green = OK

LD31 – 5V supply from onboard transformer, green = OK

LD13 – 3.3V supply from onboard transformer, green = OK

LD7 – Not used, yellow

LD8 – Not used, yellow

LD23 – Not used, yellow

LD6 - Door switches, yellow = door closed

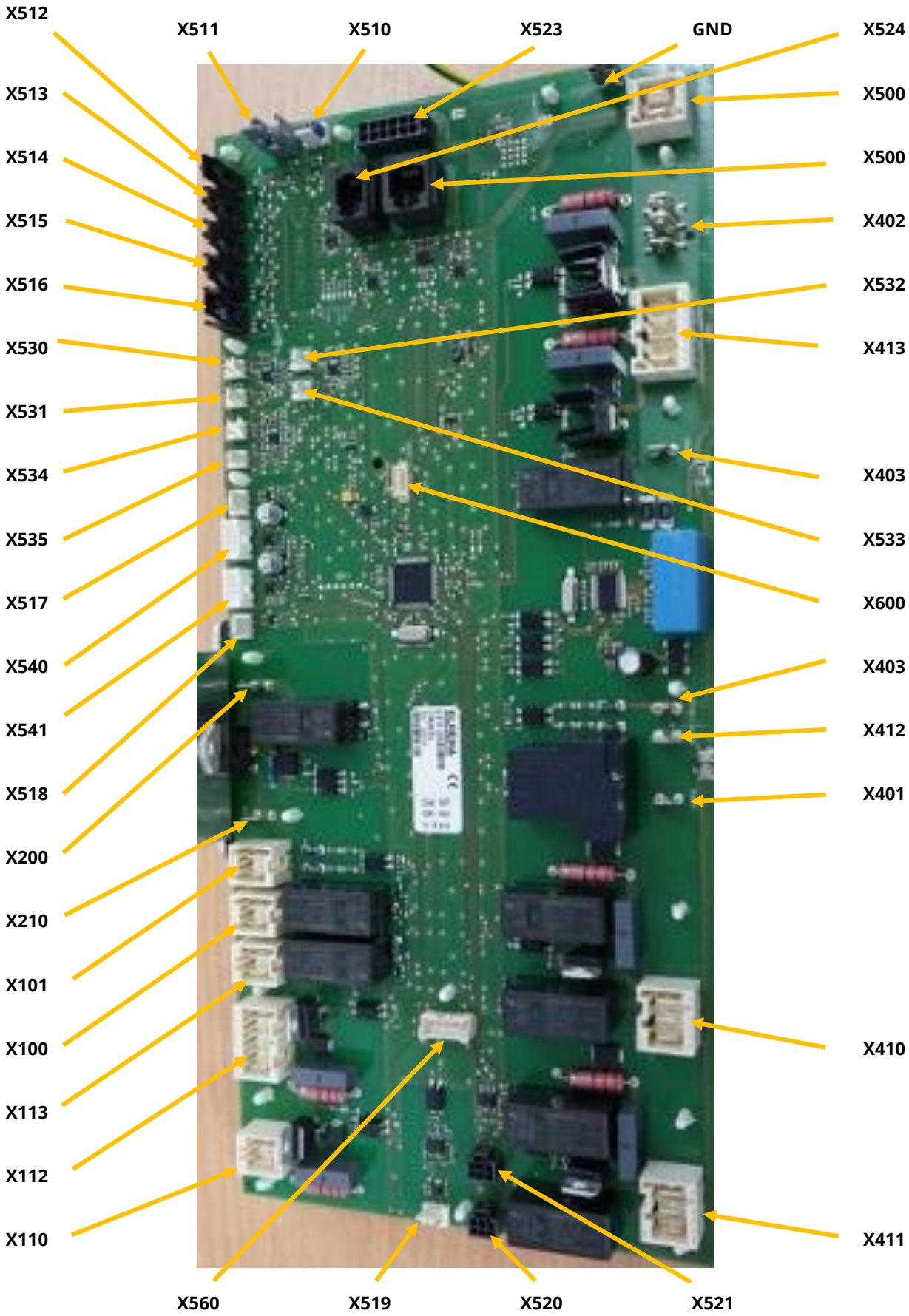
LD21 – Microwave safety relay, yellow = closed / OK

LD3 – RH Magnetron, yellow = on

LD5 - MW voltage selection relay, yellow = 200/208 VAC HV transformer tapping

LD4 – LH magnetron, yellow = on

IO terminal locations.



IO terminal legend.

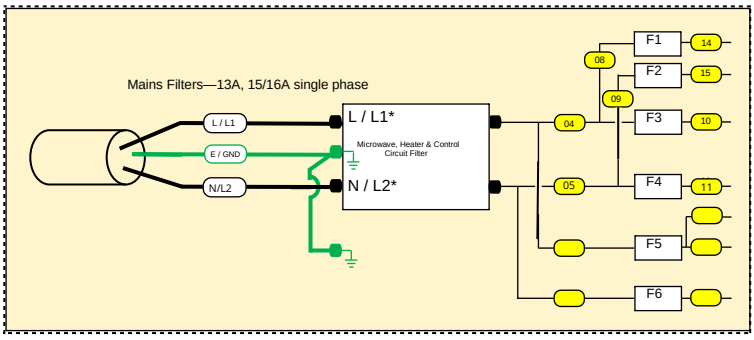
Terminal	Connection
X100	Wire 14 – Live from F1 Wire 15 – Neutral (US L2) from mains filter
X101	Wire 16 – Live to Switch Mode Power Supply Wire 17 – Neutral (US L2) to SMPS
X110	Wires 58 & 59 – cooling fan supply
X112	Stirrer motor
X113	Wire 64 – Live to Fan Safety Relay (wire 84 to VFD) Wire 65 – Neutral (US L2) to VFD
X200	Wire 10 – Live from F3
X210	Wire 29 – Live to heating element
X400	Wire 24 – Live from door SW3 for microwave circuit
X401	Wire 13 – Neutral (US L2) from F6
X402	Door Switch Interlock Wire 20 – Live from door SW2 Wire 22 – Neutral (US L2) from door SW1 Wire 23 – Live to door SW3
X403	Wire 26 – Live from F5
X410	HV Transformer Wire 31 – terminal 0. Neutral (US L2) Wire 35 – terminal 200/208. Live Wire 36 – terminal 230/240. Live
X411	Not used
X412	Wire 21 – Neutral (US L2) to door SW1
X413	Not used
X500	12VDC supply from SMPS. Wire 18 + Wire 19 -
X510	Not used – Linked out (jumper)
X511	Air Filter micro switch
X512	Cavity overheat thermostat. Wires 70 & 69
X513	Magnetron overheat thermostat. Wires 72 & 71

Terminal	Name
X514	Not used – Linked out (jumper)
X515	Not used – Linked out (jumper)
X516	Not used – Linked out (jumper)
X517	Not used
X518	Not used
X519	Convection fan speed controller (VFD) signal Wire 66 red, 0-10V Wire 67 green, 10V Wire 68 blue, GND
X520	Not used
X521	Not used
X522	Not used
X523	UI communication and power cable
X524	Not used
X530	Cavity temperature thermocouple
X531	Not used
X532	Not used
X533	Not used
X534	Not used
X535	Not used
X540	Not used
X541	Not used
X560	Not used
X600	PM
GND	Chassis ground

Note: IO Board test points (TP1 to TP58) are for factory build procedures only.

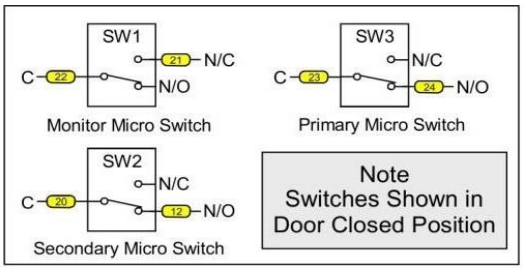
7.2 Circuit diagrams.

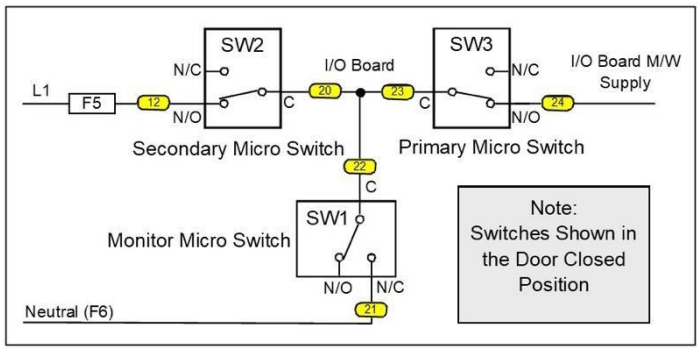
conneX® wiring diagram 50Hz 200/230V.



FUSE RATINGS						
F1	F2	F3	F4	F5	F6	F7
13 AMP	13 AMP	20 AMP	20 AMP	20 AMP	20 AMP	3 AMP
(L1)	(NEATRAL/L2)	(L1)	(NEATRAL/L2)	(L1)	(NEATRAL/L2)	(L1)

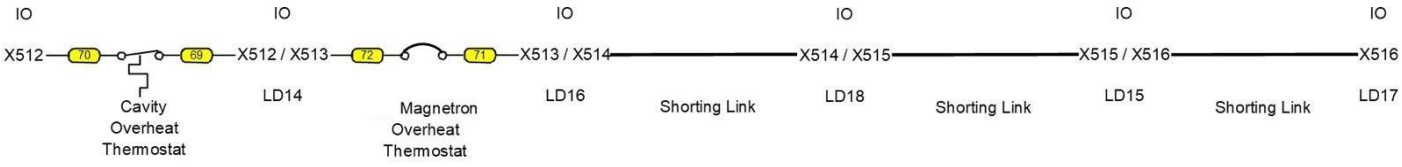
Door switches – LV safety interlock circuit



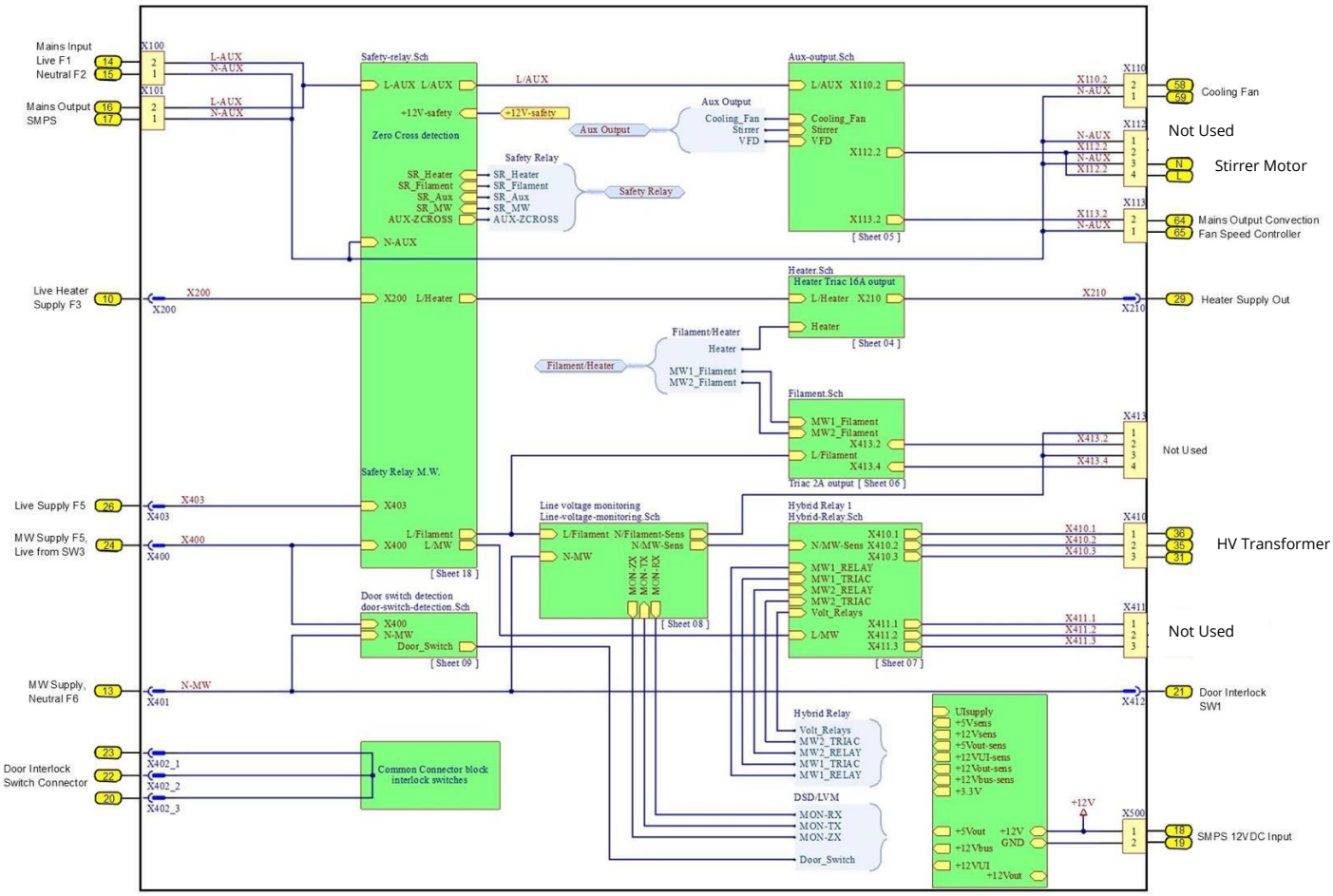


Overheat thermostats – ELV safety circuit.

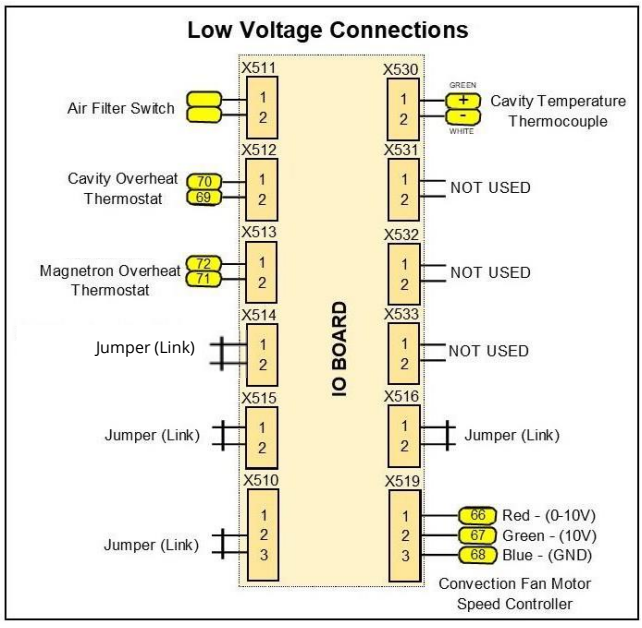
800W Ovens



IO BOARD



IO Board LV Connections.

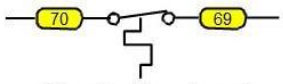


Notes: Standard power versions

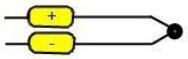
X514. Link fitted.

X112. Pins 1 & 2 not used

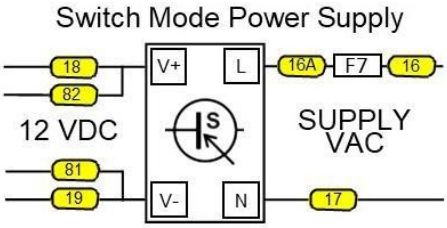
X411. Not used



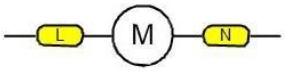
Cavity Overheat Thermostat (NC)



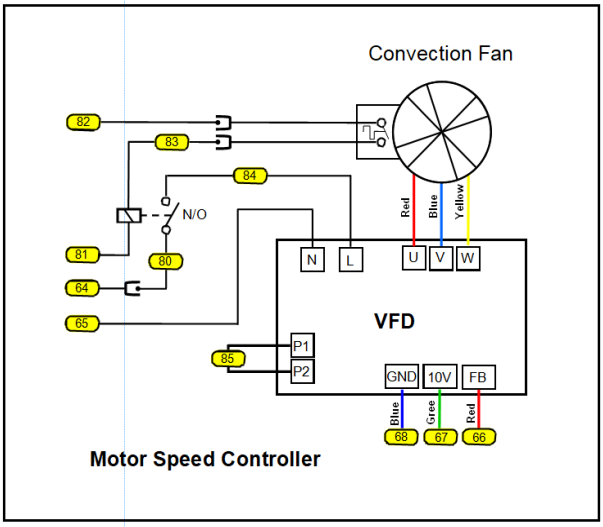
Cavity Temperature Thermocouple

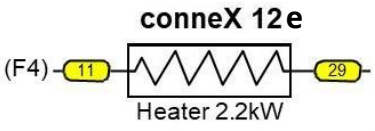


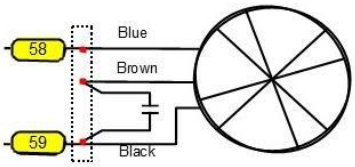
Magnetron Over-Heat Stat (NC)



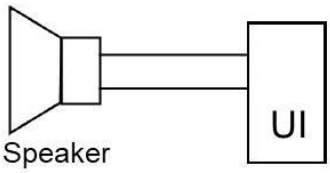
Stirrer Motor



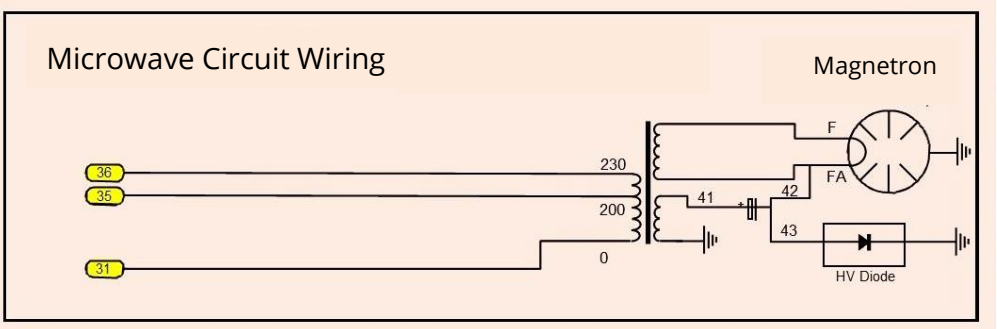




Cooling Fan



Speaker



8. Annual PM check procedure for conneX®

Tasks: Annual Technician PM check.
Frequency: Annual.
Time to complete: 1-3 hours.
Model: Merrychef conneX®12e

Safety information:

Please always adhere to all Merrychef safety aspects.


Electricity


Manual handling


Hot liquids

Service procedures.

- All tests to be carried out by a trained Merrychef technician.
- Ensure all documented safety procedures are followed for each individual task.
- Refer to the relevant section within this manual for task details.

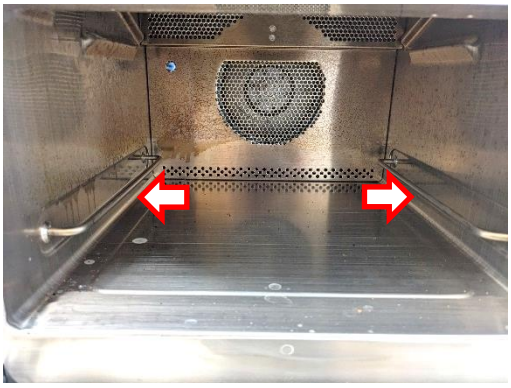
Task A.

1. Check the oven for obvious signs of damage and cleanliness. Switch the oven on and off with front switch, allow to cool down.

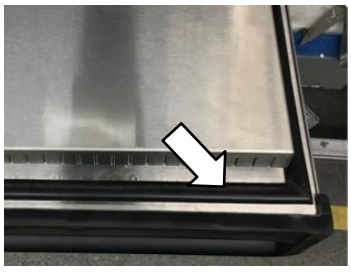
2. Check the power cord and plug for damage and replace if required.

3. Remove the air filter and check for damage, clean and insert or replace if required.

4. Remove cook plate and check for damage, clean and insert or replace if required.



5. Inspect the cook plate supports for signs of carbon and arching. Remove the side panels and replace as required.

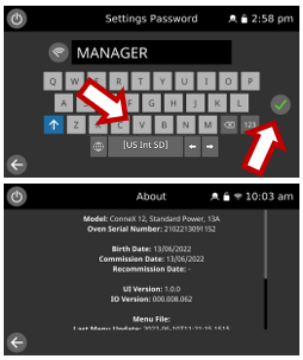


6. Check the door seal, ensuring that it is intact, not hanging loose or have any sections broken away or cracked. Replace if required and allow silicone to cure.

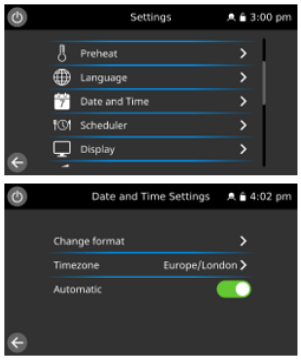
7. Remove & refit upper impinger plate inspecting for cleanliness and signs of damage (if required follow the instructions laid out in the replacement impinger Kit). Visually check the partition plate for signs of discolouration or damage.

Task B.

8. Switch the oven on and record the Serial Number. Check the firmware is correct, update if older version is observed (select the 'cog' to enter settings).

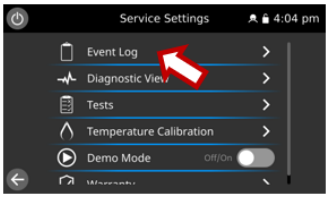


9. Enter the password MANAGER to access the settings menu. Use the displayed oven serial number if this is invalid.

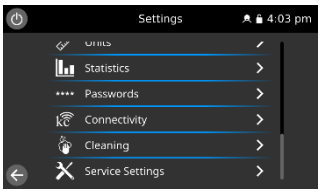


10. Check the date, time, and the time zone, correct if necessary. Refer to the Installation and User manual for details on the procedure.

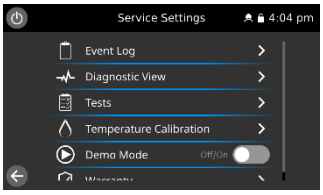
11. Enter the service settings, password SERVICE to access the service screen. Use the displayed oven serial number if this is invalid.



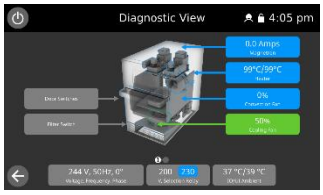
12. Check the "Event Log" for details of any logged appliance errors. Refer to the fault-finding section 5.3 to reference any errors logged.



13. Select the oven statistics and reference the service check sheet for recommended replacements, advise the customer on actions required.



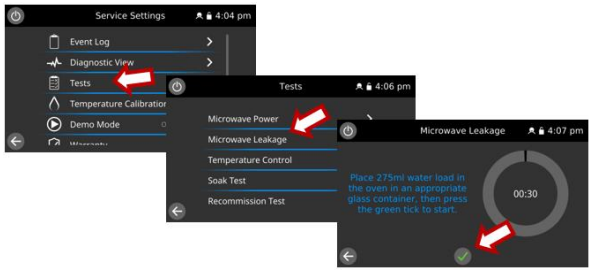
14. Select the diagnostic view to perform individual component checks.



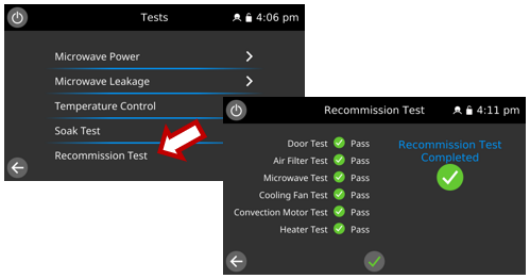
15. In diagnostic view select/operate each component to check operation, as detailed in the visual view section 5.2.
Check all speed ranges of the fans.
Record microwave (individual & combined) current draws.
Record displayed Voltage.

Note: ensure a bowl of cold water is in the cavity for the microwave current draw checks.

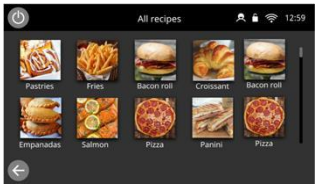
16. Exit out of visual view, place a bowl with 275 ml of cold water in the cavity and select tests / Microwave Leakage. While the test is running hold the test probe at right angles to the oven, ensuring the sensor is about 50mm away from the surface.
Test all around the front and rear of the oven, refer to section 5.6 for further details. Level must be 5mW/cm2 or lower &record.



17. Finally, remove the bowl of water from inside the cavity and select the recommission test (if the recommission test is greyed out, it means the oven is above the desired temperature and the function is disabled). Follow the onscreen instructions and record result.



18. Come out of the service and setting modes. Pre-heat the oven and cook one item of food from the operators' menu.



Planned preventative maintenance schedule for the Merrychef conneX® commercial combination oven			Daily	24 months	36 months	Comments
Item	**Description**	**Commissioning**	**Operator**			**Go to the Merrychef technical website for part numbers.**
1	Check installation and surroundings as per installation instructions.	●	●	●	●	
2	Check cook baskets for damage and replace if required.	●	●	●	●	For operator to check.
3	Check the cook plate condition.		●	●	●	If damaged replace cook plate and stubs.
4	Check air filter and clean.	●	●	●	●	Oven can be damaged if missing.
5	Inspect impinger plate, replace as Required.			●	●	Replace every 24 Months or when damaged.
6	Inspect partition plate.			●	●	Replace if damaged.
7	Visually check oven for damage.			●	●	Document findings.
8	Check condition of mains lead and plug.			●	●	Replace mains lead if damaged. Check oven model for service part number.
9	Clean oven as per user instructions.		●			
10	Check and clean steam vent pipe.			●	●	
11	Check door seal condition and replace as required.		●	●	●	Replace every 24 Months or when damaged. Consumable item.
12	Check door operation.	●	●	●	●	
13	Check chemicals are approved.					Customer is responsible.
14	Check oven serial number & firmware Revisions.	●		●	●	Update firmware if older version is displayed.
15	Check U/I condition and Operation (UI).		●	●	●	
17	Check date & time.	●		●	●	Update as required.
18	Check and record oven counter screen.			●	●	
19	Check & record amp draw for the magnetron.			●	●	
20	Check operation oven components.			●	●	
21	Check stirrer motor(s) is rotating.			●	●	Listen with all other components switched off.
22	Check oven temperature calibration.	●		●	●	Check cavity temperature is in range.
23	Unplug and isolate (LOTO).			●	●	
24	Remove all panels and discharge the HV Capacitor.			●	●	
25	Check all internal electrical connections for tightness and condition.			●	●	
26	Check magnetron and cooling duct.			●	●	Replace magnetron(s) every 36 months or every 1500 Mag Hours.
27	Check door switch condition and Adjust if required.			●	●	Replace 24 Months or when damaged.
28	Vacuum out casework.			●	●	
29	Refit all panels and plug the unit in to the electrical supply. Switch the oven On.			●	●	
30	Check & download error log file.			●	●	
31	Download cook count file.			●	●	
32	Check for microwave leakage.	●		●	●	
33	Complete recommission test and Record comments on your report.	●		●	●	
34	Pre-heat the oven and cook one item of food from the operators' menu.	●	●	●	●	
Total hrs/mins			0.5hrs	2hrs	3hrs	

= Mandatory checks that can be completed in visual view and should only take 15min to attend to and record findings in the comments column
= Mandatory
= Optional outside of PM requirement

Microwave Combination Oven

Merrychef conneX®

Part Number 32Z9262

Version 1

MERRYCHEF®

Expanding Your Opportunities

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conneX®12e Service/RepairMan_261023JW