



**Grand-fuser
Instruction manual.**

2022

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Kilncare LTD



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Instructions

Thank you for
Grand-fuser for
glasswork.



choosing to purchase the
your

We hope you will have many years happy use out of your kiln.

The Grand-fuser is one of the most advanced fusing and slumping kilns available.

The kiln is packed full of features, all of which are explained in this manual.

Please read this manual fully to get to know your kiln before use.

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Safety notices

Your Grand-fuser is designed and built to meet all European Directives and British Standards.

However, as with all kilns, there are certain measures that you must take to achieve optimum safety.

Electricity

The Grand-fuser meets all Electrical Safety Directives, including a lid safety switch. However, the kilns are electric and as such certain measures should be taken.

Keep the kiln dry.



European Declaration of Conformity.

Kilncare Limited, The Kiln Works, 907 Leek New Road, Baddeley Green,
Stoke on Trent, Staffordshire, England, ST2 7HQ.

We declare that the equipment described below was manufactured ourselves to comply with directives listed.

We do not give any assurance that the equipment is suitable for any purpose other than that listed below and must be operated and maintained in accordance with our operating instructions.

Products.

Grand-fuser.

Directives.

LVD - Low Voltage Directive 2006/95/EC.

EMC - Electromagnetic Compatibility Directive 2004/108/EC.#

#The equipment is intended for use only in premises having a service current capacity of 100 A per phase, supplied from a distribution network having a nominal voltage of 400/230 V,

The user should determine in consultation with the supply authority, if necessary, that the service current capacity at the interface point is sufficient for the equipment.

Harmonized Standards.

BS EN 1088:1995+A2:2008, BS EN 55014-1:2006, BS EN 55014-2:1997.

Description.

Glass fusing and slumping Kiln.

Purpose of use.

Glass fusing, slumping and colouring up to the maximum temperature stated on the kiln data plate.

Product serial number.

As per affixed data plate.

Manufacture year.

2022.

Technical documentation is held for this product.

Lee Sherwin,
Director,

kiln casing will get hot and so any combustible material must be kept at a safe distance. Never leave combustible materials on the kiln lid or touching the kiln during a firing.

Do not site the kiln close to flammable items such as curtains etc.

The floor must be capable of carrying the weight of the kiln.

Consideration must also be given to the ceiling area above the kiln as heat will radiate upwards from the kiln.

IMPORTANT. The top of the lid and the side cover box of the Grand-fuser will see high temperatures so careful consideration must be given to siting with regard to the safety of children and pets. It is advised that the kiln is left untouched until the kiln has finished it's given program and fully cooled. Remember, whilst the kiln is cooling it may be possible that the external case temperature actually increases.

Do not site the kiln outside.

It is advised to site the kiln in a room that has ventilation. After the first couple of firings there is almost no emissions from the kiln but there will always be vapour etc released by whatever you are firing in the kiln, especially stains so room ventilation is always advisable. The type of room venting required depends on many factors and so it is best to contact a ventilation specialist if in any doubt.

Splitting instructions

The Grand-fuser can be split to enable the kilns to be installed into rooms and studios with limited access.

Before splitting the kiln it is essential that a selection of photographs are taken of the kiln with the lid in the open closed positions from various angles. This can not only help with re-assembly but the pictures may also be required by Kilncare in the event of a guarantee claim.

To split the kiln down the first and most important part of the process is to remove the gas struts. This MUST be done with the kiln lid in the fully open position. 1 person (more on larger models) will need to hold the kiln lid in the fully open position whilst another removes the gas springs. EXTREME CARE MUST BE TAKEN to ensure that once the gas struts are removed that the lid does not try to snap the kiln shut by flipping up the front of the bed. Once you are happy that the necessary precautions have been taken to ensure safety during this process then the clips can be removed that hold the gas struts on.

The bottom section of the gas strut attaches to the kiln via a ball joint type fitting. Around the bottom or "knuckle" of the gas strut there is a small clip that recesses around the collar of the knuckle. Unclip then remove the clip. Using a suitable implement apply a slight leverage between the knuckle and the kiln bed as close to the ball joint as possible. The gas spring will free itself. Then do



the other side.

Refit the clips into the knuckle for safekeeping.

Gently and carefully lower the kiln chamber until it is seated safely on the kiln bed in its closed position.

Now remove the hinges. Simply loosen all the pins and remove them.

Disconnect the earth bonding wire between the rear leg of the kiln and the underside of the electric power box.

Unplug the thermocouple from the top of the electric power box.

Remove the electric power box which is fixed with 4 pins that screw into the back of the box from under the kiln floor. Place or temporarily attach the electric box somewhere safe on the kiln chamber for safe keeping whilst in transit.

Unplug the thermocouple from the top of the electric power box.

The chamber can now be lifted clear of the bed. Do not damage the seal. REMEMBER, the rods that carry the elements are of Quartz composition and as such, severe shocks to the chamber must be avoided.

The chamber will carry vertical or horizontal.

The kiln bed will also carry horizontal or vertical although in the vertical position the bricks are liable to shift as they are not cemented together.

Once in position the kiln can be re-assembled in reverse. THE GAS SPRINGS MUST BE FITTED LAST. Care must be taken to ensure that the safety retention clip is correctly fitted so guarding against accidental gas spring dislocation. Check that the hinges are fitted with all the pins prior to re-fitting of the gas springs.

It is important that the earth bonding wires are re-fitted correctly and soundly.

Before final connecting it is advised that all electrical connections are checked and re-tightened by a competent person.

Electrical connection

The Grand-fuser will require connection to a suitable electrical supply.

If the kiln is to be used on a 3-phase supply a neutral must also be supplied.

The electrical supply MUST have a sound earth connection.

Your Grand-fuser is supplied ready for connection to a 3-phase supply. If your supply is single phase then use the connection link fixed to the door of your connection panel.

Back up

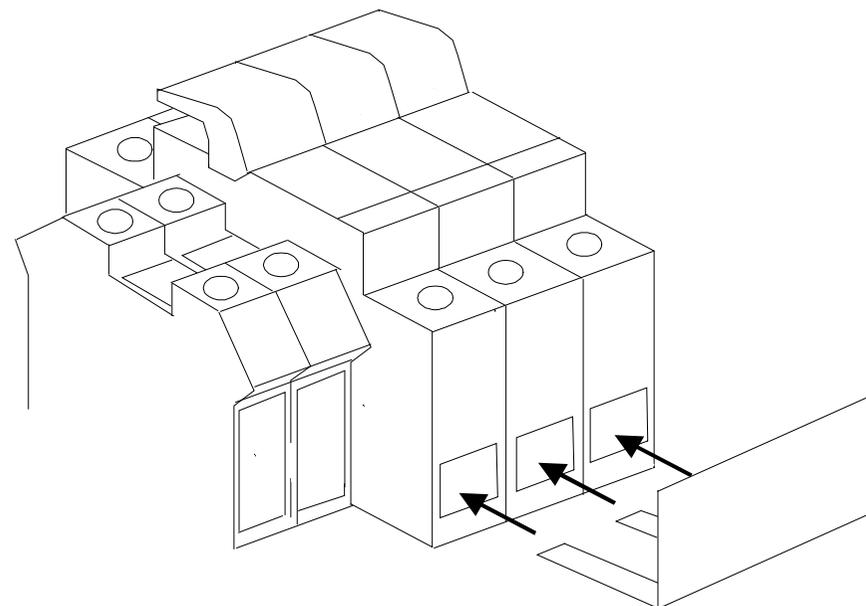
We pride ourselves on our back up and after sales service and so in the unlikely event of any problems please do not hesitate to call our staff for friendly help and advise.

Contact us

Kilncare Ltd,
The Kiln Works,
907 Leek New Road,
Baddeley Green,
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Staffordshire,
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Tel 01782 535915,
Fax 01782 535338,

E-mail sales@kilncare.co.uk, Web www.kilncare.co.uk

Notes



Kilns are porous by nature and will absorb moisture from the atmosphere, especial if the kiln is new or has had a period of inactivity. Periods of testing will be stipulated by the testing body.

KILNS AND R.C.D. "TRIPS"

Due to the reasons stated above and to insulation material properties, a certain amount of leakage to earth will probably be evident, therefore the fitting of a 30ma R.C.D. in the circuit can create a fault condition at low temperatures if the kiln is damp, at higher temperatures as the kiln insulation heats up, when first fired or used after a long period of inactivity.

This problem is relatively rare but can be solved by the fitting of a 100ma R.C.D.

Consult us or a fully qualified electrician for advise.

Looking after your kiln

A well-built kiln requires very little maintenance. Certain common sense tasks will certainly help its life such as cleanliness and careful use. Keep the area of the door seal clear of any separating material or any other objects as once

damaged the seal will need to be repaired or replaced.

Regular inspections of the gas springs that assist with the lifting of the Chamber is essential.

Check that the fixing points are still tight and are sitting level, Check that the heads of the gas springs are still in line and are also tight. Check that there is not an excessive amount of oil around the shaft/rod of the spring. A small amount of lubricating oil on the shaft is usual. The gas spring inspections should be carried out weekly. If there are any doubts over the condition of the gas springs then do not use the kiln and immediately contact Kilncare.

Keep the kiln dry and away from sources of water. REMEMBER, the kiln is for fusing and slumping and will also fire stained glass colours. IT IS NOT A MOULD DRYER. Moulds used for slumping contain a huge amount of water, it is recommended that the mould is thoroughly dried prior to insertion in the kiln. The kiln will operate with a wet mould in it but the kiln was not designed to expel large quantities of water vapour from its chamber even though the top and sides have moisture removing features. Continued use of wet moulds in the kiln chamber could result in premature deterioration of the kiln structure.

Care must be taken not to load the kiln to a height that will result in the elements being closed on to the load. This invariably results in broken element tubes. The same applies to the thermocouple that sticks through the back wall into the chamber.

When shutting the kiln lid, gently operation will also prevent accidents, even though the lid operation is dampened by the gas dampers. Depending on use it advisable to check all electrical connections are tight every 6 months or so and that no cables are discolouring due to heat.

Initial firing

Before using the kiln it is advisable to fire the kiln empty to a temperature of 600 degrees centigrade at a rate of around 200 degrees per hour.

Have the automatic dampers in the open position by programming them to be so with the KCR32C.

This will dry and "settle" the kiln.

On the first firings, a slight odour will be emitted, this is the remnants of binding resins in the boards and should stop after two or three firings depending on temperature of the firings.

For this initial firing we recommend that the kiln is in a well ventilated area.

We suggest that prior to the initial firing, that you read this instruction manual, and the controller manual to ensure you are familiar with all aspects of the kiln and usage of the kiln controller.

We also recommend that the kiln controller is set to fire the kiln at full power to a low temperature and then end, say 50 degrees, whilst being monitored to ensure that it is switching off the kiln and that no problems have occurred during transport.

At such low temperatures the kiln will overshoot the set point

Remove the clip that is inserted around and through the knuckle joint at either end of the spring. Keep the clip safe in case you loose one of the new ones. Also remove the clips from the new gas spring and keep it safe.

By applying gentle pressure to the knuckle clip it off the shoulder joint that is bolted to the kiln bed. Do not apply pressure to the spring shaft or main cylinder. A large screw driver works well for getting behind the knuckle then gently prizing off.

Now do the same at the top of the spring and the gas spring will be free.

Offer the new spring to the top knuckle and tap it on, again, only tapping the shoulder joint. The fatter cylinder of the tube always fits at the top. Refit the knuckle clip to the top.

Offer up the bottom knuckle to the bottom shoulder and repeat the process.

If the gas spring is now secured in place then the assistance to hold the lid raised can now be removed.

The gas spring will now need to be pressurised.

Where the top knuckle joins to the top of the main cylinder there is a small Allen key valve.

Using the Allen key provided, release pressure from the valve. It is recommended that this is done in small quarter turns and each turn lasting a second or less before being closed again,

After each couple of releases try to close the lid.

As you get nearer to having a balanced close, shorten the time the valve is released for.

ONCE TOO MUCH PRESSURE IS LET OUT IT CANNOT BE REPLACED.

When you are happy that the gas springs are applying equal pressure ensure that the valve is tightly closed.

The seal comprises of non-ceramic fibre strips. Remove the damaged strip. The strips are not fixed into place by any adhesive but are simply compressed into position by the retaining frame. The seal strip will remove easily.

Offer the new strip to its position and tuck the ends behind the insulation boards, use the remaining strips as a guide.

The retaining frame can now be refitted either by offering it up to the open lid or by lying the frame on the bed and carefully lowering the lid down onto it.

Uneven heating

Check that all the elements are working, there are no power failures, the main fuses, the lid safety switch, the condition of the cabling and mains isolator.

9 times out of 10 an uneven kiln is caused by a kiln power failure leading to a section of the elements not running correctly.

The above checks will need to be made by a competent kiln engineer.

Check the condition of the lid seal.

Check that the lid is sitting evenly to the bed and that the clamp is still working effectively.

Check that the elements are still in good condition and that the coils have even spacing's between them and are not bunching to one side.

Roof vents not opening. (Optional Automatic Roof Vents)

Check the event has been properly programmed with the red event light lit in the sections where you want the vents to be closed.

Contact Kilncare.

Kiln lid sits high on one side or the lid is now heavy to lift.

Check around the lower sections of the gas spring lifters on each side of the kiln for oil.

It is normal to have a small amount of lubrication around the bottom, thinner shaft of the gas springs. If there is a problem it will very often start to drip oil onto the floor directly below the gas spring.

If this is the case the gas spring will need replacing.

The faulty gas spring will be on the side that is lowest when the kiln lid is shut.

Gas spring replacement

To replace the gas spring raise the kiln to it's highest position.

A second person can be used to hold the lid in it's up position whilst one of the springs is removed.

NEVER ATTEMPT TO REMOVE A GAS SPRING WHILST THE LID IS IN THE CLOSED POSITION.

temperature by some amount.

This is normal as the controller is set to full and not a controlled rate of climb. It may also cause the controller to show an Error message or code, again, this is normal as the controller may believe that the overshoot is caused by the kiln having a fault.

This test is to ensure that the controller shuts the kiln power off, whether it be due to the correct temperature being reached or by it going into fault mode.

Control

The controller provided with the kiln will be the controller that the kiln was test fired with at our factory and so has already done a successful firing before you receive the kiln.

The controller plugs into the kiln at a socket at the right hand side of the kiln on the front of the main electrics box.

The plug and socket are sided and so will only fit one way.

Only plug in the controller when the mains is turned off.

The controller mounting bracket mounts to the front right hand side of the kiln bed using the pins provided. The controller holster can be removed and fixed to the wall if preferred.

Please read the instructions on control before starting to use your Grand-fuser.

Operation

The vents

There are vents in the front and roof of your kiln.

The vents are opened and closed manually via a vent flap. These flaps are filled with a non- dust dropping high temperature insulation pads, they removes the hazard of dust dropping whilst ceramic are inserted into the vents.

The vents on the front are spring loaded.

The vents can be used in any combination of ways and at any kiln temperature.

The stainless steel body of the vent flap will get very hot so only open and close the vents by holding the thermoplastic handles.

Optional Automatic Roof dampers

Your Grand-fuser may be fitted with automatic roof vents (dampers). The operation of these vents is controlled via the controller and is covered in the controller instructions under the section of "CONTROL RELAY" in the KCR32C manual. The sub-section directly relevant is called "EVENT" and not the "damper" section, although this section can be used if the user requires.

Loading

Load the kiln with the glass items that are to be fired. Stay within the side walls and do not load onto the side wall as this will damage the lid seal.

Remember glass will stick to the bricks so a separating medium must be used.

This can take many forms including fibre paper or a refractory batt (shelf) or bats covered with batt wash. It is not necessary that a kiln shelf is used and the work can be placed straight on the kiln floor if a separator is used, such as fibre paper etc to keep the glass from sticking to the kiln floor bricks when hot. If a kiln shelf kit is to be used, it does not need to be raised from the kiln floor and the batt does not need to have a separator between itself and the kiln floor bricks.

Some users however do prefer to raise the shelves from the floor to allow a circulation of heat to the under side of the shelf. The glass will need a separator between itself and the batt for the same reasons as it need to be separated from the brick. The kiln bricks do not need to be painted with battwash, just protect the area where the glass can touch the bricks with a separator.

Once the kiln has been loaded with the glass to be fired, lower the lid and clamp shut the clasp/s to ensure the lid seal remains tight throughout the firing.

Turn on the electrical supply. A click will be heard from the rear of the kiln, this is the safety circuit contactor and is normal.

If no display is illuminated on the controller then the controller may not be turned on at its own power on/off switch, consult your controller manual and turn the control on.

Enter the firing cycle and start the controller.

What to expect on the initial firing

Once the controller has been started and it begins to power the kiln the orange, Heat On light will illuminate on the side panel of the Grand-fuser.

The Grand-fuser is powered by a large Solid State Relay so as the kiln is turned on and off only the slight buzz of the elements may be heard. **The Solid Sate Relay runs hot and is cooled via the heavily vented area at the rear of the main power box on the lower right hand side of the kiln. These vent MUST be kept clear at ALL times.**

Safety contactor circuit

The Grand-fuser is fitted with a safety contactor as secondary back up against any failure that may occur with the kiln.

The controller will recognise a fault and stop the kiln. Though this will protect the kiln, it will not protect the medium being fired from the effects of reaching the over temperature.

Kiln control instructions

As standard, your Grand-fuser is supplied with the powerful KCR32C controller. For full instructions for the controller supplied with your kiln consult the separate instruction manual supplied with the controller

Prog No.	Program Description	Seg 1 Ramp Rate C/Hr	Seg 1 Soak Temp C	Seg 1 Soak Time Hr. mins	Seg 1 Ramp Rate C/Hr	Seg 2 Ramp Rate C/Hr	Seg 2 Soak Temp C	Seg 2 Soak Time Hr. mins	Seg 2 Ramp Rate C/Hr	Seg 3 Ramp Rate C/Hr	Seg 3 Soak Temp C	Seg 3 Soak Time Hr. mins	Seg 3 Ramp Rate C/Hr	Seg 4 Ramp Rate C/Hr	Seg 4 Soak Temp C	Seg 4 Soak Time Hr. mins	Seg 5 Ramp Rate C/Hr
1	4-6mm Float Glass Fuse	150	538	00:10	FULL	FULL	840	00:20	FULL	FULL	538	00:45	FULL	182	427	00:15	END
2	4-6mm Float Glass Slump	150	538	00:00	200	00:20	700	00:20	FULL	FULL	538	00:15	FULL	182	427	00:00	END
3	6mm Bullseye Fuse	222	677	00:30	333	00:10	795	00:30	FULL	FULL	482	01:00	FULL	83	371	00:01	END
4	6mm Bullseye Slump	167	640	00:10	FULL	01:00	482	01:00	FULL	56	371	00:01	END	END			
5	6mm System 96 Fuse	200	500	00:20	FULL	00:12	804	00:12	FULL	FULL	540	00:40	FULL	150	510	00:20	END
6	6mm System 96 Slump	155	704	00:00	FULL	00:30	540	00:30	FULL	FULL	510	00:10	FULL	26	371	00:00	END
7	Bottle Firing Cycle	170	510	00:00	250	00:10	780	00:10	FULL	FULL	510	00:00	FULL	70	400	00:30	END
8	Low Stain	200	570	00:10	FULL	00:30	516	00:30	FULL	100	300	00:00	FULL	END			
9	High Stain	200	665	00:10	FULL	00:20	550	00:20	FULL	FULL	516	00:30	FULL	100	300	00:00	END

With the mains turned off, a competent person should be used to check the condition of the two glass 1 amp fuses in the rear power box at low level at the rear of the kiln. Access to these fuses is by using the door key provided.

If the above appear correct contact Kilncare.

The control is working correctly, is showing that the kiln is receiving power but the kiln is not heating up.

With the kiln unplugged, check the cable from the kiln to the controller for damage.

Check that the controller is securely plugged into the kiln.

With the mains turned off, a competent person should be used to check the condition of the internal wiring and electrical contact points. If there is no obvious damage, then the kiln will need to be checked over with an electrical meter.

Check that the lid limit switch at the rear of the kiln is still securely fitted. A competent person should check the heat fuse, which is situated with the element connection panel on the side of the kiln lid.

Controller shows an ERROR message.
Consult the controller manual and contact Kilncare.

A crackling noise can be heard when the kiln is firing.
This will be a loose connection and needs to be fixed immediately by a competent person.
Continued use will almost certainly result in the connection failing.

Kiln is not reaching temperature or is slow.
This could be either an element failure, a burnt connection a loss of supplied power or a component failure.
Get the kiln checked by a competent kiln engineer.

Damaged seal.
The seal on the Grand-fuser can be replaced if it is damaged to the extent that it starts to cause firing errors.

To replace the seal,

Lower the kiln and close the lid clamp.

Now undo the tec screws around the lower section of the chamber that hold the stainless seal retaining frame on. The tec screws can be removed with a drill and a special attachment which is available from most tool shops or a spanner can be used.

Raise the lid and carefully remove the stainless retaining frame.

KCR32 instructions

On power up controller will go into test mode then after a few seconds will settle down and show kiln temperature in the top display.

Before starting, make sure that only the top display is illuminated, if any other lights are lit press the "start" key to extinguish them.

Buttons index

Start / stop

Step

Back

Up

Down

Function **Fn**

Advance

Pause ||

Event

Information *i*

To set a program

If whilst in programming mode no buttons are pressed for a few seconds the controller will time out and go back to kiln display.
The KCR32C has 16 settable programs. Each program has 32 segments.

Press the step key. The top display shows the program number, for instance 1. The bottom display shows "Pn". Use the up or the down keys to select the program   required.

Press "step" or "PASS".  again and the top display will show a time, for instance "0.10". The bottom display will show "- -" and the delay triangle will light. Delay is the time in hours and minutes before the kiln will actually start. Set the desired time using the "up" and the "down" keys. If no delay is required hold the down key until the display shows "PASS". Pass is below 0.00. 

Press "step" or "END".  Top display will show a ramp rate, for instance "85", "FULL". The bottom display will show 1, this is segment 1. This segment is how fast you would like the kiln to reach its first temperature in degrees per hour. A slow firing might require the first temperature to be reached "50" degrees per hour. Whilst a fast firing would be set to reach temperature as quickly as possible so the rate required would be "FULL". 

If the roof vents are required to be closed during this first ramp, hold the Function key and press the Event key. The event light should illuminate to show the roof vents will be closed. When the event light is not illuminated the dampers will remain open.

Press "step"  and the top display will show a temperature for instance "600". The bottom display will still show 1 and a light will illuminate above temperature. This temperature is in Celsius. This temperature is your first temperature. Use the "up" or "down" keys to select the desired temperature. Press "step". The top display will show a time, for instance "0.30" or "PASS". The bottom display, again will show "1" and the triangle above dwell will illuminate.  Dwell is the time in hours and minutes that you require the kiln to hold the first temperature.

Again, choose by holding the Function Key and pressing the Event key whether your roof vents will be open or closed during this soak period.

At this point, if the kiln is required to finish, press the "down" key until "END" is shown in the top display. End is below 00.

All the above is segment 1, the controller has 32 segments and so for more complicated firings carry on as above by setting the next time, temperature and dwell. When you have programmed all you require, select "END" at the start of the following segment. Press "start" and the controller will display kiln temperature again.

To run a program

Press "step" bottom display will show "Pn" and the top display will show the program number. Use the "up" or "down" keys to select the program

number required.

Press "start" the top display will show kiln temperature and the bottom display will go blank.
Press "start" again and the top display will briefly display the Program number then it will begin the program. Depending on the program contents the delay triangle or the ramp triangle will flash and the segment number will be displayed in the bottom display.
If a delay has been set the delay triangle will flash and the top display will act as a count down timer showing the hours and minutes remaining before the kiln starts to fire.
As the kiln fires the top display will show the kiln temperature and the bottom display will show the segment number. If the kiln is climbing the upward facing ramp triangle will flash. When the kiln is holding temperature the dwell light will flash.

To stop a program

Press "start".

To pause a program

Press and hold the "Function" key then press the "Pause" key. The top display will alternate between the current temperature and "- -". This temperature will be held indefinitely or until the pause key is pressed again. A warning reminder will be sounded every 10 seconds during the pause. When the pause is stopped the kiln will continue through the program from where it was paused.

To forward a program

At any time the controller can be made to skip to the next segment. To do this, hold the "Function" key and press "advance". This can be useful if the pause button is used. It may be that at the end of the manual pause you do not require

Trouble shooting

Control has no lights

If the "mains on" light is not illuminated on the kiln :-
Check that the socket outlet that the kiln is plugged into is turned on or that the mains isolator is turned on.

With the kiln unplugged or turned off, check the cable from the kiln to the controller for damage.

Check the mains fuses.

Check the condition of the mains cabling and the mains isolator/socket.

If the "mains on" light is illuminated:-
Check that the black switch on the underside of the controller is "on".

Check that the controller is securely plugged into the kiln.