CAMLAB CUB
GW3060

CAMLAB CUB EXTRA
GW4090

GLASSWARE WASHER

USER MANUAL

www.camlab.co.uk

camlab

READ THIS INSTRUCTION MANUAL CAREFULLY

Failure to read or fully understand the instruction manual, or incorrect interpretation of the instructions herein may cause damage to the appliance as well as being a source of danger for the operator and may considerably reduce the performance provided by the machine.

The manufacturer declines all liability for uses differing from those listed below.

The appliance must only be installed, serviced and repaired by trained personnel.

The warranty provided will immediately become void if the machine is used in a way that FAILS TO CONFORM to the instructions given by the manufacturer.

This manual is for informational purposes only. The contents of this manual and the appliance described herein may be liable to modification without prior notice. In no case may CAMLAB be held liable for any direct or accidental damages deriving from or concerning the use of this manual.

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Do you need information or Assistance for this appliance?

Please contact us from 8:30 to 17:30 hrs on the following numbers and addresses:

TEL	01954 233100
FAX	01954 233101
WWW	www.camlab.co.uk
Email	service@camlab.co.uk

Our Sales Department staff will provide information about prices and offers. You can view our entire product range at www.camlab.co.uk

Our Technical Support Department can tell you anything you need to know about how to use your appliance in the proper way and can also arrange on-site service support.

International customers, please contact our Export Department on +44 1954 233180

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1. KEY TO THE SYMBOLS USED IN THE MANUAL AND ON THE MACHINE

Read with the utmost care

Warning, danger

Warning, hot surfaces

2. INTRODUCTION

This manual is an integral part of the machine
It must be kept in a good condition and ready to hand for the entire life cycle of the machine.
You are advised to *carefully read* this manual and all the instructions it contains before using the machine.

This appliance conforms to directives currently in force and to the applicable reference standards.

This appliance has been built for the following function:
- Washing Laboratory glassware of various types.
- The appliance cannot be used for sterilization.
Any other use is considered improper.

The manufacturer declines all liability for uses differing from those indicated.

CAMLAB declines all liability for damage caused by washing glassware for which the relative manufacturers have not explicitly authorized automatic cleaning and decontamination.

3. GENERAL RECOMMENDATIONS

Never use alcohol or solvents such as turpentine in the appliance as they could cause explosions. Do not place materials dirtied with ash, wax or paint in the appliance.

- Do not lean or sit on the open door of the glassware washer as this could cause the appliance to tip over and endanger persons.

- Never ever touch the heating elements in the chamber immediatly after a washing program has terminated.

- The heating elements may become slightly discoloured after the glassware washer has been used. This is normal and depends on the operating mode. It will in no way impair the way the appliance operates.

- Discarded appliances must be rendered unusable. Cut off the mains cable after having detached it from the electrical supply. After this, the appliance must be consigned to an authorised waste collection centre.

- If the appliance develops a recurring fault, isolate it from the electricity supply and shut off the water supply taps. After doing this contact the Camlab Service Department.

The machine must only be used by specifically trained persons.

Camlab declines any liability for malfunction or accidents due to the appliance having been used by untrained persons.

4. GENERAL OPERATING INSTRUCTIONS

4.1 Switching on

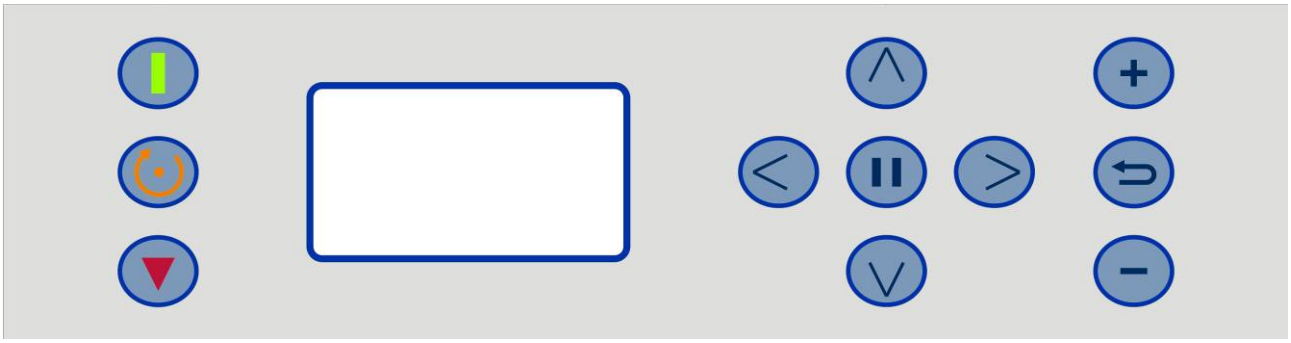
CAMLAB CUB GW3060. Switch on by turning the knob on the front panel to the right.

CAMLAB CUB EXTRA GW4090

Switch S1 that turns on the GW4090 is situated in the cabinet at the side and can only be accessed after the door of the side compartment has been opened. The door to the side compartment is opened by pressing on the top left-hand side.

4.2 CONTROLS

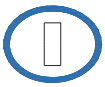
The keyboard is divided into two separate sections:



. The left-hand part of the display with keys for starting and stopping a program, and for the reset process;

. The right-hand part of the display, contains the keys used for selecting/editing programs, selecting the machine parameters and the various functions/adjustments.

A complete list of the keys and their relative functions is given below:



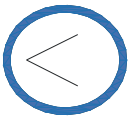
START: starts the selected program

STOP: stops the current program

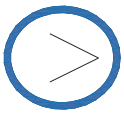
RESET: forces the machine to run through a reset procedure (both in the case of a stalled program and in other situations, such as after an alarm has occurred)

ARROW UP: selection key

ARROW DOWN: selection key



ARROW LEFT – DRYER ON: key used to start the separate drying cycle;(GW4090); it is also used for moving to the left in each menu



ARROW RIGHT – DRYER OFF: selection key for deactivating the drying cycle for the program chosen; (GW4090) it is also used for moving to the right in each menu.

ENTER: confirms the selection made/program selection; door opening

INC: increases the value in question/selects yes

ESC: quits the current screen and goes back to the previous step

DEC: decreases the value in question/selects no

The keys that are available to use appear on the bottom line of the display.

5. BRIEF DESCRIPTION OF THE OPERATING CYCLE

5.1 HOW TO CARRY OUT A WASHING CYCLE

Once the appliance has been installed correctly, connect the Camclean and Camacid containers, load the trays or racks, then proceed in the following way to conduct a washing cycle:

. turn the switch to position 1 (ON);

.after 2-3 seconds the logo will be shown: wait 15 seconds, to allow the system to initialize;

. the display will show the last chosen program. To change, press  then make choice. (e.g. “Light DI Wash”);

```
Pr:4 LIGHT DI WASH  +Dy
                (000016)
 Phase :  1
Duration:  0:45:00
                <Dryer ON>

05/02/10          09:30:17
```

in this menu, various keys will appear on the bottom line of the display:

 to begin the cycle (once the door has been shut);

 to conduct a reset cycle;

 to stop the current cycle; print the last cycle conducted; (If a printer is connected)

 to deselect (or re-select) the drying phase; (GW4090)

 to start the separate drying cycle;(GW4090)

 to open the door to the washing chamber;

 to enter the deferred starting function (max 24 h);

 to go back to the program selector menu.

Pr4 LIGHT DI WASH +Dy Phase 0 – Pre Loading TL 15.2 (TC 60) RunT:0:01:17

This menu displays the following information:
. the name and number of the program activated; with or without drying
. the phase in which the machine is operating (phase 0 and the machine is being filled with water in the example. Water filling is in two parts called “preloading” & “loading”);
. the temperature in the washing chamber (TL);
.(the target temperature (TC); (when on a heating phase)
. the time that has elapsed since the program began (RunT).

The screen will display similar information during the whole cycle.

When a program is running, the only key that can be pressed is STOP. 

Once this key has been pressed, either the door can be opened (if the temperature is no higher than 40°C) to add, remove or adjust the glassware or the cycle can be continued by pressing START.

(To terminate a program, press STOP then RESET. After 2mins, OPEN DOOR? will be displayed. Press ENTER).

The following message will appear once the cycle has ended:

Pr4 LIGHT DI WASH Program ended Open the door?

The door can now be opened by pressing  and the cleaned glassware removed.

The machine is now ready to begin another wash cycle.

It is advisable to wait a few minutes between one cycle and the next, with the door of the appliance open: this allows the washing chamber and glassware to cool down.

5.2 HOW TO CARRY OUT A SEPARATE DRYING CYCLE (GW4090)

The drying phase is a default setting in each program.
To select a separate drying cycle, press the  key

DRYING Confirm?

confirm the selection with .  The drying cycle will begin and the following message will appear:

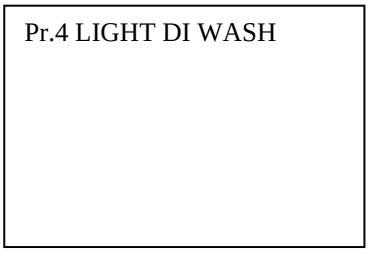
PR: DRYING DRYING TA1 76.7 TT 110 RunT:0:02:08

The drying cycle will commence with the blower on slow speed initially before increasing to full speed and the temperature is a default 110C.

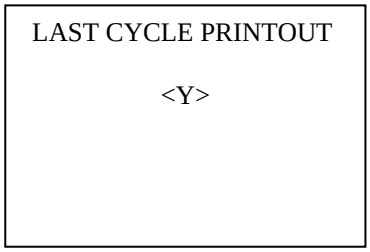
Once the 30 min drying cycle has terminated, leave the door open for a few minutes to allow the chamber and the glassware to cool (even though the drying phase always terminates with a cooling phase).

5.3 PRINTING THE LAST CYCLE EXECUTED

A printout can be made of the last cycle executed when the machine is in standby mode (If a printer is attached) Proceed as follows.



Press the STOP button. The following screen will appear:



At this point, press the ENTER key to print out the data regarding the last cycle executed.

5.4 HOW TO SELECT A WASHING CYCLE

Access the initial menu:

```
Pr.4 LIGHT DI WASH
                (000016)

Duration:  0:45:00
                <Dryer ON>

05/02/10          9:30:17
```

press  to move to the list of programs.

scroll down with key 

```
<1 Prewash>
<2 Light Wash No DI >
<3 Std Wash No DI>
<4 Light DI Wash>
<5 Std DI Wash>
<6 Intense DI Wash>
<7 Engineer Test>
```

When the cursor has reached the required program, confirm the selection with  key
The system will now access the menu of the selected program.

5.5 DEFERRED CYCLE START

```
Pr.4 LIGHT DI WASH
                (000016)
Phase N. 1
Duration:  0:45:00
                <Dryer ON>

05/02/10          09:30:17
```

Press  to access the screen where a deferred starting time can be selected for the chosen cycle.

Pr.4 postponed <4 LIGHT DI WASH> Type in the length Hour <00> Min <00>

Use “PLUS” key to enter the delay time. Use “Right Arrow” key to move the cursor from ‘hour’ to ‘min’, then press “ENTER” to confirm. The display will show a countdown timer.
Starting can be postponed for up to 24 hours.

(Press  to terminate countdown if required.)

5.6 HOW TO OPEN THE WASHING CHAMBER DOOR AND SIDE CABINET DOOR

The steel door of the GW4090 side compartment is held closed by a latch: lightly press on the top left-hand side of the door to open it. This will access the switch that powers the machine.

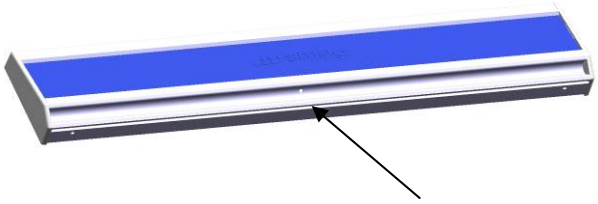
(NB: The detergent and acid containers are normally external to the machine!)
Fig. 5.6.1

The washing chamber door can only be opened by using the  button

In an emergency, the door can be opened by hand using a rod or screwdriver at least 15 cm in length, with a diameter of 2-3mm. Proceed as described below to open the door:

. find the hole under the lower profile of the door;

fig 5.6.1.1



. insert the rod/screwdriver into the hole;

. push up the rod/screwdriver delicately without forcing until you hear the locking mechanism release.

The door may be opened during a cycle only if the temperature inside the washing chamber has not exceeded 45°C. Use the keyboard to open the door.
Depending on the settings chosen for the system, a password may be required to open the door during a washing cycle. However, it is always advisable to wait until the cycle finishes before opening the door.

It can be potentially dangerous to open the door when the temperature inside the washing chamber exceeds 70°C due to the escape of steam!
Camlab declines all liability for damage to persons or property caused by forcing the door open during a wash cycle.

5.7 SECURITY POLICY, USER, SUPER USER & TECH PASSWORDS

For safety reasons, There is a security policy with four password levels that enable or disable access to the menus of the machine. These are, in increasing order:

. *user level*: For people who actually operate the machine. This password enables access to "program selection" and "change password" menus only. (This password level may be disabled.)

. *superuser level*: For the person in charge of the machine (supervisor,department head, etc.). This password can be used to access the following menus:

- . PROGRAMMING -> Loading Programs;
  - . PROGRAM EDITING -> only in relation to volumes of detergent and the drying parameters;
  - . COPY
  - . NEW PROGRAM
- . UTILITY -> accesses all the sub-menus (can also change the user passwords)
- . WASHING PARAMETERS -> only certain sub-menus, as listed below:

. WATER CONNECTION
. WATER TRAP WASH
. REGENERATION
. DRAINING

. *tech level*: For Camlab engineers.
All the menus in the lower levels as well as other “WASHING PARAMETERS” submenus can be accessed from this level, i.e.:

. EXTRA FILLING TIME
. DRAINED WATER RECOVERY
. CONDENSER ACTIVATION
. DETERGENT DISPENSERS
. FLOWMETER
. CONDUCTIVITY SENSOR
. DWP ACTIVATION
. TEMPERATURE ADJUSTMENT
. MAINTENANCE

. *Top level*: Restricted to the manufacturer.

The appliance leaves the factory with the following *passwords*:

USER	PASSWORD	USER	PASSWORD
User 1	1	User 11	B
User 2	2	User 12	C
User 3	3	User 13	D
User 4	4	User 14	E
User 5	5	User 15	F
User 6	6	User 16	G
User 7	7	User 17	H
User 8	8	User 18	I
User 9	9	User 19	J
User 10	A	User 20	K
SuperUser	ZZZ		

Remember to change the password when the appliance is used for the first time so as to be certain of who is enabled to access the machine (see 6.2 Technical Manual). (The password can be enabled or disabled as desired).

The “User Control Activation” option can be activated to make sure that the appliance is operated only by authorized users (see 6.7 Technical Manual).

5.8 BUILT-IN SOFTENER

The machine has a softener for the washing water.

Hardness in the water supply can be responsible for white deposits on the dried glassware, which may tend to become opaque after a period of time. The GW3060/4090 is equipped with an automatic water softener which softens the water by means of specific regenerating salt.

- Before the GW3060/4090 is used for the first time, pour some granular salt into the softener reservoir along with enough water to fill it. (This is usually done at Camlab before delivery) Make sure that the cap is firmly closed each time the reservoir is filled. **Do not fill to the brim! Leave a 2cm space for the float device on the underside of the cap.** (The application of a smear of silicon grease on the black seal will aid closure). The wash water and detergent mixture must not get into the salt reservoir as this would prevent the regeneration system from operating correctly. Moreover, the wash chamber and the glassware inside it would be contaminated if salt solution were to leak out.
  Only granular salt should be used, not normal kitchen salt.
  Kitchen salt may contain insoluble substances that could damage the resin over a period of time.
  NB: Two scoops of a 500ml beaker is an ideal amount of salt to use.

The ionic exchange resins of the water softener are regenerated by sodium chloride, i.e. common salt (NaCl). The only routine maintenance required is to add granular salt to the reservoir when the appliance is first used and after this, whenever the “Salt” alarm message appears on the display:

```
!!!ALARM: W075
    No salt
    Ignore??
     <N>
```

When this message appears on the display, it can be ignored by pressing the  key

and then the  key

However, it is inadvisable to ignore this message since a softener that fails to function correctly can impair the quality of the washing.

5.8.1 How to add salt

If the water used is of medium hardness, salt will need to be added about every 10 washing cycles. The reservoir of the softener contains about 1 kg of granular salt. The reservoir is under the white cap situated in the wash chamber (see fig. 3.2.2.1). Remove the lower basket, unscrew the reservoir’s cap by turning it anti-clockwise, and then pour salt inside using the funnel supplied.

Do not use compressed salt tablets or fine salt as these are not as effective as granular salt and can also clog the regeneration valve.
Close the reservoir by turning the cap ¼ turn clockwise. Make sure that the cap is not obstructed by salt granules. The cap must be screwed fully into place without forcing it.
Before proceeding with a new wash cycle, it is advisable to run the “Prewash” program 1 to flush out any salt that may have spilt into the wash chamber.

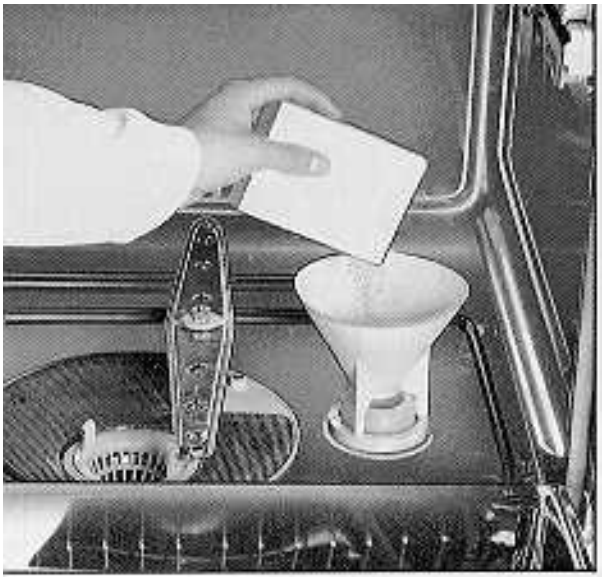


Fig. 3.2.2.1

After the salt has been added, the resins will regenerate automatically after several cycles, i.e. when the softener’s preset number of cycles has elapsed.
Initially the alarm message may still show, but after an hour or two, enough salt will have dissolved into brine to allow the alarm message to disappear.
When first run after installation, the softener’s new resins are not always regenerated to the full extent, the glassware may appear opaque during the first 2/3 cycles owing to lime residues.
If this happens, the softener’s resins can be subjected to a Forced Regeneration cycle. Consult the next chapter: “FORCED REGENERATION OF THE SOFTENER”.

5.8.2 Use of the appliance with softened mains water

If a soft mains water supply is available the regeneration cycle of the built-in softener should be inhibited and **salt should not be added**.

Consult chapter **5.1** (Technical Manual) “Connection to the water supply” for instructions about how to inhibit the built-in softener.

It is very important to make the adjustments in the correct way as the passage of softened water through a softener designed to treat hard water can produce inorganic salts. These inorganic salts can leave whitish stains on the glassware and may turn metal yellow or reddish brown.

5.8.3 Forced resin regeneration

Press **ESCAPE.** When prompted enter **superuser password**. **PROGRAMME** screen is shown. Scroll to **UTILITIES**, press **ENTER**. Scroll to **REGENERATION,** press **ENTER**.

Scroll down to **LT WATER** and enter **5** in the menu below using the **PLUS** key and confirm with **ENTER** key. The display will "**update**".

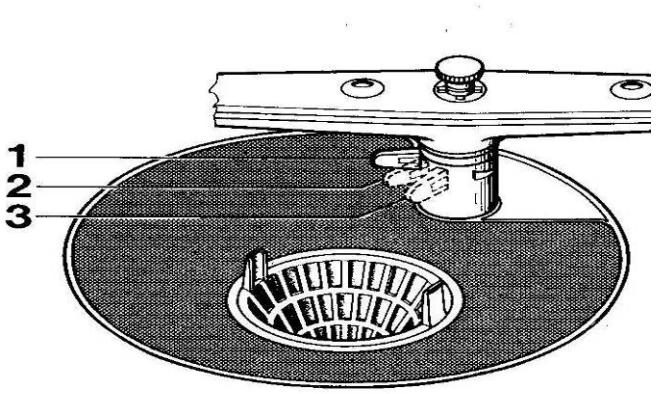
HARDNESS IN °F <00.0>
HARDNESS IN °T <00.0>
HARDNESS IN °I <00.0>
LT WATER <00.5>

ESCAPE out to select **Prog 1**, (Prewash) and press **START**. At the end, after the prewash water has been pumped out, the display will show "**REGENERATION** " whilst regeneration takes place.

Afterwards, re-enter the regeneration menu and input the correct value onto French Hardness (top line, typically **30**). Press **ENTER** to update, then **ESCAPE** back to programs.
At the start of the next chosen program, there will be several minutes of "**Resin Flush**" before the "Prewash" phase of the program commences.

5.9 HOW TO REGULATE THE WASHING PRESSURE IN THE SPRAYING ARMS

The pressure of the washing water to the top basket spraying arm (or jet rack) can be regulated by means of the red adjuster under the bottom spraying arm. Turn the adjuster lever fully clockwise (pointing to the rear, left corner) to obtain the maximum pressure in the top spraying arm or jet rack.
Turn the lever forward to obtain the maximum pressure in the bottom spraying arm as the water supply to the top one will be reduced. (Usually used when lower basket only is used).

Pressure regulator 1 Maximum flow at top level 2 Balanced flow 3 Maximum flow from bottom arm	

5.10 HOW TO FILL THE JET RACKS

The machine is supplied with basket trays as standard. If required a comprehensive range of jet racks are available to suit various washing needs.
These jet racks are simply placed on the door and then rolled inside. Connection to the upper water connector is automatic. Initially, It may necessary to adjust the connector on the jet rack post so that the rack connector **just** touches the connector in the roof of the chamber.

A loaded rack can weigh as much as 20 kg: take care when handling it. Persons with back problems should not load or unload the trays/racks.
Camlab declines all liability for problems concerning the health of persons caused by lengthy use of the machine.

Take great care when positioning objects in the baskets/racks: a good position, where all the surfaces are exposed to the washing action will contribute towards effective washing.

5.11 DETERGENT/ACID DISPENSING SYSTEM

The machine is equipped with two peristaltic pumps to dispense additives.
Each tube is marked by a tag that indicates the type of additive required.
Take care not to put the tubes into the wrong containers!

Detergent or acid spills should be cleaned up immediately

The amount of detergent and acid to dispense during a wash cycle is programmed by means of the general programming menu.
Consult the technical manual 'PROGRAMMING AND PROGRAM EDITING' chapter 7 for further details about programming and modifying the programs.

MODEL GW3060-GW4090			
Dispenser settings Recommended programming values *			
	Product	**value**	**ml/cycle**
PUMP P1	Camclean detergent	8-10	80-100
PUMP P2	Camacid neutralizer	8-10	80-100

- If necessary, the dispensing values can be changed.

* The values to be entered are equivalent to the ml/lt

6. PREPARATION FOR WASHING.

Effective washing starts with preparation of the glassware. Ensure that any solid residue is removed, if necessary by rinsing or pre-soaking (in a non-foaming solution) before carefully placing the glassware on the appropriate basket tray or jet rack. Avoid overloading basket trays and jet racks.

Avoid long delays between loading the machine and using it. Deposits could dry and harden onto the glassware or chemicals could drip from dirty glassware into the wash chamber and could cause corrosion or staining of the stainless steel.

Items must be placed on an appropriate basket tray or jet rack. Narrow mouthed glassware may not be washed internally if placed on a basket tray as the wash water may not be sprayed inside effectively. Such items should be washed on jet racks, so that an adequate supply of wash water can reach all the inside surfaces.

7. WASHING PROGRAMS - DESCRIPTION

The Camlab programs are installed in program positions 1 to 7. (Program 7 is a test program for service engineers) These programs cover a very wide range of applications providing effective washing results.

The programs are specifically recommended for washing laboratory glassware, and have been put into a “custom group” for easy access. The customer can create new customised programs by copying and/or editing any existing program. Programs can edited and modified using the keyboard.
(Camlab engineers can also change or devise new programs using special software).

7.1 WASHING PROGRAMS

Table 7.2.7 describes the functions accomplished by the 7 default programs.

Peristaltic pumps 1 and 2 are activated in the standard programs.

A drying phase is added to the programs of GW4090. (see Drying Programs section).

Warning
To prevent possible contamination between the various cycles due to water residues that may have remained after a program, it may be desired to run program N° 1 (prewash) at the beginning of a work day as a preventive safety measure.

A washing program generally comprises phases of different types:

- *Prewash with softened mains water*
  dilutes or softens the pollutants on the glassware; Use cold water without additives to eliminate coarse dirt and foam substances.

- *Hot alkaline wash*
  effective action that detaches the pollutants from the walls and solubilises them; this phase is usually performed at temperatures between 60°C and 90°C for a few minutes. Alkaline detergents are used.

- *Neutralizing in an acid environment*
  action that eliminates alkaline residues
  solubilisation of the calcium carbonate precipitates from the surfaces of the glassware prevents the surfaces from becoming opaque

- *Rinsing with softened mains water*
  dilution of the previously used chemical additives

every rinse dilutes the initial concentration of the pollutant by about 99%

- *Rinsing in demineralised water*
  dilutes the inorganic salts and any organic fractions in the previous rinse water

- *Drying phase*
  Final phase to dry the glassware

7.2 EFFICIENCY OF THE WASHING ACTION AND DETERGENTS

To ensure that the glassware processed by the washer are completely washed, the washing phases must be as effective as possible.

The following factors contribute towards improving the efficiency of the washing process:
. arrangement of the glassware in the washing trays/racks in the best possible way;
. quality and quantity of the water;
. pressure of the water in the washing ducts;
. temperature at which washing occurs;
. additives used.

7.2.1 **Arrangement of the glassware in the trays/racks**

Take the following precautions:
. do not fill the trays/racks with too much glassware at the same time;
. make sure that the glassware is positioned so that they do not overlap each other;
. remove paper labels and if used, as much agar as possible.
. bulky glassware must be put in the baskets in a manner that prevents “shadow areas” from being created, as these areas obstruct cleaning of other items;
. glassware with small necks are best washed on jet racks to enable a good jet of water internally.
. position the glassware so that they are unable to obstruct the spraying arms.

7.2.2 **Quality and quantity of water**

It is essential for the water to be of a good quality. Have the water in the water supply system periodically checked. Connect to demineralised water supply when possible (conductivity < 8-10 µS).
It may be advisable to increase the amount of water used for each phase (by entering the appropriate menu) depending on the tray/rack and program selected. This can only be determined by experimentation.

7.2.3 **Water pressure**

By operating correctly, the washing pump ensures that the pressure in the machine’s hydraulic circuit is correct. An alarm message will appear on the display if the pressure is incorrect.

7.2.4 Washing temperature

The optimum temperature at which washing takes place depends on the type of detergent used and the glassware to process. However, washing temperatures must usually exceed 50°C.

7.2.5 Detergents and Acids used

The additives used represent an important factor for obtaining an optimum washing result.

Here are the products which Camlab reccomends for goodwashing results:

alkaline detergents: Camlab's **CAMCLEAN**

acid neutralizers: Camlab's **CAMACID**

Handle cans containing detergent and acid with care: always wear protective gloves when transferring liquids, topping up and inserting the suction pipes.
Wash the affected area immediately with water if substances splash on to the skin. Consult the next section for further details.

7.2.6 First-aid measures for use of detergents

Camlab's CAMCLEAN

General advice: Remove any contaminated garments and take them to a safe place
Contact with the skin: Immediately wash the affected area with plenty of water if the product splashes on to the skin. Apply a sterile gauze if possible.
Contact with the eyes: If the product splashes into the eyes, rinse them immediately with plenty of water (for at least 10 minutes). Apply a sterile gauze if possible and consult a physician.
Swallowing: Rinse out the mouth with plenty of water and drink lots of water. Consult a physician immediately.

Camlab's CAMACID

General advice: Remove any contaminated garments.
Contact with the skin: Immediately wash the affected area with plenty of water if the product splashes on to the skin.
Contact with the eyes: If the product splashes into the eyes, rinse them immediately with plenty of water (for at least 10 min.) and consult a physician.
Swallowing: Rinse out the mouth with plenty of water and drink lots of water. Consult a physician immediately.

7.2.7 DESCRIPTION OF PROGRAMS

PROG	PROGRAM NAME	PHASE 0	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	CYCLE TIME (MIN)
1	**PREWASH**	COLD RINSE 5 mins						7
2*	**LIGHT WASH No DI**	PRE-WASH 3 mins	WASH AT 60C +5 MINS +DETERGENT	ACID RINSE 2 mins	RINSE 2 mins	HOT RINSE AT 75 °C +3 mins		45
3*	**STANDARD WASH No DI**	PRE-WASH 3 mins	WASH AT 75C +5 MINS +DETERGENT	ACID RINSE 2 mins	RINSE 2 mins	RINSE 2 mins	HOT RINSE AT 90C +3 mins	55
4*	**LIGHT DI WASH**	PRE-WASH 3 mins	WASH AT 60C +5 MINS +DETERGENT	ACID RINSE 2 mins	RINSE 2 mins	HOT DI RINSE AT 75 °C +3 mins		45
5*	**STANDARD DI WASH**	PRE-WASH 3 mins	WASH AT 75C +5 MINS +DETERGENT	ACID RINSE 2 mins	RINSE 2 mins	DI RINSE 2 mins	HOT RINSE AT 90C +3 mins	55
6	**INTENSE DI WASH**	PRE-WASH 3 mins	WASH AT 90C +10 MINS +DETERGENT	ACID RINSE 2 mins	RINSE 2 mins	DI RINSE 2 mins	HOT RINSE AT 90C +3 mins	70

PROG	PROGRAM NAME	PHASE 0	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	CYCLE TIME (MIN)
7	**ENGINEER TEST**	WASH AT 60C +4 MINS +DETERGENT	ACID RINSE 2 mins	DI RINSE 1 mins				20

NOTE ** WASHING TIMES:
The times given in the table are indicative and refer to the following operating conditions:
415V – 7.0 kW three phase electric power supply
Cold water supplied at 20°C, 3 bar. Warm water at 40C, 3 bar

Program 1 is actually not a washing program but a simple prewash lasting 5 minutes.

The GW4090 has in addition, a 30 min drying cycle at 110C.

7.3 THE THERMAL DISINFECTION PROCESS

Over the last few years, many efforts have been made to improve the decontamination of instruments and glassware: specific standards for both the process and techniques used have been issued and have defined the state-of-the-art. All this has provided the end-user with quality and safety advantages.

We would now like to go on to describe the **A_0** concept (see Tab. 1 on the next page) defined by EN ISO 15883, which explains the meaning of the temperature and time values indicated in the thermal disinfection programs.

Value A_0 indicates the degree of thermal disinfection of the corresponding program: thermal disinfection is all the more efficacious and suitable for particular instruments the higher its value is. Research has been conducted according to which, by conducting washing cycles that comply with these 2 parameters, i.e. temperature @93°C and holding time @10 min., one obtains a high degree of microbiological disinfection in the treated materials, such as to inactivate the majority of the bacteria (with the exception of spores) and heat-resistant viruses such as the HIB viruses of hepatitis A and B as well as the HIV virus responsible for AIDS.
Thermal disinfection processes that provide a good degree of disinfection can also be carried out at lower temperatures and with shorter holding times. The temperature/holding time combination depends on which type of disinfection is required.
A stands for the equivalent time in seconds required to produce a given disinfection effect at a temperature of 80°C (taken as a reference). If **D** is the time required to reduce the bio burden on the instrument treated by a factor 10 (thus with a 90% “lethality” degree) at a particular temperature, value **z** can be expressed as the temperature increase (in K degrees) required to reduce **D** (in boldface) by a factor 10. In view of this, **A_0** stands for the value of A when the temperature is 80°C and value **z** equals 10.
In short, the value of **A_0** expresses the degree of “lethality” in seconds at a temperature of 80°C, released by the thermal disinfection process to the device under treatment, with reference to microorganisms that possess a **z** value of 10 (a characteristic valid for many microorganisms). The **A_0** value that must be obtained depends on both the type and number of microorganisms on the contaminated medical device and on its successive use.
According to EN ISO 15883 and the recommendations of the Robert Kock Institute (European authority on the subject), an **A_0** of 600 is considered as the minimum standard for non-critical medical devices, i.e. for those that only come into contact with uninjured skin. A further condition required is that microbic contamination must only be slight and there must be no heat-resistant pathogens present. An **A_0** value of 600 can be obtained by maintaining a temperature of 80°C for 10 minutes or 90°C for 1 minute or again, 70°C for 100 minutes (lower temperatures are not recommended).
If instruments are contaminated with heat-resistant viruses, such as those of hepatitis B, the value of **A_0** must be at least 3000. This can be obtained by maintaining a temperature of 90°C for 5 minutes.
An **A_0** value of 3000 is considered the minimum value to apply to all medical devices considered to be critical.

Programs that include thermal disinfection have therefore been designed to offer the following $\mathbf{A_0}$ values:

TEMPERATURE AND TIME	$\mathbf{A_0}$
90°C for 1 min	600
90°C for 5 min	3000
93°C for 5 min	6000
93°C for 10 min	12000

For the sake of convenience, the formula for calculating $\mathbf{A_0}$ is given below

$$A_0 = \tau \bullet 10^{\left(\frac{T-80}{10}\right)}$$

where:

τ = time in seconds for which the disinfection temperature must be maintained

T = disinfection temperature in °C

ALARMS

Different messages appear on the display if the appliance operates in a faulty way and water or additives are lacking. There are two different situations, depending on how serious the fault is:
. *warning messages*;
. *true alarm signals*.
In the first case, there will be a message allowing the user to ignore the warning and proceed with the selected cycle: while in the second case, the user must press the Reset button and comply with the relative procedure in order to overcome the situation.

By and large, an alarm indicates that the machine is operating in a faulty way and needs to be repaired by a technician. Sometimes, however, the alarm may be caused by a temporary situation. Before calling Camlab service you are therefore advised to make a **Reset** and repeat the cycle a second time. Call Camlab if the alarm persists.

The possible alarm messages are indicated below.

To reset the machine when one of these messages appears, depress the RESET key for a couple of seconds in order to activate the RESET cycle.
If a cycle has been stopped mid-cycle during a high temperature phase, remember that the temperature must drop below 45°C before the door can be opened with ENTER key.

8 ALARM MESSAGES

Alarm ID	Message	Action
1	WATER HEATING FAILED	Check the condition of the safety thermostat. Call the Camlab Technical Assistance Service if the fault persists.
2	TEMP. PROBE TL1-TC	Repeat the cycle: It could be a temporary alarm.
4	OVERTEMPERATURE TL1	Repeat the cycle: It could be a temporary alarm.
5	PROBE TL1 DISCONNECTED	Call the Technical Assistance Service
7	PROBE TA1 DISCONNECTED	Call the Technical Assistance Service
9	PROBE TB DISCONNECTED	Call the Technical Assistance Service
10	PROBE TCL DISCONNECTED	Call the Technical Assistance Service
11	LACK OF COLD WATER	Check the cold water supply pressure and flow. Is valve filter blocked?
12	LACK OF WARM WATER	Check the warm water supply for pressure and flow. Is valve filter blocked?
13	LACK OF DEMI WATER	Check the DI water supply for pressure and flow. Is the filter blocked?
14	COLD WATER PRESSURE	Check the water supply (cock open/closed, water pressure, connection pipe, etc.)
15	WARM WATER PRESSURE	Check the water supply (cock open/closed, water pressure, connection pipe, etc.)
16	DEMI WATER PRESSURE	Check the water supply (cock open/closed, water pressure, connection pipe, etc.)
17	COLD WATER LOAD TIME EXCEEDED	Check the water supply (cock open/closed, water pressure, connection pipe, etc.)
18	WARM WATER LOAD TIME EXCEEDED	Check the water supply (cock open/closed, water pressure, connection pipe, etc.)
19	DEMI WATER LOAD TIME EXCEEDED	Check the water supply (cock open/closed, water pressure, connection pipe, etc.)
20	WATER LOAD SYSTEM FAILURE	Check the water supply (cock open/closed, water pressure, connection pipe, etc.)
22	COLD WATER FLOWMETER FAILURE	Check the water supply (cock open/closed, water pressure, connection pipe, etc.) Repeat the cycle
23	INSUFFICIENT WATER IN CHAMBER	Check the water supply (cock

		open/closed, water pressure, connection pipe, etc.)
24	NO WATER IN CHAMBER	Check the water supply (cock open/closed, water pressure, connection pipe, etc.) Is the drain pipe too low?
25	NO PRESS IN HYD SYS: FOAM	Is wash pump running? Check for foam in chamber. If foam is present, carry out RESET, add anti-foam soln and run Prog 1.
29	WASHING CHAMBER DRAINAGE FAILURE	Possible drain pump failure or blockage.Make sure that the drain pipe is not kinked.
30	SAFETY CHAMBER LEVEL EXCEEDED	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
31	SAFETY LEVEL FAILED	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
32	SUMP FULL	Make a Reset cycle. Repeat the cycle. Call the Technical Assistance Service if the fault persists.
33	LACK OF WATER IN THE STEAM CONDENSER	Check the water supply (cock open/closed, water pressure, connection pipe, etc.) Repeat the cycle. Call the Technical Assistance Service if the fault persists.
34	CONDENSER DRAINAGE FAILED	Make sure that the drain pipe is positioned as indicated in the manual.
35	CONDENSER LEVEL SWITCH FAILED	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
36	CONDENSER DRAINING PUMP FAILED	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
37	NOT REACHED TARGET DRAINAGE AT T=	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
38	COOLED DRAINAGE FAILED	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
41	DETERGENT PUMP No.1 FAULT (flowmeter nr.1 optional)	Make sure that the suction tubes of can P1 are in a good condition and not squashed. Repeat the cycle. Call the Technical Assistance Service if the fault persists.
42	ACID PUMP No2 FAULT (flowmeter nr.2 optional)	Make sure that the suction tubes of can P2 are in a good condition and not squashed. Repeat the cycle. Call the Technical Assistance Service if the fault persists.
43	PUMP 3 INFLOW FAILED (flowmeter nr.3 optional)	Make sure that the suction tubes of can P3 are in a good condition and

		not squashed. Repeat the cycle. Call the Technical Assistance Service if the fault persists.
44	PUMP 4 INFLOW FAILED (flowmeter nr.4 optional)	Make sure that the suction tubes of can P4 are in a good condition and not squashed. Repeat the cycle. Call the Technical Assistance Service if the fault persists.
46	PUMP 1 TUBE CLOGGED	See 41
47	PUMP 2 TUBE CLOGGED	See 42
48	PUMP 3 TUBE CLOGGED	See 43
49	PUMP 4 TUBE CLOGGED	See 44
51	VERIFIY CONNECTIONS FLOWMETER/PUMPS	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
52	DOOR 1 ELECTRICALLY OPEN	Make sure that the door is properly closed before beginning a cycle. Call the Technical Assistance Service if the fault persists.
54	DOOR 1 MECHANICALLY OPEN	Make sure that the door is properly closed before beginning a cycle. Call the Technical Assistance Service if the fault persists.
56	DOORLOCK 1 FAILURE	Make sure that the door is properly closed before beginning a cycle. Call the Technical Assistance Service if the fault persists.
58	DRYING 1 FAILURE	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
60	DRYING 1 SAFETY SWITCH ON	Press the 2nd button located on the bottom of the drawer (see §17.1) and repeat the cycle. If the fault persists, call the Technical Assistance Service.
62	HEATING THERMOSTAT ON	Press the 1st button located on the bottom of the bottom drawer (see §17.1) and repeat the cycle. If the fault persists, call the Technical Assistance Service.
63	BLOWER 1 FAILED	Call the Technical Assistance Service
65	FAN SENSOR 1 FAILED	Call the Technical Assistance Service
67	COOLING FAILED -WARNING: HIGH TEMP	Call the Technical Assistance Service
68	TANK 1 EMPTY	Fill the relative can.
69	TANK 2 EMPTY	Fill the relative can.
70	TANK 3 EMPTY	Fill the relative can.
71	TANK 4 EMPTY	Fill the relative can.
73	ARCHIVE ERROR	Error inside the microprocessor. Call the Technical Assistance Service if the fault persists.
74	CHAMBER LEAKAGE	Call Technical Assistance
75	LACK OF SALT	Fill the softener's salt reservoir

76	BOILER SAFETY SWITCH ON	If it is present, try to reactivate the thermostat and repeat the cycle. If the problem persists, call the Technical Assistance Service.
77	TEMPERATURE > 45°C	Appears (if option selected) if the temperature of the water entering in the first phase exceeds 45°C.
78	RECOVERY FAILED	Error inside the microprocessor. Call the Technical Assistance Service if the fault persists.
79	PROGRAM ERROR	Program error. Check the settings of the required cycle.
80	COLD/WARM WATER FLOWMETER FAILURE	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
81	DEMI WATER FLOWMETER FAILURE	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
82	SYSTEM FAILURE SOL.1	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
84	OVERTEMPERATURE TA1	Repeat the cycle. Call the Technical Assistance Service if the fault persists.
91	ARCHIVE FULL	Download the data from the archive.
92	CHANGE FILTER	Air filter replacement required
93	MAINTENANCE REQUEST	Call the Technical Assistance Service

NB: Not all error codes apply to all models of glasswasher.

9 CLEANING AND SERVICING

Before proceeding with any servicing work, isolate the electrical and water connections, i.e. make sure that the water cocks are shut and that the switches of both the machine and electric panel are in the OFF positions.

9.1 ROUTINE INSPECTIONS

The following inspections must be carried out periodically to make sure that the machine remains in a perfect condition.

Each day

Check the detergent and acid levels
Check and clean the spraying arms and chamber filters
Visual inspection of the washing results after each cycle

Each month

Wipe the exterior with proprietary stainless steel cleanser.

Every year

Have the machine serviced by Camlab Service Technician

9.2 HOW TO CLEAN THE SPRAYING ARMS

The spray arms can be easily removed in order to clean the nozzles and prevent clogging. Periodically remove the spray arms after having unscrewed the knurled nuts, wash them carefully, fit them back in their housings and fully tighten the knurled nuts. It is particularly important to make sure that the small circular hole at the end of the spraying arm is perfectly clean.
NB: The knurled nut on the upper tray has a left hand thread!

9.3 HOW TO CLEAN THE FILTERS

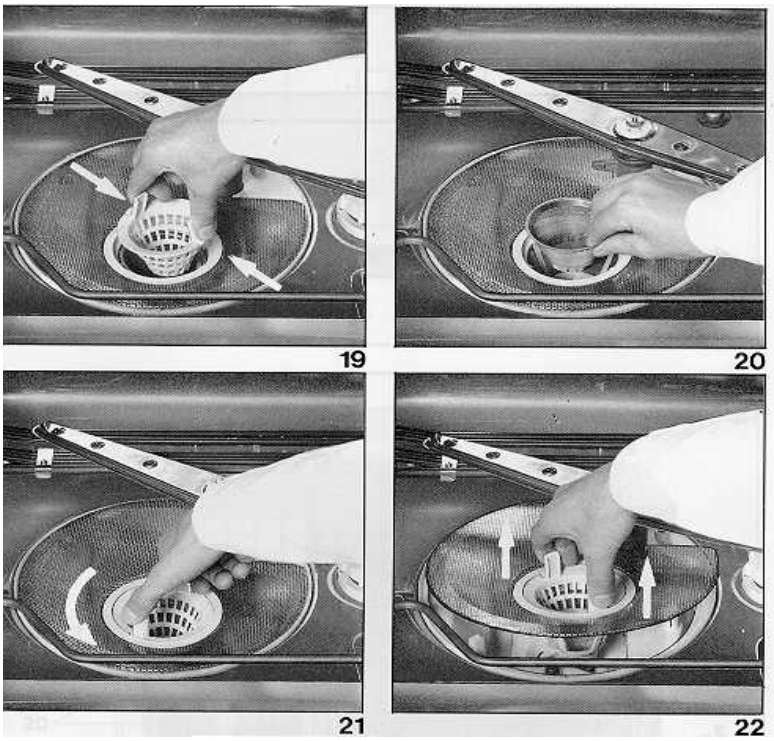
The chamber filter comprises a circular filter with a filter cone, a microfilter and a coarse filter. To ensure that the machine functions in an efficient way, it is extremely important to keep the filters clean. Inspect the filters often (e.g. if glassware with paper labels is washed, the filters must be checked after each cycle to remove paper and label adhesive) and remove any deposits that could impair the way the appliance operates. Blocked filters can cause the machine to overfill!

Coarse filter
Remove the coarse filter by pressing on the lobes and pulling upwards (fig. 19). Clean the filter and set it back in position.
Microfilter
This is positioned under the coarse filter (fig. 20). It is advisable to check and clean it when the coarse filter is inspected.
Use a brush and hot water to clean this filter.

Circular filter
Proceed as described below to disassemble this filter:

- hold the coarse filter by its lobes and turn it in the anti-clockwise direction (fig. 21).
- lift the entire assembly (i.e. filter, filter cone, coarse filter and microfilter) without pressing the lobes (fig. 22).

When this filter is cleaned, it is also advisable to clean the others.



9.4 HOW TO CLEAN THE WATER INLET FILTERS

The inlet filters installed at the water taps must be periodically cleaned. This is done by simply unscrewing the supply pipes (after turning the water off!).

9.5 INSPECTION

If the appliance fails to function, before calling Camlab Service make sure that:-
the machine is receiving power
the machine has been turned on and the display is lit
the water taps are fully open
the water filters are not clogged
the inlet pipes are not kinked

9.6 LONG IDLE PERIODS

If the machine is to remain idle for a long period of time, it is advisable to:

- Carry out a Prog 6 cycle without a load
- Detach the electricrical plug from the socket
- Dose several litres of water into the tank by hand (use demineralised water if available)
- Leave the door ajar to prevent unpleasant odours from forming
- Detach the water connections
- Seal tops of detergent and acid containers

9.7 DRYING AIR FILTER(GW4090)

The air filter of the drying system must be periodically checked and changed. It is located in the upper part of the detergent pump compartment.

The mat filter installed possesses 98% DOP efficiency and should be replaced once a year.
This operation is simple to do and the user can carry it out after ordering the spare filter.
Unscrew the 8 screws that hold the filter in place in order to disassemble the filter holder and install the new filter.

9.8 EXTERNAL CLEANING

The external parts of the appliance must be periodically cleaned.
The front panel can be cleaned with a soft cloth, using water and a delicate detergent (such as the ones used for crockery) in diluted form.
Do not use alcohol, solvents or the ammonia-based products used for cleaning windows.

The steel surfaces can be cleaned with a stainless steel cleanser.
If there are heavy incrustations, use a descaler product to remove water hardness markings.

In places where strong acids are used in the laboratory (hydrochloric/sulphuric/nitric), it is advisable to clean the machine with a soft cloth soaked in paraffin oil. This film will protect the steel from acid vapour aggression.

9.9 WHEN TO SERVICE THE APPLIANCE

The user should call Camlab Service Dept every 12 months for preventive maintenance purposes and for the visual inspection required for safety reasons.

Make sure that there is a clear area of at least 1m^2 in front of the machine before proceeding with any maintenance/repair work.

10 INSTALLED MACHINE SET-UP

Model machine: _____

Machine serial number: _____

11 NOTES