

Model 1575 ImmunoWash

Instruction Manual

**Catalog Number
170-7009**



Warranty

The 1575 ImmunoWash is warranted against defects in materials and workmanship for 1 year. If any defects occur in the instruments or accessories during this warranty period, Bio-Rad Laboratories will repair or replace the defective parts at its discretion without charge. The following defects, however, are specifically excluded:

1. Defects caused by improper operation.
2. Repair or modification done by anyone other than Bio-Rad Laboratories or an authorized agent.
3. Damage caused by substituting alternative parts.
4. Use of fittings or spare parts supplied by anyone other than Bio-Rad Laboratories.
5. Damage caused by accident or misuse.
6. Damage caused by disaster.
7. Corrosion caused by improper solvent or sample.

This warranty does not apply to parts listed below:

Fuses

For any inquiry or request for repair service, contact Bio-Rad Laboratories. Inform Bio-Rad of the model and serial number of your instrument.

Regulatory Notice

IMPORTANT: This Bio-Rad instrument is designed and certified to meet EN 61010* safety standards. Certified products are safe to use when operated in accordance with the instruction manual. This instrument should not be modified or altered in any way. Alteration of this instrument will:

Void the manufacturer's warranty

Void the EN 61010 safety certification

Create a potential safety hazard

Bio-Rad Laboratories is not responsible for any injury or damage caused by the use of this instrument for purposes other than those for which it is intended, or by modifications of the instrument not performed by Bio-Rad Laboratories or an authorized agent.

*EN 61010 is an internationally accepted electrical safety standard for laboratory instruments.

Important Notice

Before installing this unit, please read carefully the installation instructions.

This instrument is intended for clinical diagnostic and research laboratory use and must be operated only by specialized personnel aware of the potential risks connected to the chemical and bacteriological agents normally used with this unit.

The Aerosol Protection Cover must always be closed when the instrument is operated to reduce the risk of contamination from ambient air. Since the unit is not completely sealed, this risk is not completely eliminated, and the operator should dress with appropriate safety protection when using hazardous substances or biological agents.

While the unit is connected to the power, it is dangerous to operate without the cover. This operation can be done only by specialized and trained service personnel. Contact your local Bio-Rad representative if service is required.

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Section 1 Instrument Appearance

1.1 Front Panel Keyboard Display

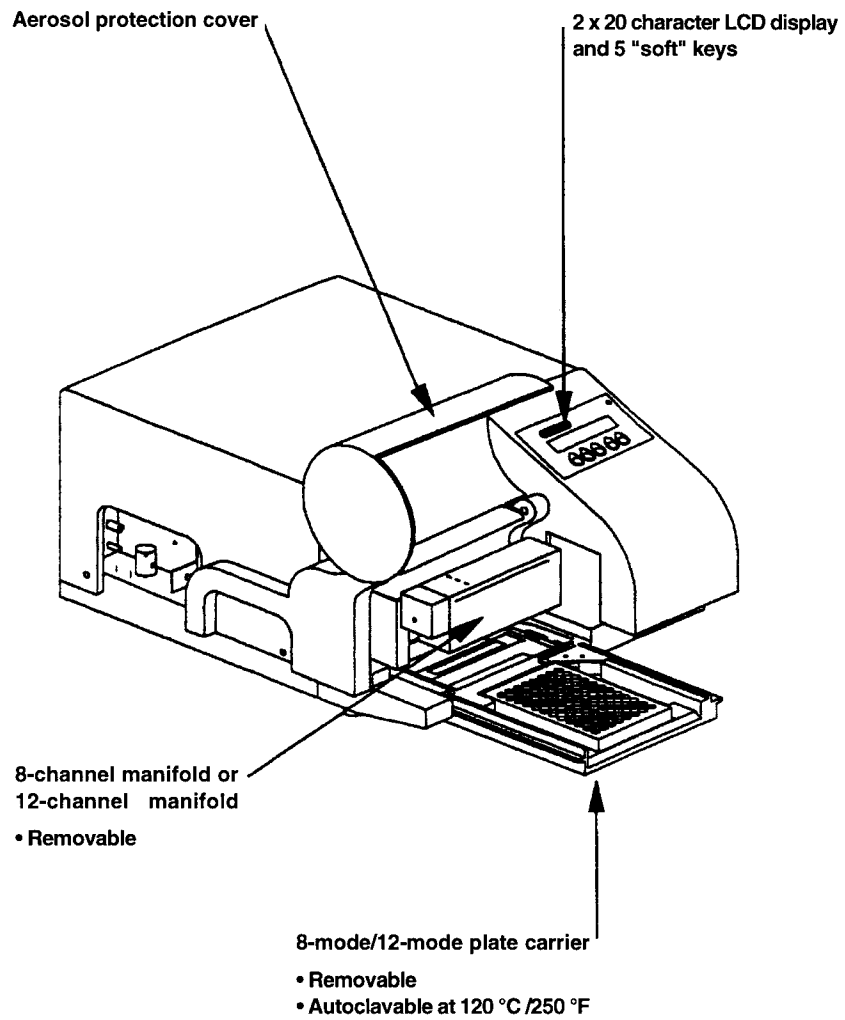


Fig. 1. Model 1575 ImmunoWash.

1.2 Outside Dimensions (mm)

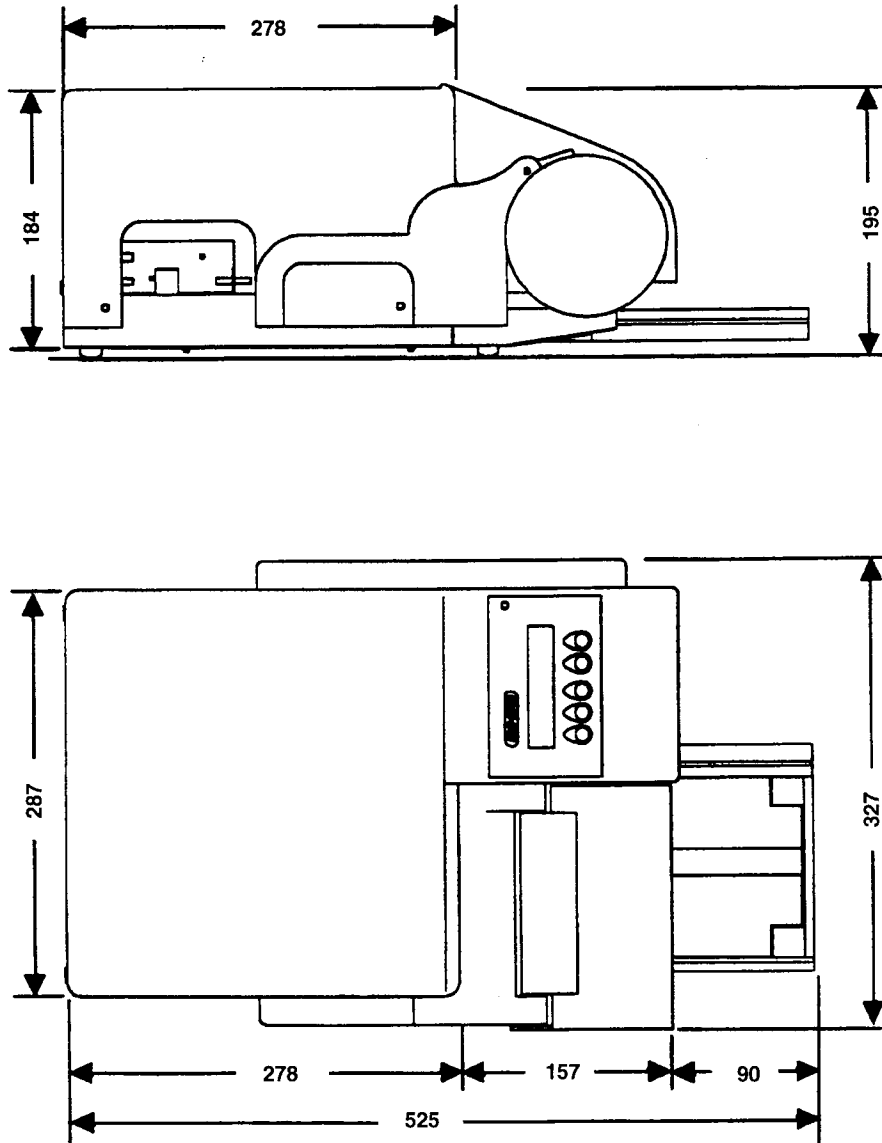


Fig. 2. Outside dimensions.

1.3 Hydraulic Circuit

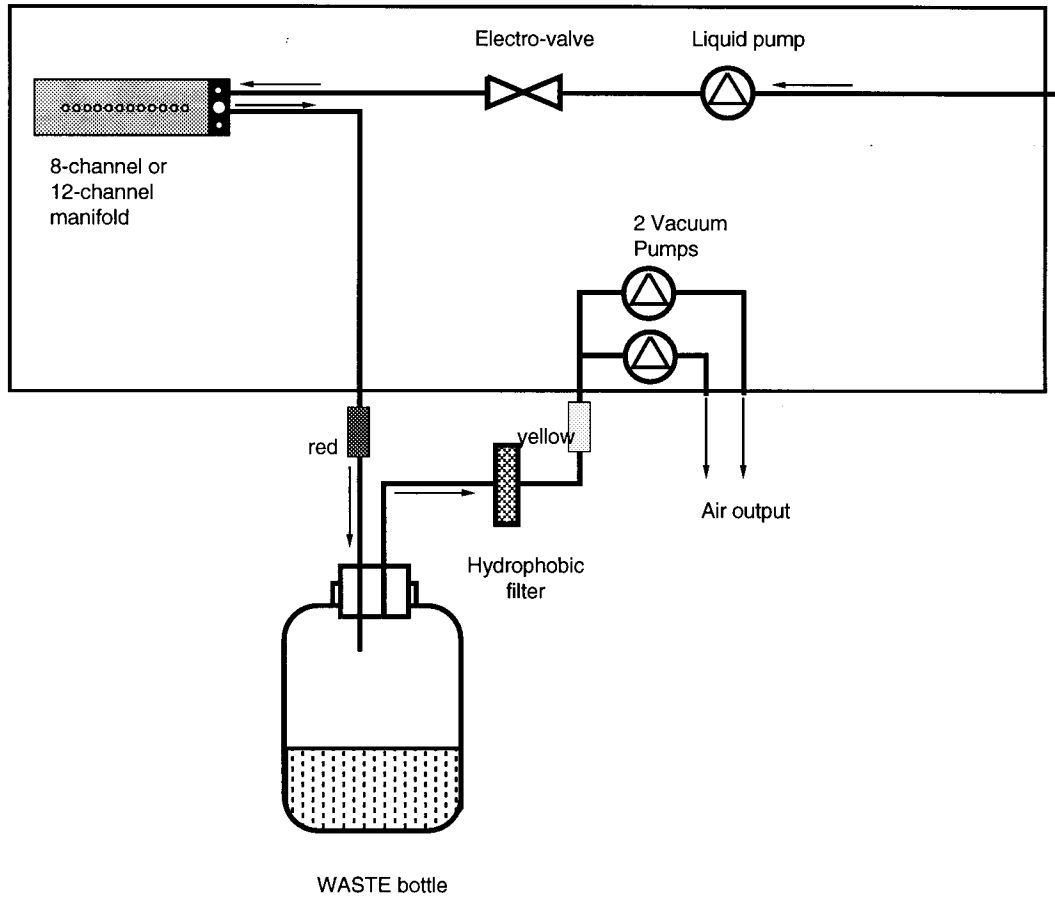


Fig. 3. ImmunoWash hydraulic circuit.

Section 2 Installation

2.1 Unpacking

- Carefully unpack accessories and washer.

Important:
Do not lift the washer
by pulling on the foam frames.

- First remove accessories at the top and beside the washer.
- Hold the washer (not the foam) and lift up.
- Remove the foam and plastic bag and place washer on a stable, horizontal surface.
- Slightly open aerosol cover and remove thin piece of foam by pulling it down.

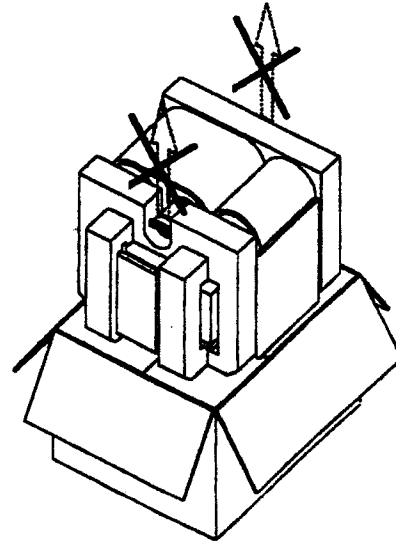


Fig. 4. ImmunoWash unpacking.

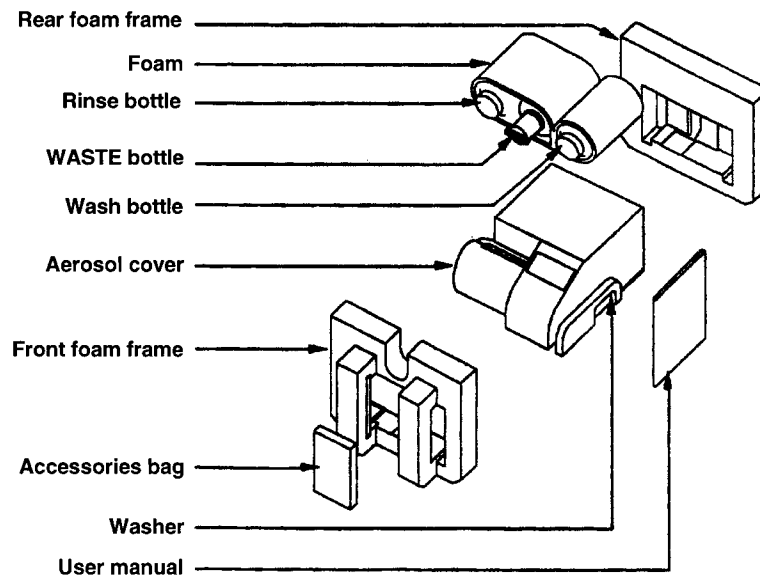


Fig. 5. ImmunoWash components.

2.1 Unpacking (continued)

- In washer working area (Fig. 6 & 7):
Remove adhesive tape blocking lower foam piece on plate carrier.
Twist (1) and remove (2) upper foam pieces between manifold and top of front panel.
Push manifold bracket manually upward.
Remove (3) lower foam piece between manifold and plate carrier.
- Pull and push plate carrier to check that it moves freely.

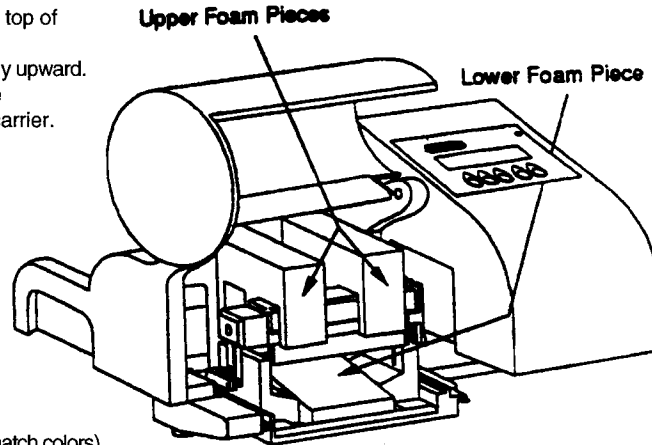


Fig. 6. Location of foam pieces.

- On rear panel:
Connect tubes on rear panel (match colors).
Blue-connect to WASH or RINSE bottle
Red-connect to WASTE bottle
Yellow-connect to WASTE bottle

- Vacuum pump protection :
Cut yellow tube halfway between WASTE bottle and washer and insert hydrophobic filter in line (supplied in maintenance kit).

- Connect power cord.
Fuse installed : 2.5 A Slow Blow.
Plug power cord into main socket.
The washer is equipped with universal input switch mode power supply (85 VAC to 264 VAC; 47 Hz to 440 Hz).

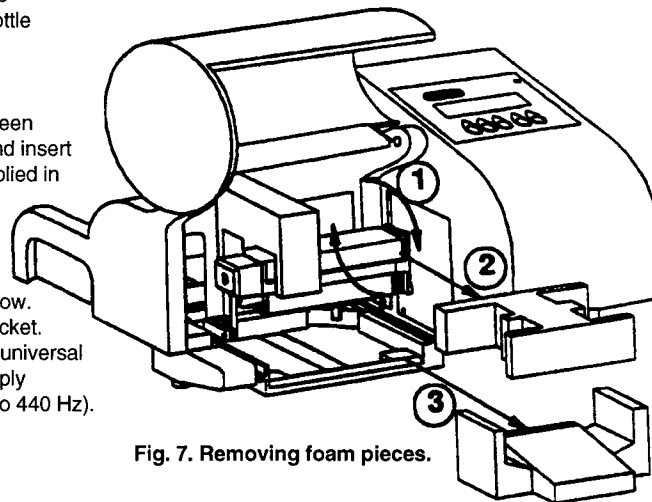
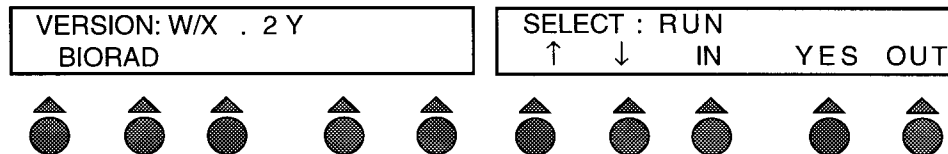


Fig. 7. Removing foam pieces.

Turn the washer ON (ON/OFF switch on rear panel)

When plate carrier and manifold are moving to their home position, the following message appears on the display:
After initialization:



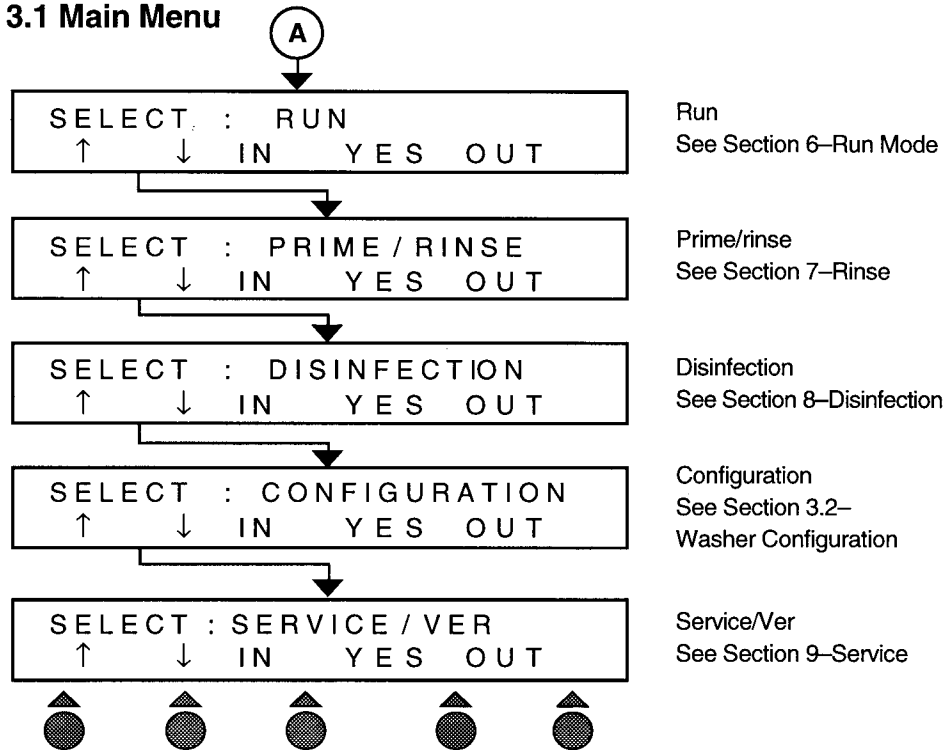
Fill one RINSE bottle with demineralized water and prime the hydraulic circuit with at least 5 RINSE operations (see RINSE Section 7).

The washer is ready to use.

DO NOT RUN DISPENSE PUMP WITHOUT LIQUID FOR MORE THAN 1 MINUTE.
Dispensing pump valves will prematurely wear when run in dry condition.

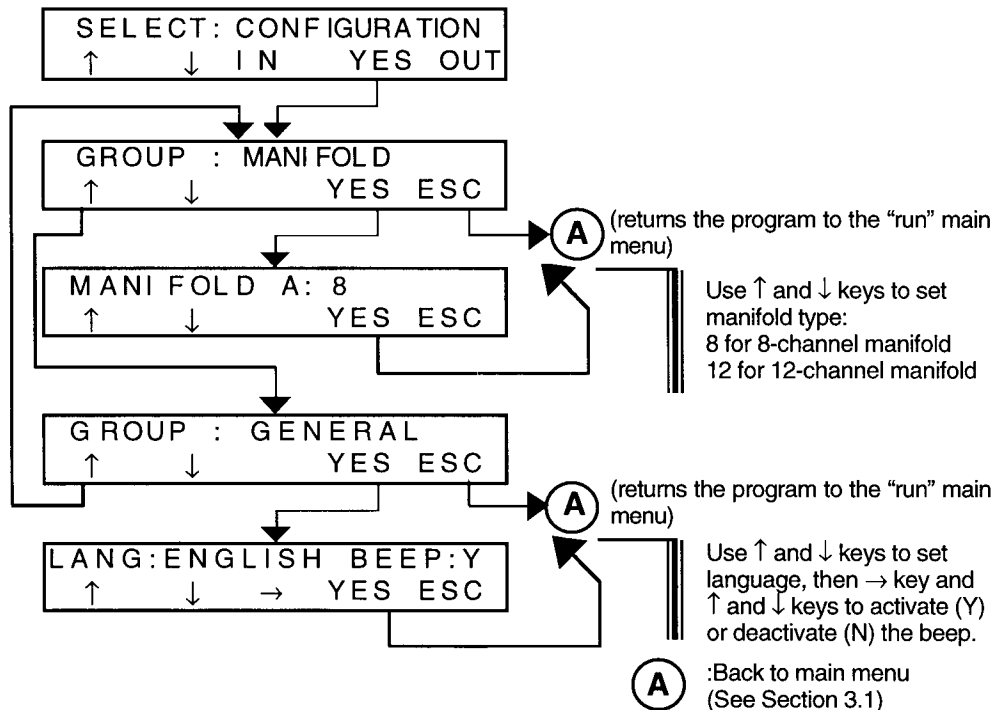
Section 3 Configuration

3.1 Main Menu



3.2 Washer Configuration

Enter "Configuration" menu



Section 4 Kit and Plate Definitions and Parameters

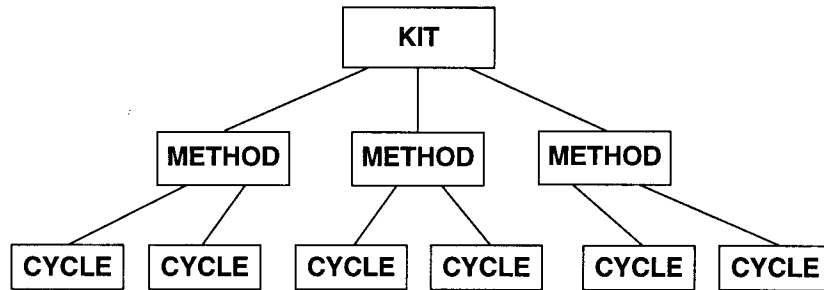


Fig. 8. Kit Structure

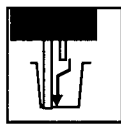
4.1 Cycles

A microplate is washed according to the selected program which is a “KIT” built from a succession of “methods” using elementary sequences called “cycles”.

Every elementary cycle is a combined motion of the manifold and the plate carrier and specifies dispensing pump, aspirating pump, and pinch valve movement. Plate handling parameters such as Position, Speed, and Time are defined as “PLATE” parameters. Liquid handling parameters such as dispensing, aspirating times, choice of liquids, etc. are called “KIT” Parameters.

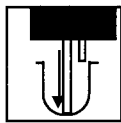
In the 1575 ImmunoWash, the six elementary cycles are as follows:

A. ASPIRATION



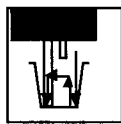
A

The aspirating needle moves down and aspirates until reaching the well bottom (see Figure A)



B

The needle is shifted close to wall (Aspiration Horizontal Position) for a flat bottom well (Figure C) and remains centered for a curved bottom well (Figure B)



C

Programmed parameters:
Kit parameters:

CROSW. ASP.
YES or NO

Crosswise aspiration (CWA)
(for flat bottom only):

The aspiration needle is shifted close to the well wall (Aspiration Horizontal Position) and moves down to the well bottom and aspirates. When the aspiration time has elapsed, the aspiration needle moves up to mid-well height and is shifted to the opposite end of the well (not touching the bottom). The needle moves down to the bottom and a second aspiration sequence takes place.

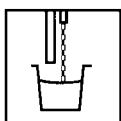
ASP. TIME

Aspiration time
0.1 to 9.9 sec, 0.1 sec increments
Time during which the aspirating needle is kept at the well bottom and is aspirating.

Plate parameters:

ASP .HOR. POS	Aspiration Horizontal Position (for flat bottom only) 0.0 (centered) to 2.0 mm, 0.1 mm increments (see also Figure 9)
ASP. VERT. POS	Aspiration Vertical Position 0.1 to 15.0 mm, 0.1 mm increments (see also Figure 9) 0.1 is the highest needle position 15.0 is the lowest needle position
ASP. DOWNW. SPEED	Aspiration Downward Speed 0 to 9, in 1 unit increments (minimum speed=0; speed max=9)

B. DISPENSING



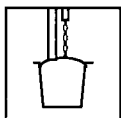
The dispensing needle is placed over the well and dispenses a wash solution into the well.

When the dispensed volume is higher than well capacity, the aspiration needle aspirates the overflow to prevent liquid spilling into adjacent wells

Programmed parameters:

Kit parameters:

VOLUME (for one well)
50 to 3,000 μ l, 50 μ l increments
(the well volume is approximately 370 μ l)



OVERFLOW 1.0 to 12.9 mm, 0.1 mm increments
(see also Figure 9)
This parameter sets the height of the aspirating needle and thus the height of the liquid in the well.
1.0 is the highest needle position
12.9 is the lowest needle position (for the overflow).

It is recommended to dispense a volume slightly higher than desired and include an overflow phase in order to obtain equal distribution of volume in each well; the slight flow rate variations among dispensing needles are compensated for in the overflow phase.

LIQUID Wash R1 to Wash R9
When launching a kit in the RUN mode, the display will remind you to connect the correct Wash bottle prior to starting.

FLOW Flow rate compensation
-5 to +5, in 1 unit increments

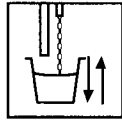
The flow rate of the dispensing pump is adapted to the operating manifold. However, the flow rate can be slightly modified with this parameter (lower flow rate with negative value, higher flow rate with positive value).

Plate parameters:

DISP. UPW. SPEED Dispensing Upward Speed
0 to 9, in 1 unit steps
(speed minimum = 0; speed max =9)

C. WASH

Aspiration sequence followed by dispensing sequence



Programmed parameters:

Kit parameters:

CROSW. ASP. Crosswise aspiration
YES or NO for flat bottom only
See details page 7.

ASP.TIME Aspiration time
0.1 to 9.9 sec 0.1 sec increments
see details page 7.

VOLUME (for one well)
50 to 3,000 μ l, in 50 μ l steps
(the well volume is approximately 370 μ l)
See details Figure 9, page 13.

OVERFLOW 1.0 to 12.9 mm, 0.1 mm increments
1.0 is the highest needle position
12.9 is the lowest needle position (for the overflow).
See details Figure 9, page 13.

LIQUID Wash R1 to Wash R9
See details page 8.

Plate Parameters

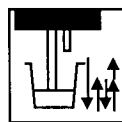
ASP.HOR.POS Aspiration Horizontal Position (for flat bottom only)
0.0 to 2.0 mm, 0.1 mm increments (see also
Figure 9, page 13)

ASP.VERT.POS Aspiration Vertical Position
0.1 to 15.0 mm, 0.1 mm increments
(see also Figure 9, page 13)
0.1 is the highest needle position
15.0 is the lowest needle position

ASP. DOWNW. SPEED Aspiration Downward Speed
0 to 9, in 1 unit increments
(speed minimum = 0; speed max = 9)

DISP. UPW. SPEED Dispensing Upward Speed
0 to 9, in 1 unit increments
(speed minimum = 0; speed max = 9)

D. BOTTOM WASH



Bottom Washing

Only the bottom of the well is washed; the following sequences apply:

Downward aspirating movement of the needle into the well down to Aspiration Vertical Position. Aspiration at Aspiration Vertical Position during Aspiration Time.

One or two upward dispensing movements to Bottom Wash Vertical Position, dispensing at this position during a Bottom Wash Time, followed by downward aspirating movement down to Aspiration Vertical Position. Aspiration for duration of Aspiration Time. Dispensing up to Overflow Position. With crosswise aspiration (for flat bottom only): every aspiration sequence (close to the wall) is immediately followed by another aspiration sequence at the opposite side of the well wall.

Programmed parameters:

Kit parameters:

CROSW. ASP.	Crosswise aspiration YES or NO for flat bottom only See details page 7.
ASP. TIME	Aspiration time 0.1 to 9.9 sec, 0.1 sec. increments See details page 7.
VOLUME (for one well)	50 to 3,000 µl, 50 µl increments (the well volume is approximately 370 µl) Volume is used during the last dispensing sequence.
OVERFLOW	1.0 to 12.9 mm, 0.1 mm increments 1.0 is the highest needle position 12.9 is the lowest needle position (for the overflow). See details Figure 9, page 13.
LIQUID	Wash R1 to Wash R9 See details page 8.
FLOW	flow rate compensation -5 to +5, in 1 unit increments See details page 8.
BOT. WASH NUMBER	Bottom Wash Number 1 or 2 Number of Bottom Wash Sequences.
BOT. TIME	Bottom Wash Time 0.1 to 9.9 sec, 0.1 sec. increments Dispense time at the Bottom Wash Vertical Position.

Programmed parameters:

ASP. HOR. POS.	Aspiration Horizontal Position (for flat bottom only) 0.0 to 2.0 mm, 0.1 mm increments (see also Figure 9, page 13) Aspiration Horizontal Position is used for all Aspiration, Bottom Wash, and Bottom Aspiration sequences.
ASP. VERT. POS	Aspiration Vertical Position 0.1 to 15.0 mm, 0.1 mm increments

(see also Figure 9, page 13)
0.1 is the highest needle position
15.0 is the lowest needle position
Aspiration Vertical Position is used for all aspiration sequences.

B.W. VERT. POS Bottom Wash Vertical Position
0.1 to 15.0 mm, 1.0 mm increments (see also Figure 9, page 13)
0.1 is the highest needle position
15.0 is the lowest needle position
Bottom Wash Vertical Position is the height of the aspirating needle during the dispensing sequence of the bottom wash.

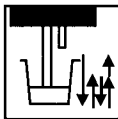
ASP. DOWNW. SPEED Aspiration Downward Speed
0 to 9, in 1 unit increments
(speed minimum = 0; speed max = 9).
Aspiration Downward Speed is used during the first aspiration sequence.

DISP. UPW. SPEED Dispensing Upward Speed
0 to 9, in 1 unit increments.
(speed minimum = 0; speed max = 9)
Dispensing Upward Speed is used during the last Dispensing sequence.

BOT. DOWNW. SPEED Bottom Downward Speed
0 to 9, in 1 unit increments
(speed minimum = 0; speed max = 9)
Speed of all downward movements for all bottom sequences (wash and aspiration).

BOT. UPWARD. SPEED Bottom Upward Speed
0 to 9, in 1 unit increments.
(speed minimum = 0; speed max = 9)
Speed of all upward movements for all bottom sequences (wash and aspiration).

E. BOTTOM ASP.



Bottom aspiration utilizes the following sequences:
Downward aspirating movement of the needle into the well down to Aspiration Vertical Position.
Aspiration at Aspiration Vertical Position for a specified Aspiration Time.

One or two downward aspirating movements to Bottom (aspiration) Position followed by downward aspirating movement down to Aspiration Vertical Position. Aspiration at Aspiration Vertical Position for the specified Aspiration Time.

With crosswise aspiration (for flat bottom only): every aspiration sequence (close to the wall) is immediately followed by another aspiration sequence at the opposite side of the wall as described on page 7.

Programmed parameters:

Kit parameters:

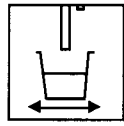
CROSW.ASP	Crosswise aspiration YES or NO for flat bottom only See details on page 7.
ASP.TIME	Aspiration time 0.1 to 9.9 sec, 0.1 sec increments see details on page 7.
BOT.ASP.NUMBER	1 or 2 Number of Bottom Aspiration Sequences.

Plate parameters:

ASP. HOR. POS	Aspiration Horizontal Position (for flat bottom only) 0.0 to 2.0 mm, 0.1 mm increments (see also Figure 9, page 13) Aspiration Horizontal Position is used for all Aspiration, Bottom Wash and Bottom Aspiration sequences.
ASP. VERT. POS	Aspiration Vertical Position 0.1 to 15.0 mm, 0.1 mm increments (see also Figure 9, page 13) 0.1 is the highest needle position 15.0 is the lowest needle position Aspiration Vertical Position is used for all Aspiration sequences.
BOT. VERT. POS.	Bottom (Aspiration) Vertical Position 0.1 to 15.0 mm, 0.1 mm increments (see also Figure 9, page 13) 0.1 is the highest needle position 15.0 is the lowest needle position. Bottom (Aspiration) Vertical Position is the height of the aspirating needle during the aspiration sequence of the bottom aspiration.
ASP. DOWNW. SPEED	Aspiration Downward Speed 0 to 9, in 1 unit increments (speed minimum = 0; speed max = 9) Aspiration Downward Speed is used during the first Aspiration sequence.
BOT. DOWNW. SPEED	Bottom Downward Speed 0 to 9, in 1 unit increments (speed minimum = 0; speed max = 9) This doubles the speed of all downward movements for all bottom sequences (wash and aspiration).
BOT. UPWARD. SPEED	Bottom Upward Speed 0 to 9, in 1 unit increments (speed minimum = 0; speed max = 9) This denotes the speed of all upward movements for all bottom sequences (wash and aspiration).

F. AGITATION

Plate Agitation



The microplate is agitated horizontally during the agitation time at a specified agitation amplitude and agitation speed.

Programmed parameters:

Kit parameters:

SHAKE TIME

Agitation Time

0.1 to 59.9 sec, 0.1 sec increments

Plate parameters:

SHAKING AMPLITUDE

Agitation Amplitude

0 to 9, in 1 unit steps

SHAKING SPEED

Agitation Speed

0 to 9, in 1 unit steps

4.2 Needle Positions

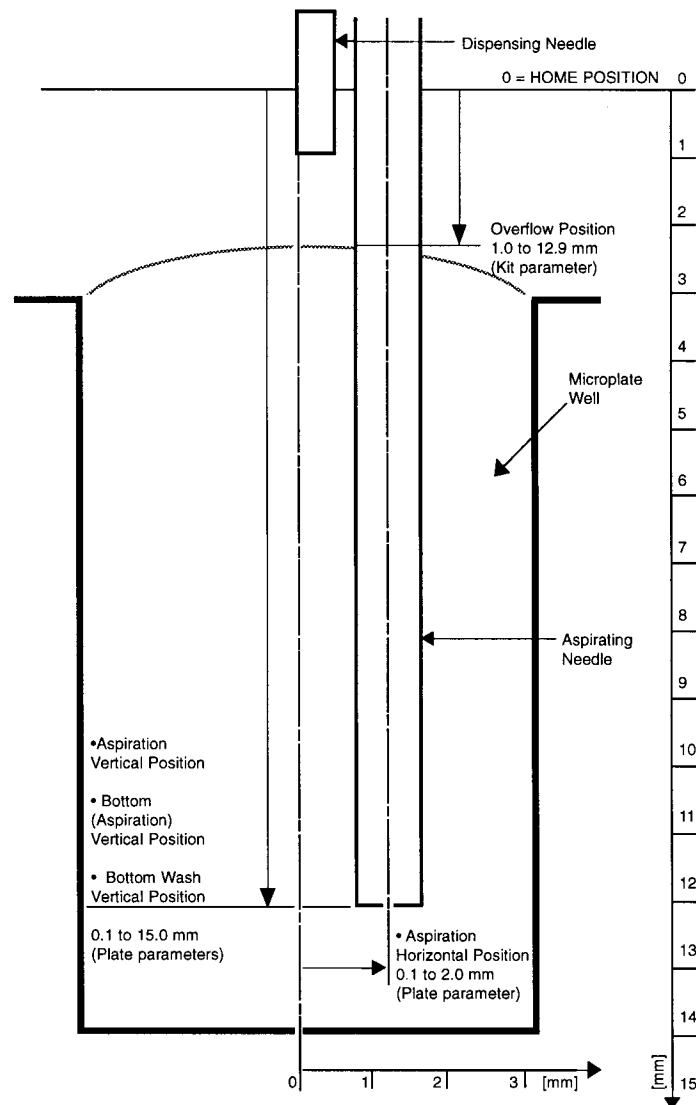


Fig. 9. Description of needle parameters in kit. Identification and range of parameters for the location of the needles in relation to the microplate well. Graduations in this sketch are only for illustration. Set these parameters in real conditions with a real plate; well dimension may vary from one plate type to another one.

4.3 Methods

A method is a completely defined module made up of one or two elementary cycles as described in Section 4.1 (page 7). Every kit is made up of a succession of methods.

In a method, elementary cycles can be applied n times (n = 1 to 9).

For methods using two elementary cycles, only the first cycle is applied “n” times.

When repeated several times, the waiting time between elementary cycles (0 min 0 sec to 59 min 0 sec in PLATE mode and 0 min 0 sec to 9.9 sec in STRIP mode) is called Soaking Time.

The time between the two methods (0 min 0 sec to 59 min 0 sec) is called Method Interval.

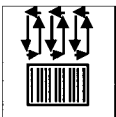
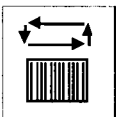
Whether the selected mode is STRIP or PLATE (see definition below), a methods is always completely finished on the whole plate prior to the start of the next method.

Methods available in the 1575 ImmunoWash

Method	Abbreviated Name	Method Name on LCD Display	Refer to Section 4.1
Single-cycle Method			
nA	ASPIRATION	Aspiration	A
nD	DISPENSING	Dispensing	B
nW	WASH	Wash	C
nw	BOTTOM WASH	Bottom Washing	D
na	BOTTOM ASP.	Bottom aspiration	E
nAg	AGITATION	Plate Agitation	F
Two-cycle Method			
nW + A	WASH + ASP	Wash + Aspiration	
nW + a	WASH+BOT.ASP	Wash + Bottom Aspiration	
nw + A	BOT.WASH+ASP	Bottom Wash + Aspiration	
nw + a	B.WASH+B.ASP	Bottom Washing + Bottom Aspiration	

Kit parameters for a method

MODE STRIP OR PLATE

		
	STRIP mode: the total method is applied on the strip prior to processing the next strip.	PLATE mode: the elementary cycle is applied successively on all strips prior to applying next elementary cycle.
Example :	STRIP Mode	PLATE Mode
Method 3W+A	3W + A on 1st strip 3W + A on 2nd strip etc... 3W + A on last strip	W on the whole plate W on the whole plate W on the whole plate A on the whole plate

NR OF CYCLES Number of Cycles = n
1 to 9, 1 unit increments
the number of elementary cycles that will be used within the method.

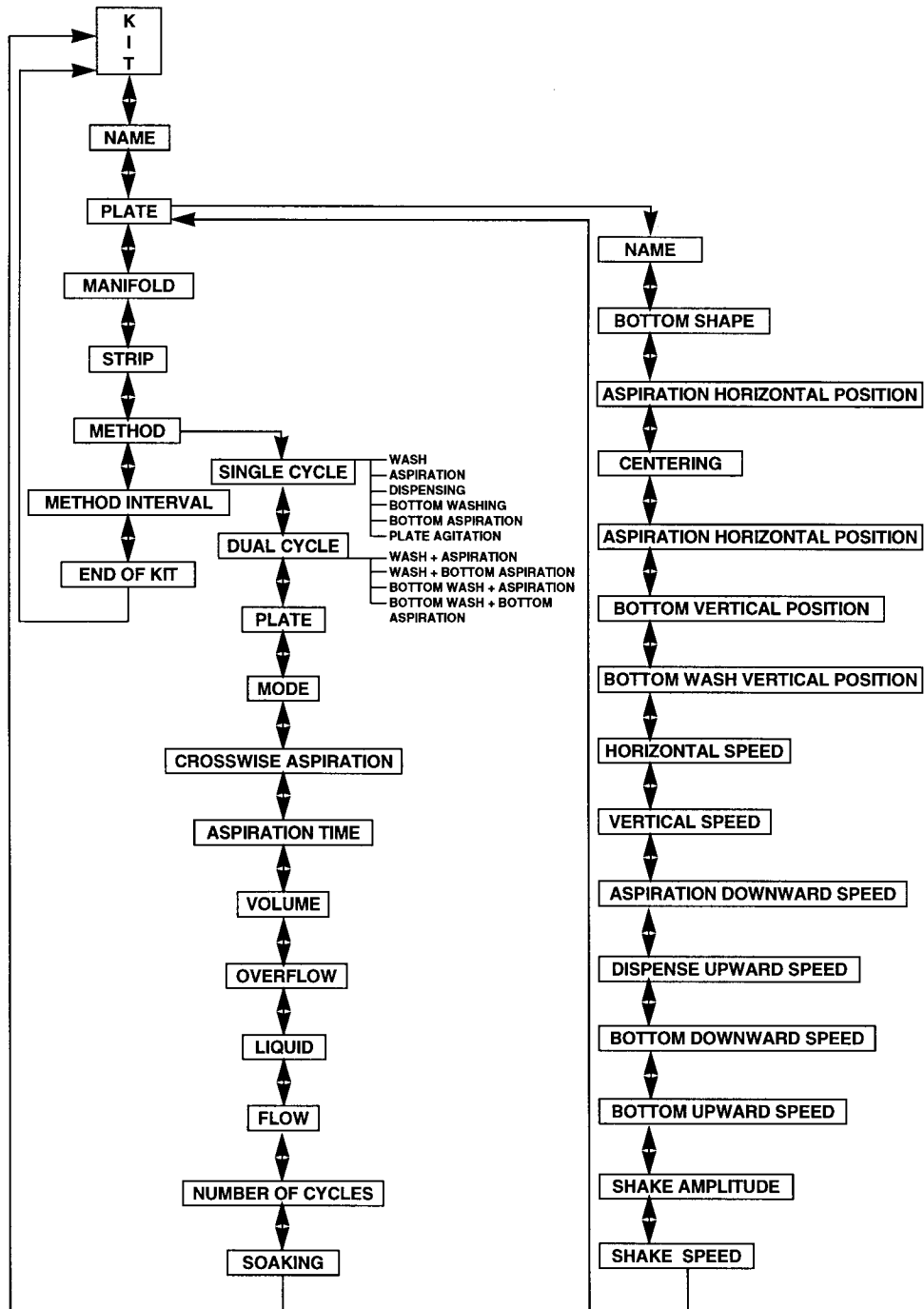
SOAKING Soak time
0 min 0 sec to 59 min 0 sec, 1 sec in increments in Plate mode.
0 min 0 sec to 9.9 sec, 0.1 sec increments in Strip mode.

MET. INTER Method Interval
0 min 0 sec to 59 min 0 sec, 1 sec increments

Section 5 Setting Up Programs

5.1 Kit Structure

The diagram below details the overall on-board software architecture. In the Model 1575, wash procedures are referred to as KITS. KITS are in turn composed of all parameters associated with the actual instrument configuration. With the exception of PLATE program, all parameters of the KIT are associated with liquid delivery (dispense) and removal (aspirate). As described in the sections that follow, the user can edit all parameters associated with the KIT by inserting, deleting, adding, or editing METHODS and PLATES or editing all remaining parameters. The flow chart below shows this overall functionality.



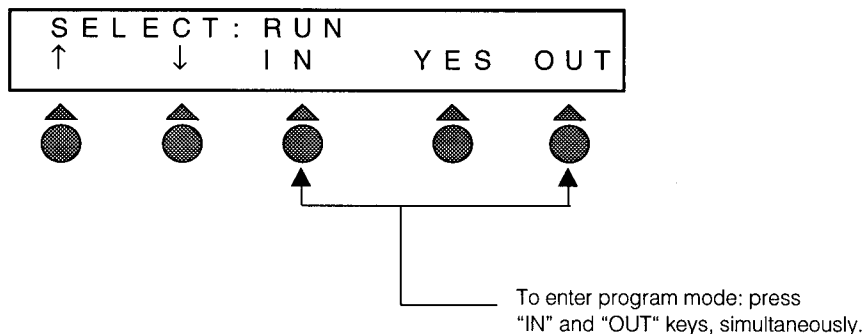
As described in Section 4.1. Definition of KIT and PLATE Parameters, parameters directly depending on KIT (such as dispensing, aspirating times, liquids, etc.) are called “KIT Parameters”. Parameters depending on microplate dimensions (mainly POSITION and SPEED parameters) are called “PLATE parameters”.

During program setup, each kit is linked to one plate with the “Plate number” parameter (Figure 10). This implies that the PLATE must already exist or must be programmed prior to creation of the kit program.

Up to 10 PLATEs can be programmed.

Up to 75 KITs can be programmed.

5.2 Access to Programming Mode



5.3 Functional keys

Displayed menu commands corresponding to soft keys on the 1575 ImmunoWash are listed below. Each key provides program functionality.

- ↑ and ↓ Allow the user to scroll the different options at each level.
- IN Moves the plate carrier inside for storage and packing.
- YES Used to accept the displayed values and move forward in the program.
- OUT Moves the plate carrier out to the loading position.
- ESC Enables the user to back up to previous displays, to the main menu, or to stop a function.
- Moves the cursor to another position on the display for additional input.

5.4 Programming Synopsis

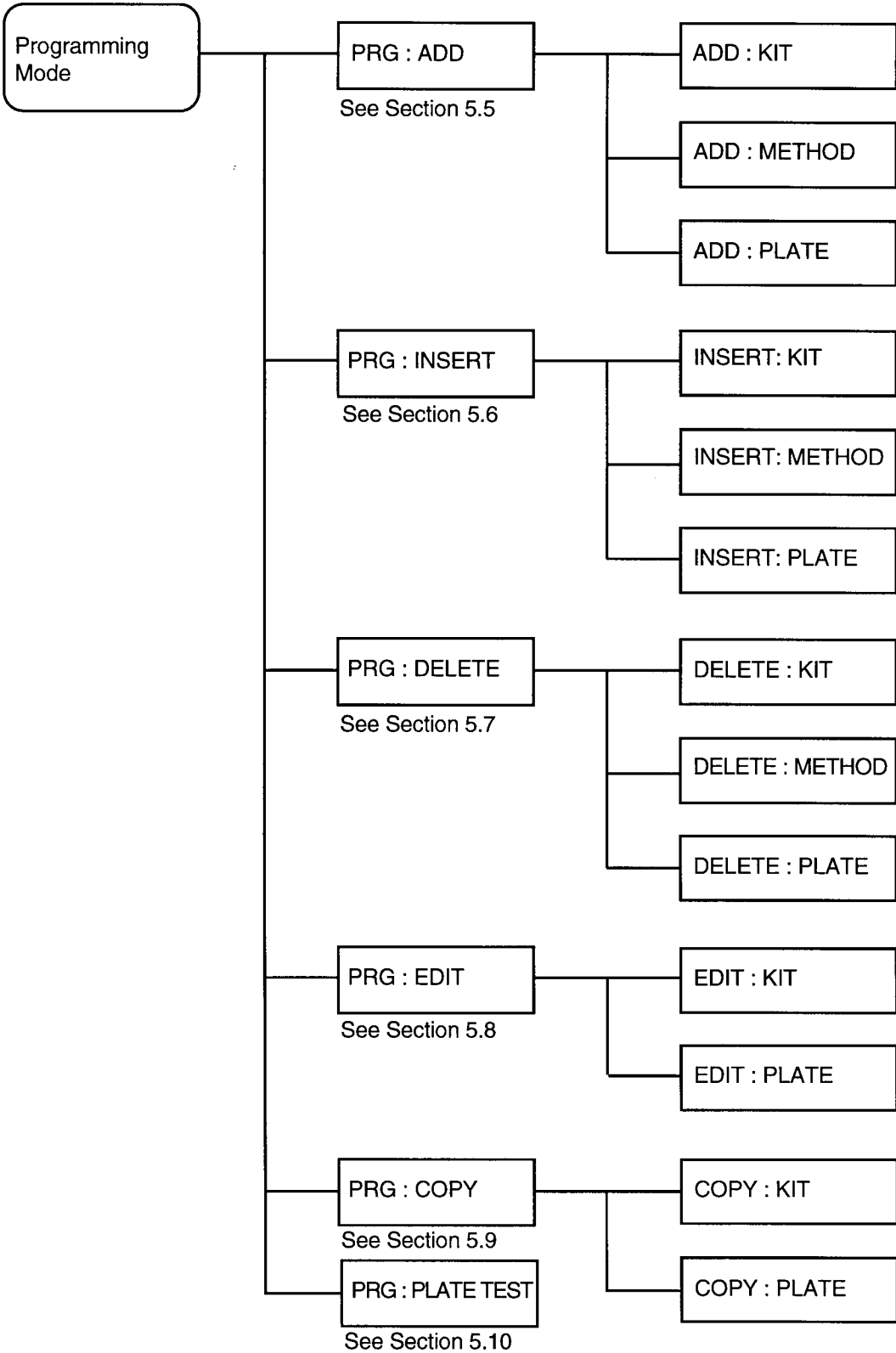
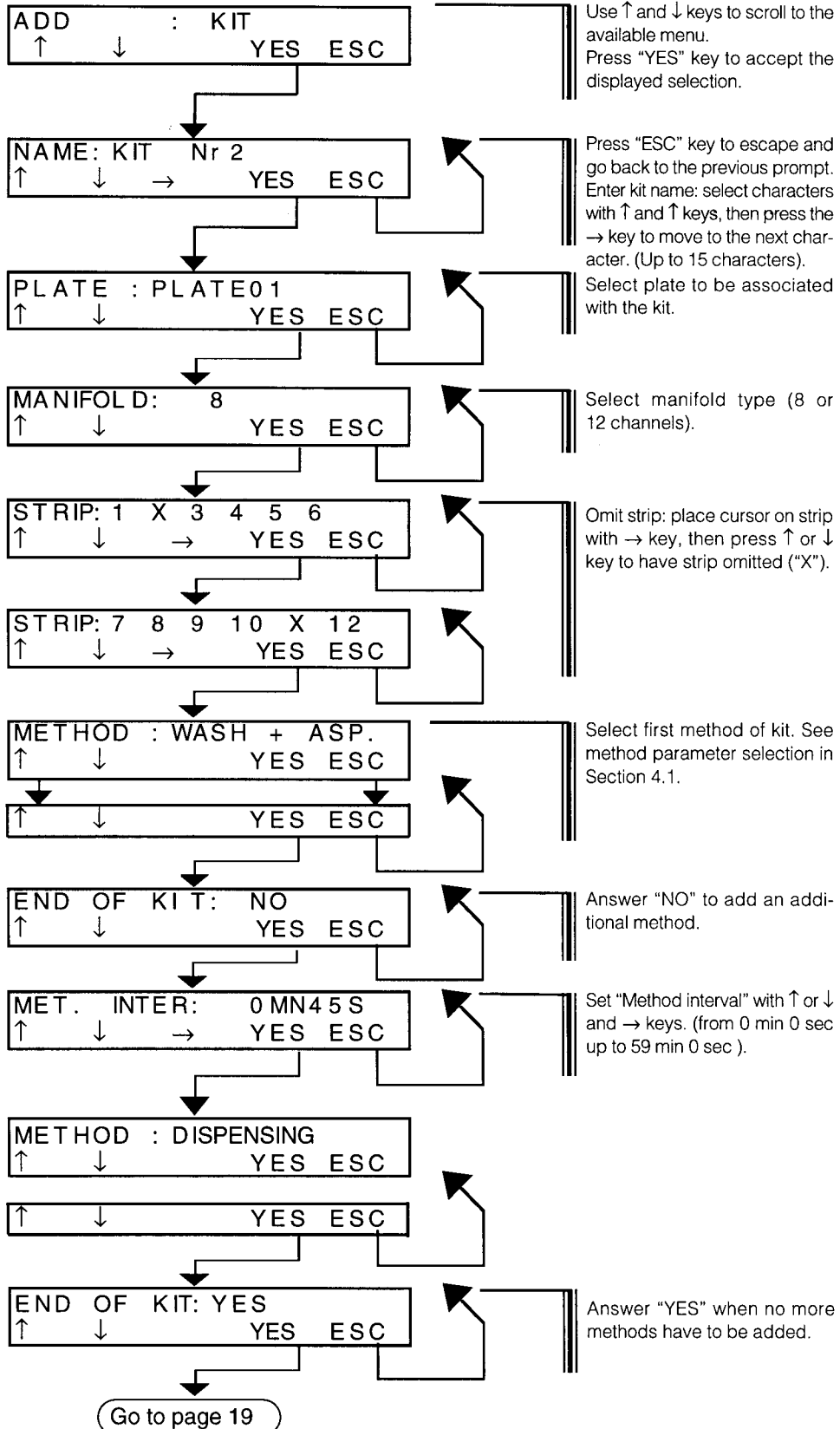


Fig.10 Programming Mode Flow Chart.

5.5 ADD - ADD:KIT

The kit is added at the end of the existing kit list



continued from page 18

Nr OF KITS : 2
↑ ↓ YES ESC

Select the number of times the kit is to be run with ↑ or ↓ keys. (up to 9 times).

KIT INTER: 0 MN 0 S
↑ ↓ → YES ESC

When running several times, set "Kit interval" with ↑ or ↓ or → keys. (from 0 min 0 s up to 59 min 59 sec).

SELECT: RUN
↑ ↓ IN YES OUT

The new kit is added at the end of the existing kit list. Display returns to main menu.

ERRORS in KIT programming:

ERR: 24 TOO MANY KIT PROGRAMMED YES

75 kits are already programmed. You must first delete an existing kit prior programming a new one.

SELECT: RUN
↑ ↓ IN YES OUT

ERR: 32 KIT NAME IMPOSSIBLE YES

You have entered no name or the kit name you have entered already exists. You are prompted to enter a new name to continue kit programming.

NAME:
↑ ↓ → YES ESC

ERR: 25 NOT ENOUGH MEMORY YES

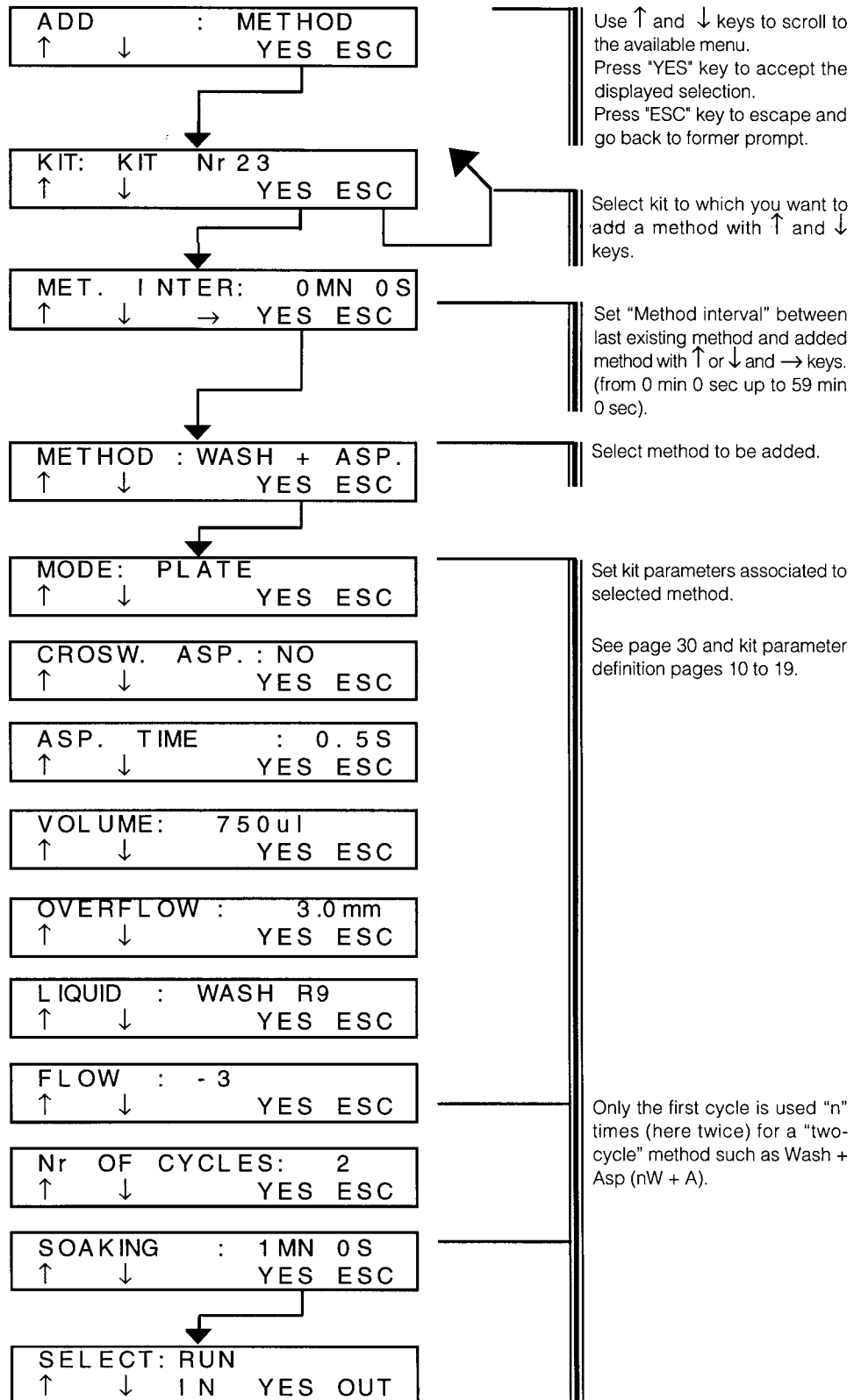
Memory is full because one or several kits contain a large number of methods.

SELECT: RUN
↑ ↓ IN YES OUT

You must first delete an existing kit prior to programming a new one.

ADD: METHOD

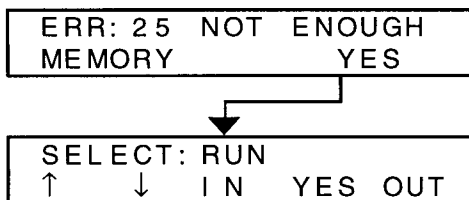
The method is added after the last method of the selected kit.



Summary of kit parameters associated to method.

METHOD :		WASH + ASP	WASH+BOT.ASP	BOT.WASH+ASP	B.WASH+B.ASP	WASH	ASPIRATION	DISPENSING	BOTTOM WASH.	BOTTOM ASP.	AGITATION
Method code :		nW+A	nW+a	nW+A	nW+a	nW	nA	nD	nW	nA	nAg
Kit parameter	VALUE										
MODE :	STRIP or PLATE	•	•	•	•	•	•	•	•	•	•
CROSW. ASP.:	YES or NO	•	•	•	•	•	•		•	•	
ASP. TIME:	0.1 to 9.9 sec	•	•	•	•	•	•		•	•	
VOLUME:	50 to 3000 µL	•	•	•	•	•		•	•		
OVERFLOW:	1.0 to 12.9 sec	•	•	•	•	•		•	•		
LIQUID :	WASH R1 to WASH R9	•	•	•	•	•		•	•		
FLOW :	-5 to +5	•	•	•	•	•		•	•		
BOT. WASH NUMBER:	1 or 2			•	•				•		
BOTTOM TIME :	0.1 to 9.9 sec			•	•				•		
BOT. ASP. NUMBER	1 or 2		•		•					•	
SHAKE TIME :	0.1 to 59.9 sec										•
Nr OF CYCLES	1 to 9	•	•	•	•	•	•	•	•	•	•
SOAKING:	0 to 59 mn in PLATE mode 0 to 9.9sec in STRIP mode	•	•	•	•	•	•	•	•	•	•

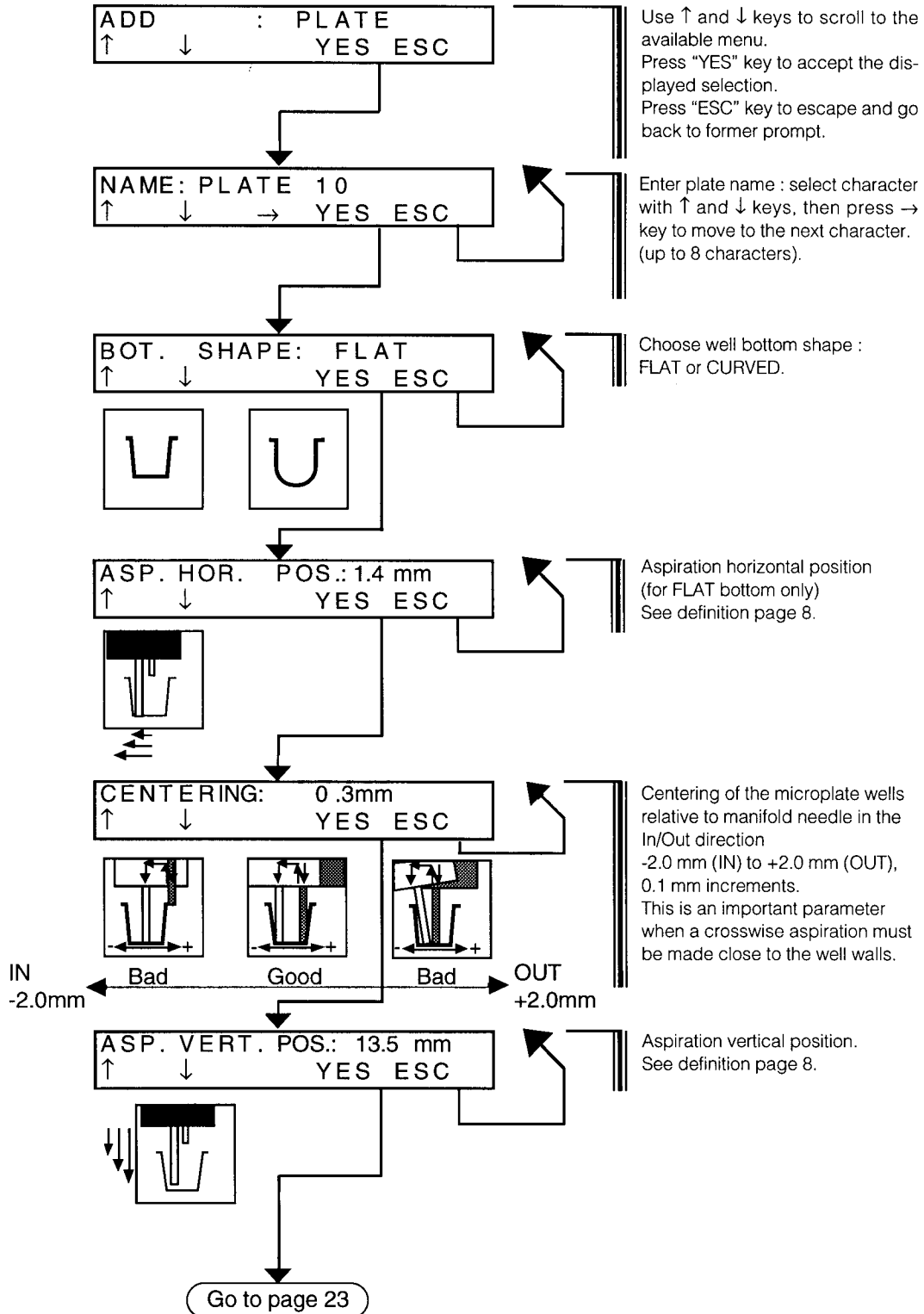
ERRORS in METHOD programming:



Memory is full because one or several kits contain a large number of methods.
You must first delete an existing kit or existing method prior to programming a new one.

ADD: PLATE

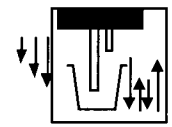
The plate is added at the end of the existing plate list.



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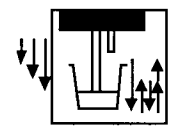
BOT. VERT. POS.: 11.8 mm
↑ ↓ YES ESC

Bottom (aspiration) vertical position.
See definition page 12.



B. W. VERT. POS.: 11.8 mm
↑ ↓ YES ESC

Bottom Wash Vertical Position.
See definition page 11.



HORIZONTAL SPEED: 6
↑ ↓ YES ESC

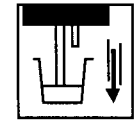
Horizontal speed :
In/Out plate carrier speed during non-work movements.
(movement to home position, return movement from last to first strip, etc.).
0 to 9, in 1 unit increments
(speed minimum = 0; speed max = 9).

VERTICAL SPEED: 6
↑ ↓ YES ESC

Vertical speed :
Up / Down manifold speed during non-work movements
(movement to home position, etc.)
in 1 unit increments.
(speed minimum = 0; speed max = 9).

ASP. DOWNW. SPEED: 6
↑ ↓ YES ESC

Aspiration downward speed.
See definition page 9.

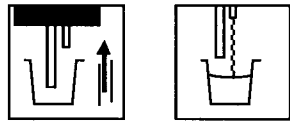


Go to page 24

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DISP. UPW . SPEED: 6
↑ ↓ YES ESC

Dispense upward speed.
See definition page 9.



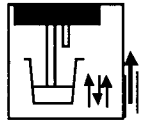
BOT. DOWNW. SPEED: 3
↑ ↓ YES ESC

Bottom downward speed
See definition page 11.



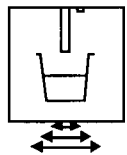
BOT. UPWARD SPEED: 6
↑ ↓ YES ESC

Bottom upward speed
See definition page 11.



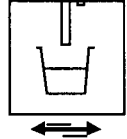
SHAKING AMPLITUDE: 2
↑ ↓ YES ESC

Shaking amplitude
See definition page 13.



SHAKING SPEED: 9
↑ ↓ YES ESC

Shaking speed
See definition page 13.



SELECT: RUN
↑ ↓ IN YES OUT

ERRORS in PLATE programming:

```
ERR: 26 ALREADY
10 PLATES!! YES
```

10 plates are already programmed. You must first delete an existing plate prior to programming a new one.

```
SELECT: RUN
↑ ↓ IN YES OUT
```

```
ERR: 33 PLATE NAME
IMPOSSIBLE YES
```

You have entered no name or the plate name you have entered already exists. You are prompted to enter a new name to continue plate programming.

```
NAME:
↑ ↓ → YES ESC
```

5.6 INSERT

INSERT: KIT

The new kit is inserted before another kit.

```
INSERT : KIT
↑ ↓ YES ESC
```

```
BEF.: KIT Nr 23
↑ ↓ YES ESC
```

Select kit before which you want to insert the new kit.

```
NAME: KIT Nr 24
↑ ↓ → YES ESC
```

Enter new kit name. Then follow the procedure in Section 5.5, ADD:METHOD.

Then, follow the same procedure as in Section 5.5 ADD:KIT.

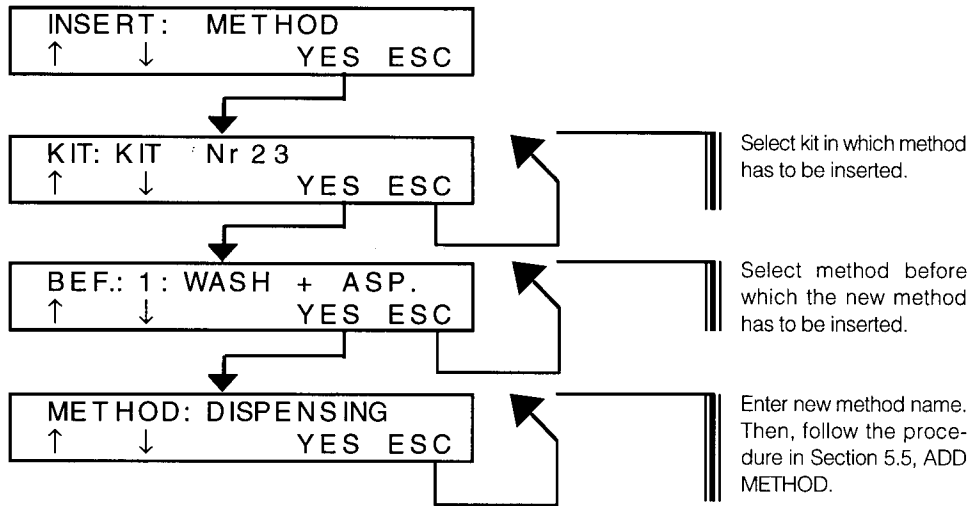
Temporary Kit

```
RUN: TEMPORARY KIT
↑ ↓ YES ESC
```

Power failure or accidental switching OFF during kit insertion will cause the kit to be lost unless the first method has been completely programmed. In this case, the completely programmed methods can be found in a kit named TEMPORARY KIT. This kit is always inserted at the top of the kit list. It is then possible to copy this Temporary Kit, write its correct name, and continue with programming of methods and kit repetition parameters. After saving under the correct name, delete the temporary kit.

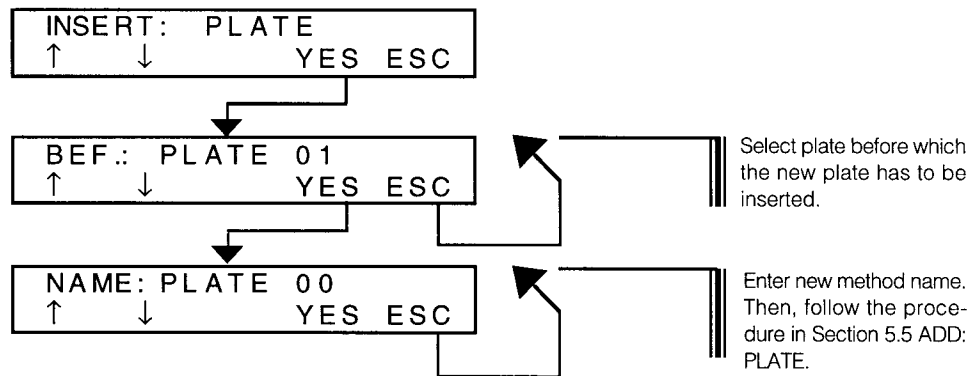
INSERT: METHOD

The new method is inserted before another method.



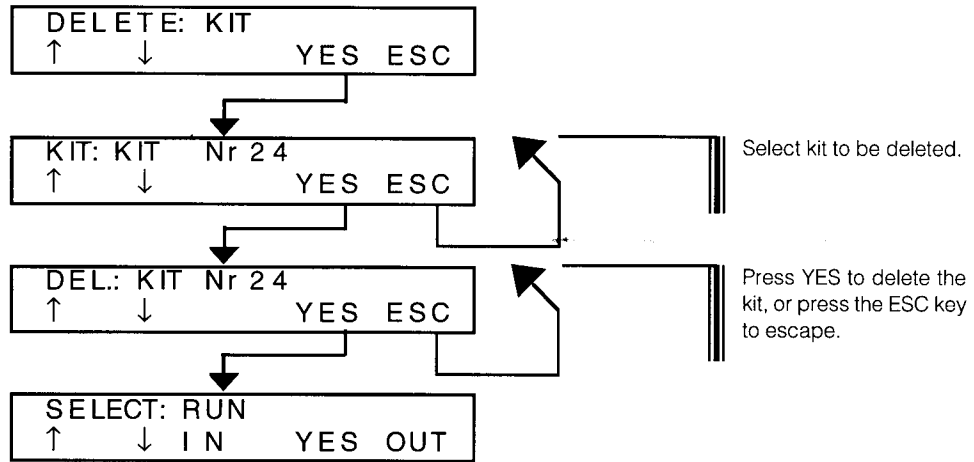
INSERT: PLATE

The new plate is inserted before another plate.

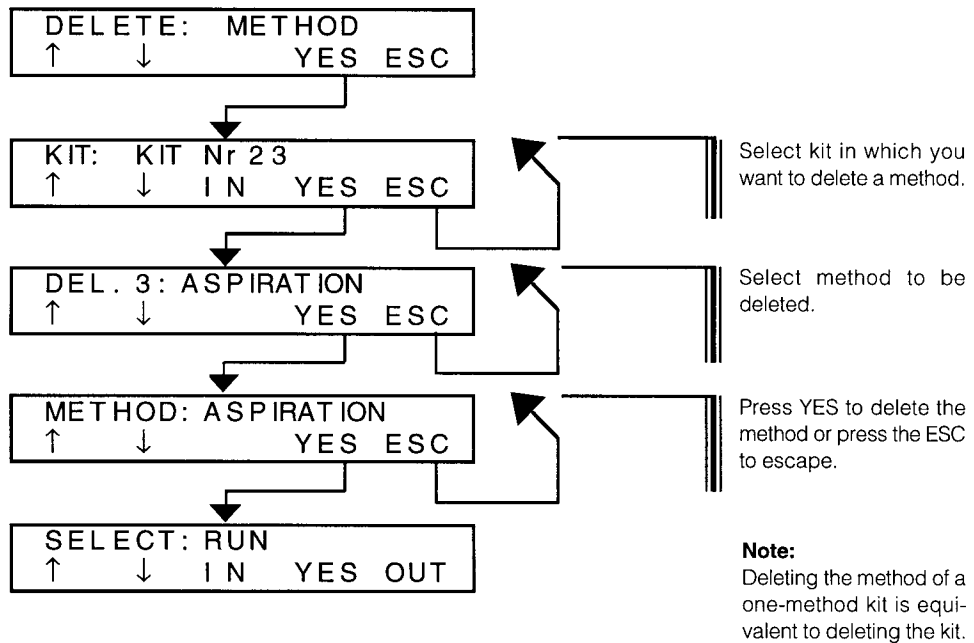


5.7 DELETE

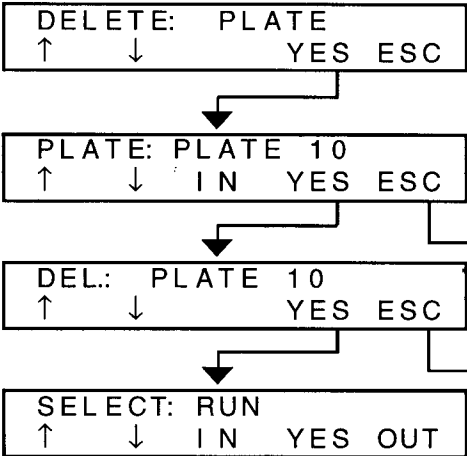
DELETE: KIT



DELETE: METHOD



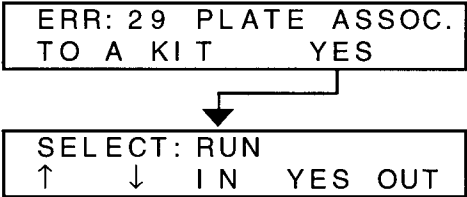
DELETE: PLATE



Select plate to be deleted.

Press YES to delete the plate or press ESC to escape.

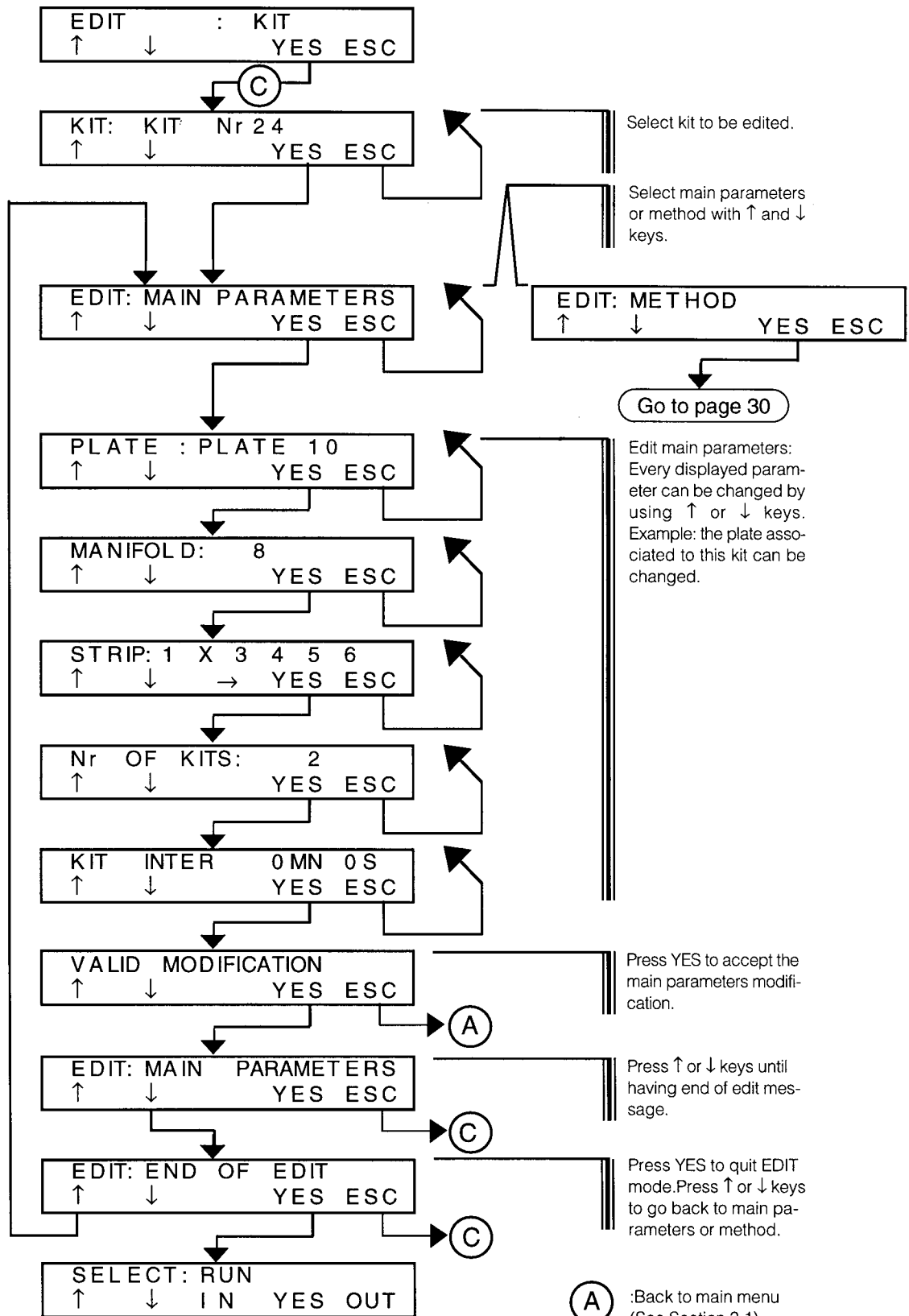
ERROR in PLATE deletion:



The plate is still associated with one or several kits. You must first associate the other plate to affected kits or delete those kits prior deleting this plate.

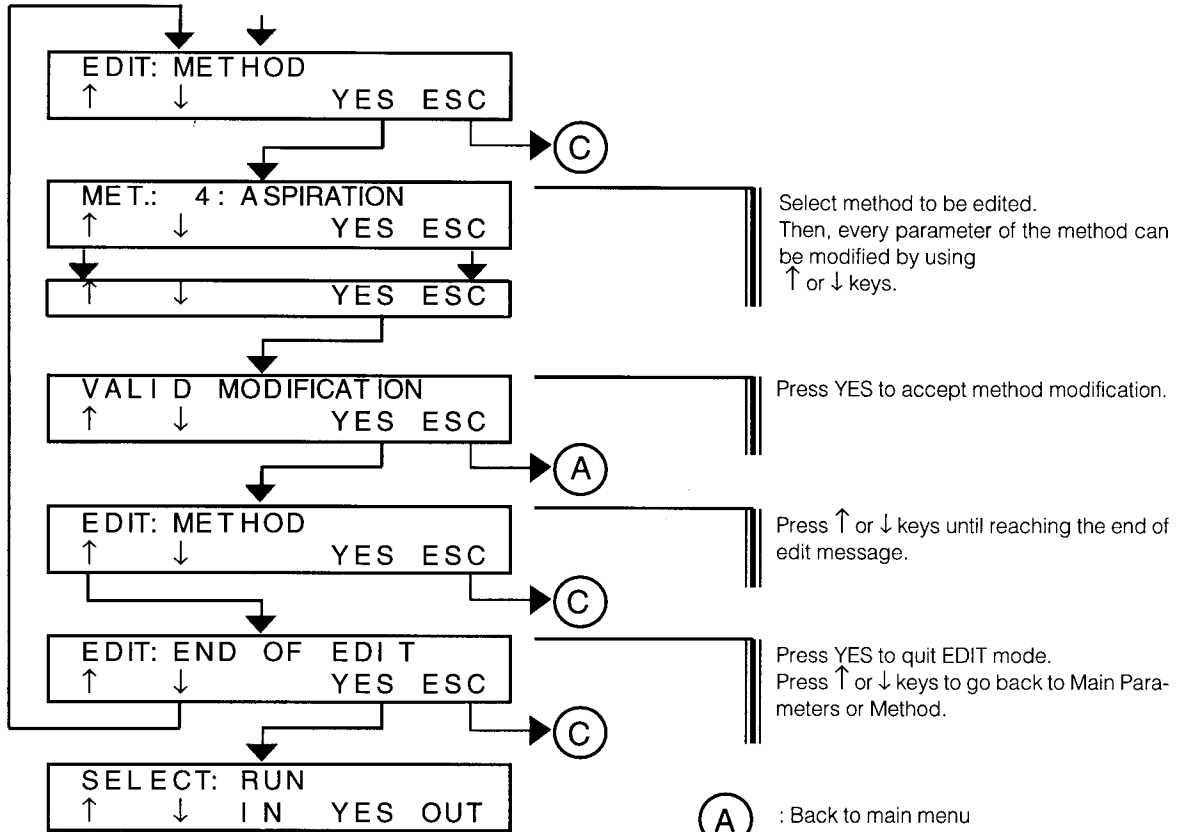
5.8 EDIT

EDIT: KIT



EDIT: (continued)

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Select method to be edited. Then, every parameter of the method can be modified by using ↑ or ↓ keys.

Press YES to accept method modification.

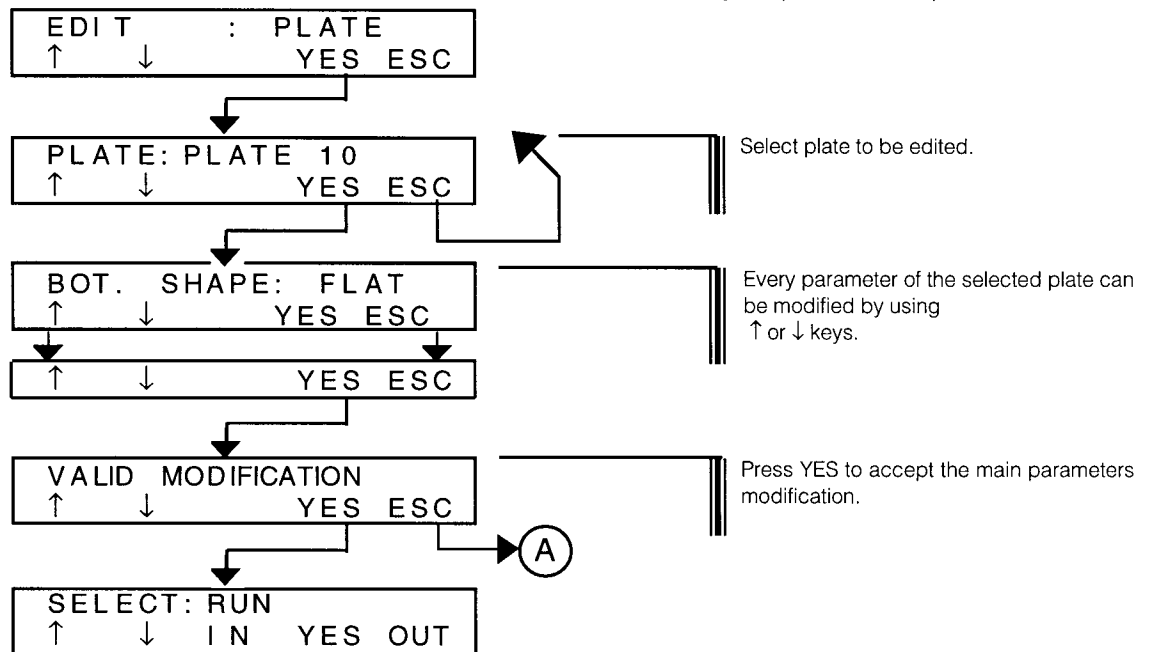
Press ↑ or ↓ keys until reaching the end of edit message.

Press YES to quit EDIT mode. Press ↑ or ↓ keys to go back to Main Parameters or Method.

(A) : Back to main menu (See Section 3.1).

(C) : Back to kit edition (See Section 5.8).

EDIT: PLATE



Select plate to be edited.

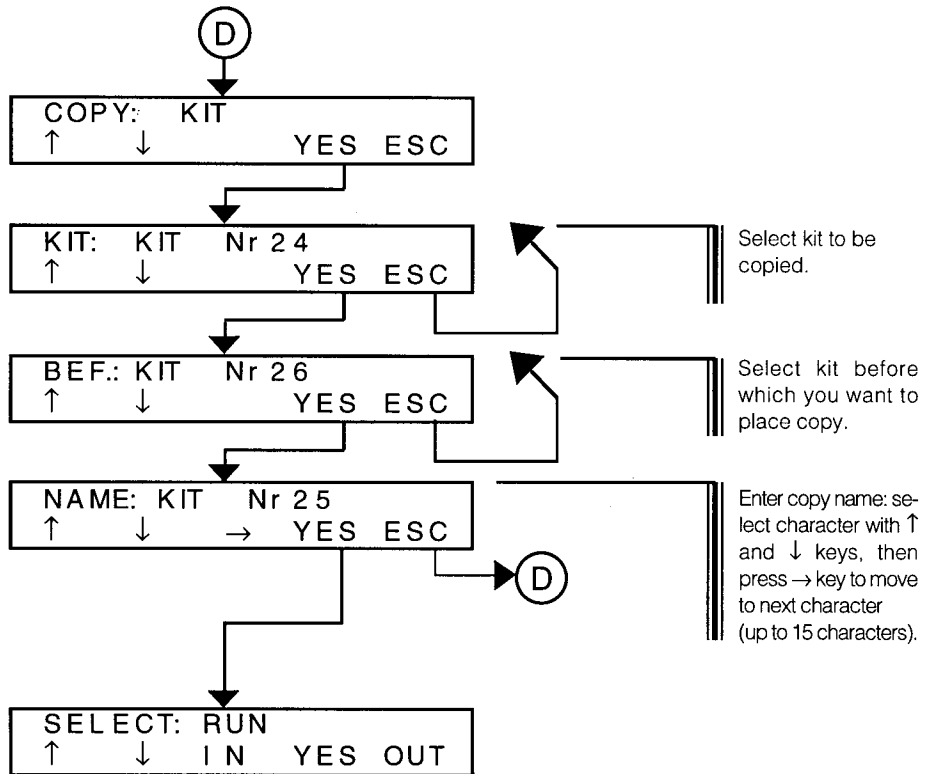
Every parameter of the selected plate can be modified by using ↑ or ↓ keys.

Press YES to accept the main parameters modification.

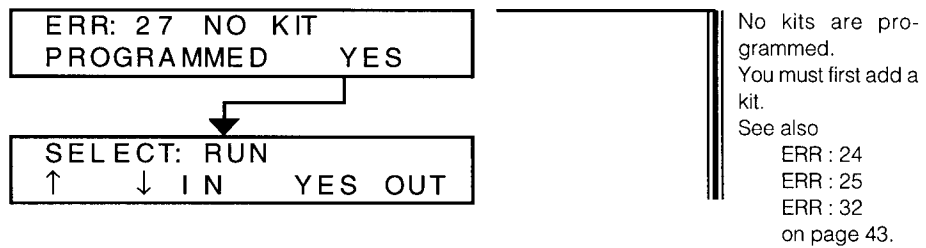
(A) : Back to main menu (See Section 3.1).

5.9 COPY

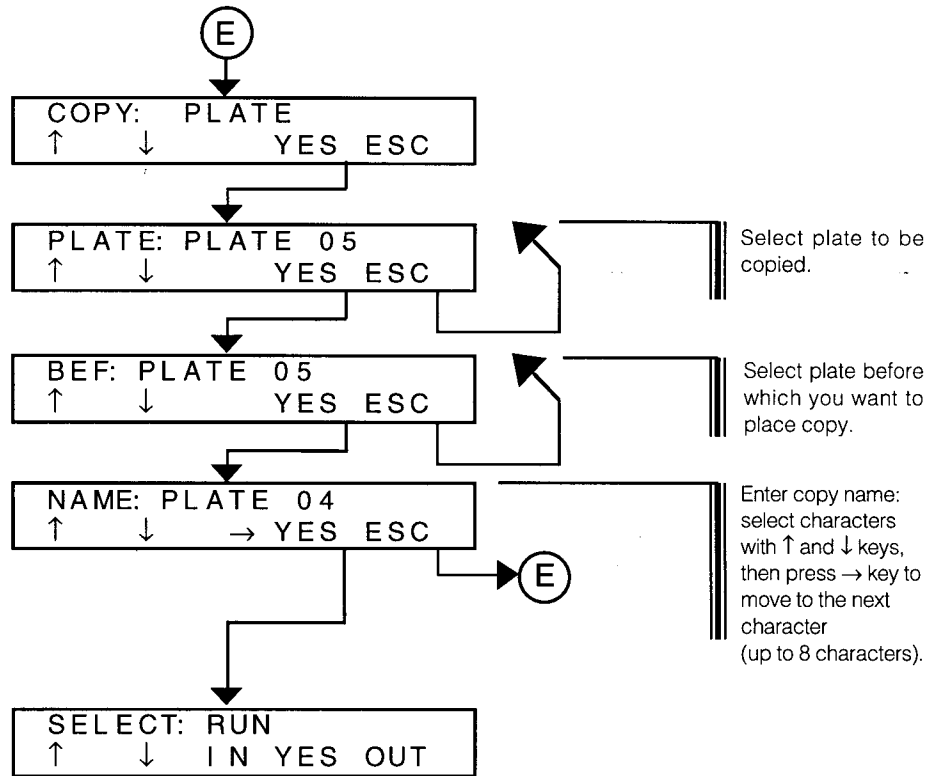
COPY: KIT



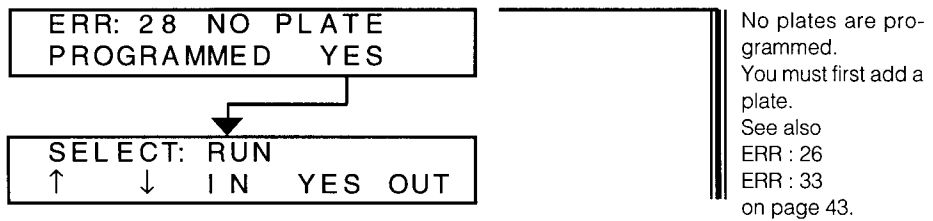
ERROR in KIT copy:



COPY: PLATE



ERROR in PLATE copy:



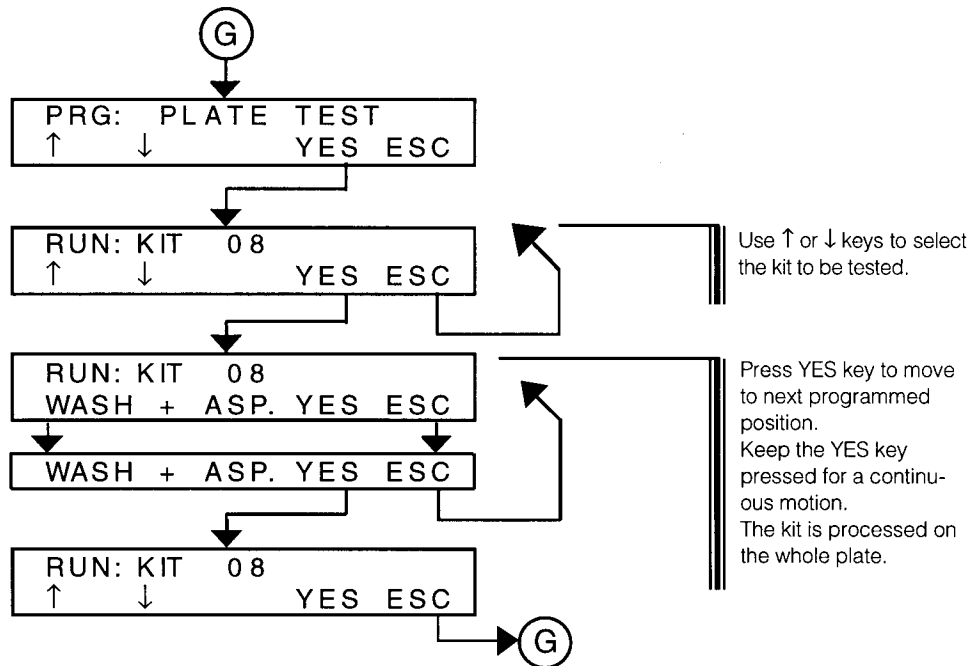
5.10 PLATE TEST

Step-by-Step RUN

The programmed kit can be used in a step-by-step mode *i.e.* manifold and plate carrier are stopped at each programmed position (Aspiration horizontal position, Aspiration vertical position, Overflow position, etc.) to check if these positions are correct. If they are incorrect, the user must edit (see section 5.8) the tested kit or its assigned plate in order to modify the position parameter(s):

Use ↑ and ↓ keys to select the kit to be tested.

Press YES key to move to next programmed position. Keep the YES key pressed for a continuous motion (preferably deactivate the beep). The kit is processed on the whole plate.

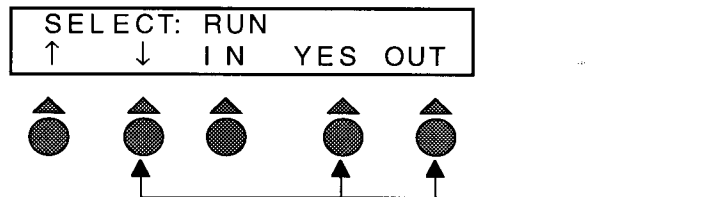


5.11 RAM Initialization

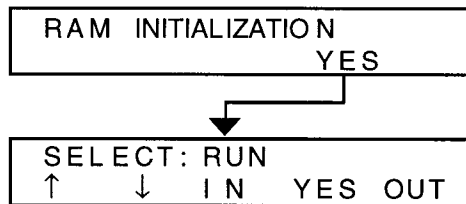
Every programmed kit and plate is saved in RAM (Random Access Memory). The contents of this MEMORY can be erased by a RAM Initialization, thus deleting the whole set of kits and plates that have been programmed by the user. Instrument software, demo kits and plates are not deleted as they are saved in an EPROM not affected by RAM initialization.

Performing RAM Initialization:

Turn the unit ON while keeping these keys pressed:



The following message is displayed.

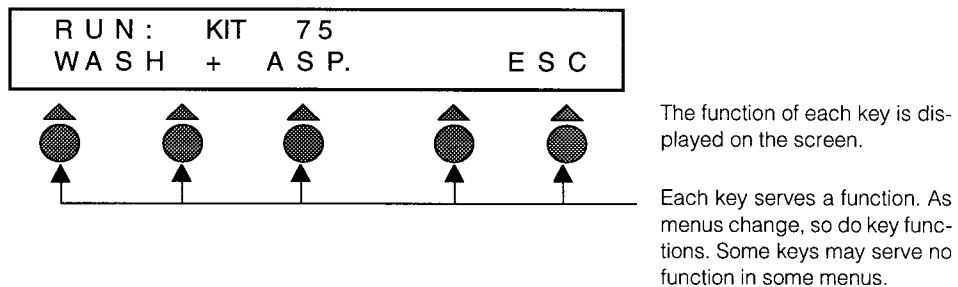
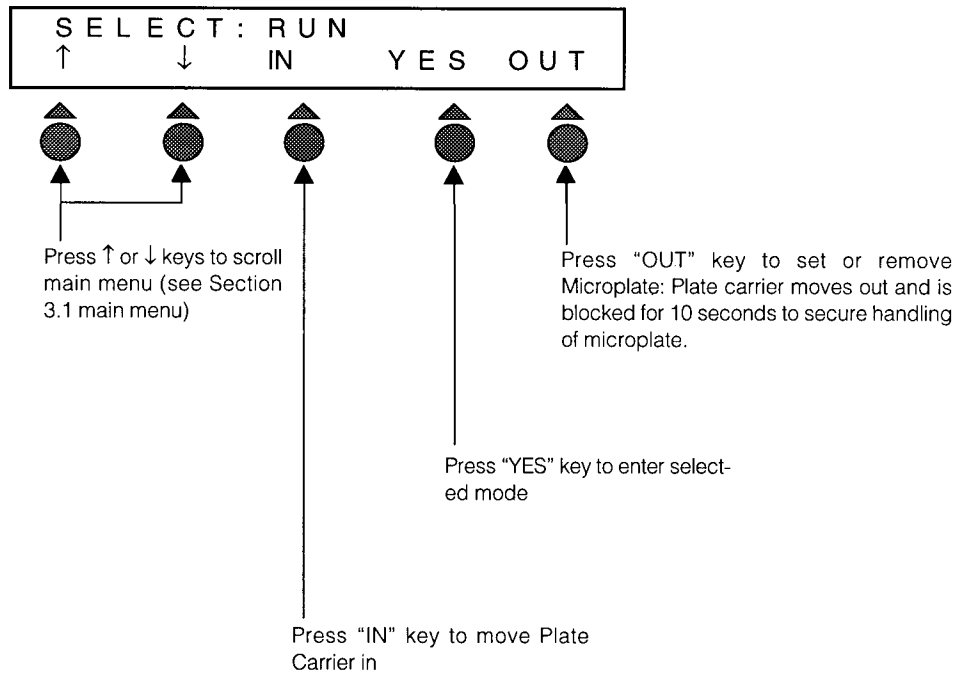


Press YES to have the RAM reinitialize.
All saved programs will be erased.

Section 6 Run Mode

6.1 How to Use the Key Pad

Each membrane key serves a particular function which is indicated with a word, symbol, or abbreviation on the display just above the key of interest. Functionality for individual keys may or may not change as the user moves to different display menus. The diagrams below provide a guide which explains usage of keys on the Model 1575 ImmunoWash.



6.2 Microplate Loading

The 1575 ImmunoWash plate carrier supports both 8- and 12-way modes for processing 96-well microplates. Place the microplate on the plate carrier according to the mode selected:

1575 ImmunoWash configured in 8-way mode (with 8-Channel Manifold): one strip is composed of 8 wells (numbered A to H)

Number of strips: 12 (numbered 1 to 12)

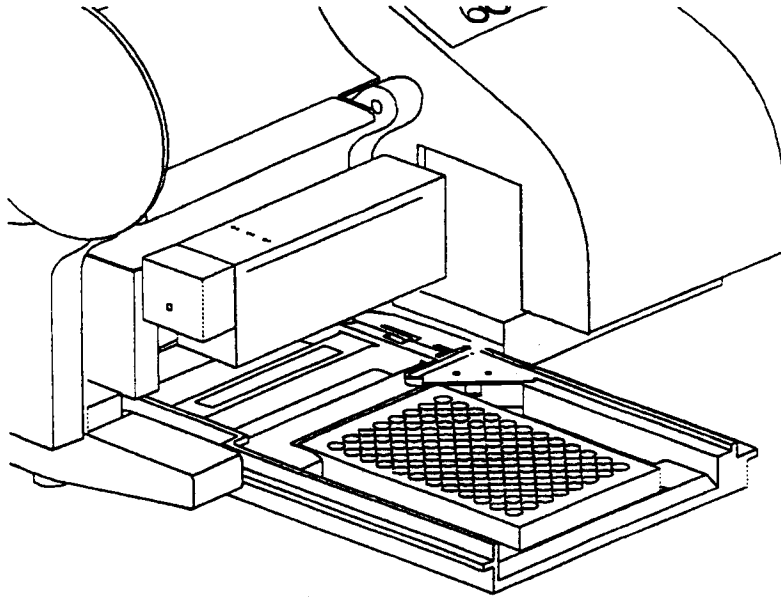


Fig. 11. ImmunoWash with 8-Channel Manifold.

1575 ImmunoWash configured in 12-way mode (with 12-Channel Manifold);

One strip is composed of 12 wells (numbered 1 to 12)

Number of strips: 8 (numbered A to H)

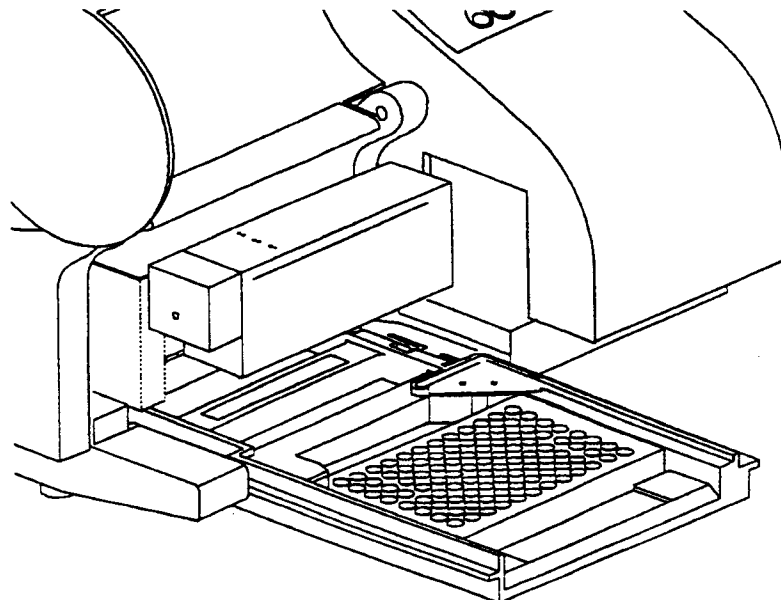
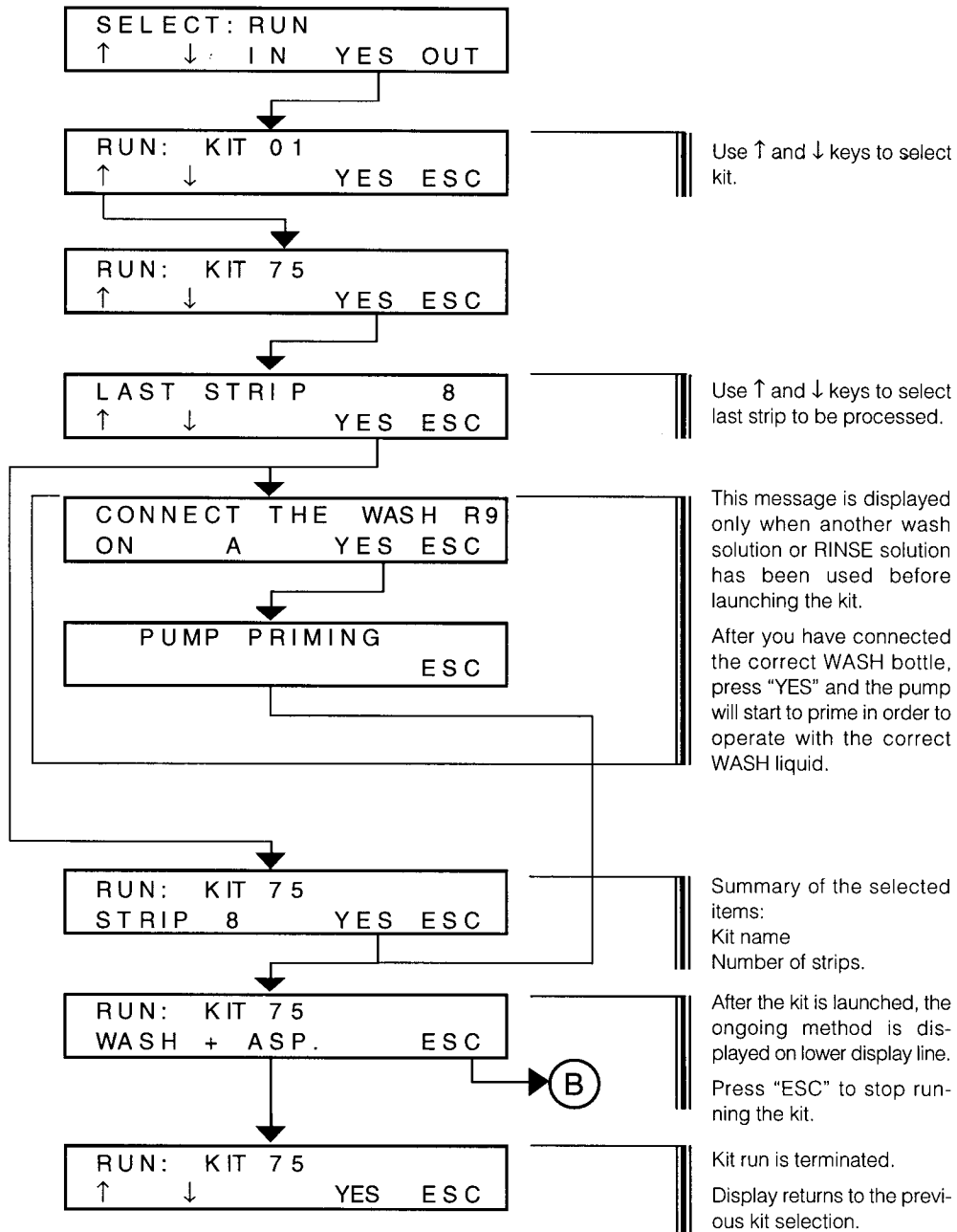


Fig. 12. ImmunoWash with 12-Channel Manifold.

6.3 Select a Kit to Perform a Run

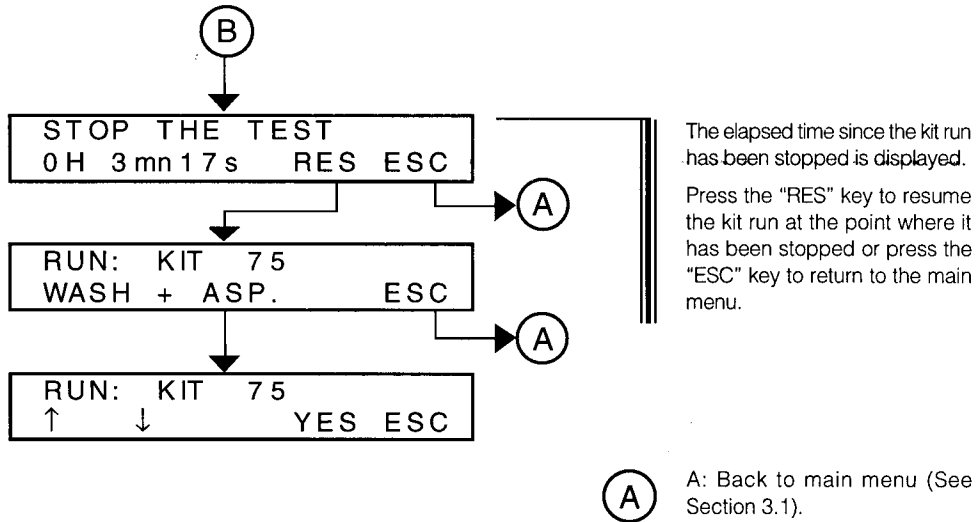
After powering up the Model 1575 ImmunoWash, the display will read SELECT: RUN. To run a wash with a predefined kit, follow the sequence described below. Please consult Section 5 Setting Up Programs, for information on configuring a kit and all its associated elements.



6.4 Wash Interruption or Power Failure

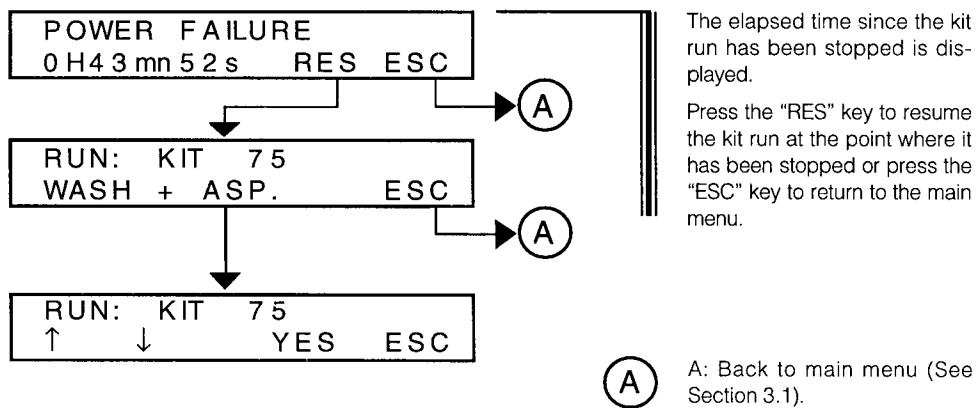
Wash Interruption

Pressing the key associated with ESC will stop the kit wash procedure and bring up the following message on the display:



Power Failure

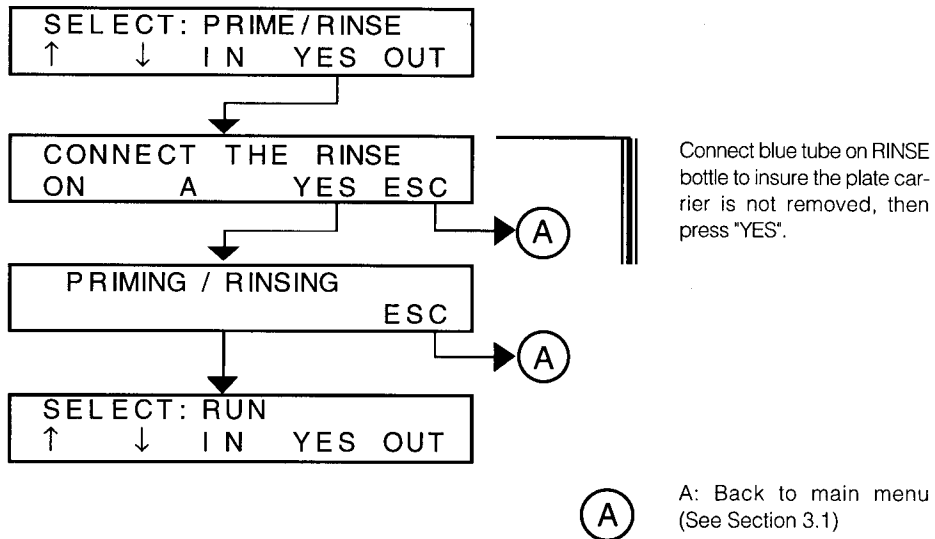
When a power failure occurs during a kit run, the following message will appear when power comes back on:



Section 7 Rinse

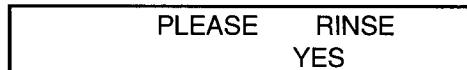
7.1 Rinse

Prior to performing any wash procedures after connecting a new buffer bottle, it is necessary to prime the system. This ensures proper vacuum pressure and correct dispense volume delivery of wash buffer. To prime the 1575 ImmunoWash, use the arrow keys in the SELECT menu to scroll to PRIME/RINSE and follow the instructions below.



7.2 Please Rinse

The message



is displayed to remind the user to perform a rinse operation when the washer has not been used for 10 minutes after a WASH operation.

Press “YES” key to return to the main menu. From there you may access the RINSE procedure, if desired.

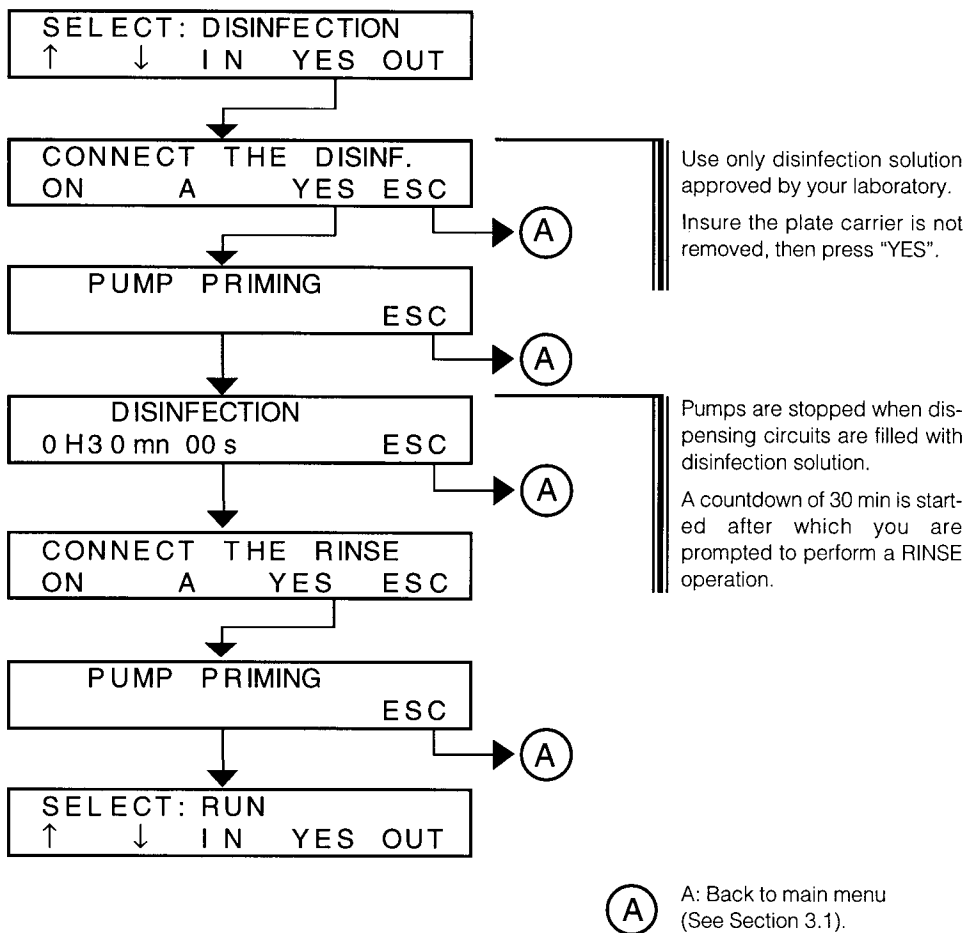
Important

The washer must never be switched off with WASH solution inside tubing and manifold. Solid crystals from dried WASH solution will clog dispensing needles and freeze the electrovalve tube.

Section 8 Disinfection

8.1 Disinfection

System disinfection proves necessary prior to shipping or handling an instrument and should also be performed if the instrument has not been used for more than one day. Make up a 10% bleach solution of sodium hypochloride (+/- 3%) in deionized water to use for disinfection purposes, attach the bottle to the system, and follow the instructions below. The disinfection program applies to internal surfaces of tubing, connectors, manifold, and manifold needles.



Important:

Avoid concentrated bleach for disinfecting the washer as a thorough rinsing of the tubes will not remove traces of bleach from inside tubing and manifold. This can corrupt reagents used in subsequent wash procedures.

Disinfect the washer when it has not been used for more than 1 day. When used daily, disinfect it at least once each week.

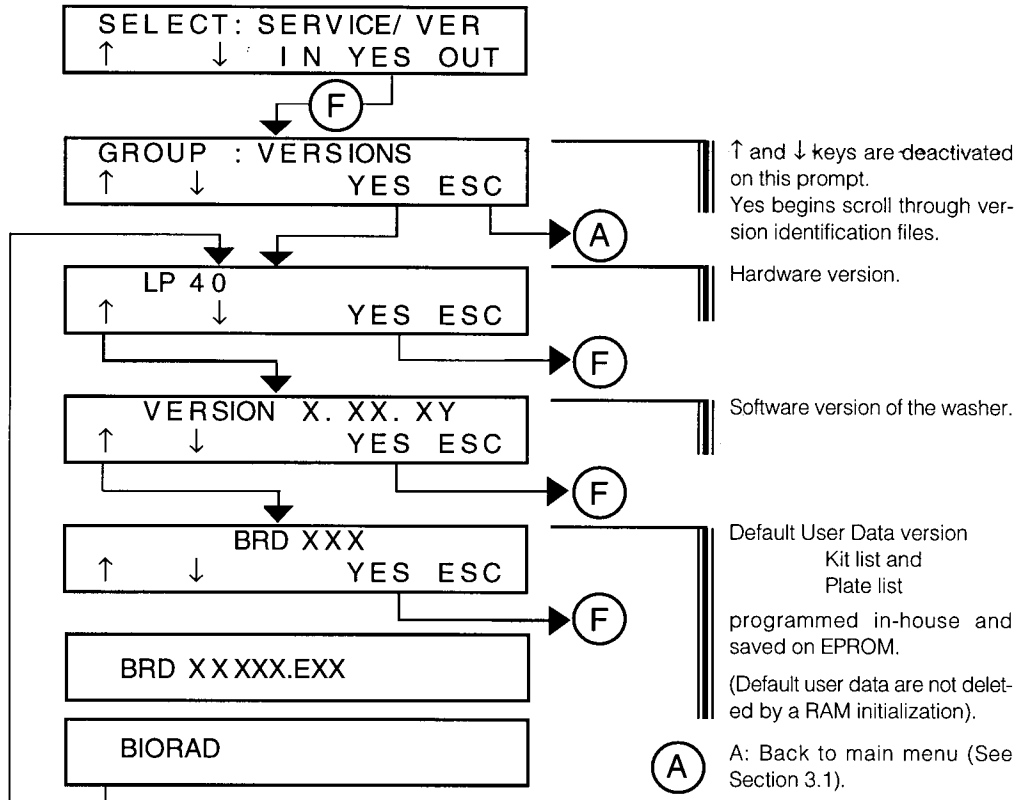
Disinfect the washer prior to any servicing or handling, shipment, or change of site.

Perform a wipe down of the instrument with a 10% bleach solution in deionized water.

Section 9 Service

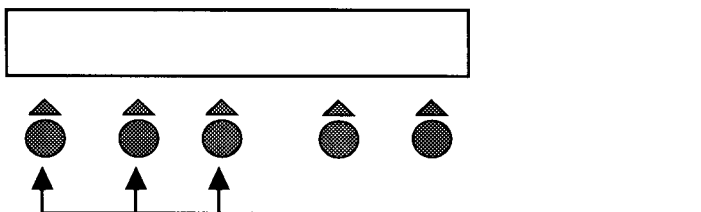
9.1 Hardware and Software Version

To access the service menu, follow the sequence below:



9.2 Key Codes to Access Service Software

Turn the unit ON while keeping these keys pressed:



One of following messages is displayed :

01 ADJUSTMENT
↑ ↓ YES

or

02 MAINTENANCE
↑ ↓ YES

or

03 NON STOP RUN
↑ ↓ YES

9.3 Daily Maintenance

Prior to starting to wash:

It is recommended to pour an appropriate disinfecting liquid into the bottom of the WASTE bottle prior to connecting it to the washer. In this way, liquid coming from the washer into the WASTE bottle will be deactivated.

Important: Avoid bleach

Fill RINSE bottle with deionized or distilled water. Connect it to washer. Launch a Rinse and check that pinch valve tube and manifold are not clogged. If clogged, change pinch valve tube, clean manifold.

When washing is terminated:

Rinse the washer. Use only deionized or distilled water for rinsing. Turn the unit off. Tubes and manifold will be kept wet with water that will prevent them from clogging. Empty WASTE bottle, rinse it thoroughly with tap water. Empty WASH bottle, and rinse it thoroughly with distilled water.

9.4 Manifold Cleaning

Aspirate needles and chamber

- Remove the manifold
- Using a duster or a non scratching utensil, thoroughly clean the outside of the dispense and aspirate needles.
- Remove the silicone top seal of the manifold.
- Using the big pin supplied in the maintenance kits, clean the large aspirating needles.
- Rinse out the aspirate chamber with deionized or distilled water. Thoroughly clean the walls of the aspirating cavity.
- Look through the aspirate needles to ensure that cleaning is adequate.
- Put the silicone top seal back in its place.

Dispense needle and chamber

- Remove the silicone cap from the chamber of the manifold using a stem or a screwdriver inserted from the opposite end of the cylindrical chamber.
- Using one of the small pins supplied in maintenance kit, clean the small dispense needle.
- Using the cylindrical brush supplied in the maintenance kit, thoroughly clean the small dispense chamber. Thoroughly rinse the dispense chamber with deionized water. Insure that all impurities are removed from the manifold.
- Plug the dispense chamber of the manifold with the silicone plug. Place it as close as possible to the first needle without blocking it. Extra silicone caps are supplied in the maintenance kit.
- Remount the manifold, replace the tubing, and reprime the system.

9.5 Error List

Hardware related errors

ERR:03	Up/Down position error
ERR:04	In/Out position error at Out motion
ERR:05	In/Out position error at In motion
ERR:06	Max allowed step number performed on In/Out motion
ERR:07	Max allowed step number performed on Up/Down motion
ERR:20	Manifold not present (for the selected kit)

Software related errors

ERR:24	Too many kits programmed
ERR:25	Not enough memory
ERR:26	Already 10 plates
ERR:27	No kit programmed
ERR:28	No plate programmed
ERR:29	Plate associated to a kit (cannot be deleted)
ERR:32	Kit name impossible
ERR:33	Plate name impossible

Section 10 Specifications

Electrical Data

Voltage	220/110 VAC 50/60 Hz
Consumption	100 VA maximum

Physical Data

Dimensions	
Width	32.5 cm
Length	40.05 cm (plate carrier in), 52.55 cm (plate carrier out)
Height	19.3 cm
Weight	9.6 Kg
Operating Conditions	15–30 °C/15–85% Relative Humidity

Hardware Specifications

Manifolds Available	8- and 12-way
Vacuum Power	9 L/min
Waste Bottle Volume	2,000 ml
User Interface	2 x 20 character LCD screen 5 diaphragm keys flat keyboard

Software Specifications

Kits	Up to 75 wash programs available. Each is saved under its own name (up to 15 characters long)
Methods	6 single cycle washing methods: Wash, Aspiration, Dispensing, Bottom Washing, Bottom Aspiration, Shaking; 4 two cycle washing methods Wash + Aspiration, Wash + Bottom Aspiration, Bottom Wash + Aspiration, Bottom Wash + Bottom Aspiration
Soak Time	0 to 99 sec in Strip mode, 0 to 59 min in Plate mode
Repetition	Every method can be repeated from 1 up to 9 times
Wash Mode	Strip or Plate Modes available
Omit Strip	Any strip can be omitted during kit programming
Plates	Up to 10 plate parameter sets programmable accepts flat or curved bottom microplates
Adjustments	Vertical or horizontal needle speeds, vertical and horizontal positions of the aspirating needle in relation to the well are completely programmable.
Other Features	Priming sequence of the hydraulic system at change of Wash solution Disinfection program of the hydraulic circuit [Setable user access]

Functional Performance

	8-channel manifold	12-channel manifold	Parameters
Aspiration			
Max residual volume in a well (flat bottom)	<2 µl	<2 µl	<ul style="list-style-type: none"> • Crosswise aspiration • Horizontal aspiration position = 2 mm • Downward aspirating speed = 0 • Aspiration time = 1.5 sec
Distribution accuracy			with overflow phase
Variation of well volume between min and max volumes over one plate	Avg = 15 µl	Avg = 15 µl	<ul style="list-style-type: none"> • Average value: 350 µl • Overflow position = 3.2 mm • Flow = 0 (8-C manifold) • Flow = 2 (12-C manifold)

Section 11

Ordering Information

Part Number	Product Description
170-7020	8-Channel Manifold
170-7021	12-Channel manifold
170-7022	2 L Waste Bottle with cap
170-7023	Rinse bottle with cap
170-7024	External tubing set
170-7025	Wash bottle with cap and tube
170-7026	Maintenance Kit
170-7027	Hydrophobic filter
170-7028	Pinch valve
170-7029	Pinch valve tube (set of 5)

BIO-RAD**Bio-Rad
Laboratories****Molecular
Bioscience Group****2000 Alfred Nobel Drive
Hercules, California 94547
Telephone (510) 741-1000
Fax: (510) 741-5800**

Australia, Bio-Rad Laboratories Pty Limited, Block Y Unit 1, Regents Park Industrial Estate, 391 Park Road, Regents Park, NSW 2143 • Phone 02-9414-2800 • Fax 02-9914-2888
Austria, Bio-Rad Laboratories Ges.m.b.H., Auhofstrasse 78D, 1130 Wien • Phone (1) 877 80 01 • Fax (1) 876 56 29
Belgium, Bio-Rad Laboratories S.A./N.V., Begoniastraat 5, 9810 Nazareth Eke • Phone 09-385 55 11 • Fax 09-385 85 54
Canada, Bio-Rad Laboratories (Canada) Ltd., 5671 McAdam Road, Mississauga, Ontario L4Z 1N9 • Phone (905) 712-2771 • Fax (905) 712-2980
China, Bio-Rad Laboratories, 14, Zh Chun Road, Hai Dian District, Beijing 100088 • Phone (01) 2046622 • Fax (01) 2051876
Denmark, Bio-Rad Laboratories, Symbion Science Park, Fruebjergvej 3, DK-2100 København • Phone 39 17 9947 • Fax 39 27 1698
France, Bio-Rad Laboratories, Pihatörmä 1A 02240, Espoo, • Phone 90 804 2200 • Fax 90 804 1100
Germany, Bio-Rad S.A., 94/96 rue Victor Hugo, B.P. 220, 94 203 Ivry Sur Seine Cedex • Phone (1) 49 60 68 94 • Fax (1) 46 71 24 67
Germany, Bio-Rad Laboratories GmbH, Heidemannstraße 164, D-80839 München/Postfach 450133, D-80901 München • Phone 089 31864-0 • Fax 089 31864-100
India, Bio-Rad Laboratories, C-248 Defence Colony, New Delhi 110 024 • Phone 91-11-461-0103 • Fax 91-11-461-0765
Italy, Bio-Rad Laboratories S.r.l., Via Cellini, 18/A, 20090 Segrate Milano • Phone 02-21809 1 • Fax 02-21809-399
Japan, Nippon Bio-Rad Laboratories, 7-18, Higashi-Nippori 5-Chome, Arakawa-ku, Tokyo 116 • Phone 03-5811-6270 • Fax 03-5811-6272
The Netherlands, Bio-Rad Laboratories B. V., Fokkerstraat 10, 3905 KV Veenendaal • Phone 0318-540668 • Fax 0318-542216
New Zealand, Bio-Rad Laboratories Pty Ltd., P. O. Box 100-051, North Shore Mail Centre, Auckland 10 • Phone 09-443 3069 • Fax 09-443 3087
Pacific, Bio-Rad Laboratories, Unit 1111, 11/F., New Kowloon Plaza, 38, Tai Kok Tsui Road, Tai Kok Tsui, Kowloon, Hong Kong • Phone 7863300 • Fax 7891257
Singapore, Bio-Rad Laboratories (Singapore) Ltd., 221 Henderson Rd #05-18, Henderson Building, Singapore 0315 • Phone (65) 272-9677 • Fax (65) 273-4835
Spain, Bio-Rad Laboratories, S. A. Avda Valdeaparra 3, Pol. Ind. Alcobendas, E-28100 Alcobendas, Madrid • Phone (91) 661 70 85 • Fax (91) 661 96 86
Sweden, Bio-Rad Laboratories AB, Ekensbergsvägen 128, Box 1097, S-172 22 Sundbyberg • Phone 46-(0)8-627 60 00 • Fax 46-(0)8-627 54 00
Switzerland, Bio-Rad Laboratories AG, Kanalstrasse 17, Postfach, CH-8152 Glattbrugg • Phone 01-809 55 55 • Fax 01-809 55 00
United Kingdom, Bio-Rad Laboratories Ltd., Bio-Rad House, Maylands Avenue, Hemel Hempstead, Herts HP2 7TD • Free Phone 0800 181134 • Fax 01442 259118

BIO-RAD**Bio-Rad
Laboratories****Molecular
Bioscience Group**

2000 Alfred Nobel Drive
Hercules, California 94547
Telephone (510) 741-1000
Fax: (510) 741-5800

Australia, Bio-Rad Laboratories Pty Limited, Block Y Unit 1, Regents Park Industrial Estate, 391 Park Road, Regents Park, NSW 2143 • Phone 02-9414-2800 • Fax 02-9914-2889
Austria, Bio-Rad Laboratories Ges.m.b.H., Auhofstrasse 78D, 1130 Wien • Phone (1) 877 89 01 • Fax (1) 876 56 29
Belgium, Bio-Rad Laboratories S.A./N.V., Begoniastraat 5, 9810 Nazareth Eke • Phone 09-385 55 11 • Fax 09-385 65 54
Canada, Bio-Rad Laboratories (Canada) Ltd., 5671 McAdam Road, Mississauga, Ontario L4Z 1N9 • Phone (905) 712-2771 • Fax (905) 712-2990
China, Bio-Rad Laboratories, 14, Zhi Chun Road, Hai Dian District, Beijing 100088 • Phone (01) 2046622 • Fax (01) 2051876
Denmark, Bio-Rad Laboratories, Symbion Science Park, Fruerbjergvej 3, DK-2100 Kystebhavn • Phone 39 17 9947 • Fax 39 27 1698
Finland, Bio-Rad Laboratories, Pihatörmä 1A 02240, Espoo • Phone 90 804 2200 • Fax 90 804 1100
France, Bio-Rad S.A., 94/96 rue Victor Hugo, B.P. 220, 94 203 Ivry Sur Seine Cedex • Phone (1) 49 60 68 34 • Fax (1) 46 71 24 67
Germany, Bio-Rad Laboratories GmbH, Heidemannstraße 164, D-80939 München/Postfach 450133, D-80901 München • Phone 089 31884-0 • Fax 089 31884-100
India, Bio-Rad Laboratories, C-248 Defence Colony, New Delhi 110 024 • Phone 91-11-461-0103 • Fax 91-11-461-0765
Italy, Bio-Rad Laboratories S.r.l., Via Cellini, 18/A, 20090 Segrate Milano • Phone 02-21609 1 • Fax 02-21609-399
Japan, Nippon Bio-Rad Laboratories, 7-18, Higashi-Nippori 5-Chome, Arakawa-ku, Tokyo 116 • Phone 03-5811-6270 • Fax 03-5811-6272
The Netherlands, Bio-Rad Laboratories B. V., Fokkerstraat 10, 3905 KV Veenendaal • Phone 0318-540666 • Fax 0318-542216
New Zealand, Bio-Rad Laboratories Pty Ltd., P. O. Box 100-051, North Shore Mail Centre, Auckland 10 • Phone 09-443 3099 • Fax 09-443 3097
Pacific, Bio-Rad Laboratories, Unit 1111, 11/F., New Kowloon Plaza, 38, Tai Kok Tsui Road, Tai Kok Tsui, Kowloon, Hong Kong • Phone 7893300 • Fax 7891257
Singapore, Bio-Rad Laboratories (Singapore) Ltd., 221 Henderson Rd #05-19, Henderson Building, Singapore 0315 • Phone (65) 272-9877 • Fax (65) 273-4835
Spain, Bio-Rad Laboratories, S. A. Avda Valdeleparra 3, Pol. Ind. Alcobendas, E-28100 Alcobendas, Madrid • Phone (91) 661 70 85 • Fax (91) 661 96 98
Sweden, Bio-Rad Laboratories AB, Ekensbergsvägen 128, Box 1097, S-172 22 Sundbyberg • Phone 46-(0)8-627 50 00 • Fax 46-(0)8-627 54 00
Switzerland, Bio-Rad Laboratories AG, Kanalstrasse 17, Postfach, CH-8152 Glattbrugg • Phone 01-809 55 55 • Fax 01-809 55 00
United Kingdom, Bio-Rad Laboratories Ltd., Bio-Rad House, Maylands Avenue, Hemel Hempstead, Herts HP2 7TD • Free Phone 0800 181134 • Fax 01442 259118