PINILAB® WASHERS
K/V40 / PW41

PW40 : 85499
PW41 : 85508

Manuel d'Utilisation
User Manual

Code du manuel - Manual code : **87050**
N° lot - Lot number: 9807 - 0003

Revision du manuel: Juillet 1998 - Logiciel versions 2.xx.2Y pour PW40 et PW41 – Français

Manual Revision : July 1998 - Software versions 2.XX.2Y for PW40 and PW41 - English

Impression : 03/00
Printed : 03/00

BIO-RAD

TABLE OF CONTENTS

IMPORTANT

Please read carefully before using the PLATE WASHERS PW40 or PW41

SANOFI DIAGNOSTICS PASTEUR reserves the right to make technical improvements to this equipment and documentation without prior notice as part of a continuous program or product development. This manual supersedes all previous editions.

About this manual

This manual has been written for the laboratory technician and describes how to use the PW40 and PW41 plate washers.
This manual is designed to give you the information you need to :

- install the PW40 or the PW41
- operate with the PW40 or the PW41 to suit your particular needs
- perform the PW40 or the PW41 basic maintenance procedures, including disinfection.

This manual also describes all the features and specifications of the PW40 and PW41 hardware and configuration software.

You will find explanations of all the error messages and a problem solving guide in the PW troubleshooting guide.

SAFETY INFORMATION

WARNING : ELECTRIC SHOCK HAZARD

To operate, this instrument must be mandatory connected to a wall socket equipped with earth.
Furthermore the electrical line must be protected by an adapted fuse and a differential circuit breaker.

The access to the mains supply input plug, located on instrument rear panel, must be kept free, in order to use this plug, if necessary, as cut-off device.

Although this instrument is fully insulated and grounded, it is important for all users to be aware of the potential hazards of using liquids in close proximity to an electrical supply. In the event of any spillage, the instrument must be immediately isolated from the electrical supply and drained. Spilt liquid should be removed as soon as possible.

Serious damage to the instrument may occur if fluid is allowed to penetrate the case. The electrical supply MUST NOT be reconnected until the instrument has been fully inspected by a qualified technician or service engineer.

SERVICING MUST ONLY BE CARRIED OUT BY A QUALIFIED TECHNICIAN OR SERVICE ENGINEER.

WARNING : SPILLAGES

In some operating modes (e.g. dispensing fluids or purging the system, particularly under automatic control) it is possible to overfill the wells of a microplate. This can result in spillage of liquids and/or contamination with hazardous substances. Care should be taken to ensure that overfilling does not occur.

If environmentally hazardous fluid is spilled, the instrument must first be isolated from the electrical supply and physically isolated from the working environment by placing it in a fume cupboard or similar location. Contact the nearest service centre for assistance, advising them of the health hazards associated with the spilled materials.

WARNING : INCORRECT OPERATION

OPERATING THIS EQUIMENT IN WAYS OTHER THAN DETAILED IN THIS MANUAL MAY IMPAIR THE PROTECTION PROVIDED BY THE INSTRUMENT.

DO NOT operate this equipment with the covers removed - potentially dangerous voltages are contained within.

DO NOT operate this equipment with the safety earth (ground) disconnected.

CAUTION

DO NOT poke fingers, pencils or other implements into plate carrier entry slot.

BE PREPARED for unexpected movement of the plate carrier and noise from the Washer pump when the Washer is controlled by external computer.

ENSURE that the main power cable is correctly wired. Colour codes are as follows:

Europe		United States	
BROWN	LIVE	BLACK	LIVE
BLUE	NEUTRAL	WHITE	NEUTRAL
GREEN/YELLOW	EARTH (Ground)	GREEN	GROUND

SAFETY SYMBOLS

The following alarm and information symbols can be found in several places in the washer. Only a qualified personal aware of the security procedures is allowed to repair this instrument.
Please read this manual carefully before using this instrument.

⎓ Direct current

~ Alternating current

⎓~ Direct and alternating current

⏚ Earth (ground) terminal

⏚ Protective earth (ground) terminal

| On

O Off

⚠ Caution (see enclosed documents)

ENSURE that all connections are tight and all blocking elements (foams,...) have been removed before switching on the Washer.

If there is any doubt or concern about the safety of the instrument contact the nearest approved service centre.

1• FEATURES AND SPECIFICATIONS

PW40

1.1 PW40 Basic features

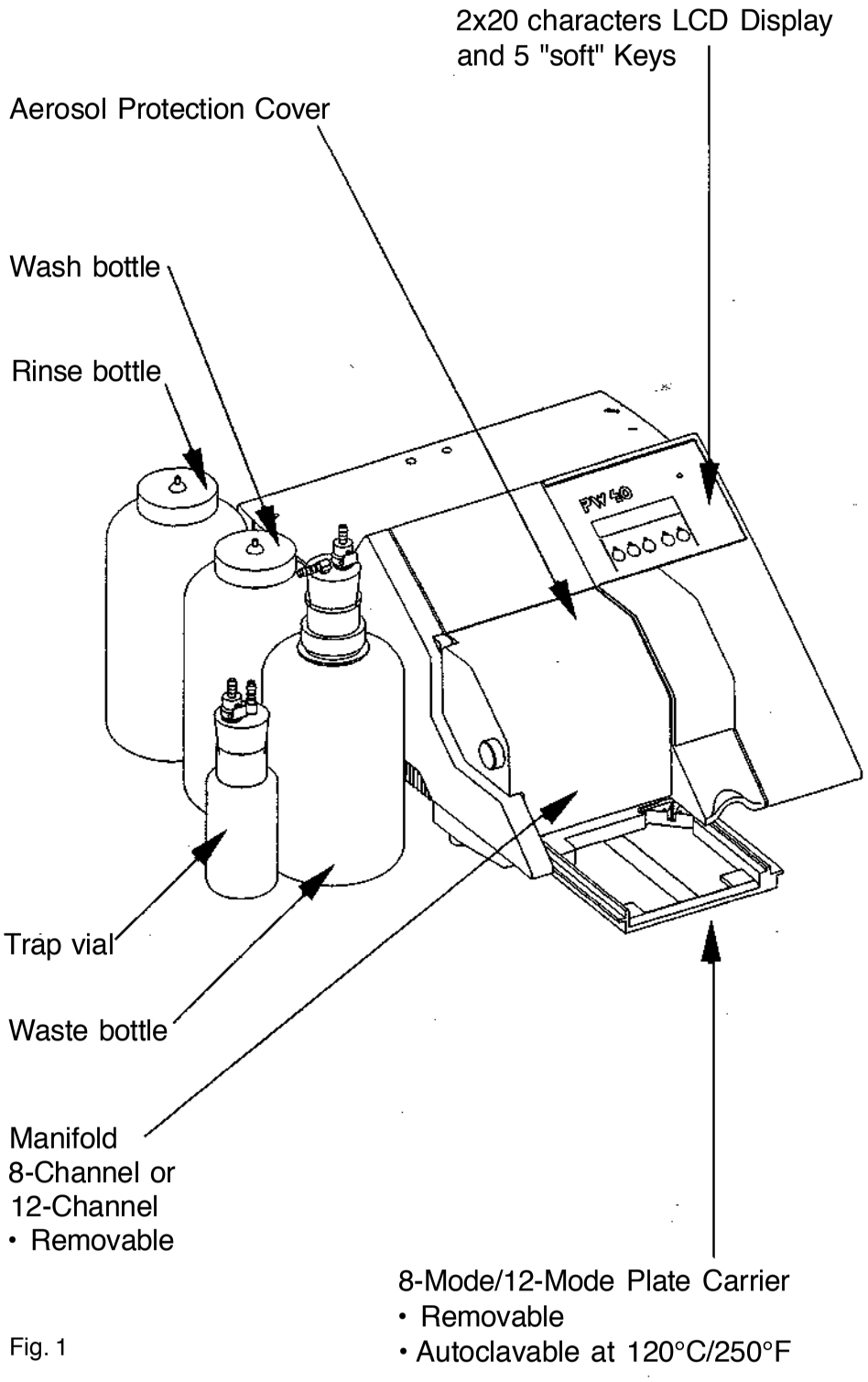
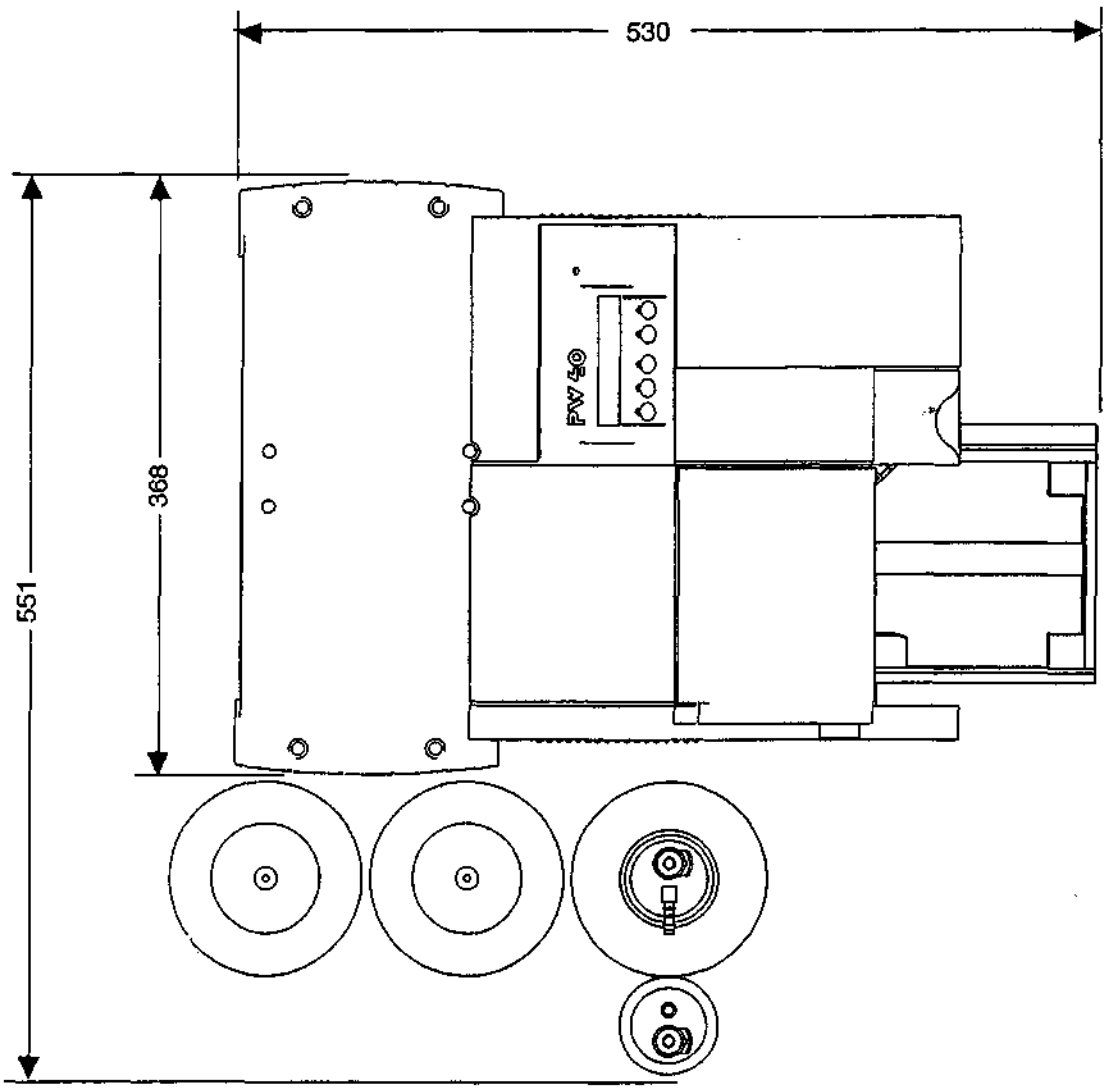


Fig. 1

PW40

1.2 PW40 Outside dimensions [mm]



Washer's height: 243 mm (without bottles)

Fig. 2

PW40

1.3 PW40 Hydraulic circuit

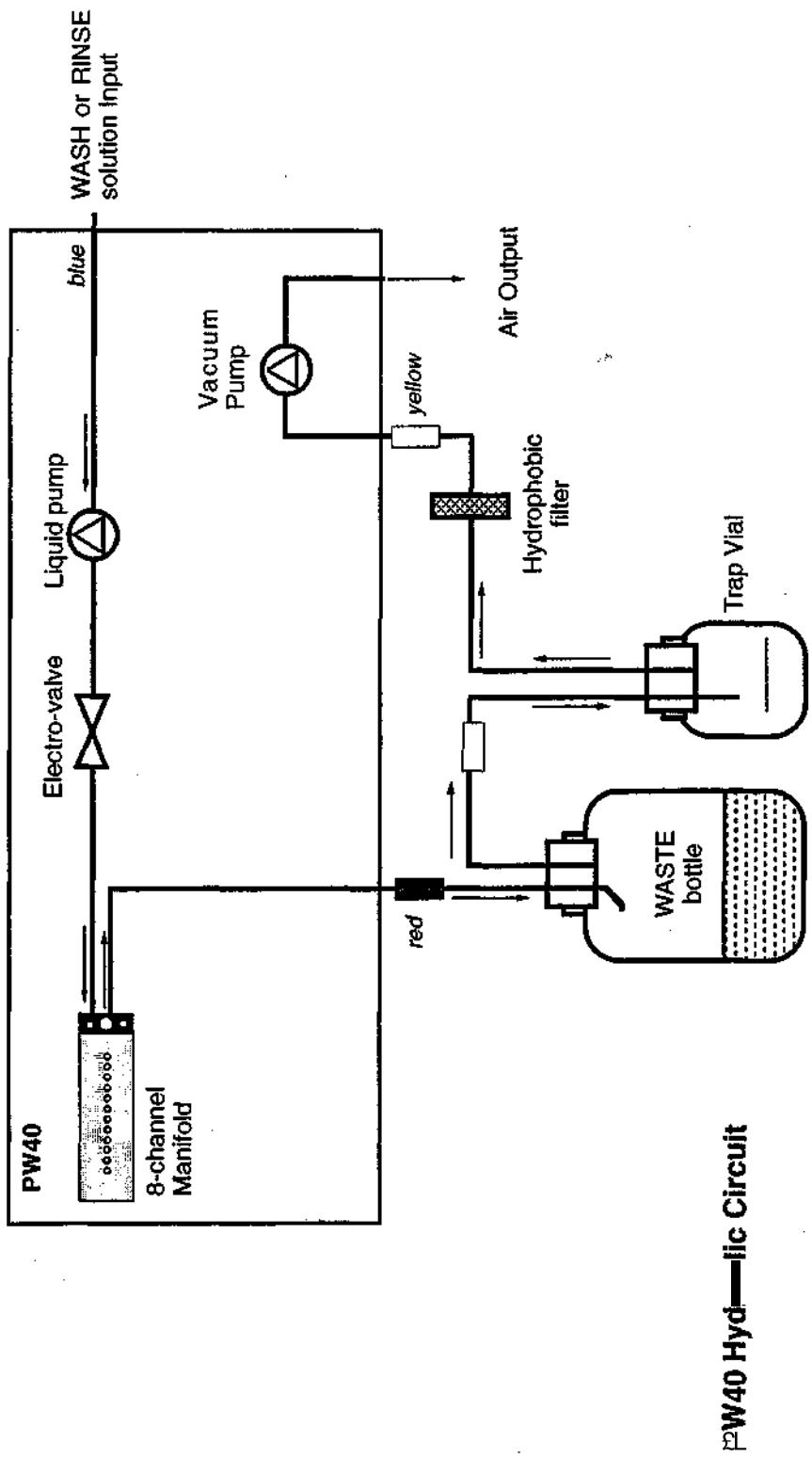


Fig. 3 PW40 Hydraulic Circuit

PW41

1.4 PW41 Basic features

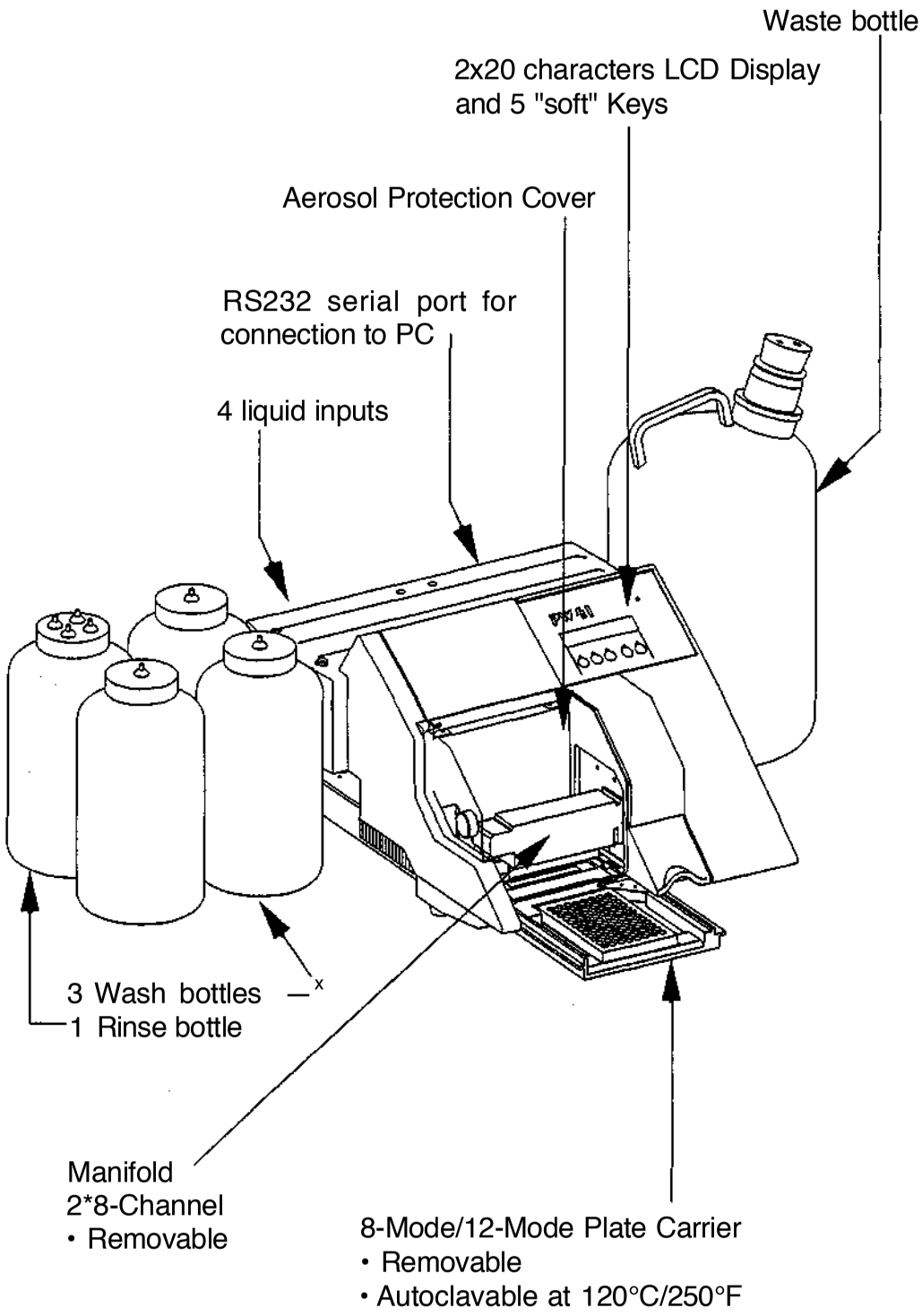
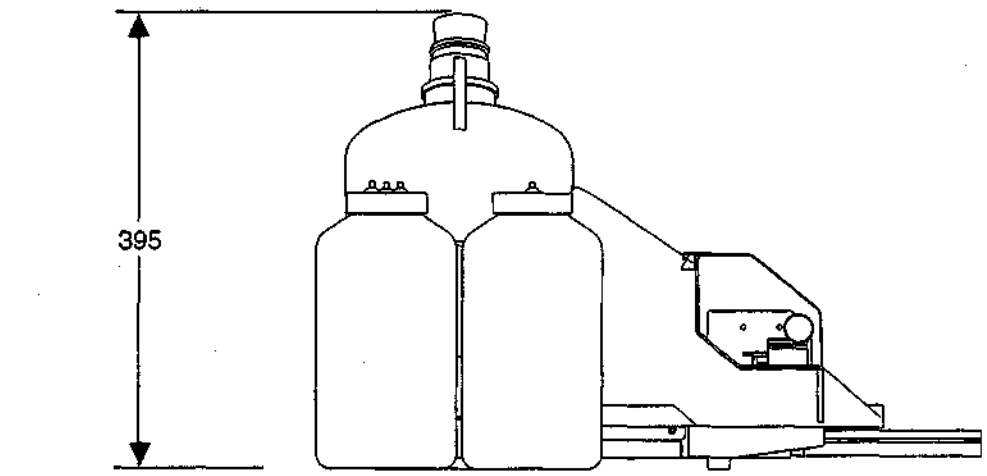


Fig. 4

1• FEATURES AND SPECIFICATIONS

PW41 1.5 PW41 Outside dimensions [mm]



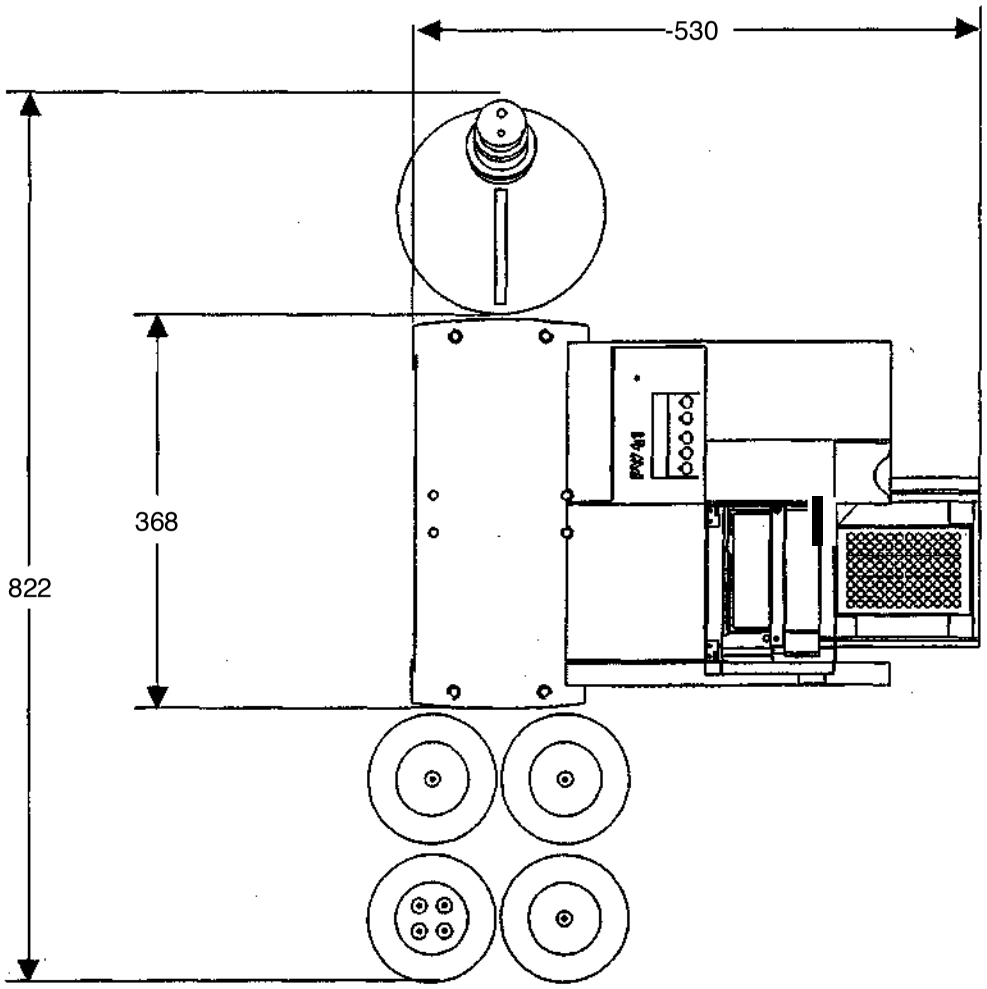


Fig. 5

PW41

1.6 PW41 Hydraulic circuit

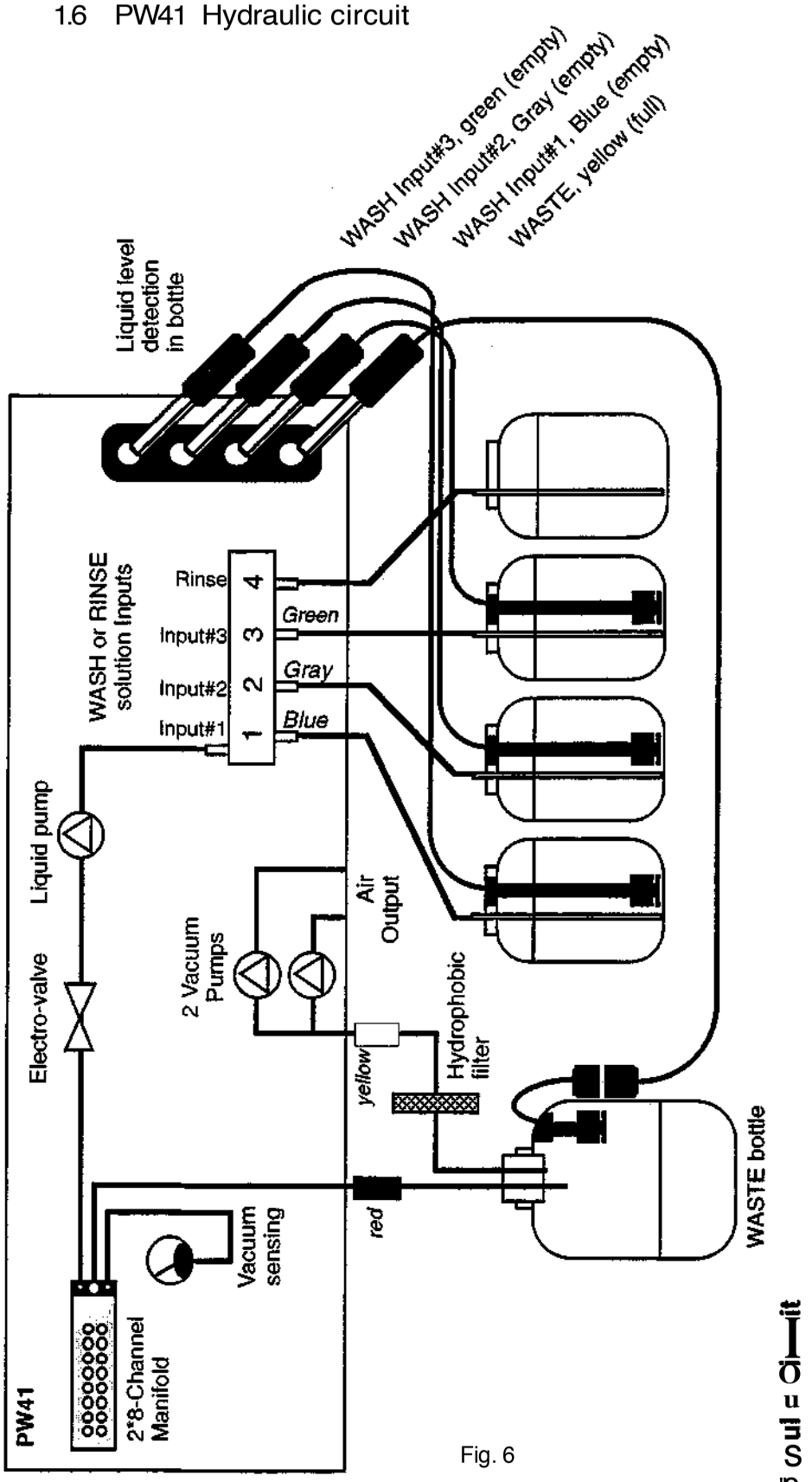


Fig. 6

1.7 Technical features

1.7.1 Electrical Data

Voltage	240/100 VAC, 50/60 Hz
Consumption	100 VA max
Fuses	2,5 AT (2 fuses, 5x20 mm)
Power Cord	on CEI socket

1.7.2 Physical data

Dimensions, including bottles

Width	551 mm,PW40 822 mm, PW41
Length	530 mm, Plate carrier out, PW40 & PW41.
Height	300 mm, PW40 395 mm, PW41.
Weight (without accessories)	11,0 Kg, PW40 11,6 Kg, PW41
Operating conditions	15-30 °C /15 - 85 %R.H.

1.7.3 Hardware specifications

Manifold	PW40:	8 or 12 channel (Default: 8 channel)
	PW41:	8, 2*8, 3*8, 12 or 2*12 channel (Default: 2*8)
Vacuum power	PW40 :	1 integrated vacuum pump (maxi 8 L/min)
	PW41 :	2 integrated vacuum pumps (maxi 16 L/min).

Volume of WASTE bottle

PW40 :	2 litres
PW41:	8 litres

User interface: Flat keyboard with 5 diaphragm keys
2x20 characters LCD screen , backlighted
onPW41.

1.7 Technical features (continued)

1.7.4 Software specifications

Kits	Up to 75 washing kits programmable. Each kit is saved under its own name (up to 15 characters) and is a combination of methods repeated or not, with or without soaking times, in strip mode or in plate mode.
Method	6 single-cycle washing methods : Wash, Aspiration, Dispensing, Bottom Washing, Bottom Aspiration, Agitation. 4 two-cycle washing methods : Wash + Aspiration, Wash + Bottom Aspiration, Bottom Wash + Aspiration, Bottom Wash + Bottom Aspiration.
Soak time	0 to 9,9 sec Strip mode 0 to 59 min 59 sec in Plate mode.
Repetition	Every method can be repeated from 1 up to 9 times.
Wash mode	Strip mode or Plate mode.
Omit strip	Strips can be omitted at kit programmation.
Plates	Up to 10 plate parameter sets programmable. Accepts flat or curved bottom microplates. Vertical and horizontal speeds, vertical and horizontal positions of the aspirating needle in relation with the wells are programmable.
Other features	-Priming sequence of the hydraulic system at change of Wash solution. - Disinfection program of the hydraulic circuit. - User programming can be inhibited.

1.8 Software parameters for Wash protocols

This section describes the Wash protocols, their methods and their software parameters.
It is useful to be read prior starting to programme new wash protocols or new kits.

1.8.1 WASH protocol definition :

A WASH protocol, also called a KIT, is made of a succession of Wash Methods.
There are 10 different wash methods available and every method is programmed with its own batch of specific parameters.
Also, the Wash protocol is associated to a batch of plate parameters -Positions- that are set in respect to plate geometry (flat, U or V shaped well,...) as well as Speeds needed for the wash process

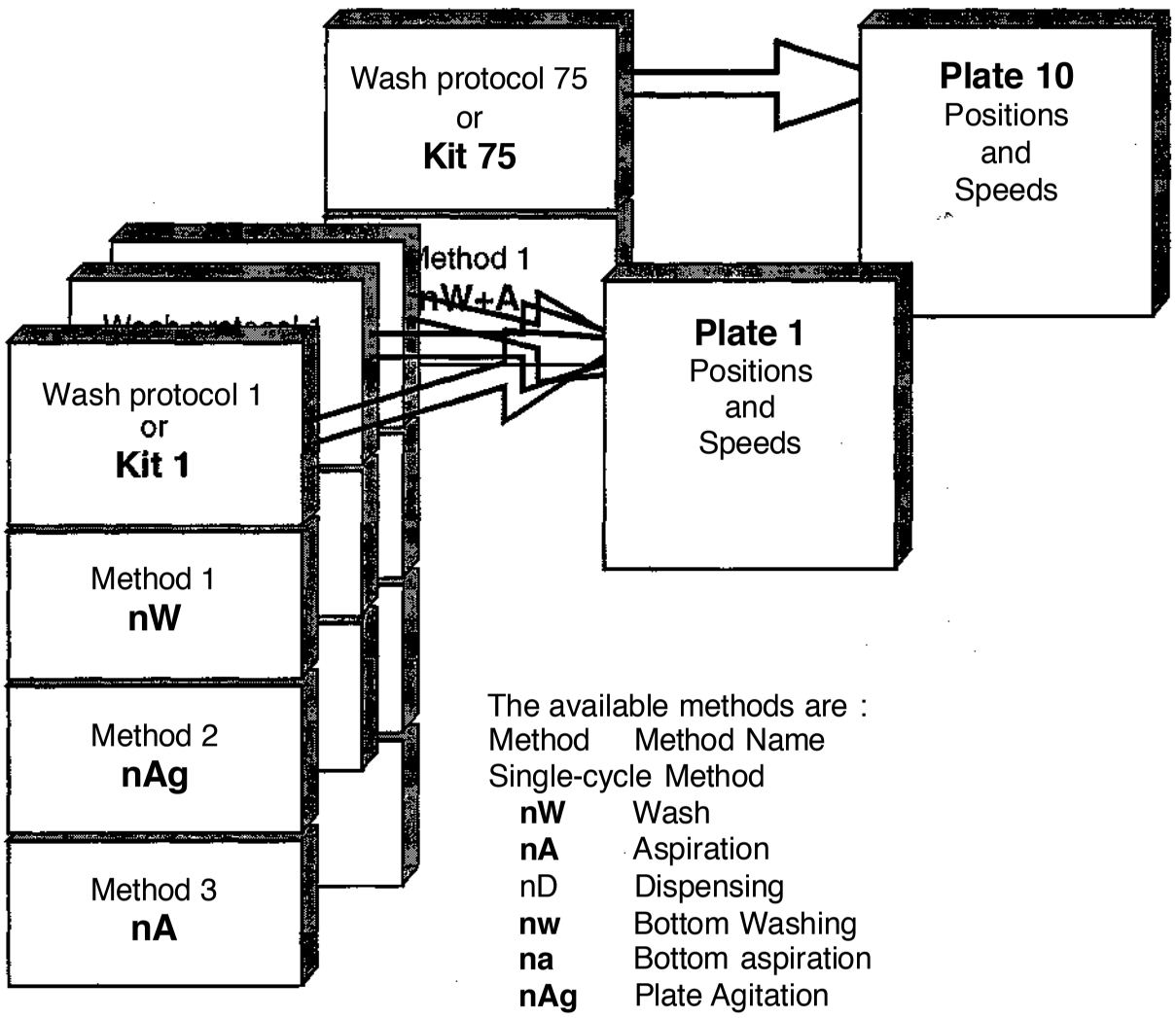


Fig. 7

The available methods are :

Method	Method Name
Single-cycle Method	
nW	Wash
nA	Aspiration
nD	Dispensing
nw	Bottom Washing
na	Bottom aspiration
nAg	Plate Agitation
Two-cycle Method	
nW + A	Wash + Aspiration
nW + **a**	Wash + Bottom Aspiration
nw + A	Bottom Wash + Aspiration
nw + **a**	Bottom Washing + Bottom Aspiration

1.8 Software parameters for Wash protocols (continued)

1.8.2 Methods

A method is a completely defined module made of one or two elementary cycles. Every kit is made of a succession of methods.

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

For method using two elementary cycles, only the first cycle is applied "n" time.
When repeated several times, the waiting time between elementary cycles is called Soaking Time.
The waiting time between two methods is called Method Interval.
Whatever the selected mode, STRIP or PLATE (see definition below), a method is always completely finished on the whole plate prior starting the next method.

Available methods :

Method	Abbreviated Name on LCD Display	Method Name
Single-cycle Method		
nW	**WASH**	Wash
nA	**ASPIRATION**	Aspiration
nD	**DISPENSING**	Dispensing
nw	**BOTTOM WASH.**	Bottom Washing
na	**BOTTOM ASP.**	Bottom aspiration
nAg	**AGITATION**	Plate Agitation
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 associated to method :

•MODE

STRIP or PLATE

	 STRIP mode: the total method is applied on the strip prior processing the next strip.	 PLATE mode : the elementary cycle is applied successively on all strips prior 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

1.8 Software parameters for Wash protocols (continued)
1.8.2 Methods (continued)

Nr OF CYCLES Number of Cycles = n
1 to 9, step 1
number of elementary cycles that will be applied within the method.

• **SOAKING** Soak time
Omn Osec to 59mn Osec, step 1 sec in PLATE mode.
Omn Osec to 9,9sec, step 0,1 sec in STRIP mode.
Waiting time between two consecutive elementary cycle within one method.

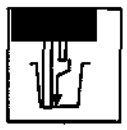
• **MET. INTER** Method Interval
Omn Osec to 59mn Osec, step 1 sec
Waiting time between two consecutive methods.

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions

Parameters directly depending on KIT or Wash protocol (such as dispensing, aspirating times, liquids, etc... are called "KIT Parameters", Parameters depending on the microplate dimensions (mainly POSITION and SPEED parameters) are called "PLATE parameters".
In the washer, the elementary cycles are as follows :

A
ASPIRATION

The aspirating needle goes down and aspirates until reaching the well bottom. The needle is shifted close to wall *(Aspiration Horizontal Position)* for flat bottom well;
it remains centered for curved bottom well.



Programmed parameters :
Kit parameters :

• **CROSW. ASP.** Crosswise aspiration (CWA)
(for flat bottom only)

YES or NO

the aspiration needle is shifted close to the wall *(Aspiration Horizontal Position)* while going down to well bottom and aspirates; once the aspiration time has elapsed, the aspiration needle is going up to approx middle of well height and is shifted to opposite end of wall (no scratch on the bottom); the needle goes down to bottom and a second aspiration sequence takes place.

• **ASP. TIME** Aspiration time
0,1 to 9,9 sec, step 0,1 sec
Time during which the aspirating needie is kept at the well bottom and is aspirating.

Plate parameters :

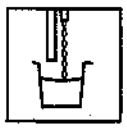
• **ASP. HOR. POS.** Aspiration Horizontal Position
(for flat bottom only)
0,0 (centered) to 2,0 mm, step 0,1 mm
(see also fig. 8 at the end of §1.8)

• **ASP.VERT.POS.** Aspiration Vertical Position
0,1 to 15,0 mm, step 0,1 mm (see also fig. 8 at the end of §1.8)
0,1 is the highest needle position
15,0 is the lowest needle position

• **ASP. DOWNW. SPEED** Aspiration Downward Speed
0 to 9, step 1. (speed mini = 0; speed max=9)

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

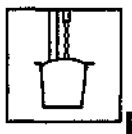
D
DISPENSING



The dispensing needle is placed over the well and dispenses a wash solution in the well.
When the dispensed volume is higher than well capacity, the aspiration needle aspirates the overflow to prevent liquid spilling on next wells.

Programmed parameters ;
Kit parameters :
• **VOLUME** (for one well)
50 to 3000 liL, step 50 lil_
(the well volume is approx. 370 *\iL)*

• **OVERFLOW**
1,0 to 12,9 mm, step 0,1 mm (see also fig. 8 at the end of §1.8).
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 wished and have an overflow phase in order to obtain an equal distribution of volume in each well; the slight flow rate variations among dispensing needles are compensated by the overflow phase.

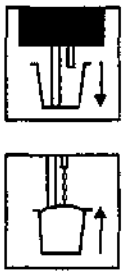
• **LIQUID**
Wash W1 to Wash W9
When launching a kit in the RUN mode, the display will remind you to connect correct Wash bottle prior starting.

• **FLOW** flow rate compensation
-5 to +5, step 1.
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, step 1. (speed mini = 0; speed max=9)

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

W
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 1/10.

• **ASP. TIME** — Aspiration time
0,1 to 9,9 sec, step 0,1 sec. — See details page 1/10.

• **VOLUME** — (for one well)
50 to 3000 nl_, step 50 liL
(the well volume is approx. 370 lxL)

• **OVERFLOW**
1,0 to 12,9 mm, step 0,1 mm
1,0 is the highest needle position
12,9 is the lowest needle position (for the overflow).
See details page 1/11.

• **LIQUID**
Wash W1 to Wash W9 — See details page 1/11.

•**FLOW** — flow rate compensation
-5 to +5, step 1. — See details page 1/11.

Plate parameters

• **ASP. HOR. POS.** — Aspiration Horizontal Position
(for flat bottom only)
0,0 to 2,0 mm, step 0,1 mm
(see also fig. 8, at the end of §1.8)

• **ASP.VERT.POS.** — Aspiration Vertical Position
0,1 to 15,0 mm, step 0,1 mm
(see also fig. 8, at the end of §1.8)
0,1 is the highest needle position
15,0 is the lowest needle position

• **ASP. DOWNW. SPEED** — Aspiration Downward Speed
0 to 9, step 1. (speed mini = 0; speed max=9)

• **DISP. UPW. SPEED** — Dispensing Upward Speed
0 to 9, step 1. (speed mini = 0; speed max=9)

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

w
BOTTOM WASH.

Bottom Washing
the bottom of the well is thoroughly washed, followed by a normal Wash (W) sequence.
Following sequences are applied :
-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 up 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 at *Aspiration Vertical Position* during *Aspiration Time.*
-Dispensing up to *Overflow Position.*

In case of crosswise aspiration (for flat bottom only):
every aspiration sequence (close to the wall) is immediately followed by an other aspiration sequence to the opposite end of wall as described on page 1/10.

Programmed parameters :
Kit parameters :

- **CROSW. ASP.** — Crosswise aspiration
  YES or NO — for flat bottom only
  See details page 1/10.

- **ASP. TIME** — Aspiration time
  0,1 to 9,9 sec, step 0,1 sec. — See details page 1/10.

- **VOLUME** — (for one well)
  50 to 3000 \i*L,* step 50 µL
  (the well volume is approx. 370 lil_)
  Volume is applied at the last Dispensing sequence.

- **OVERFLOW**
  1,0 to 12,9 mm, step 0,1 mm
  1,0 is the highest needle position
  12,9 is the lowest needle position (for the overflow).
  Overflow is applied at the last Dispensing sequence.
  See details page 1/11.

- **LIQUID** — Wash W1 to Wash W9
  See details page 1/11.

- **FLOW** — flow rate compensation
  -5 to +5, step 1. — See details page 1/11.

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

w

BOTTOM WASH. (continued)

Bottom Washing (continued)

• BOT. WASH NUMBER Bottom Wash Number
! or 2
Number of Bottom Wash Occurence.

• BOTTOM TIME Bottom Wash Time
0,1 to 9,9 sec, step 0,1 sec.
Time when dispensing at the Bottom Wash Vertical Position.

Plate parameters :

• ASP. HOR. POS. Aspiration Horizontal Position (for flat bottom only)
0,0 to 2,0 mm, step 0,1 mm (see also fig. 8 at the end of §1.8)
Aspiration Horizontal Position is applied for all Aspiration, Bottom Wash and Bottom Aspiration sequences.

• ASP.VERT.POS. Aspiration Vertical Position
0,1 to 15,0 mm, step 0,1 mm (see also fig. 8 at the end of §1.8)
0,1 is the highest needle position
15,0 is the lowest needle position
Aspiration Vertical Position is applied for all Aspiration sequences.

• B.W.VERT.POS. Bottom Wash Vertical Position
0,1 to 15,0mm, step 0,1 mm (see also fig. 8 at the end of §1.8)
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, step 1. (speed mini = 0; speed max=9)
This Speed is applied only at the first Aspiration sequence.

• DISP. UPW. SPEED Dispensing Upward Speed
0 to 9, step 1. (speed mini = 0; speed max=9)
Dispensing Upward Speed is applied at the last Dispensing sequence.

• BOT. DOWNW. SPEED Bottom Downward Speed
0 to 9, step 1. (speed mini = 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, step 1. (speed mini = 0; speed max=9)
Speed of all upward movements for all bottom sequences (wash and aspiration).

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

a
BOTTOM ASP.

Bottom aspiration
following sequences are applied :
-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 aspirating movements up to *Bottom (aspiration) Position* followed by downward aspirating movement down to *Aspiration Vertical Position.*
-Aspiration at *Aspiration Vertical Position* during *Aspiration Time.*

In case of crosswise aspiration (for flat bottom only):
every aspiration sequence (close to the wall) is immediately followed by an other aspiration sequence to the opposite end of wall as described on page 1/10.

Programmed parameters :
Kit parameters :

• **CROSW. ASP.** — Crosswise aspiration for flat bottom only
YES or **NO**
See details page 1/10

• **ASP. TIME** — Aspiration time
0,1 to 9,9 sec, step 0,1 sec. — See details page 1/10.

• **BOT. ASP. NUMBER** — Bottom Aspiration Number
1 or 2
Number of Bottom Aspiration Occurence.

Plate parameters :

• **ASP. HOR. POS.** — Aspiration Horizontal Position (for flat bottom only)
0,0 to 2,0 mm, step 0,1 mm (see also fig. 8 at the end of §1.8)
Aspiration Horizontal Position is applied for all Aspiration, Bottom Wash and Bottom Aspiration sequences.

• **ASP.VERT.POS.** — Aspiration Vertical Position
0,1 to 15,0 mm, step 0,1 mm (see also fig. 8 at the end of §1.8)
0,1 is the highest needle position
15,0 is the lowest needle position
Aspiration Vertical Position is applied for all Aspiration sequences.

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

a
BOTTOM ASP. (continued)

Bottom aspiration (continued)
Plate parameters (continued):

• **BOT.VERT.POS.** Bottom (Aspiration) Vertical Position
0,1 to 15,0mm, step 0,1mm (see also fig. 8 at the end of §1.8)
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, step 1. (speed mini = 0; speed max=9)
Aspiration Downward Speed is applied at the first Aspiration sequence.

• **BOT. DOWNW. SPEED** Bottom Downward Speed
0 to 9, step 1. (speed mini = 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, step 1. (speed mini = 0; speed max=9)
Speed of all upward movements for all bottom sequences (wash and aspiration).

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

Ag

AGITATION

Plate Agitation
The microplate is shaken horizontally during the *Agitation* T/mewith an *Agitation Amplitude* and an *Agitation Speed.*

Programmed parameters :

Kit parameters :

- **SHAKE TIME** — Agitation time

0,1 to 59,9 sec, step 0,1 sec.

Plate parameters :

- **SHAKING AMPLITUDE** — Agitation Amplitude

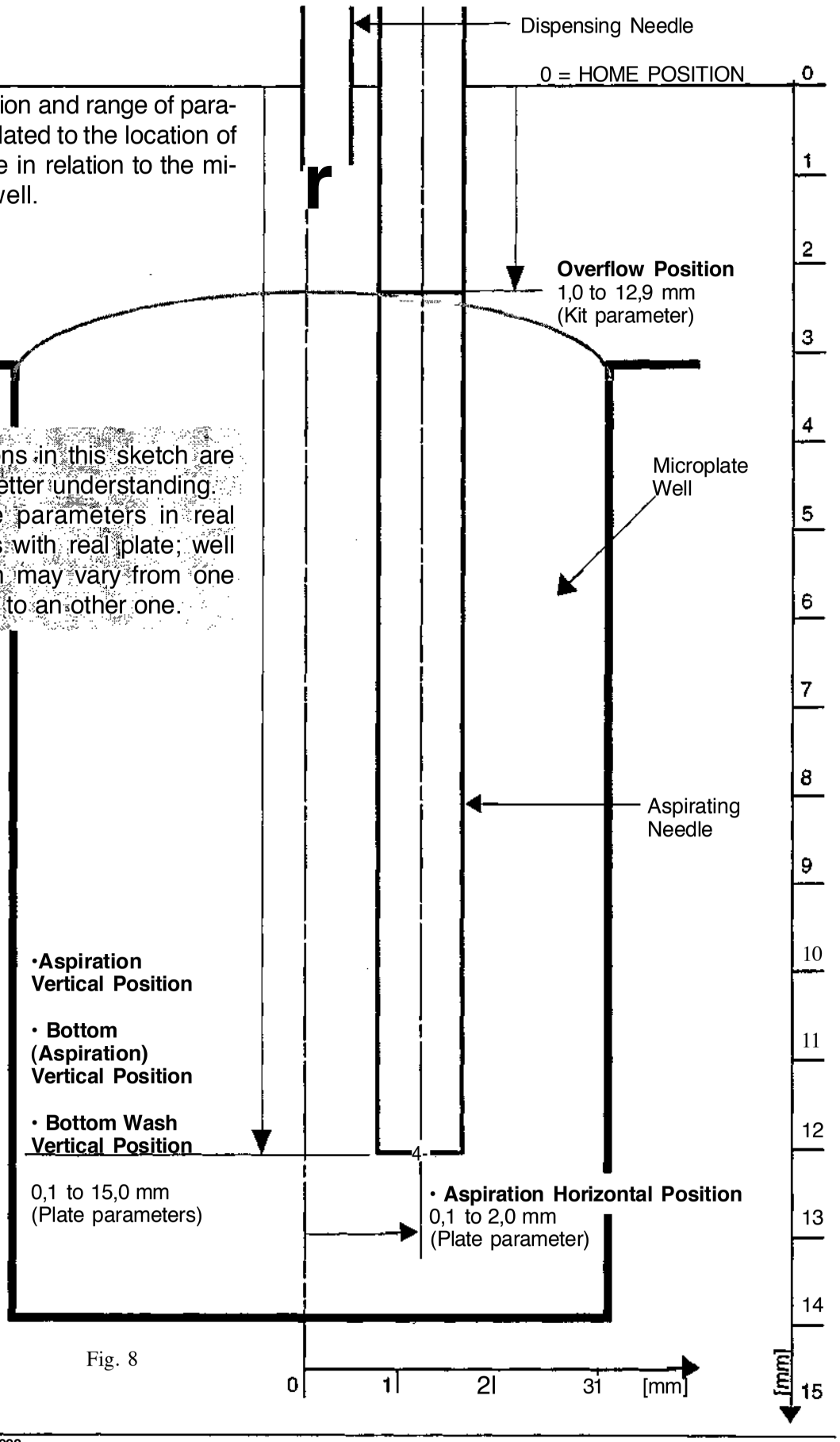
0 to 9, step 1

- **SHAKING SPEED** — Agitation speed

0 to 9, step 1

1.8 Software parameters for Wash protocols (continued)
1.8.3 Parameter's definitions (continued)

Identification and range of parameters related to the location of the needle in relation to the microplate well.



Graduations in this sketch are only for better understanding. Set these parameters in real conditions with real plate; well dimension may vary from one plate type to an other one.

Fig. 8

2• INSTALLATION

2.1 Unpacking

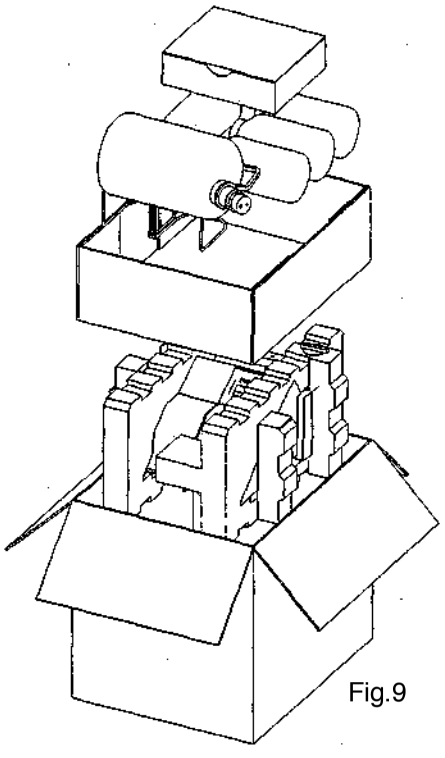


Fig.9

• Carefully unpack accessories and washer.

IMPORTANT:
Do not lift up the washer
by pulling on the foam frames!

• First remove accessories at the top and beside the washer.

• Then, hold the washer (not the foams) and lift up.

• Remove the foams, remove plastic bag and place washer on a stable, horizontal surface.

• Install bottles beside the washer as shown in user manual on §1.1 for PW40 or § 1.4 for PW41.

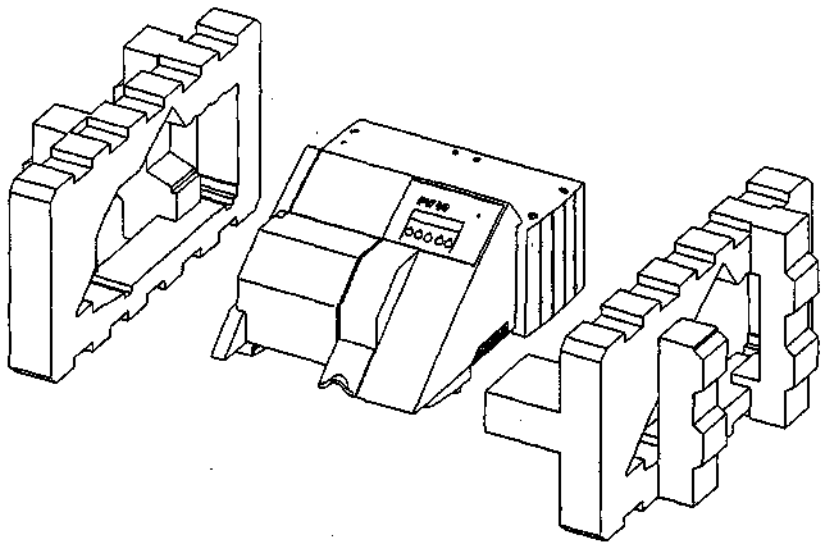


Fig.1O

2.1 Unpacking (continued)

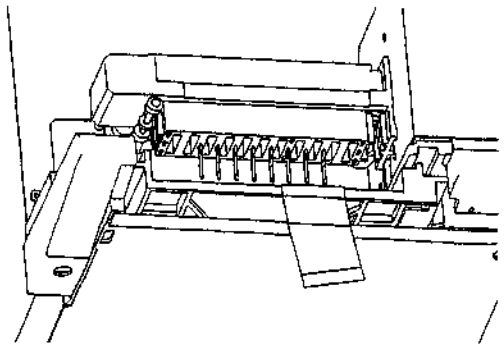


Fig.11

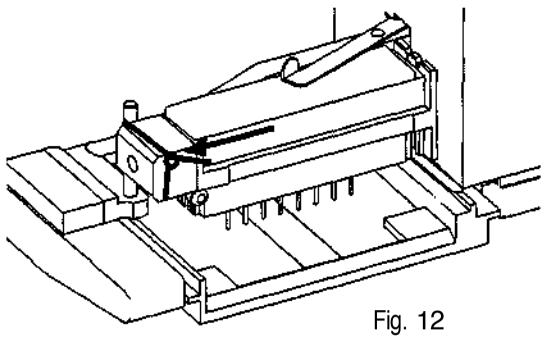


Fig. 12

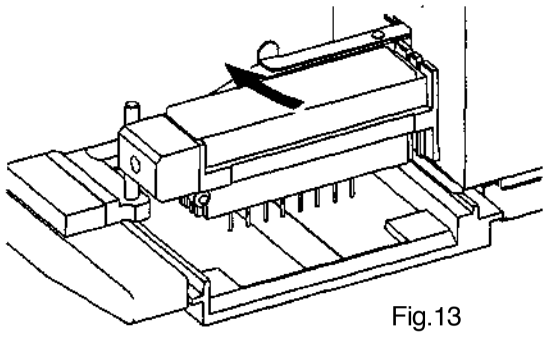


Fig.13

• **In washer working area (Fig. 11,12 & 13):**
-Remove adhesive tape blocking aerosol cover.
-Remove adhesive tape blocking plate carrier to bottom plate (fig. 11).

• **Pull and push plate carrier to check that it moves freely.**

• **Manifold**
-Remove the tie blocking the manifold on the left side (fig. 12): push the tie to the left.
Remove the tie from the vertical shaft.
-Turn blocking device as shown on fig. 12 and ensure to not hinder the manifold Up/Down motion.

• **On rear panel** :
Connect tubes on rear panel (match colours).

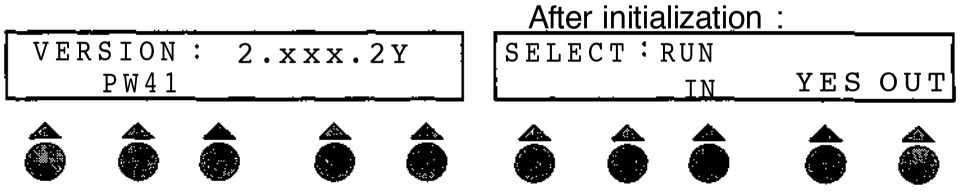
blue	=	Wash 1
gray	=	Wash 2
green	=	Wash 3
transparent	=	Rinse
red	=	to Waste bottle (liquid)
Yellow	=	Vacuum to Waste bottle (air)

• **Vacuum pump protection** :
Cut yellow tube at halfway between WASTE bottle and washer and place hydrophobic filter (supplied in maintenance kit).

• **Connect power cord.**
Fuse installed : 2,5 A Slow Blow.
Plug Power Cord to mains socket; washer is equipped with universal input switch mode power supply (85 VAC to 264 VAC; 47 Hz to 440 Hz).

• **Turn the washer ON (ON/OFF switch on rear panel)**
Whereas plate carrier and manifold are moving to their home position, following message appears on display :

After initialization :

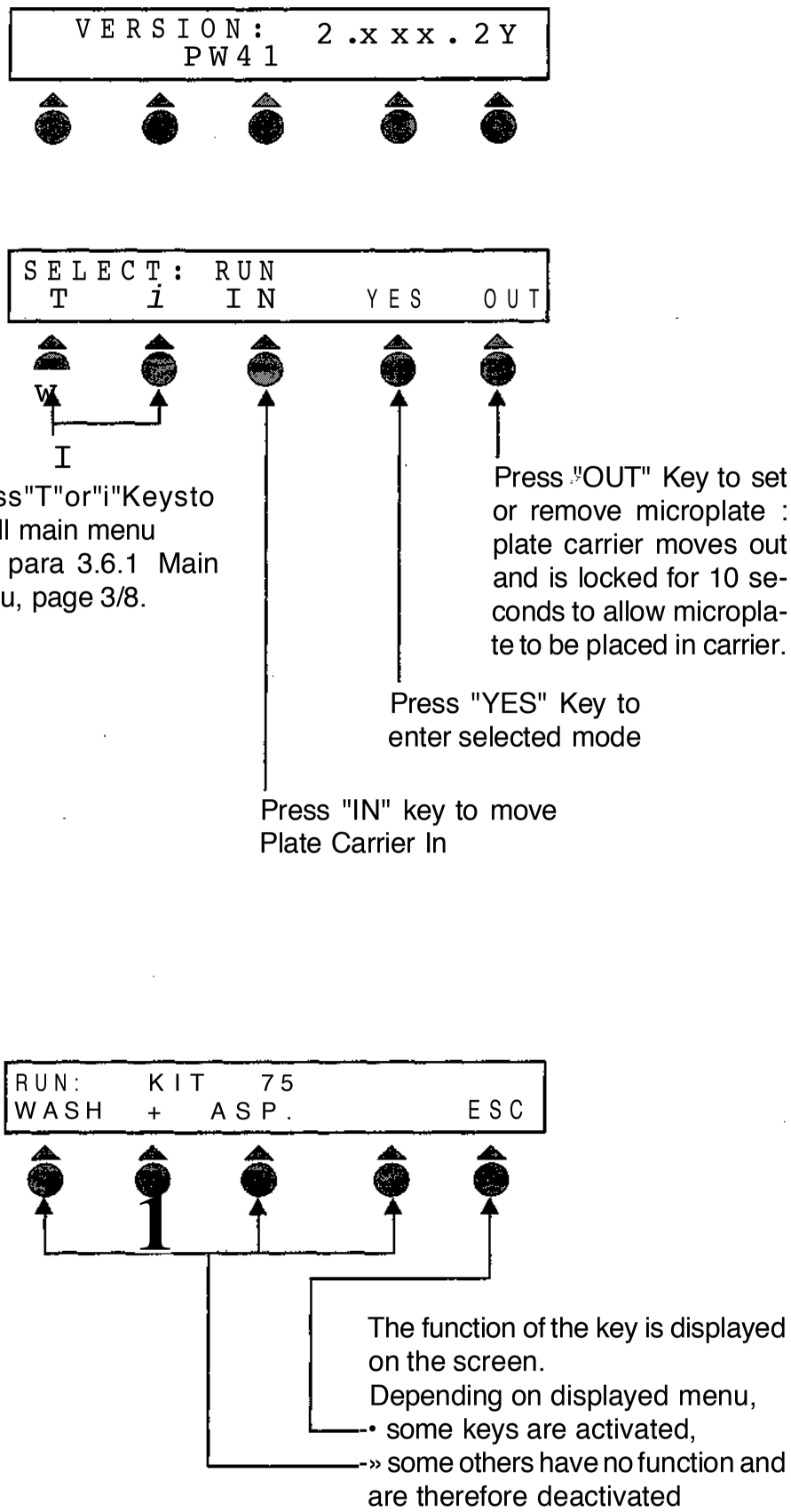


• **Fill one RINSE bottle with demineralized water and prime hydraulic circuit with at least 5 RINSE operations**
(see RINSE mode, §3.5).
• The washer is ready to use.

3• OPERATING INSTRUCTIONS

3.1 Run Mode

3.1.1 How to use the Keyboard?



3.2 Microplate loading

Place the 96-well microplate on the plate carrier with "A1" corner resting against metal spring on the right side (fig. 13).

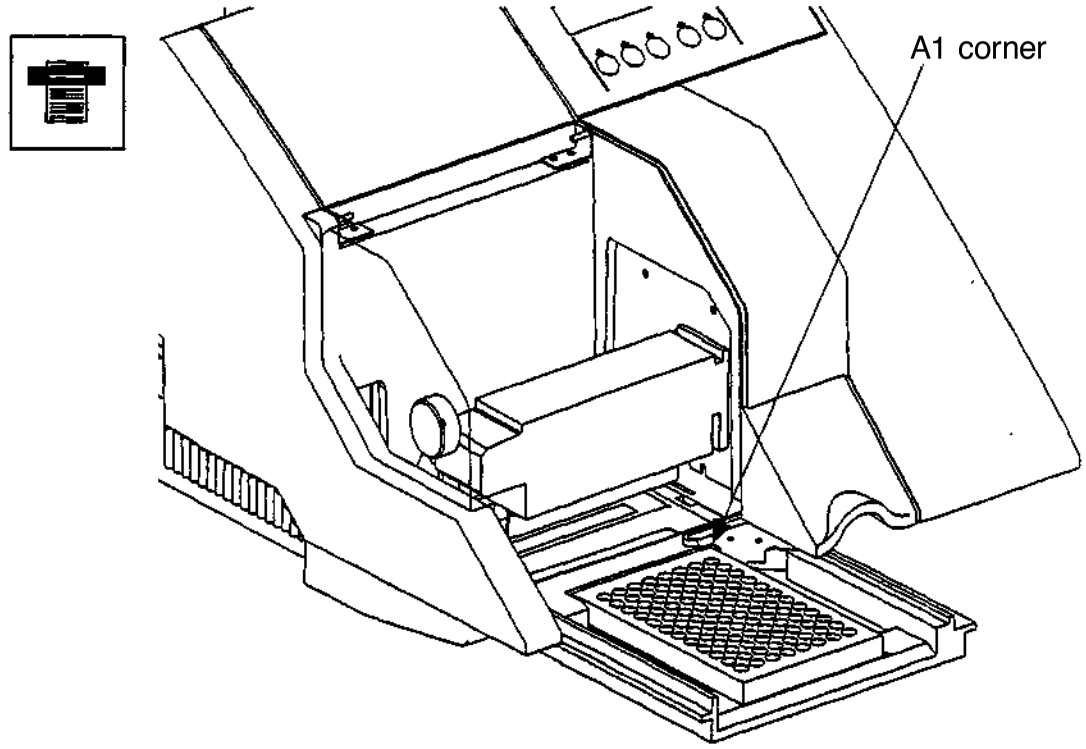
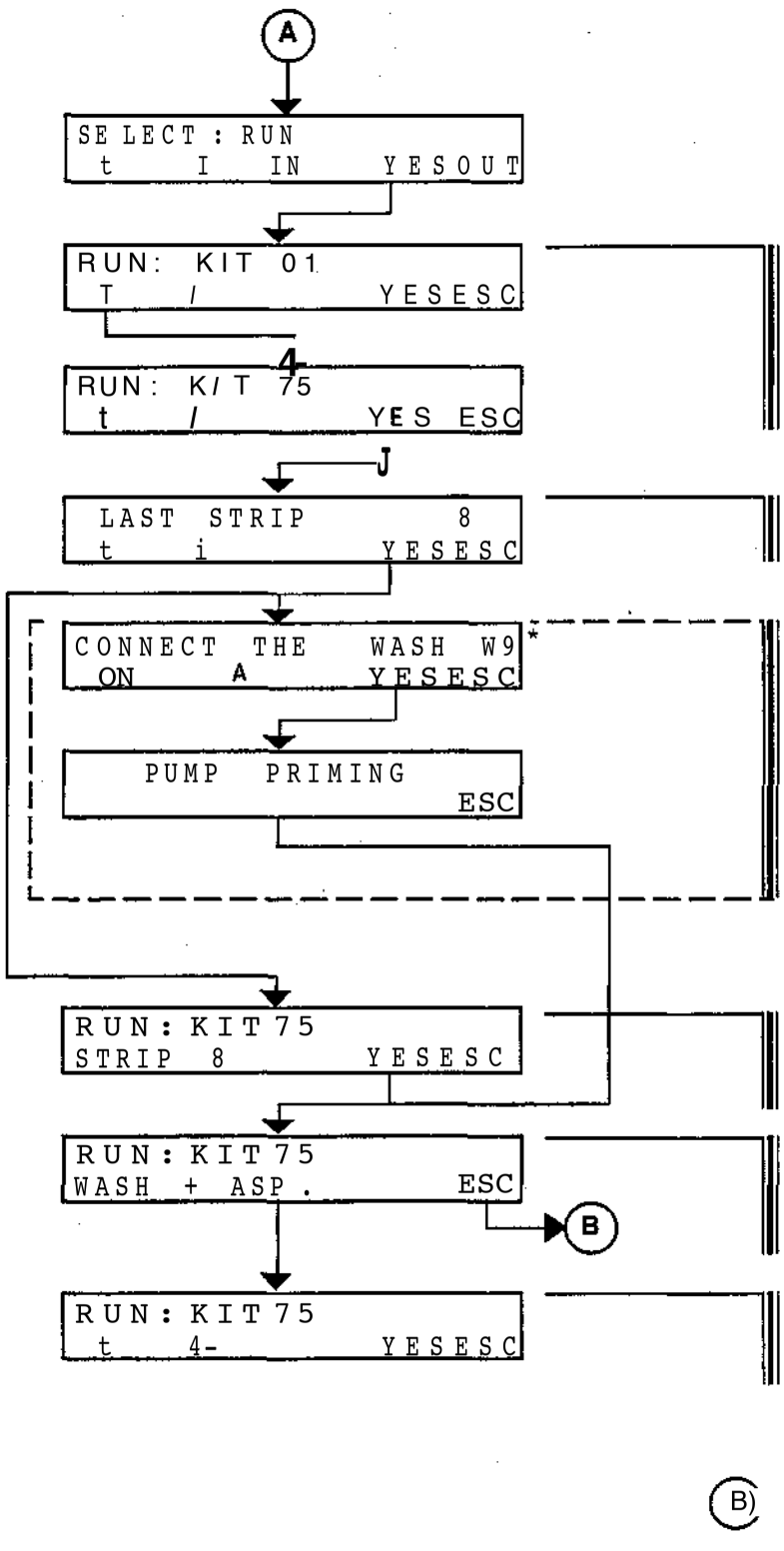


Fig. 13

3• OPERATING INSTRUCTIONS

3.3 Select one KIT



Use "T" and "i" keys to select kit

Use "T" and "4" keys to select last strip to be processed

for PW40 only : This message* is displayed when the requested wash buffer is not connected.
Once you have connected correct WASH bottle, press "YES" and the pump will start to prime in order to operate with correct WASH liquid.
for PW41 : See ERR 21 on next page.

Summary of the selected items :
- Kit name
- Number of strip.

Once the kit is launched, the on-going method is displayed on lower display line.
Press "ESC" to stop running kit.

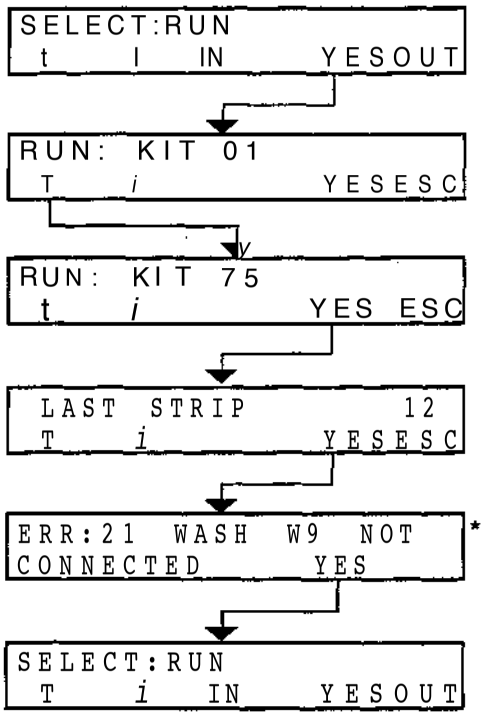
Kit is terminated.
Display is back to previous kit selection

(B) : See §3.4.1

* : may appear as "CONNECT THE WASH R9".

3.3 Select one KIT (continued)

ERR:21 with PW41 :



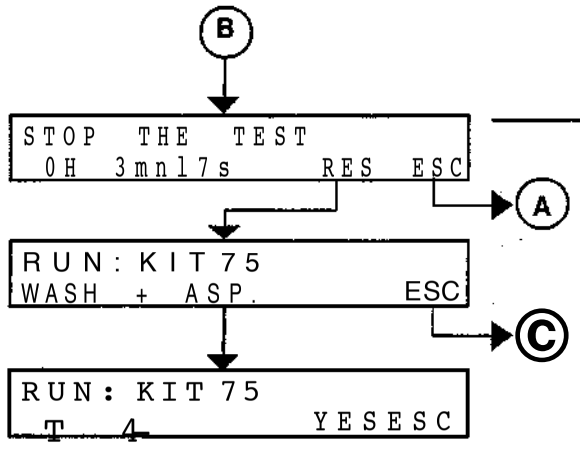
Error 21 indicates that Wash buffer W9 (or R9) requested in "KIT 75" is not connected.
Connect Wash buffer W9 (or R9) at input 1, 2 or 3.
Then enter washer configuration to modify input assignment accordingly (see §3.6.2).

* : may appear as "ERR:21 WASH R9 NOT CONNECTED".

3.4 WASH interruption or Power Failure

3.4.1 WASH interruption

When the "ESC" key is pressed whereas a kit is running, the following message is displayed :

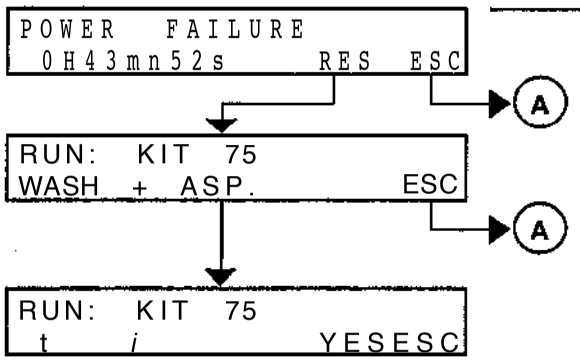


The elapsed time since the kit has been stopped is displayed.
Press the "RES" key to resume the kit at the point where it has been stopped or
press the "ESC" key to go back to main menu.

(A1) : Back to main menu (See §3.3).

3.4.2 POWER Failure

When a power failure occurs whereas a kit is running, the following message will be displayed when power is back :

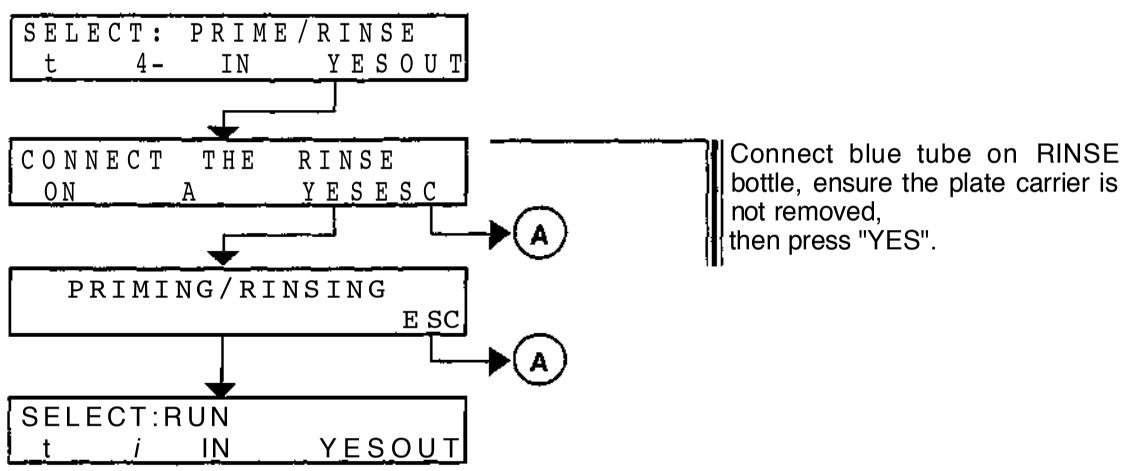


The elapsed time since the kit has been stopped is displayed.
Press the "RES" key to resume the kit at the point where it has been stopped or
press the "ESC" key to go back to main menu.

(A) : Back to main menu (See §3.3).

3.5 RINSE

3.5.1 RINSE (with PW40)



Connect blue tube on RINSE bottle, ensure the plate carrier is not removed,
then press "YES".

(A) : Back to main menu (See §3.3).

3.5.2 Please RINSE (with PW40)

The message

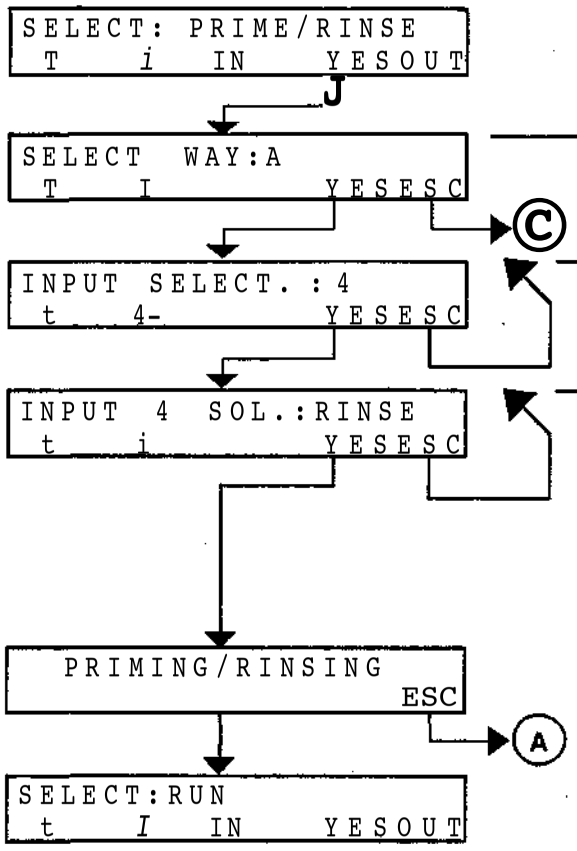
```
PLEASE RINSE
YES
```

is displayed to incite user to perform a RINSE operation when the washer has not been used during 10 minutes after a WASH operation.
Press "YES" Key to go back to main menu and launch a RINSE.

IMPORTANT
The washer should never be switched off with WASH solution inside the tubing and manifold.
Solid crystals from dried WASH solution could clog the dispense needles and clamp electrovalve tube.

3.5 RINSE (continued)

3.5.3 RINSE (with PW41)



Way is mandatory "A" on PW41.
Press YES to continue.

Select washer input according to rinsing or priming that you want to do.

Indication of the liquid connected to selected input. If you change liquid, use "T" or "I" keys to modify input assignment (same as in washer configuration, page 3/9).
Note:
-Input 4 is mandatory RINSE.

(A) : Back to main menu (See §3.3).

3.5.4 Automatic Rinsing (with PW41)

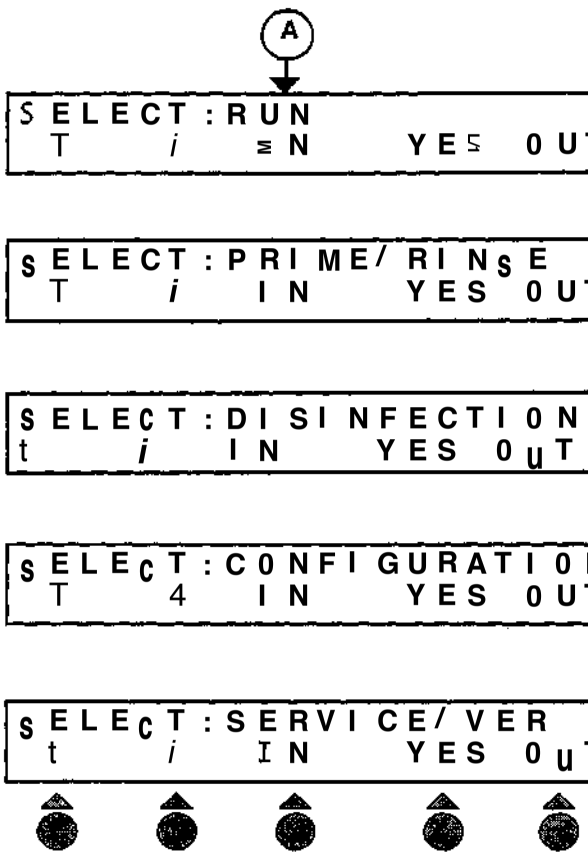
One automatic rinsing sequence will take place as soon as the time set in "RINSE PARAM." (see §3.6.2. Washer's configuration) has elapsed after the last wash.

Note :
When the washer won't be used for several days, it is recommended to connect all inputs to rinse bottle and rinse every input as described above in order to clean the pinch valve tube of every input. See also §4.1.2 Storage condition.

IMPORTANT
The washer should never be switched off with WASH solution inside tubing and manifold.
Solid crystals from dried WASH solution could clog the dispense needles and clamp electrovalve tube.

3.6 Configuration

3.6.1 Main menu



RUN
See §3.1 Run Mode

PRIME/RINSE
See §3.5 RINSE

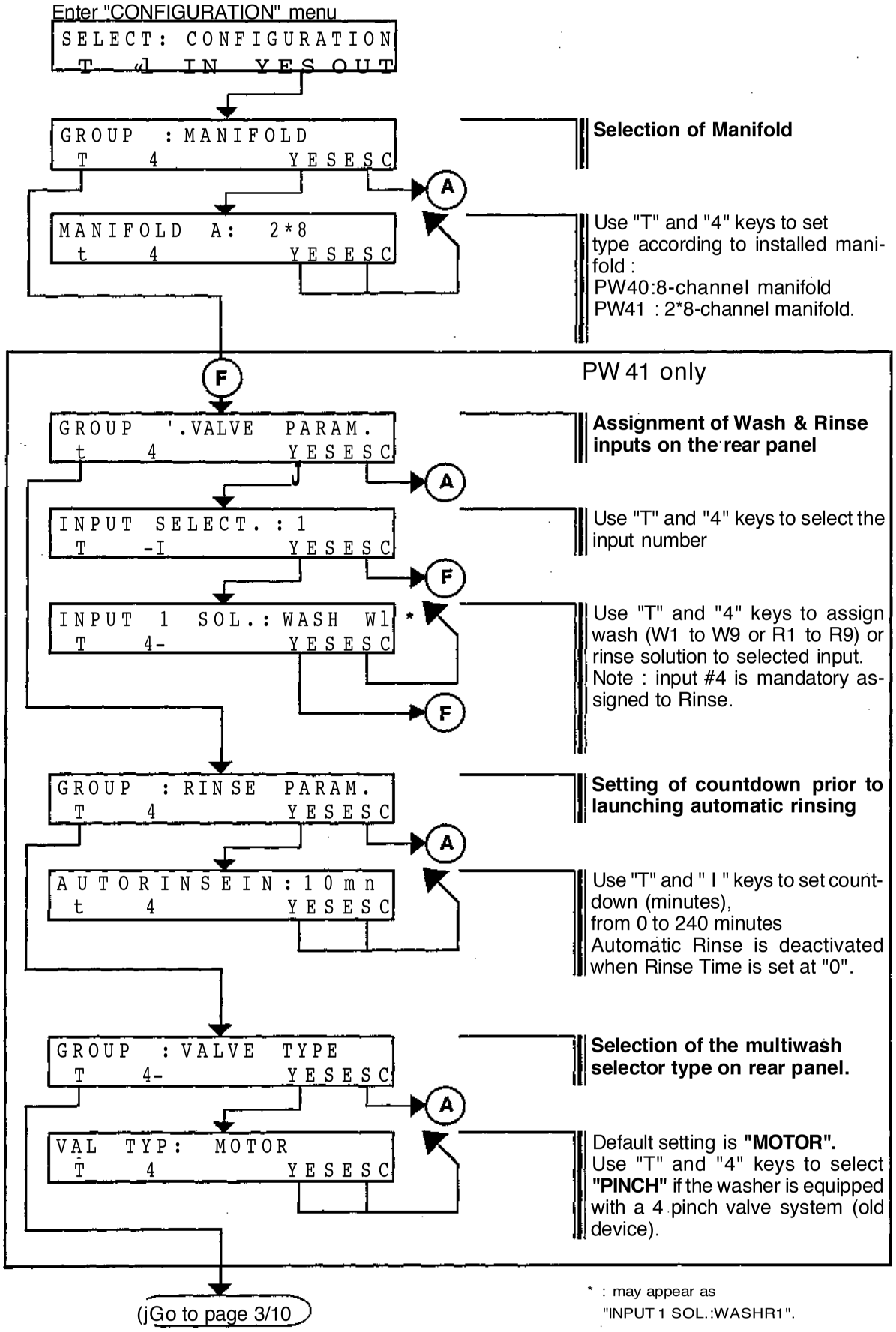
DISINFECTION
See §4.2.2 DISINFECTION

CONFIGURATION
See §3.6.2 Washer's configuration

SERVICE/VER
See §4.3.1 Hardware and Software version

3.6 Configuration (continued)

3.6.2 Washer's configuration



3.6 Configuration (continued)

3.6.2 Washer's configuration (continued)

(continuation from page 3/9)

PW41 only

GROUP :VACUUM DET.
T 4 YESESC

Activation of the vacuum detection

VAC. TRSH: 20pts
T 4 YESESC

Use "T" et "4" keys to set the vacuum sensing threshold.
(Default value : 20 points.)

VACUUM DET ON A YES
t 4 YESESC

Use "T" and "4" keys to activate (YES) or deactivate (NO) vacuum detection.

GROUP : RS232 PARAM
t 4 YESESC

Setting of RS232 serial port for connection to PC.

BAUDS:9600 WAKE UP:Y
T 4 -> YESESC

Baud rate can be reduced in case of transmission problem between PC and washer.
Use "T" and "4" keys to set Baud rate.
(Setting of Wake up function is ignored)

GROUP :LIQUID DET.
T 4- YESESC

Activation of the liquid detection in wash and waste bottles

WASH LEVEL DET:YES
t 4 YESESC

WASTE LEVEL DET:YES
T J. YESESC

Use "T" and "4" keys to activate (YES) or deactivate (NO) liquid level detector in Wash bottle, then in Waste bottle.

GROUP : GENERAL
t 4 YESESC

Setting of dialogue interface parameters.

LANG:ENGLISH BEEP:Y
t 4 -> YESESC

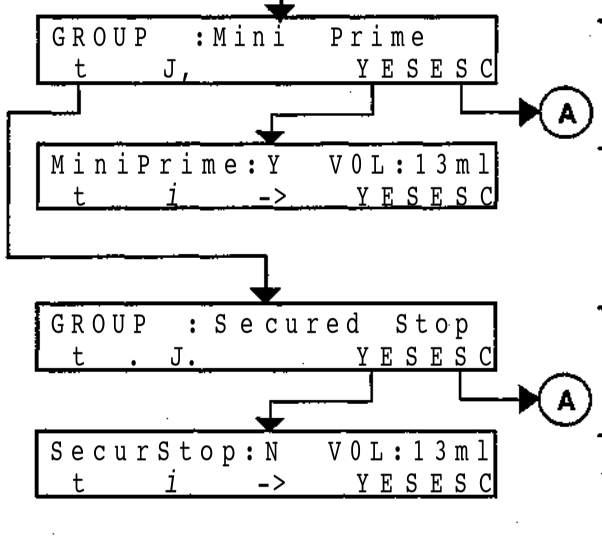
Use "T" and "4" keys to set language, then "->" key and "T" and "4" keys to activate (Y) or deactivate (N) the Beep.

(j3otopage3/iO

3.6 Configuration (continued)

3.6.2 Washer's configuration (continued)

(continuation from page 3/10)



Activation of a mini priming sequence before every wash protocol.

Use "T" and "/" keys to activate (Y) or deactivate (N), then "->" key and "T" and "/" to set the volume from 1 to 30ml.

Activation of the secured stop after every wash protocol to remove air from manifold.

Use "T" and "/" keys to activate (Y) or deactivate (N), then "->" key and "T" and "/" to set the volume from 1 to 30ml.

(A) : Back to main menu (See §3.3).

3.7 PROGRAMMING

3.7.1 Kit Structure

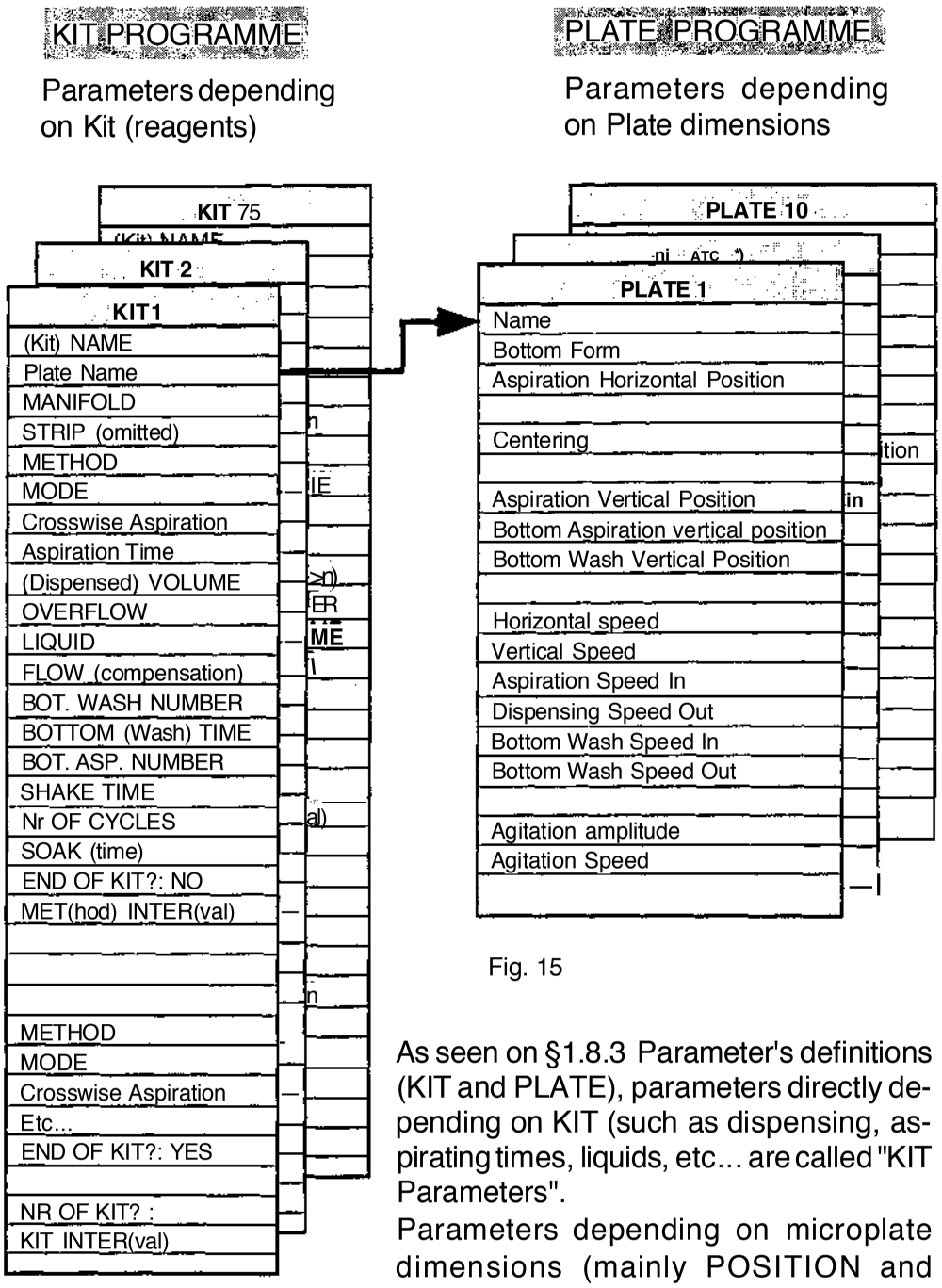


Fig. 15

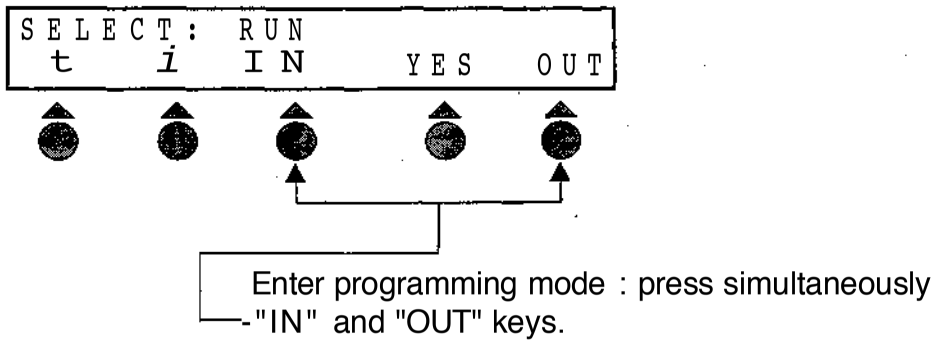
As seen on §1.8.3 Parameter's definitions (KIT and PLATE), parameters directly depending on KIT (such as dispensing, aspirating times, liquids, etc... are called "KIT Parameters".
Parameters depending on microplate dimensions (mainly POSITION and SPEED parameters) are called "PLATE parameters".

At programming, each kit is mandatory linked to one plate with the "Plate number" parameter (Fig. 15).
This implies that the PLATE must be already existing or must be programmed **prior** the associated KIT is programmed.

Up to 10 PLATEs can be programmed.
Up to 75 KITs can be programmed.

3.7 PROGRAMMING (continued)

3.7.2 Access to PROGRAMMING mode



Enter programming mode : press simultaneously "IN" and "OUT" keys.

3.7 PROGRAMMING (continued)

3.7.3 Programming Synopsis

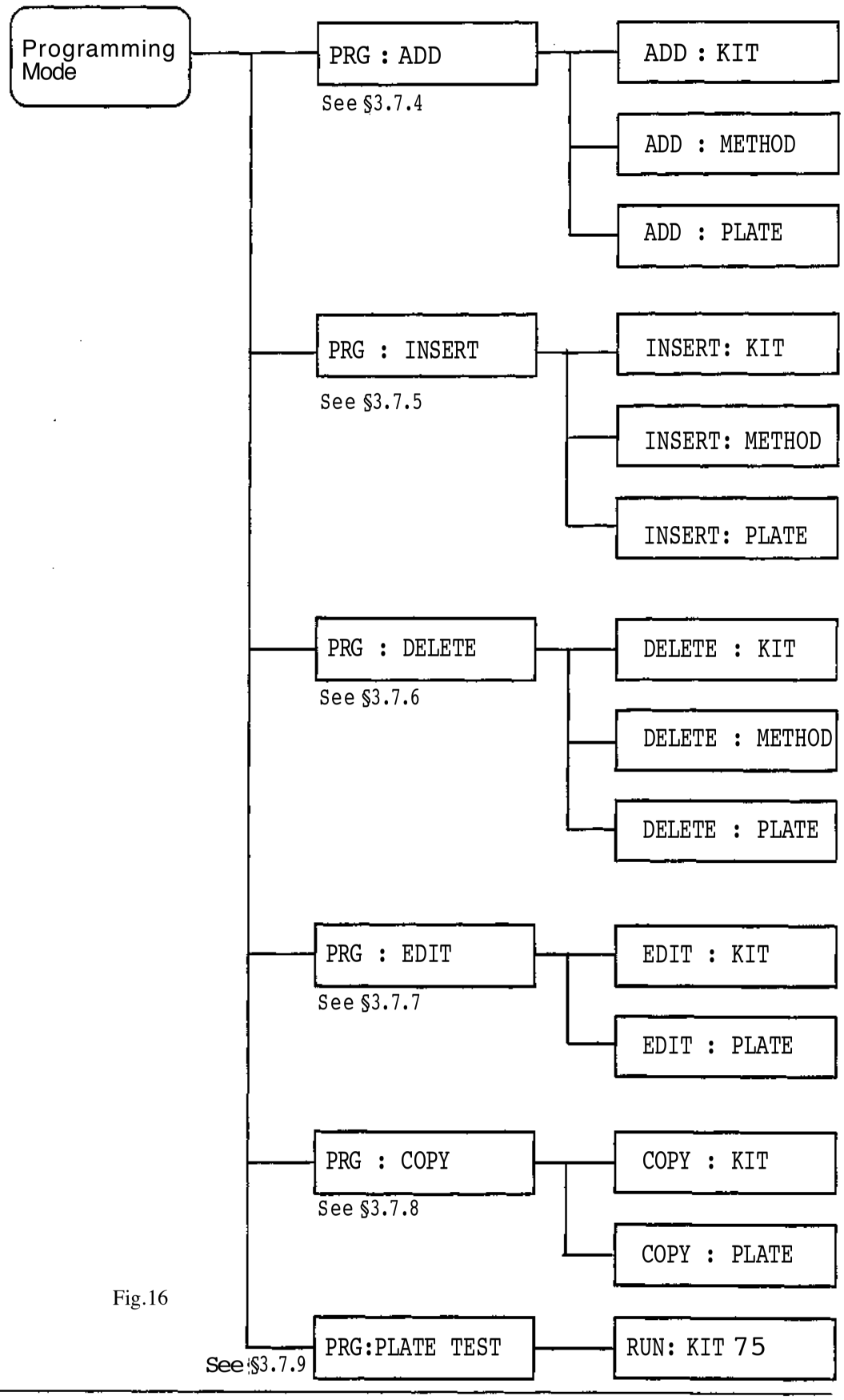
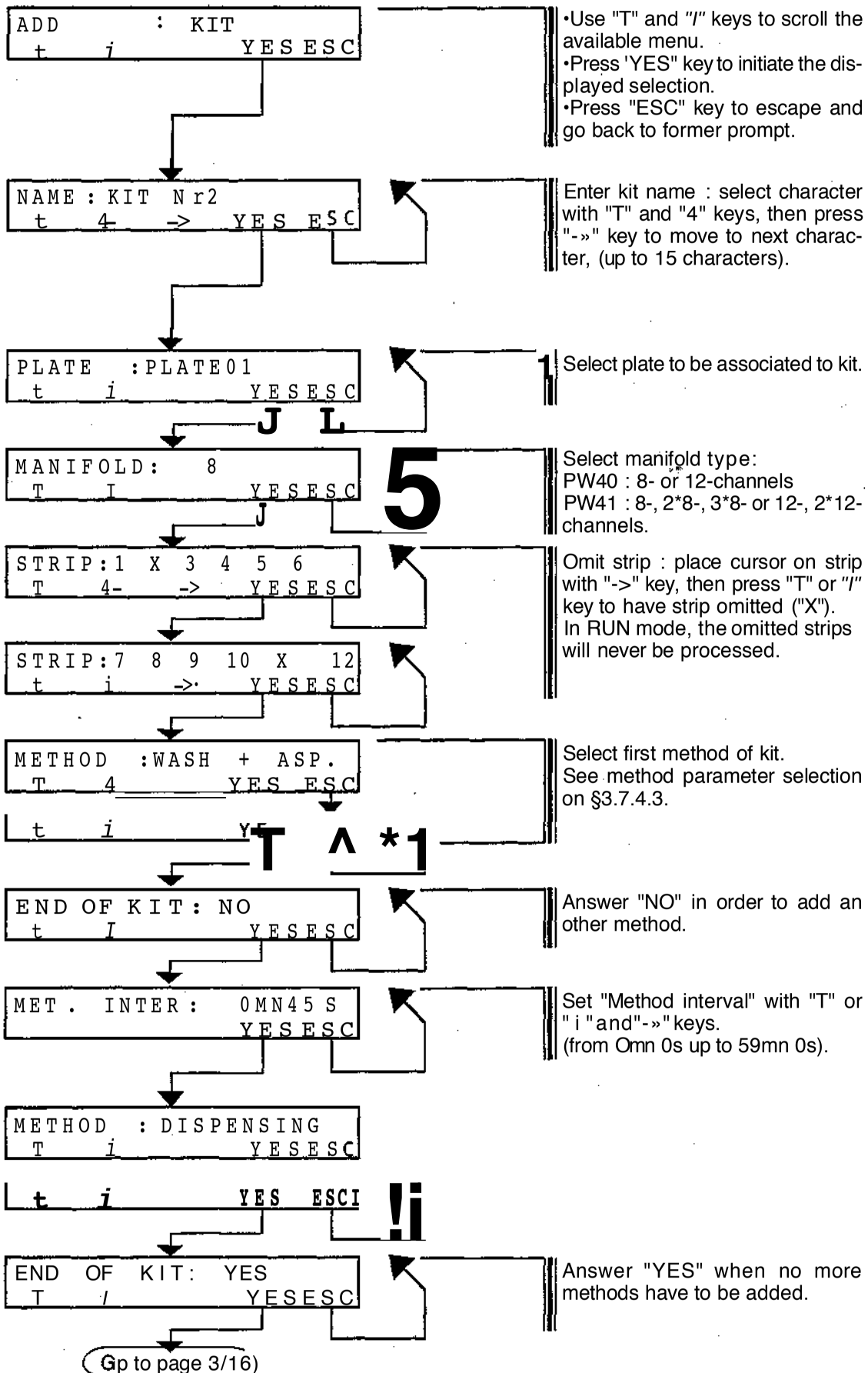


Fig.16

3.7 PROGRAMMING (continued)

3.7.4ADD 3.7.4.1 ADD: KIT

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



•Use "T" and "/" keys to scroll the available menu.
•Press 'YES" key to initiate the displayed selection.
•Press "ESC" key to escape and go back to former prompt.

Enter kit name : select character with "T" and "4" keys, then press "-»" key to move to next character, (up to 15 characters).

Select plate to be associated to kit.

Select manifold type:
PW40 : 8- or 12-channels
PW41 : 8-, 2*8-, 3*8- or 12-, 2*12-channels.

Omit strip : place cursor on strip with "->" key, then press "T" or "/" key to have strip omitted ("X").
In RUN mode, the omitted strips will never be processed.

Select first method of kit.
See method parameter selection on §3.7.4.3.

Answer "NO" in order to add an other method.

Set "Method interval" with "T" or "i "and"-»" keys.
(from Omn 0s up to 59mn 0s).

Answer "YES" when no more methods have to be added.

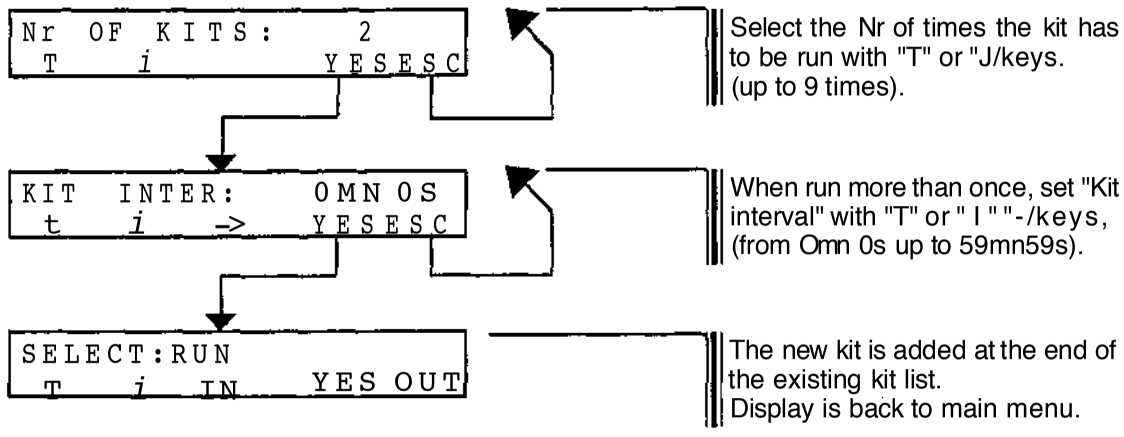
Gp to page 3/16)

3.7 PROGRAMMING (continued)

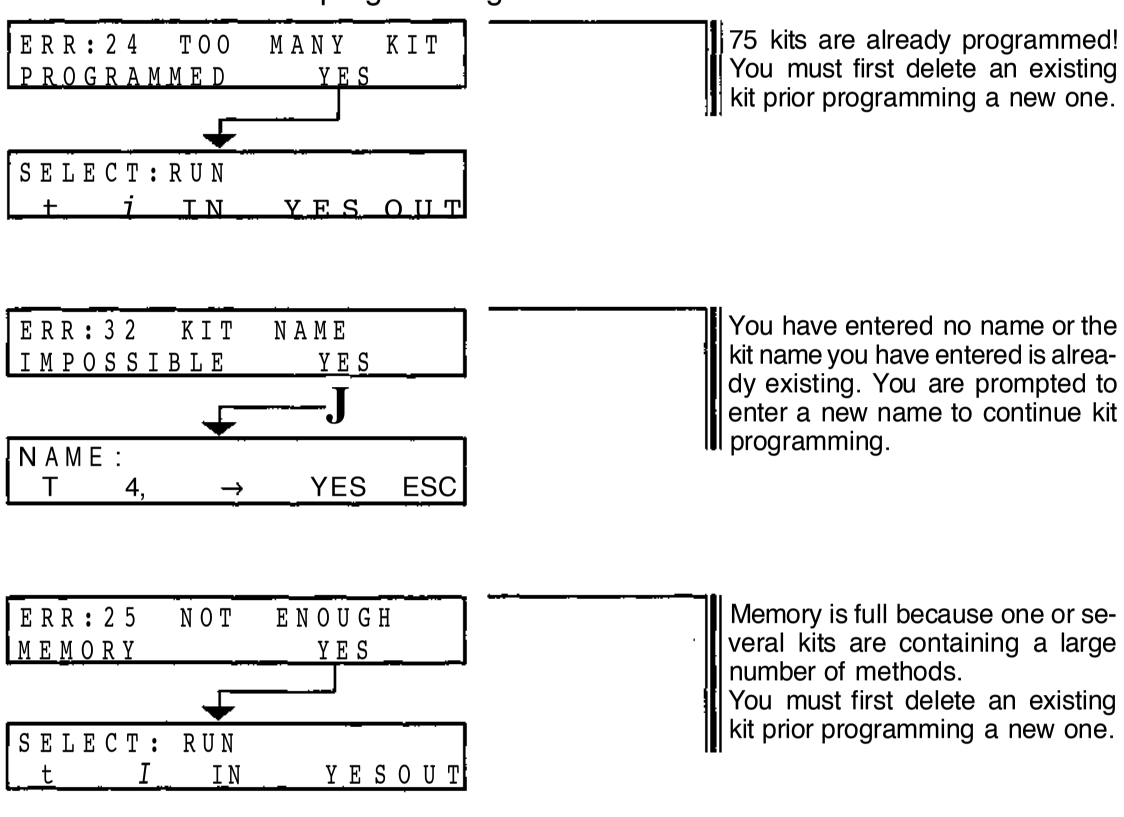
3.7.4 ADD (continued)

3.7.4.1 ADD : KIT (continued)

(continuation from page 3/15)



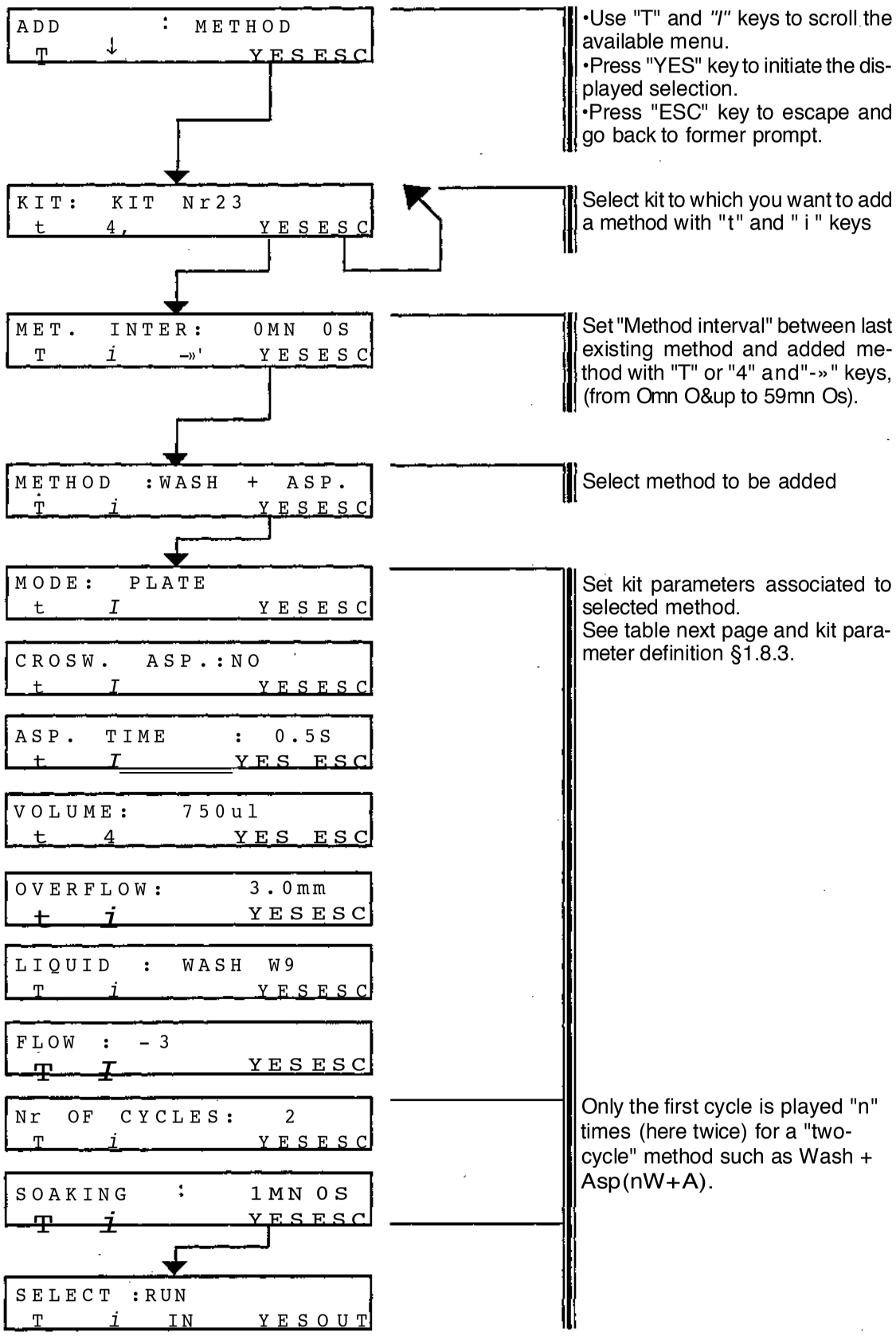
3.7.4.2 ERRORS on KIT programming



3.7 PROGRAMMING (continued)

3.7.4ADD (continued)

3.7.4.3 ADD : METHOD The method is added after the last method of the selected kit



3• OPERATING INSTRUCTIONS

3.7 PROGRAMMING (continued)

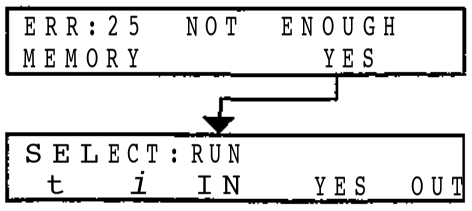
3.7.4ADD (continued)

3.7.4.3 ADD : METHOD (continued)

Summary of kit parameters associated to method.

			METHOD :	WASH + ASP.	WASH+BOT.ASP.	BOT.WASH + ASP.	B.WASH.ASP.	WASH	ASP.	DISPENSING	BOTTOM WASH.	BOTTOM ASP.	AGITATION
			Method Code :	**nW+A**	**nW+a**	**nw+A**	**nw+a**	**nW**	**nA**	**a c**	**nw**	**na**	**nAg**
Kit parameter	Value	See def.											
MODE :	STRIP or PLATE	p. 1/10		•	•	•	•	•	•	•	•	•	
CROS. ASP. :	YES or NO	p. 1/12		•	•	•	•	•	•		•	•	
ASP. TIME :	0,1 to 9,9 sec	p. 1/12		•	•	•	•	•	•		•	•	
VOLUME :	50 to 3000 µL	p. 1/13		•	•	•	•	•		•	•		
OVERFLOW :	1,0 to 12,9ram	p. 1/13		•	•	•	•	•		•	•		
LIQUID :	WASH W1 to WASH W9	p. 1/13		•	•	•	•	•		•	•		
FLOW :	-5 to +5	p. 1/13		•	•	•	•	•		•	•		
BOT. WASH NUMBER:	1 or 2	p. 1/16				•	•				•		
BOTTOM TIME :	0,1 to 9,9 sec	p. 1/16				•	•				•		
BOT. ASP. NUMBER:	1 or 2	p. 1/17				•	•				•		
SHAKE TIME :	0,1 to 59,9 sec	p. 1/19											•
Nr OF CYCLES:	1 to 9	p. 1/11		•	•	•	•	•	•	•	•	•	•
SOAKING:	0 to 59 mn in PLATE mode	p. 1/11											
	0 to 9,9 sec i STRIP mode			•	•	•	•	•	•	•	•	•	•

3.7.4.4 ERROR on METHOD programming



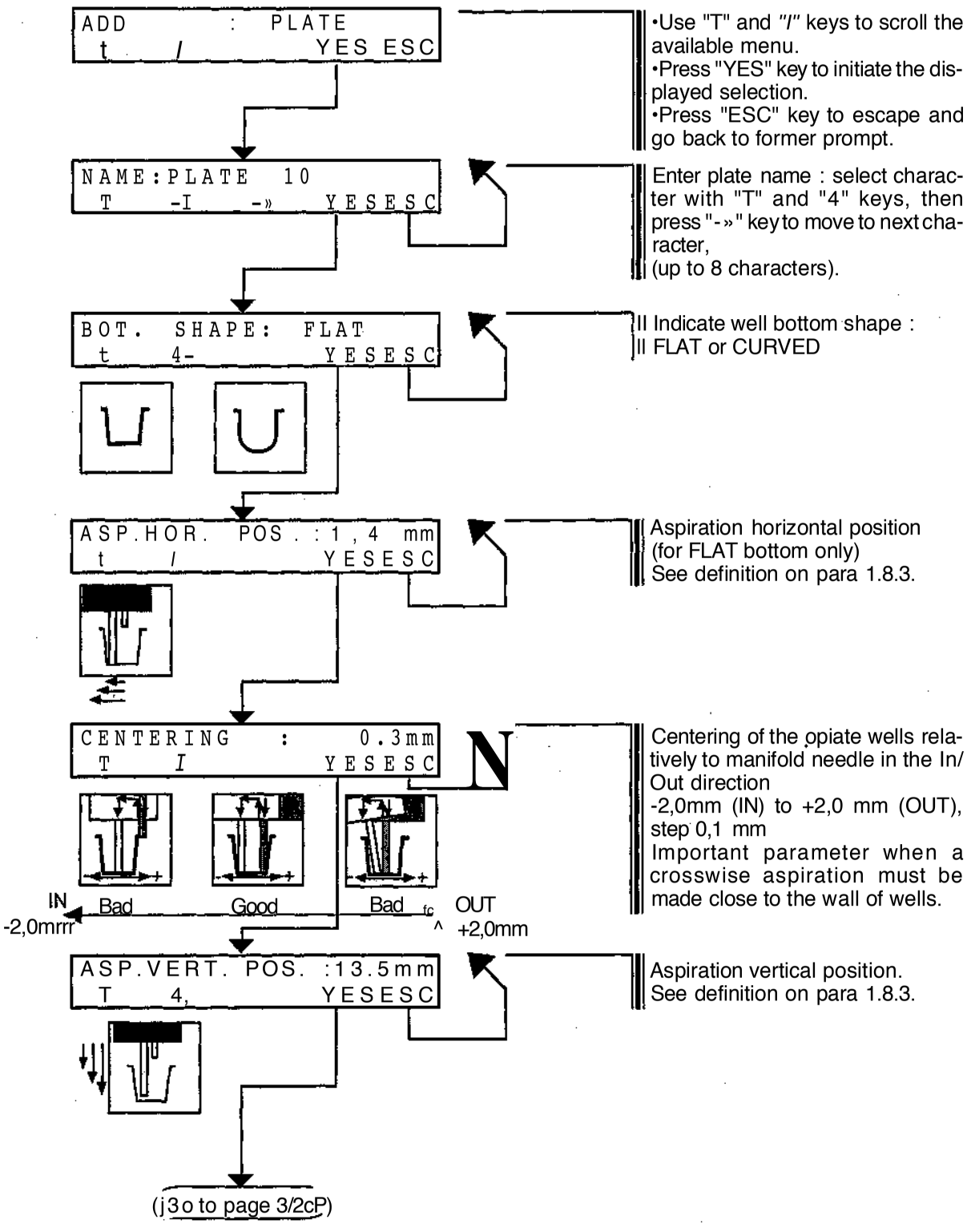
Memory is full because one or several kits are containing a large number of methods.
You must first delete an existing kit or existing method prior programming a new one.

3.7 PROGRAMMING (continued)

3.7.4 ADD (continued)

3.7.4.5 ADD : PLATE

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

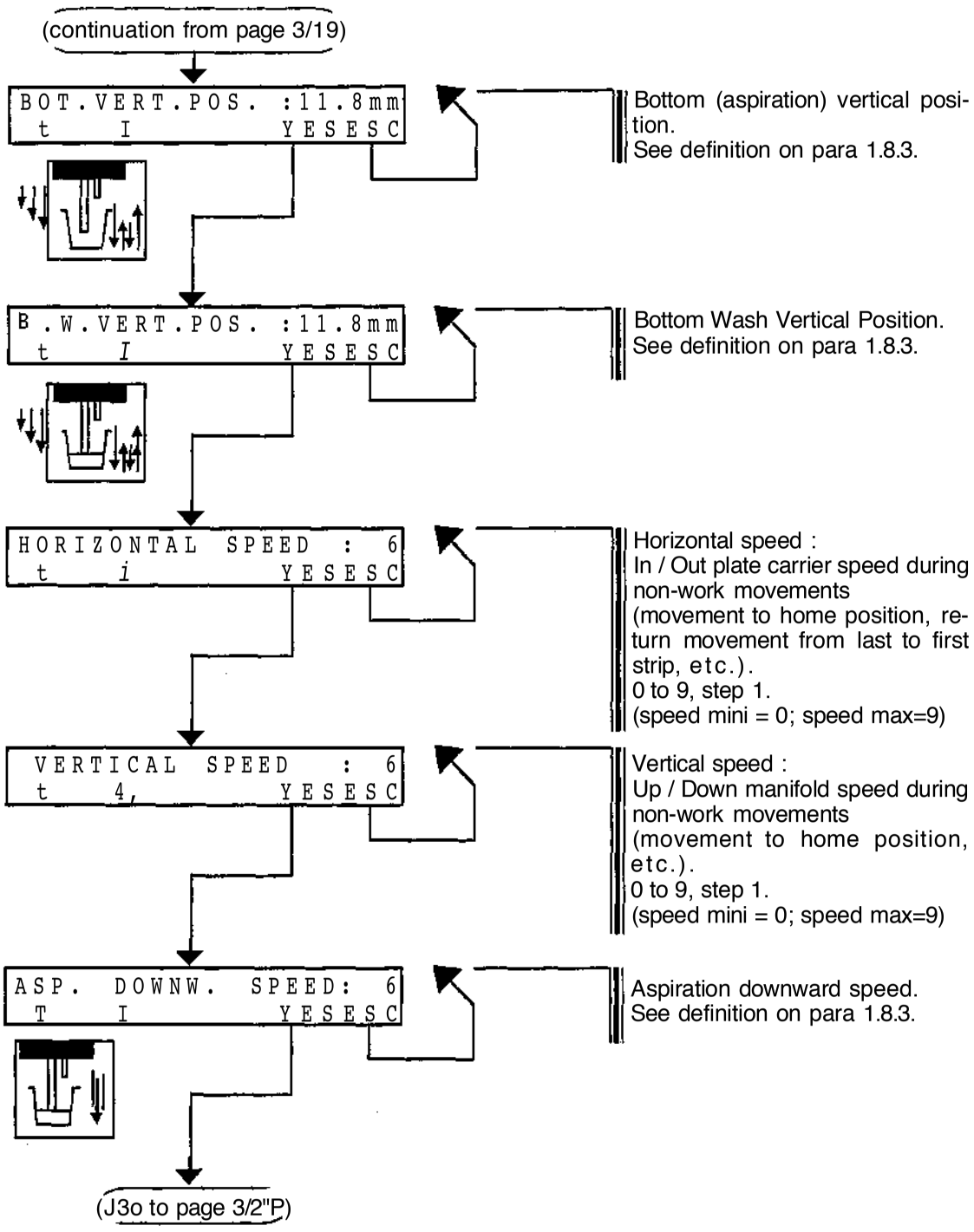


(j3o to page 3/2cP)

3.7 PROGRAMMING (continued)

3.7.4ADD (continued)

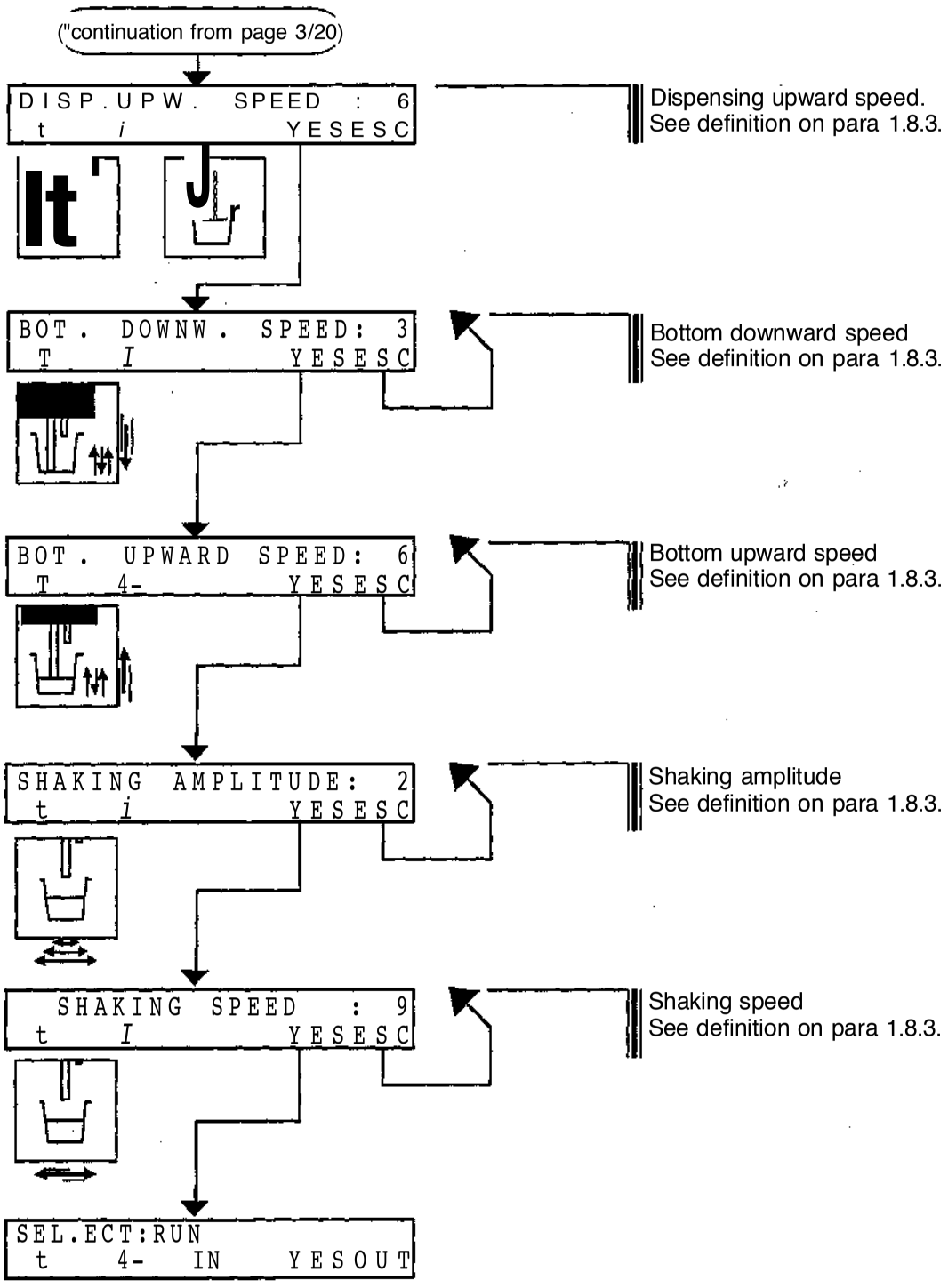
3.7.4.5 ADD : PLATE (continued)



3.7 PROGRAMMING (continued)

3.7.4 ADD (continued)

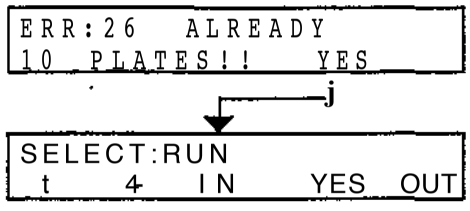
3.7.4.5 ADD : PLATE (continued)



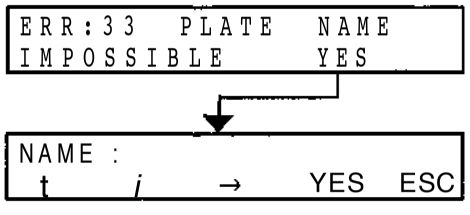
3.7 PROGRAMMING (continued)

3.7.4ADD (continued)

3.7.4.6 ERRORS on PLATE programming



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



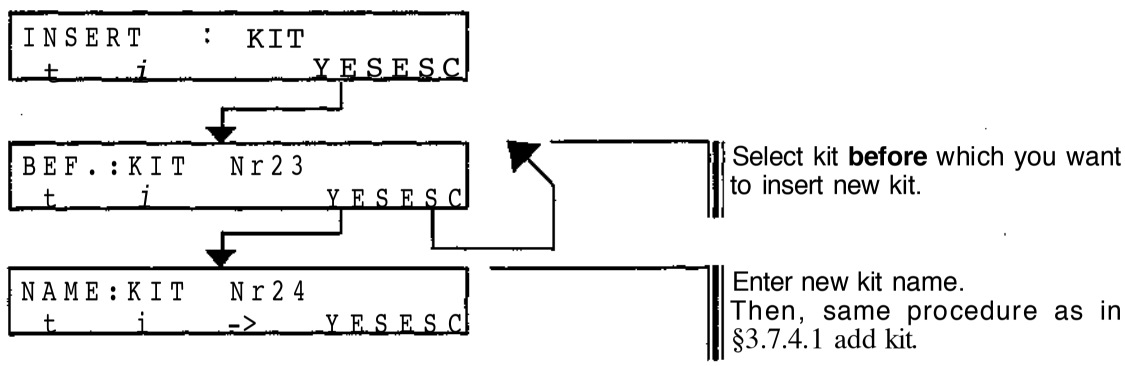
You have entered no name or the plate name you have entered is already existing. You are prompted to enter a new name to continue plate programming.

3.7 PROGRAMMING (continued)

3.7.5 INSERT

3.7.5.1 INSERT: KIT

The new kit is inserted **before** another kit

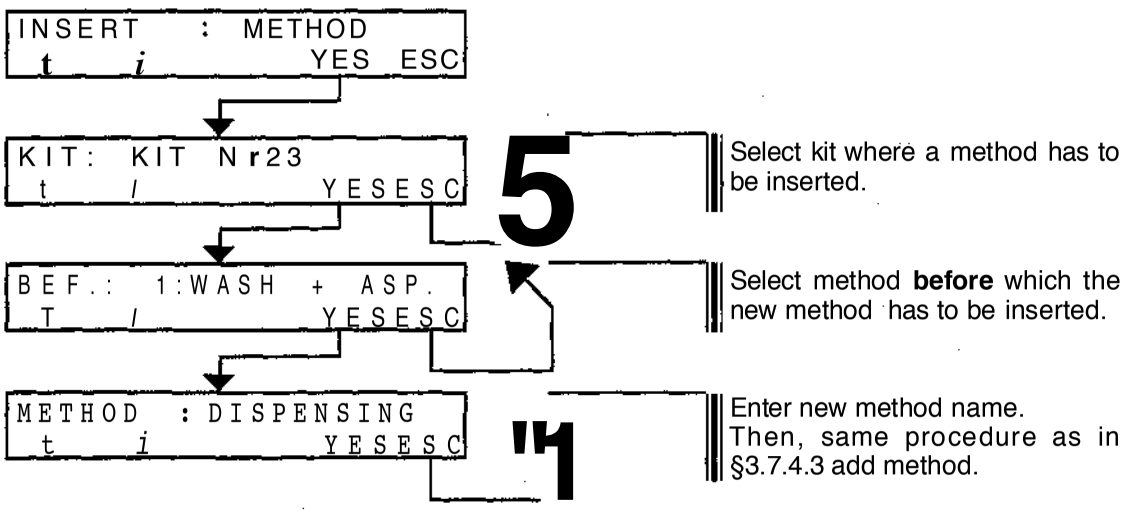


3.7.5.2 TEMPORARY KIT

Power failure or erroneous OFF switching 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 first place of the kit list. It is then possible to COPY this Temporary Kit and write its correct name, then continue with programming of next methods and kit repetition parameters.
Once saved under its correct name, it is highly recommended to DELETE the TEMPORARY KIT.

3.7.5.3 INSERT: METHOD

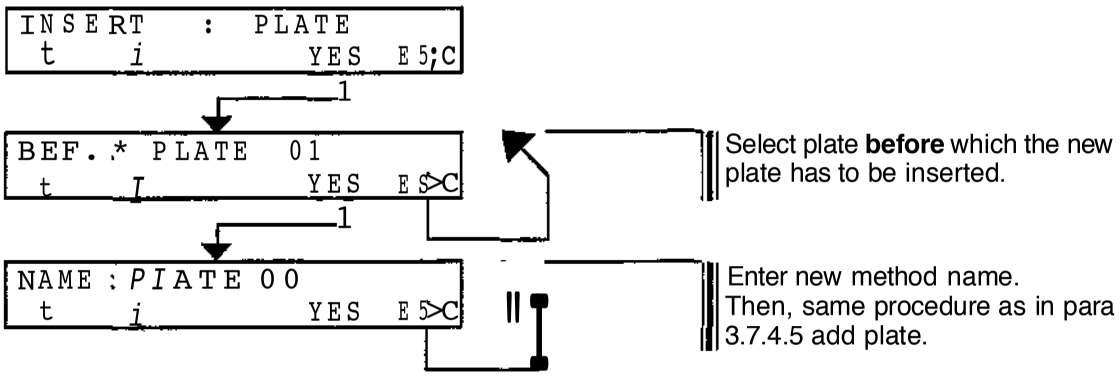
The new method is inserted **before** another method



3.7 PROGRAMMING (continued)

3.7.5 INSERT (continued)

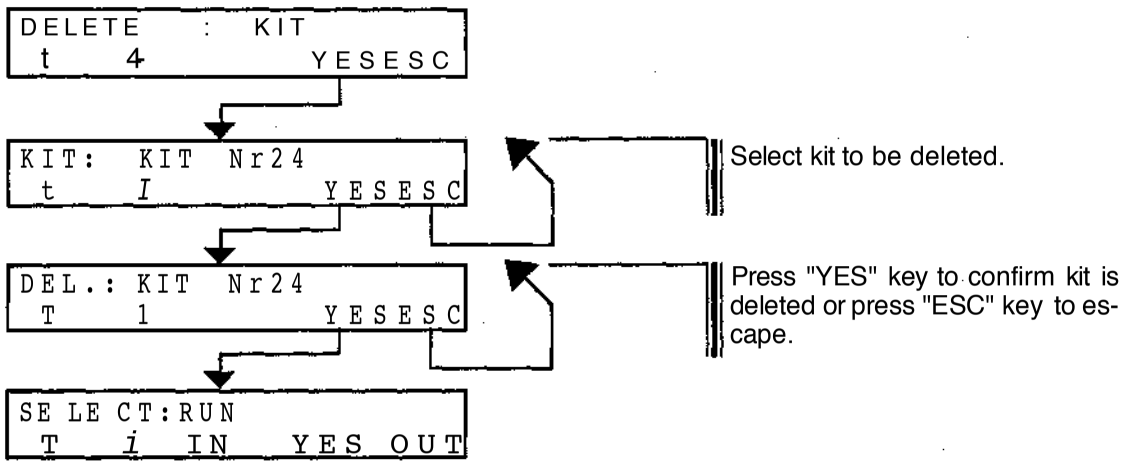
3.7.5.4 INSERT : PLATE The new plate is inserted **before** another plate



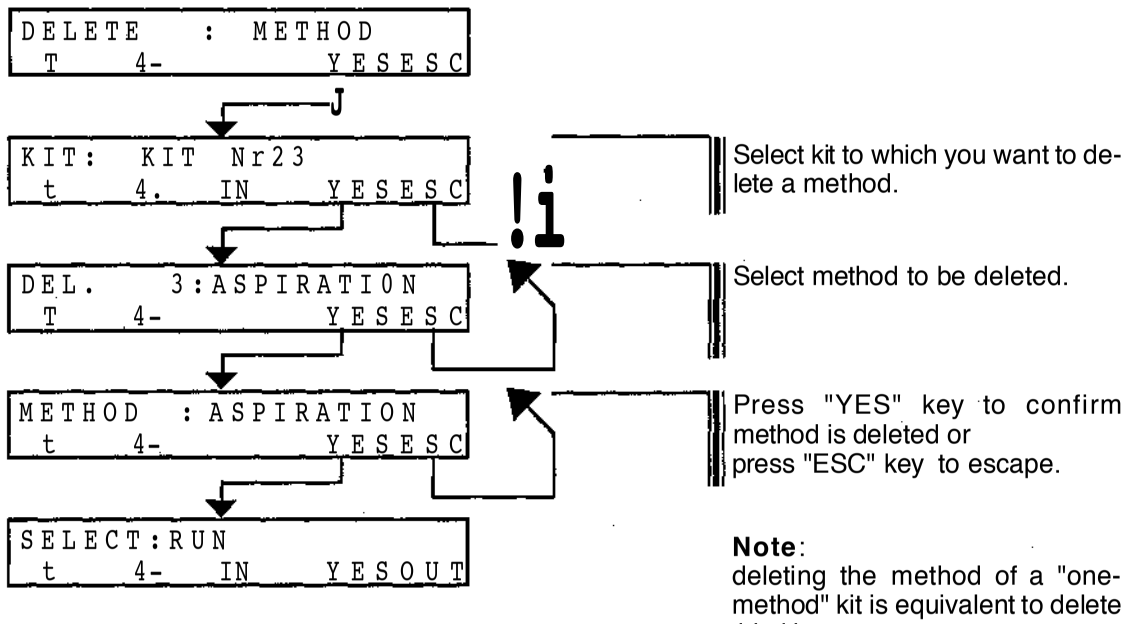
3.7 PROGRAMMING (continued)

3.7.6 DELETE

3.7.6.1 DELETE: KIT



3.7.6.2 DELETE : METHOD

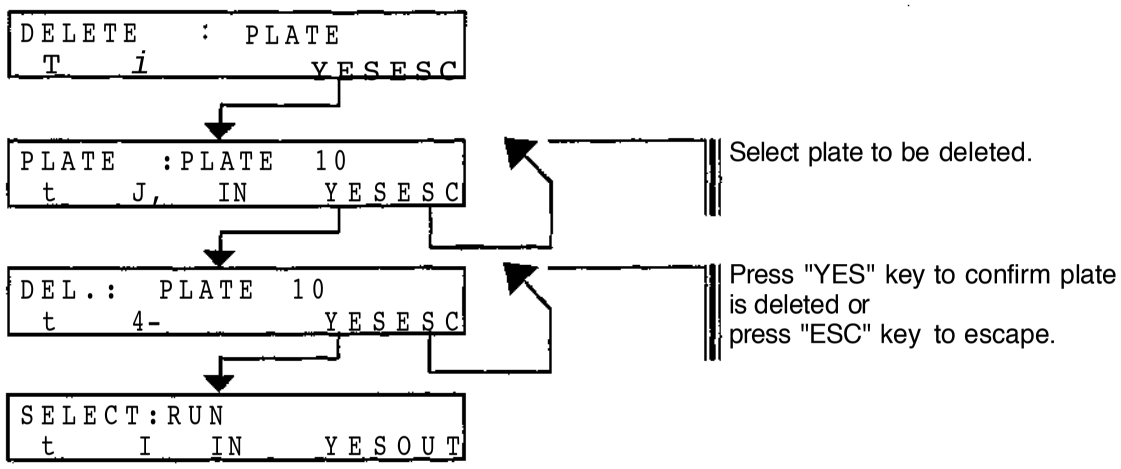


Note:
deleting the method of a "one-method" kit is equivalent to delete this kit.

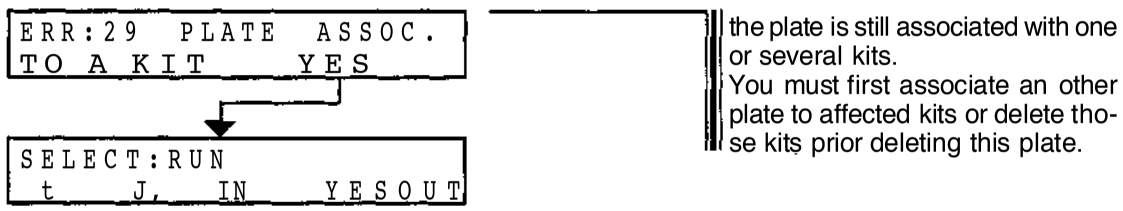
3.7 PROGRAMMING (continued)

3.7.6 DELETE (continued)

3.7.6.3 DELETE : PLATE



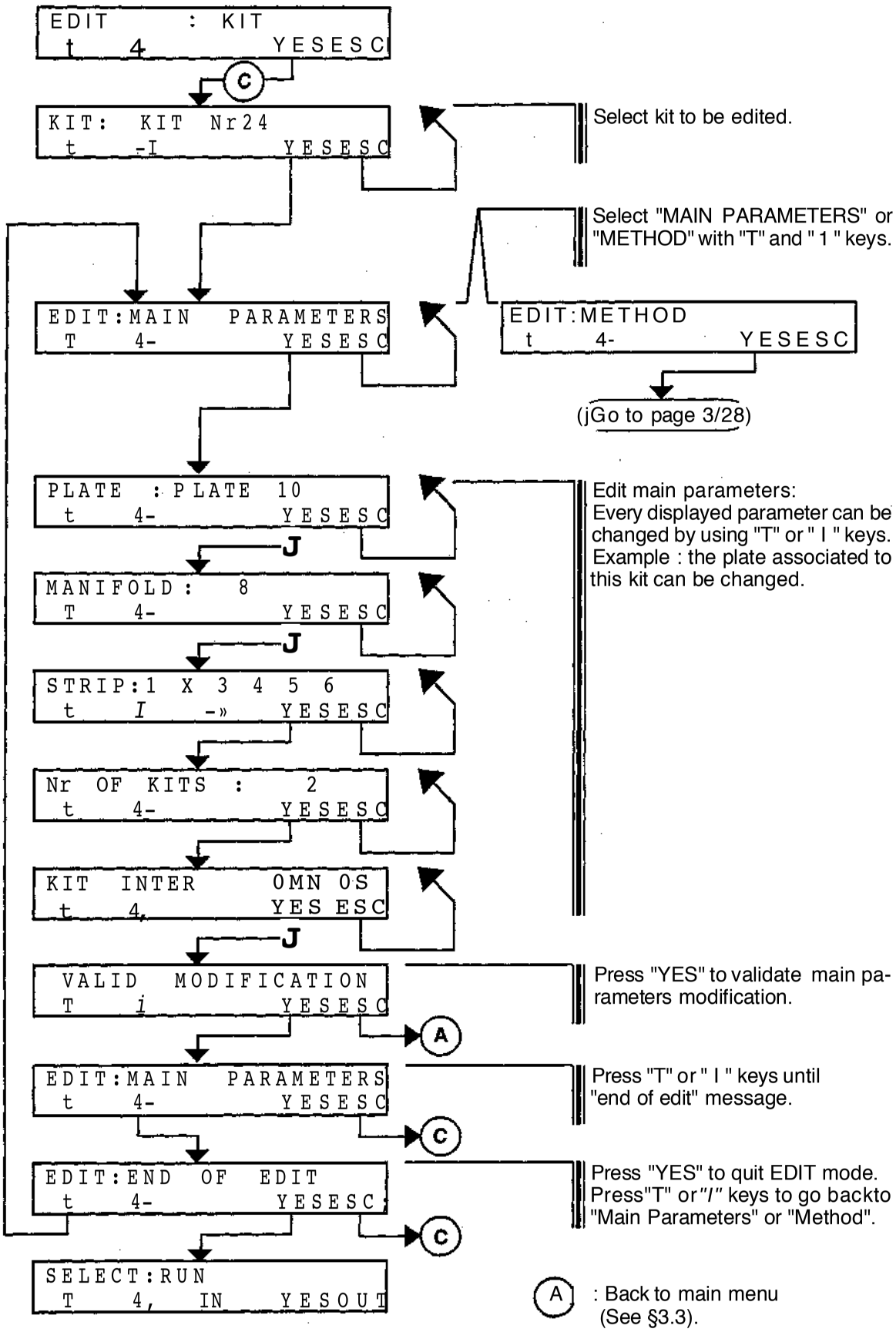
3.7.6.4 ERROR on PLATE deletion



3.7 PROGRAMMING (continued)

3.7.7 EDIT

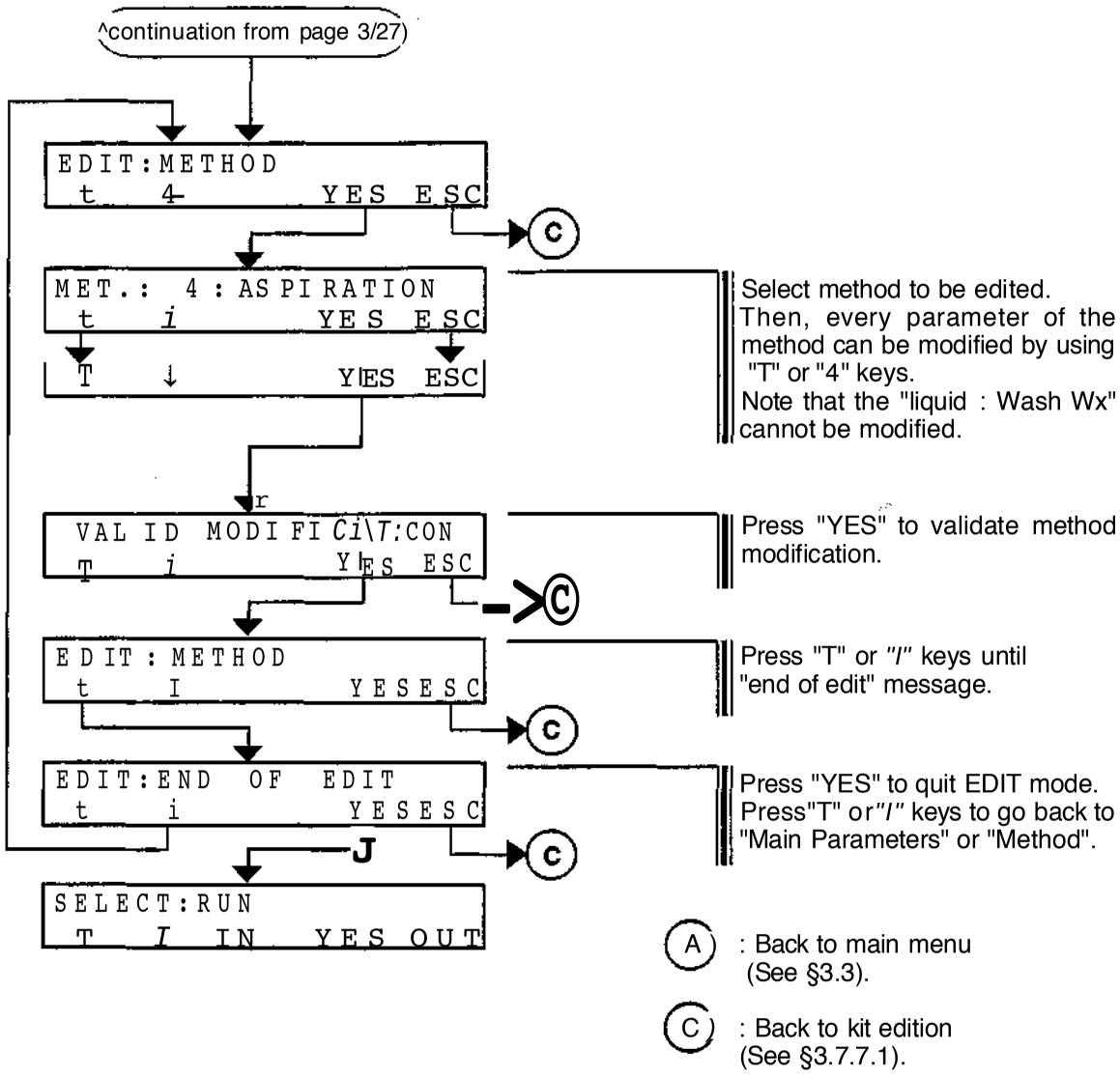
3.7.7.1 EDIT: KIT



3.7 PROGRAMMING (continued)

3.7.7 EDIT (continued)

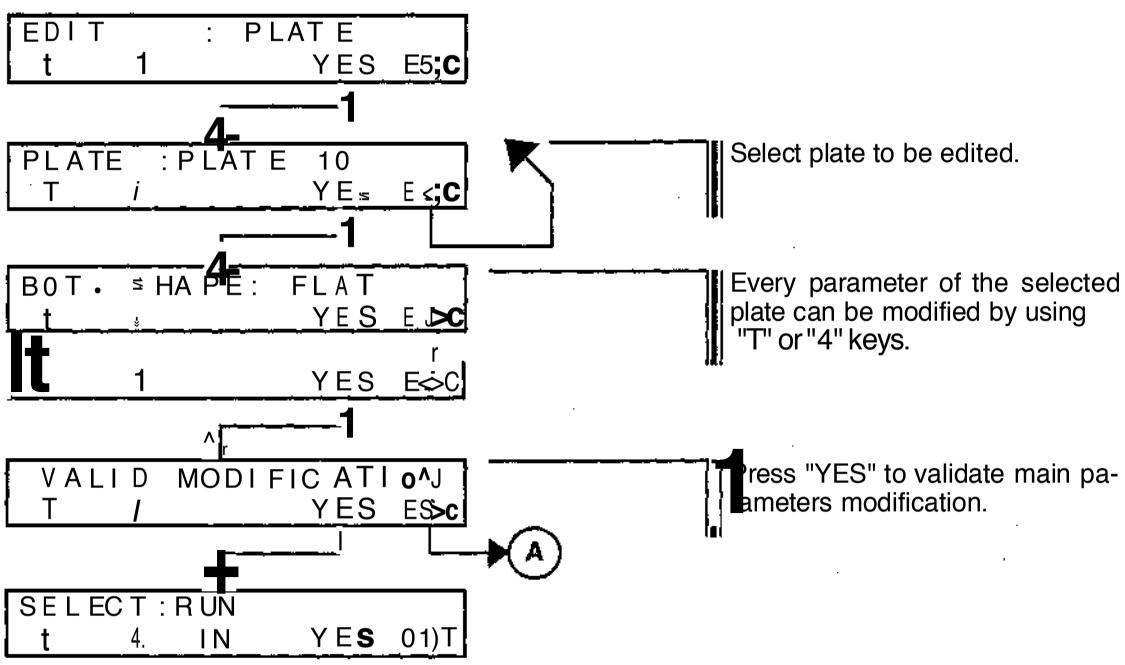
3.7.7.1 EDIT : KIT (continued)



3.7 PROGRAMMING (continued)

3.7.7 EDIT (continued)

3.7.7.2 EDIT PLATE

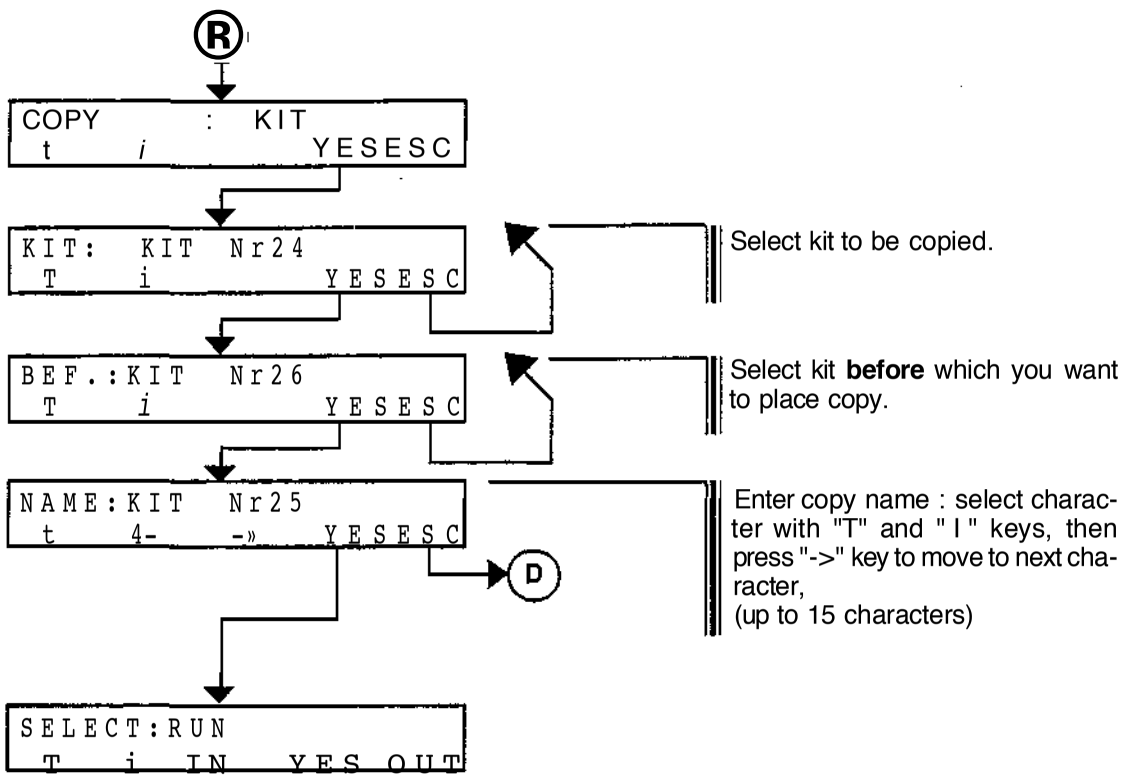


(A) : Back to main menu (See §3.3).

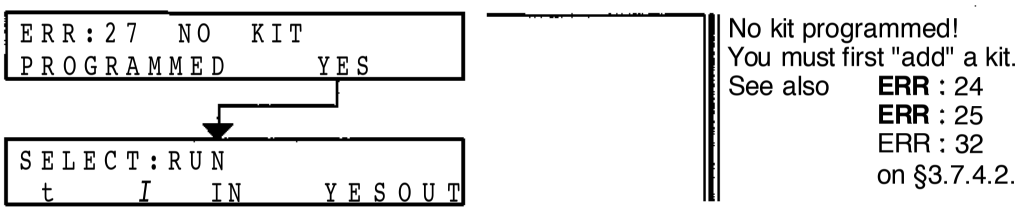
3.7 PROGRAMMING (continued)

3.7.8 COPY

3.7.8.1 COPY : KIT



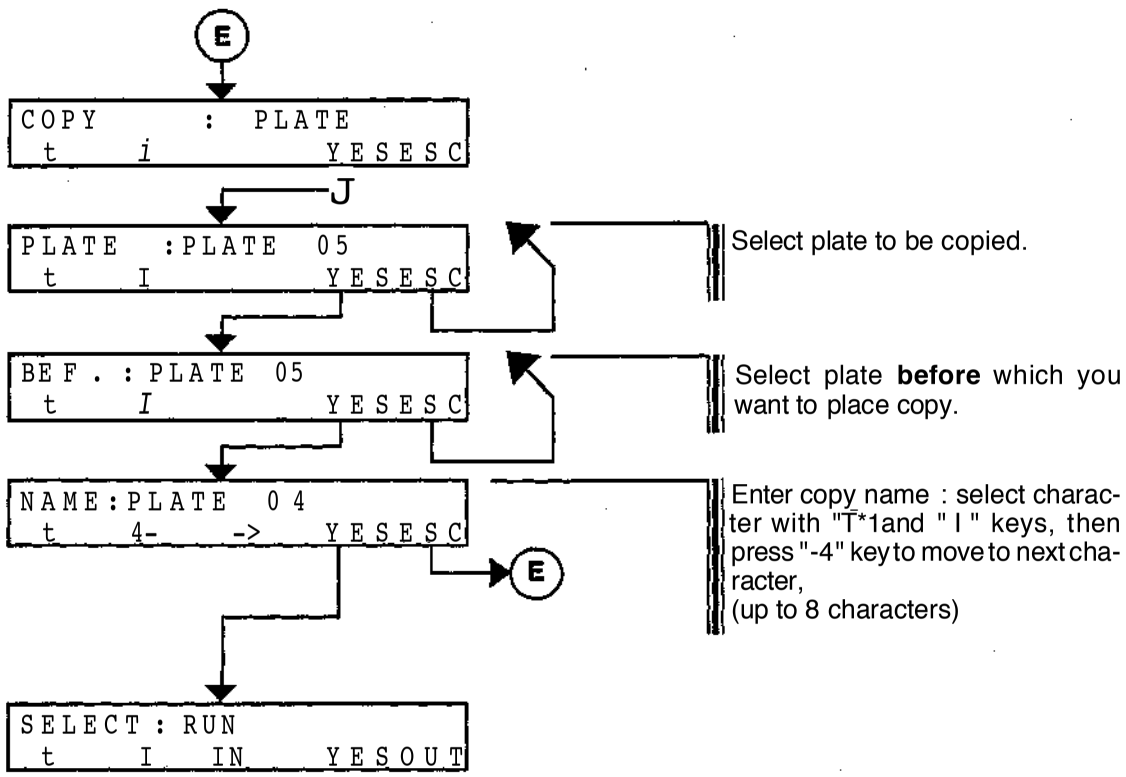
3.7.8.2 ERROR on KIT copy



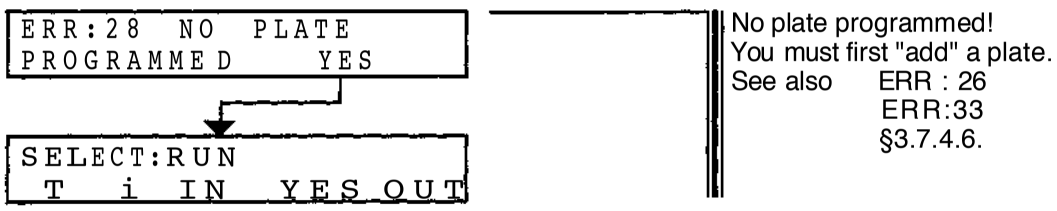
3.7 PROGRAMMING (continued)

3.7.8 COPY (continued)

3.7.8.3 COPY: PLATE



3.7.8.4 ERROR on PLATE copy

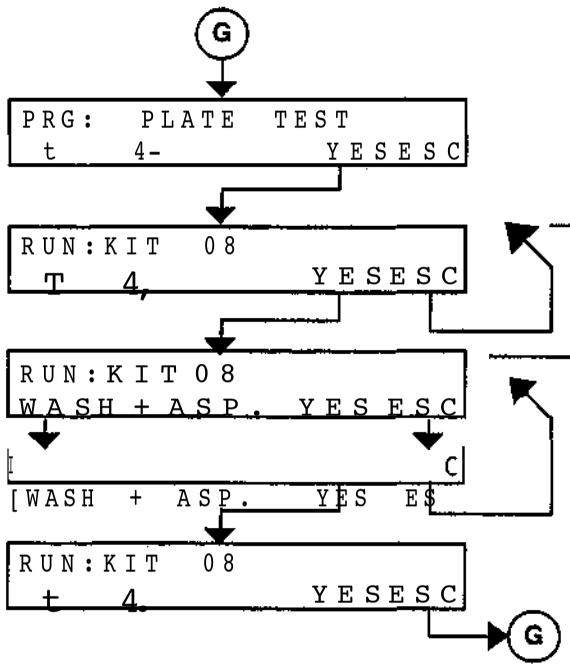


3.7 PROGRAMMING (continued)

3.7.9 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 positions (Aspiration horizontal position, Aspiration vertical position, Overflow position, etc..) in order to check if these positions are correct. If not correct, user must edit (see §3.7.7) the tested kit or its assigned plate in order to modify position parameter(s).



Use "T" or "/" keys to select kit to be tested.

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

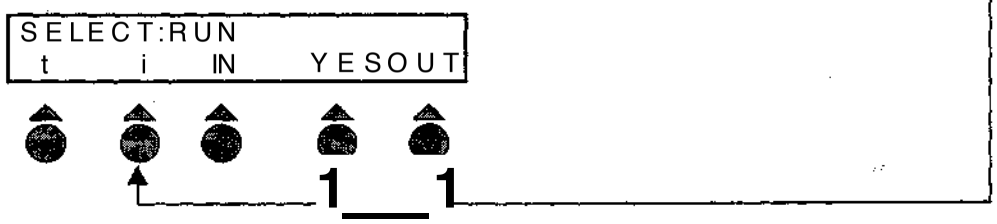
3.7 PROGRAMMING (continued)

3.7.10 RAM initialization

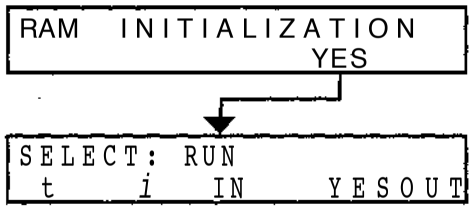
Every programmed kit and programmed plate are saved on a RAM (Random Access Memory).
The contents of this MEMORY can be erased by a "RAM initialization" thus deleting the whole set of kits and plates that have been programmed by the user.
Instrument software and DEMO kits and plates are not deleted as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

How to perform the **RAM initialization?**

• Turn the unit ON while keeping those keys pressed :



Following message is displayed :



Press "YES" to have the RAM reset.

4* MAINTENANCE & TROUBLESHOOTING

4.1 Routine maintenance Procedures

4.1.1 Daily Maintenance

Prior starting to wash :
It is recommended to pour an appropriate disinfection solution in the bottom of the WASTE bottle prior connecting it to the washer. Thus, the infected liquid coming from the washer and going into the WASTE bottle will be deactivated.
IMPORTANT: **Avoid bleach**
Fill the rinse bottle with deionized water. Connect it to the washer. Launch a Rinsing sequence and check that pinch valve tube and manifold are not clogged.
Otherwise, change pinch valve tube, clean manifold (see § 4.2.1 hereafter).

When washing is terminated :
Rinse the washer . Use only deionized water for rinsing. Turn the washer off. Tubes and manifold will be kept wet with water that will prevent them from clogging.
Empty WASH bottle, rinse it thoroughly with deionized water.

4.1.2 Washer storage conditions

The washer should never be stored with Wash solution inside dispensing tubes and manifold otherwise the liquid pump, the pinch valve tube and the manifold might be clamped if completely dry, thus preventing any further dispensing of liquid.
In this case priming must be made with the help of a syringe filled with deionized water connected at the Rinse input of the washer.

4.2 Cleaning and disinfection

4.2.1 Cleaning the manifold

The manifold is infectious.
Disinfect it prior any further cleaning.
See disinfection procedure on next § 4.2.2.

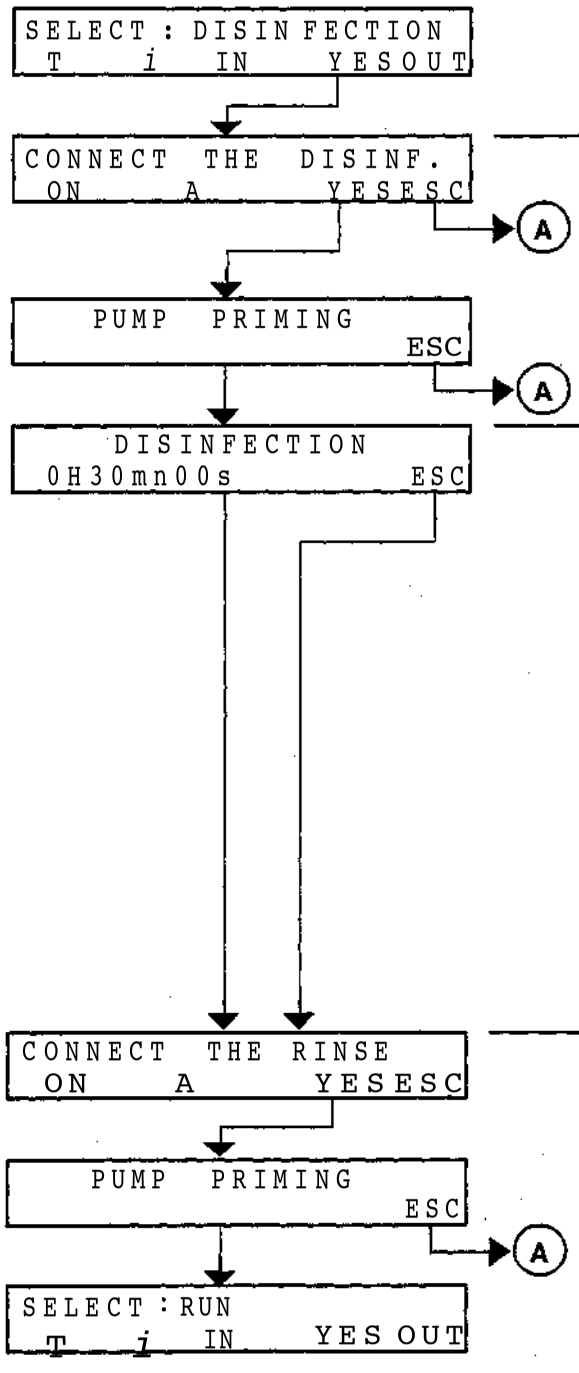
Aspirate needles and chamber
• Remove the manifold.
• Using a duster or a non scratching utensil, thoroughly clean the outside of the dispense and aspirate needles.
• Remove the silicon top seal of the manifold.
• Using the big pin supplied in maintenance kit, clean the big aspirating needles.
• Rinse 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 silicon top seal back in its place.

Dispense needle and chamber
• Push the silicon cap from the chamber of the manifold using a stem or a screwdriver entered from the opposite end of the cylindrical chamber.
• Using one of the small pin supplied in maintenance kit, clean the small dispense needle.
• Using the cylindrical brush supplied in maintenance kit, thoroughly clean the small dispense chamber. Thoroughly rinse dispense chamber with deionized water. Ensure that all impurities are removed from the manifold.
• Plug dispense chamber of the manifold with the silicon plug. Place it as close as possible to the first needle however without blocking it. Extra silicon caps are supplied in the maintenance kit.
• Remount the manifold, replace the tubing and reprime.

4.2 Cleaning and disinfection (continued)

4.2.2 Disinfection

The disinfection program applies to internal surfaces of tubing, connectors, manifold and manifold needles.



Use disinfection solution approved by your laboratory. Connect the tube(s) on rinse bottle cap. Fill RINSE bottle with the disinfection solution.
Ensure the plate carrier is not removed,
Then press "YES".

Pumps are stopped whereas dispensing circuits are filled with disinfection solution.
A countdown of 30 mn is started after which you are prompted to perform a RINSE operation.

IMPORTANT
The final RINSING sequence must be performed in all cases *after the disinfection procedure has been started (even for demonstration purpose).*
The software uses this final rinsing sequence to set the "Rinse" liquid at all the 4 inputs.
The automatic rinsing will not be possible (ERR 18) if rinsing is not done after disinfection.

Remove disinfection solution and fill RINSE bottle with deionized water (DiH2O)
Then press "YES"

Then, prior launching a wash protocol, assign the correct Wash solution to the wash input(s) in the CONFIGURATION menu or by priming the circuit with the PRIMING/RINSING menu.

(A) : Back to main menu

IMPORTANT:

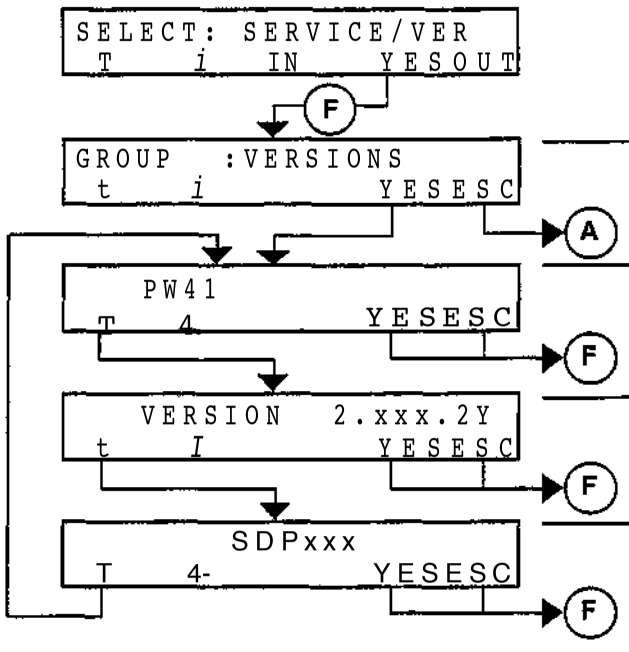
• Avoid bleach for disinfecting the washer as a thorough rinsing of the tubes will not prevent traces of bleach to remain inside tubing and manifold. This can be enough to corrupt reagents of next washing.

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

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

4.3 Troubleshooting

4.3.1 Hardware and software version



"T" and " I " keys are deactivated on this prompt.

Hardware version.

Software version of the washer.

Default User Data version
- Kit list and
- Plate list

programmed in factory and saved on EPROM.
(Default user data are not deleted by a RAM initialization).

Ⓡ : Back to main menu (See §3.3).

Appendix

Accessories and spare part list

Part Number	Designation
82386	PW4X/LP35 WASTE BOTTLE 2L W/O CAP
82387	PW4X/LP35 COMPLETE WASTE BOTTLE 2L
82388	PW4X/LP35 WASTE 2L RUBBER CAP+TUBE
87042	PW4x COMPLETE WASH BOTTLE
87049	PW4x RINSE 2L SCREW CAP+TUBE
87053	PW4x WASH BOTTLE WITHOUT CAP
87054	PW40 WASH 2L SCREW CAP+TUBE
87058	PW4x RINSE BOTTLE WITHOUT CAP
87059	PW4x COMPLETE RINSE BOTTLE
87063	PW41 COMPLETE WASTE BOTTLE+DETECTOR
87086	PW41 SCREW CAP WASH BOTTLE+LEVEL DETECTION
87087	PW41 COMPLETE WASH BOTTLE+TUBE+LEVEL DETECTION
87088	PW41 COMPLETE WASTE BOTTLE 8L+LEVEL DETECTION
87067	PW41 WASTE 2L RUBBER CAP+LONG TUBE
87040	PW4x 12 CHANNEL MANIFOLD
87041	PW4x 8 CHANNEL MANIFOLD
87045	PW4x MANIFOLD CONNECTOR
87046	PW4x MANIFOLD CONNECTOR RINGS
87051	PW4x RUBBER SEAL FOR MANIFOLD
87055	PW41 2x12 CHANNEL MANIFOLD
87056	PW41 2x8 CHANNEL MANIFOLD
87057	PW41 3x8 CHANNEL MANIFOLD
87085	PW41 MANIFOLD CONNECTOR VACUUM SENSING
85509	PW40/LP35 COMPLETE TRAP VIAL
87082	PW40/LP35 TRAP VIAL CAP+TUBE
87083	PW40/LP35 TRAP VIAL WITHOUT CAP
87782	PW41 MOTOR SELECTOR TUBING SET
87094	PW4x/LP35 WASTE TUBING RED & YELLOW
87043	PW4x DISPENSING TUBE BLUE
87044	PW4x EXTERNAL TUBING SET
87047	PW4x PINCH VALVE TUBE
87060	PW4x DISPENSING TUBE RINSE TRANSPARENT
87061	PW41 DISPENSING TUBE WASH2 WHITE
87062	PW41 DISPENSING TUBE WASH3 GREEN
87064	PW41 4 WAY VALVE TUBE
87090	PW41 LINK TUBE 4WAY VALVE/UNIT
87091	PW41 SET TUBE MULTI WASH SELECTOR
87048	PW4x REMOVABLE uPLATE CARRIER
87081	PW4x HOLDER BOTTLE ON TOP WASHER
87089	PW41 HOLDER 2L.BOTTLES BESIDE WASHER
87004	PW41 FUSE 2-5AT 5X20 250V
85274	PW4X/LP35 HYDROPHOBIC FILTER 1liM
87092	PW41 RS232 CORD
87052	PW40 STANDARD MAINTENANCE KIT
87093	PW MAINTENANCE KIT
87050	PW USER MANUAL F/E

	Kit name NAME NAME	PLATE	MANIFOLD	strip omtted STRIP	METHOD		MODE		Crosswise Aspiration CROSW. ASP	Aspiration time ASP. TIME	Dispensed volume VOLUME	Overflow position OVERFLOW	Selected liquid LIQUID	Flow compensation FLOW	Bottom Wash Number BOT.WASH NUMBER	Bottom Wash Time BOTTOM TIME	Bottom Aspiration Nbr BOT. ASP. NUMBER	SHAKE TIME	Nr OF CYCLES	SOAKING	Method Interval MET. INTER.	Nr OF KITS	Kit Interval KIT INTER
*	T01 N1 500uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	500µL	2,5	W1	0	---	---	1	---	1	0s	---	1	---
*	T01 N1 800uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	1	0s	---	1	---
*	T01 N1 800uL C	Curved02	8	---	W+a		Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	1	0s	---	1	---
*	T01 N2 500uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	1	0s	---	1	---
*	T01 N2 800uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	1	0s	---	1	---
*	T01 N2 S2 500uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	500µL	2,5	W1	0	---	---	1	---	2	0s	---	1	---
*	T01 N2 S2 800uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	2	2mn	2mn	1	---
*	T01 N2 S3 800uL	Flat 01	8	---	W	a	Plate	Plate	No	0,8s	800µL	2,5	W1	0	---	---	1	---	2	2mn	2mn	1	---
*	T01 N2 800uL C	Curved02	8	---	W+a		Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	2	0s	0s	1	---
*	T01 N3 800uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	3	0s	---	1	---
*	T01 N3 1000uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	1000µL	2,5	W1	0	---	---	1	---	3	0s	0s	1	---
*	T01 N3 800uL O	Curved02	8	---	W+a		Plate	Plate	Yes	0,3s	---	---	W1	0	---	---	1	---	3	0s	---	1	---
*	T01 N4 800uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	4	0s	---	1	---
*	T01 N4 1000uL	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	1000µL	2,5	W1	0	---	---	1	---	4	0s	0s	1	---
*	T01 N4 800uL O	Curved02	8	---	W+a		Plate	Plate	Yes	0,3s	---	---	W1	0	---	---	1	---	4	0s	---	1	---
*	T01 N5 800µL	Flat 01	8	---	W	a	Plate	Plate	Yes	0,3s	---	---	W1	0	---	---	1	---	5	0s	---	1	---
*	T01 N5 S10s 800	Flat 01	8	---	W	a	Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	5	10s	10s	1	---
*	T01 N5 800µL C	Curved02	8	---	W+a		Plate	Plate	No	0,3s	800µL	2,5	W1	0	---	---	1	---	5	0s	---	1	---
*	T01 N6 500uL	Flat 01	8	---	W	a	Plate	Plate	Yes	0,3s	500µL	2,5	W1	0	---	---	1	---	6	0s	0s	1	---

	Kit name NAME / NAME	PLATE	MANIFOLD	strip omtted / STRIP	METHOD	MODE	Crosswise Aspiration / CROSW. ASP	Aspiration time / ASP. TIME	Dispensed volume / VOLUME	Overflow position / OVERFLOW	Selected liquid / LIQUID	Flow compensation / FLOW	Bottom Wash Number / BOT.WASH NUMBER	Bottom Wash Time / BOTTOM TIME	Bottom Aspiration Nbr / BOT. ASP. NUMBER	SHAKE TIME	Nr. OF CYCLES	SOAKING	Method Interval / MET. INTER.	Nr OF KITS	Kit Interval / KIT INTER
•	T01 N6 800µL	Flat 01	8	---	W	Plate	No	0,3s	800µL	2,5	W1	0	---	---	---	---	6	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T02 N3B1,0s 800	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	2	1,0s	---	---	3	0s	0s	1	---
					a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		
•	T02 N5B0,5s 800	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	2	0,4s	---	---	5	0s	0s	1	---
					a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		
	T03 N3 800µL	Flat 01	8	---	w+a	Strip	Yes	0,5s	800µL	2,5	W1	0	1	0,4s	1	---	3	0s	---	1	---
	T04 N3 800µL	Flat 01	8	---	w+A	Strip	Yes	0,5s	800µL	2,5	W1	0	2	0,4s	---	---	3	0s	---	1	---
	T05 N3 800µL	Flat 01	8	---	w+a	Strip	Yes	0,5s	800µL	2,5	W1	0	2	0,4s	1	---	3	0s	---	1	---
	T06 N3 800µL	Flat 01	8	---	W	Strip	Yes	0,5s	800µL	2,5	W1	0	---	---	---	---	3	0s	---	1	---
	T07 N5 800µL	Flat 01	8	---	W+a	Strip	Yes	0,5s	800µL	2,5	W1	0	---	---	1	---	5	0s	---	1	---
•	T07 N5 S1s 800	Flat 01	8	---	W+a	Strip	Yes	0,5s	800µL	2,5	W1	0	---	---	1	---	5	1s	---	1	---
•	T08 N3 800µL	Flat 01	8	---	W	Plate	No	0,5s	800µL	2,5	W1	0	---	---	---	---	3	0s	0s	1	---
					A	Plate	Yes	0,5s	---	---	---	---	---	---	---	---	1	---	---		
•	T08 N4 800µL	Flat 01	8	---	W	Plate	No	0,5s	800µL	2,5	W1	0	---	---	---	---	4	0s	---	1	---
					A	Plate	Yes	0,5s	---	---	---	---	---	---	---	---	1	---	---		
•	T09 N3 S40s 500	Flat 04	8	---	w+A	Plate	Yes	0,3s	500µL	2,7	W1	0	1	0,8s	--	---	3	40s	---	1	---
•	T09 N5 S40s 500	Flat 04	8	---	w+A	Plate	Yes	0,3s	500µL	2,7	W1	0	1	0,8s	--	---	5	40s	---	1	---
•	T10 N2 800µL	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	1	0,4s	---	---	2	0s	0s	1	---
					a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		
•	T10 N3 800µL	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	1	0,4s	---	---	3	0s	0s	1	---
					a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		
•	T10 N5 S10s 800	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	1	0,4s	---	---	5	10s	10s	1	---
					a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		
•	T10 N6 800µL	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	1	0,4s	---	---	6	0s	0s	1	---
					a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		

Kit name NAME NAME	PLATE	MANIFOLD	strip omtted STRIP	METHOD	MODE	Crosswise Aspiration CROSW. ASP	Aspiration time ASP. TIME	Dispensed volume VOLUME	Overflow position OVERFLOW	Selected liquid LIQUID	Flow compensation FLOW	Bottom Wash Number BOT.WASH NUMBER	Bottom Wash Time BOTTOM TIME	Bottom Aspiration Nbr BOT. ASP. NUMBER	SHAKE TIME	Nr OF CYCLES	SOAKING	Method Interval MET. INTER.	Nr OF KITS	Kit Interval KIT INTER
T11 N3 800µL	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	2	0,4s	---	---	3	0s	0s	1	---
				A	Plate	Yes	0,5s	---	---	---	---	---	---	---	---	1	---	---		
T12 N3 800µL	Flat 01	8	---	w	Plate	No	0,5s	800µL	2,5	W1	0	2	0,4s	---	---	3	0s	0s	1	---
				a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		
T13 N3 800µL	Flat 01	8	---	W	Plate	No	0,5s	800µL	2,5	W1	0	---	---	---	---	3	0s	---	1	---
T14 N3 800µL	Flat 01	8	---	W	Plate	No	0,5s	800µL	2,5	W1	0	---	---	---	---	3	0s	0s	1	---
				a	Plate	Yes	0,5s	---	---	---	---	---	---	1	---	1	---	---		
T15 N1 S1mn 800	Flat 01	8	---	W	Plate	No	0,5s	800µL	2,5	W1	0	---	---	---	---	1	---	1mn	1	---
				A	Plate	Yes	0,5s	---	---	---	---	---	---	---	---	1	---	---		
T16 N1 S1mn 800	[illegible] 01	8	---	w	Plate	No	0,3s	800µL	2,5	W1	0	1	0,4s	---	---	1	---	1mn	1	---
				A	Plate	Yes	0,3s	---	---	---	---	---	---	---	---	1	---	---		
T17 N1 S1mn 800	Flat 01	8	---	w	Plate	No	0,3s	800µL	2,5	W1	0	1	0,4s	---	---	1	---	1mn	1	---
				a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
T18 N1 S1mn 800	Flat 01	8	---	w	Plate	No	0,3s	800µL	2,5	W1	0	2	0,4s	---	---	1	---	1mn	1	---
				A	Plate	Yes	0,3s	---	---	---	---	---	---	---	---	1	---	---		
T19 N1 S1mn 800	Flat 01	8	---	w	Plate	No	0,3s	800µL	2,5	W1	0	2	0,4s	---	---	1	---	1mn	1	---
				a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
T20 N3 800	Fl.t 01	8	---	W	Plate	No	0,5s	800µL	2,5	W1	0	---	---	---	---	3	0s	---	1	---
• T21 N1 S1mn 800	Flat 01	8	- ^	W	Plate	No	0,3s	[illegible]	2,5	W1	0	---	---	---	---	1	---	1mn	.	---
				a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
QCKit	Flat 01	8	---	W	Plate	Yes	0,5s	50[illegible]	1,0	[illegible]	*	---	---	---	---	1	5s	0s	.	---
				Ag	---	---	---	---	---	---	---	---	---	---	---	1	5s	0s		
				A	Plate	Yes	0,5s	---	---	---	---	---	---	---	---	1	5s	---		

^	ro	8	4	01	en	7	00	to	1o	
Flat01	Cu[redacted]		Flat 04							Plate name NAME
Flat	Curved		Flat							Bottom shape BOT. SHAPE
1,4	i		1√i							Aspiration horizontal position ASP. HOR. POS.
0,3	0,3		0,5							Plate centering CENTERING
18 "oi	120		14,5							Aspiration vertical position ASP. VERT. POS.
9,5	9,5		9,5							Bottom aspiration vertical position BOT. VERT. POS.
to "oi	9,5		9,5							Bottom Wash vertical position B.W. VERT. POS.
ɑ	o)		a>							HORIZONTAL SPEED
8	8		8							VERTICAL SPEED
6	en		4							Aspiration downward speed ASP. DOWNW. SPEED
to	to		to							Dispensing upward speed DISP. UPW. SPEED
en	en		4							Bottom Wash downward speed BOT. DOWNW. SPEED
to	to		8							Bottom Wash upward speed BOT. UPWARD SPEED
1	1		1							SHAKING AMPLITUDE
to	to		to							SHAKING SPEED

Plate sheet

DATE : JU/09/96
St-OddS ', NOISIA3U

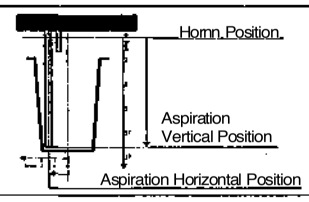
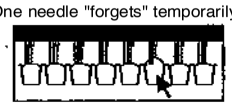
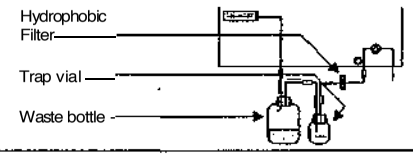
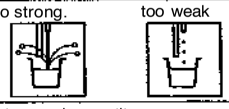
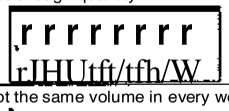
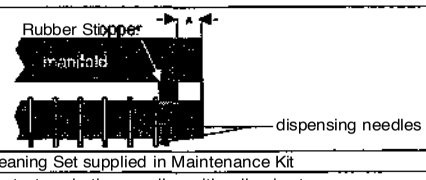
	Kit name NAME NAME	PLATE	MANIFOLD	strip omtted STRIP	METHOD	MODE	Crosswise Aspiration CR0SW. ASP	Aspiration time ASP. TIME	Dispensed volume VOLUME	Overflow position OVERFLOW	Selected liquid LIQUID	Flow compensation FLOW	Bottom Wash Number BOT.WASH NUMBER	Bottom Wash Time BOTTOM TIME	Bottom Aspiration Nbr BOT. ASP. NUMBER	SHAKE TIME	Nr OF CYCLES	SOAKING	Method Interval MET. INTER.	Nr OF KITS	Kit Interval KIT INTER
•	T01 N1 500uL	Flat 01	16	---	W	Plate	No	0,8s	500µL	2,5	W1	5	---	---	---	---	1	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N1 800uL	Flat 01	16	---	W	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	1	0s	0s	1	---
					a	Plate	Yes	0,8s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N1 800uL α	Curved02	16	---	W+a	Plate	No	0,8s	800µL	2,5	W1	5	---	---	1	---	1	0s	---	1	---
•	T01 N2 500uL	Flat 01	16	---	W	Plate	No	0,3s	5 o L	Z5	W1	5	---	---	---	---	2	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N2 800uL	Flat 01	16	---	W	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	2	0s	0s	1	---
					a	Plate	Yes	0,8s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N2 S2 500uL	Flat 01	16	---	W	Plate	No	0,3s	500µL	2,5	W1	5	---	---	---	---	2	2mn	2mn	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N2 S2 800uL	Flat 01	16	---	W	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	2	2mn	2mn	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N2 S3 800uL	Flat 01	16	---	W	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	2	3mn	3mn	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N2 800uL C	Curved02	16	---	W+a	Plate	No	0,3s	800µL	2,5	W1	5	---	---	1	---	2	0s	---	1	---
•	T01 N3 800uL	Flat 01	16	---	W	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	3	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N3 1000uL	Flat 01	16	---	W	Plate	No	0,[illegible]	1000µL	2,5	W1	5	---	---	---	---	3	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N3 800uL O	O [illegible]02	16	---	W+a	Plate	No	0,3s	800µL	2,5	W1	5	---	---	1	---	3	0s	---	1	---
•	T01 N4 800uL	Flat 01	16	---	W	Plate	No	0,8s	800µL	2,5	W1	5	---	---	---	---	4	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N4 1000uL	Flat 01	16	---	W	Plate	No	0,3s	1000µL	2,5	W1	5	---	---	---	---	4	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N4 800uL o	Curved02	16	---	W+a	Plate	No	0,3s	800µL	2,5	W1	5	---	---	1	---	4	0s	---	1	---
•	T01 N5 800µL	Flat 01	16	---	W	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	5	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N5 S10s 800	Flat 01	16	---	W	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	5	10s	10s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		
•	T01 N5 800µL C	Curved02	16	---	W+a	Plate	No	0,8s	800µL	2,5	W1	5	---	---	1	---	5	0s	---	1	---
•	T01 N6 500µL	Flat 01	16	---	W	Plate	No	0,3s	500µL	2,5	W1	5	---	---	---	---	6	0s	0s	1	---
					a	Plate	Yes	0,3s	---	---	---	---	---	---	1	---	1	---	---		

	Kit name NAME NAME	PLATE	MANIFOLD	strip omtted STRIP	METHOD	MODE	Crosswise Aspiration CROSW. ASP	Aspiration time ASP. TIME	Dispensed volume VOLUME	Overflow position OVERFLOW	Selected liquid LIQUID	Flow compensation FLOW	Bottom Wash Number BOT.WASH NUMBER	Bottom Wash Time BOTTOM TIME	Bottom Aspiration Nbr BOT. ASP. NUMBER	SHAKE TIME	Nr OF CYCLES	SOAKING	Method Interval MET. INTER.	Nr OF KITS	Kit Interval KIT INTER
*	T01 N8 800µL	Flat 01	16	---	W a	Plate	No	0,3s	800µL	---	W1	---	---	---	---	---	1	---	0s	1	---
*	T02 N3B1,0s 800	Flat 01	16	---	w a	Plate	Yes	0,5s	800µL	2,5	W1	5	2	1,0s	1	---	3	0s	---	---	---
*	T02 N5B0,5s 800	Flat 01	16	---	w a	Plate	No	0,5s	800µL	2,5	W1	5	2	0,4s	1	---	5	0s	---	---	---
	T03 N3 800µL	Flat 01	16	---	w+a	Strip	Yes	0,5s	800µL	2,5	W1	5	1	0,4s	1	---	3	0s	---	---	---
	T04 N3 800µL	Flat 01	16	---	w+A	Strip	Yes	0,5s	800µL	2,5	W1	5	2	0,4s	---	---	3	0s	---	---	---
	T05 N3 800µL	Flat 01	16	---	w+a	Strip	Yes	0,5s	800µL	2,5	W1	5	2	0,4s	1	---	3	0s	---	---	---
	T06 N3 800µL	Flat 01	16	---	W	Strip	Yes	0,5s	800µL	2,5	W1	5	---	---	---	---	3	0s	---	---	---
	T07 N5 800µL	Flat 01	16	---	W+a	Strip	Yes	0,5s	800µL	2,5	W1	5	---	---	1	---	5	1s	---	1	---
*	T07 N5 S1s 800	Flat 01	16	---	W+a	Strip	Yes	0,5s	800µL	2,5	W1	5	---	---	1	---	5	0s	---	---	---
*	T08 N3 800µL	Flat 01	16	---	W A	Plate	No	0,5s	800µL	2,5	W1	5	---	---	---	---	3	0s	---	1	---
*	T08 N4 800µL	Flat 01	16	---	W A	Plate	No	0,5s	800µL	2,5	W1	5	---	---	---	---	4	0s	---	---	---
*	T09 N3 S40s 500	Flat 04	16	---	w+A	Plate	Yes	0,3s	500µL	2,7	W1	5	---	---	---	---	3	40s	---	1	---
*	T09 N5 S40s 500	Flat 04	16	---	w+A	Plate	Yes	0,3s	500µL	2,7	W1	5	---	---	---	---	5	40s	---	1	---
*	T10 N2 800µL	Flat 01	16	---	w a	Plate	No	0,5s	800µL	2,5	W1	5	1	0,4s	1	---	2	0s	---	1	---
*	T10 N3 800µL	Flat 01	16	---	w a	Plate	No	0,5s	800µL	2,5	W1	5	1	0,4s	---	---	3	0s	---	---	---
*	T10 N5 S10s 800	Flat 01	16	---	w a	Plate	No	0,5s	800µL	2,5	W1	5	1	0,4s	1	---	5	10s	---	1	---
*	T10 N6 800µL	Flat 01	16	---	w a	Plate	No	0,5s	800µL	2,5	W1	5	1	0,4s	1	---	6	0s	---	---	---

	Kit name NAME	PLATE	MANIFOLD	strip omtted STRIP	METHOD	MODE	Crosswise Aspiration CROSW. ASP	Aspiration time ASP. TIME	Dispensed volume VOLUME	Overflow position OVERFLOW	Selected liquid LIQUID	Flow compensation FLOW	Bottom Wash Number BOT.WASH NUMBER	Bottom Wash Time BOTTOM TIME	Bottom Aspiration Nbr BOT. ASP. NUMBER	SHAKE TIME	Nr OF CYCLES	SOAKING	Method Interval MET. INTER.	Nr OF KITS	Kit interval KIT INTER
	T11 N3 800µL	Flat 01	16	---	w A	w Plate Plate	No Yes	0,5s 0,5s	800µL ---	2,5 ---	W1 ---	5 ---	2 ---	0,4s ---	--- ---	--- ---	3 1	0s ---	0s ---	1	---
	T12 N3 800µL	Flat 01	16	---	w a	w Plate Plate	No Yes	0,5s 0,5s	800µL ---	2,5 ---	W1 ---	5 ---	2 ---	0,4s ---	--- ---	--- ---	3 1	0s ---	0s ---	1	---
	T13 N3 800µL	Flat 01	16	---	W	Plate	No	0,5s	800µL	2,5	W1	5	---	---	---	---	3	0s	---	1	---
	T14 N3 800µL	Flat 01	16	---	W 8	Plate Plate	Yes	0,5s 0,5s	800µL ---	2,5 ---	S1 ---	5 ---	--- ---	--- ---	--- ---	--- ---	3 8	0s 8	8 ---	1 ---	--- ---
	T15 N1 S1mn 800	Flat 01	16	---	*	Plate	No	0,5s	800µL	2,5	S1	5	---	---	---	---	1	0s	0s	1	---
	T16 N1 S1mn 800	Flat 01	16	---	S	Plate	No	0,3s	800µL	2,5	W1	5	---	---	---	---	1	0s	0s	1	---
	T17 N1 S1mn 800	Flat 01	16	---	S	Plate	No	0,3s	800µL	2,5	S1	5	---	---	---	---	1	0s	0s	1	---
	T18N1 S1mn800	Flat 01	16	---	w	Plate	No	0,3s	800µL	2,5	S1	5	---	---	---	---	1	0s	0s	1	---
	T19N1 S1mn800	Flat 01	16	---	S	Plate	No	0,3s	800µL	2,5	S1	5	---	---	---	---	1	0s	0s	1	---
	T20 N3 800	Flat 01	16	---	W	Plate	No	0,5s	800µL	2,5	W1	5	---	---	---	---	1	0s	0s	1	---
•	T21 N1 Simn800	Flat 01	16	---	S a	Plate Plate	No Yes	0,3s 0,3s	800µL ---	2,5 ---	W1 ---	5 ---	--- ---	--- ---	--- ---	--- ---	3 1	0s ---	0s ---	1	---
	QCKit	Flat 01	18	---	§	Plate	Yes	0,5s	500µL	1,0	S1	*	---	---	---	10s	1	0s	8	1	---

10											
9											
8											
7											
6											
5											
4						Flat 04					Plate name NAME
3						Flat					Bottom shape BOT. SHAPE
2						1≥		—	1		Aspiration horizontal position ASP. HOR. POS.
1						0,5		0e	0,3		Plate centering CENTERING
						14,5		12,0	13,5		Aspiration vertical position ASP. VERT. POS.
						9,5		9,5	9,5		Bottom aspiration vertical position BOT. VERT. POS.
						9,5		9,5	9,5		Bottom Wash vertical position B.W. VERT. POS.
						9		cn	cn		HORIZONTAL SPEED
						CO		CD	00		VERTICAL SPEED
						·u		cn	cn		Aspiration downward speed ASP. DOWNW. SPEED
						to		to	to		Dispensing upward speed DISP. UPW. SPEED
						4		.	0)		Bottom Wash downward speed BOT. DOWNW. SPEED
						to		9	to		Bottom Wash upward speed BOT. UPWARD SPEED
						1		1	1		SHAKING AMPUTUDE
						to		to	to		SHAKING SPEED

DATE: 31/05/96
REVISION: 03

Bad washing condition	Factor generating risks	How to restore good washing conditions?	Comments
Inadequate aspiration		Adjust Aspiration Parameters	
Too much residual volume in the wells 	- **Aspiration Vertical Position** not set correctly	ASPiration VERTical Position must be touching bottom of well to avoid aspirating needles blocked by foam (*)	Plate parameter 
	- **Aspiration Horizontal Position** not set correctly	ASPiration HORizontal POSition must be as close as possible to well's wall. Use CROSswise ASPiration Compensate possible horizontal offset with CENTERING parameter	Plate parameter Kit parameter Plate parameter
	- **Aspiration Downward Speed** not set correctly	Reduce ASPiration DOWNward SPEED	Plate parameter
One needle "forgets" temporarily to aspirate 	- **High concentration of wetting agent in wash buffer**: needle might be blocked by foam	Respect dilution factor. Never use higher wetting agent concentration than required.	
	- **Waste bottle** is full	Check waste bottle, ensure no foam goes on the yellow tube. Empty Waste Bottle prior starting to Wash	
	- **Hydrophobic Filter** is clogged	Change Hydrophobic Filter Possibly install a trap vial	
	Contact your application specialist for advice		
Inadequate dispensing		Adjust Dispensing Parameters	
too strong. too weak 	- **Flow Rate** is not set correctly	Adjust FLOW rate compensation between -5 (weak) and +5 (strong)	Kit parameter
not enough quantity 	- **Volume** is not set correctly	Adjust VOLUME between 50 to 3000 µL by step of 50 (iL Always dispense slightly more than the awaited volume in the well and aspirate the volume in excess by setting the OVERFLOW position (see below)	Kit parameter
not the same volume in every well 	- **One or several dispensing needles must be cleaned**	Always ensure dispensing needles are clean Use metallic cleaning pin supplied in maintenance kit	
	- **Overflow position** not set correctly	Adjust OVERFLOW position of the aspirating needle in order to aspirate the excess of dispensed VOLUME	Kit parameter
Often less volume in 1st strip than in the next ones. (Manifold dripping in rinsing tank when on standby before wash process) 	- **High concentration of wetting agent in wash buffer**	Respect dilution factor. Never use higher wetting agent concentration than required.	
	- **Rubber stopper in manifold dispensing chamber** not set correctly. This might create an excessive air bubble inside the dispensing chamber of manifold leading to dripping	**"A" dimension for Rubber Stopper [mm]** Shape of rubber stopper: square / round Manifold channel 8: 23≤AS24 / 26≤A≤27 2*8: 0 / 0 3*8: 0 / 0 12: 5≤A≤6 / 8≤A≤9 2*12: 0 / 0	
	- **Manifold is dirty**	Clean manifold, rinse and dry it completely Spray silicone grease onto dispensing needles	Cleaning Set supplied in Maintenance Kit -Protect aspirating needles with adhesive tape -Spray silicone grease on dispensing needle; ensure all the outside surface of needle is treated. -Clean inside of dispensing needles with metallic pin supplied in maintenance kit.
	-**If still dripping:**	Activate **"MiniPrime"** and **'Secured Stop"** to compensate and minimize dripping	In Main menu, select "CONFIGURATION", available in firmware equal or more recent than 1.50.2Y for PW40 and 4.43.2Y for PW41
Manifold dripping during Wash process 	- **Pinch Valve Tube** is leaking	Change pinch Valve tube	spare supplied in Maintenance kit
	- **Manifold connector with O-rings** is leaking	Ensure O-rings are correctly seated in manifold connector If still leaking, change O-rings.	spare supplied in Maintenance kit
	Contact your application specialist for advice		

Appendix

Revision	Upgrade Description
October 1996	First official release of the user manual compatible for both PW40 and PW41 washers.
July 1997	Implementation of the new motorized multiwash selector Modified pages - page 1/6 § 1.6 LP41 Hydraulic circuit - page 3/9 § 3.6.2 Washer's Configuration Implementation of the selection between the new multiwash selector (MOTOR) and the old one (PINCH valve). Page 3/10 modified accordingly and page 3/11 created.
September 1997	Implementation of the new, internal design with integrated blocking device of the manifold. Modified pages - page 2/2 § 2. Installation
April 1998	Modified warning message for electrical shock hazard. Modified pages - page 5 Bottles are removed from top and placed beside the washer. Modified pages - page 1/1,1/2,1/4,1/5,1/7 § 1« Features and Specifications. - page 2/1 § 2.1 Unpacking. Tie blocking the manifold on the left side is replaced by adhesive tape (reason : the vertical guide is shorter.) Implemented in serial product in May 98. Modified pages - page 2/2 § 2. Installation.
July 1998	"WASH Wx" may appear as" WASH Rx" on display in several firmware versions. In the manual, the affected displays are marked with an "*" and the alternative message is displayed on a foot note. The text associated to the displays mention both "Wx" or "Rx" possibilities. Modified pages - page 3/3, 3/4 & 3/9 - page 3/11 (transfer of foot note "A: back to main menu" from page 3/9) § 3* Operating Instructions. Upgrade according to the configuration of the vacuum sensing (adjustable vacuum threshold). Modified page - page 3/10 § 3.6.2. Washer's configuration. Tie blocking the manifold on the left side is still used. Modified page - page 2/2 §2. Installation. Upgrade according to the new PW40 trap vial (Yellow tube is now transparent and orange tube is now yellow). Modified page -page 1/3 § 1 * Features and Specifications. Update of the accessories and spare part list. Modified page -page A/1 § Appendix.

Appendix

Index

Symbols

A

B

C

D

E

F

H

I

K

L

Index (continued)