

# ELECTROLAB



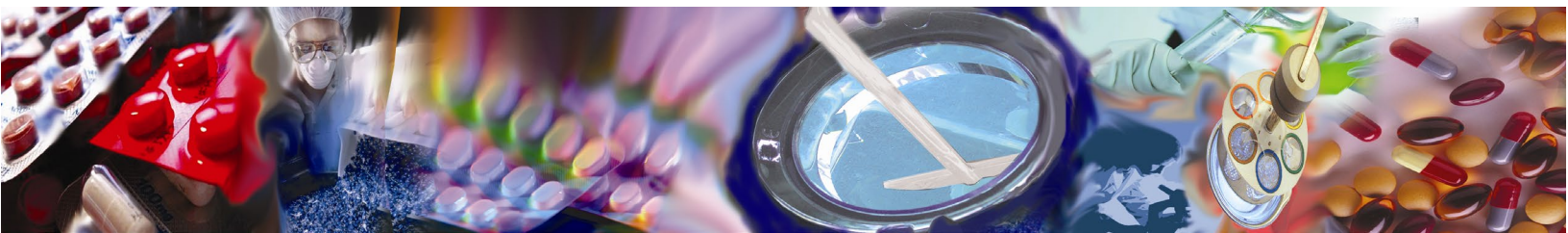
## RECIPROCATING DISSOLUTION TESTER

MODEL NO: **ERD-03 (USP-3)**  
**ERD-07 (USP-7)**

## OPERATIONAL MANUAL

**ELECTROLAB**

EL 23/24, T. T. C. Electronic Zone,  
M.I.D.C. Mahape, Navi Mumbai 400 710, India  
Tel : 91 - 22 - 4161 31 31  
Website: [www.electrolabgroup.com](http://www.electrolabgroup.com)



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# 1. PREFACE

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## **Purpose and Use**

The operational manual shows you the construction and operation of ERD-03 (USP3) and ERD-07 (USP7). The screen displays used in the manual are only for representational purpose and bears no resemblance of functioning of USP-3 and USP-7 apparatus in one unit.

Please read the instructions carefully, especially the precaution aspects. Always keep the operational manual close to the instrument. The manual should always be within reach so as to give assistance in answering any questions, which may arise.

## **All Rights Reserved**

The operating instructions may not be reproduced or duplicated, neither fully nor in part, in any form or by any means without first obtaining written permission from **ELECTROLAB**.

This manual was put together with the necessary care. However, errors and omissions cannot be completely excluded. **ELECTROLAB** reserves the right, in the course of further development of the product, to change technical data and specifications without prior notice.

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No liability is assumed for damage resulting from the disregard of information in this manual.

## 2. UNPACKING OF INSTRUMENT

This section gives the brief detail about the unpacking procedure of the instrument.

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*Complete the Following steps to safely unpack your apparatus and accessories.*

Step 1: Open each carton carefully and check the contents for any damages which may occur during shipping. But if it does, contact both the carrier who delivered the instrument and **ELECTROLAB** service engineer. Though claims for damage are filled with the carrier, we can help you file a claim and get the instrument in functioning as quickly as possible.

Step 2: Carefully open the instrument from its shipping carton.

Step 3: Remove all cushioning material and tape.

Step 4: Place the instrument on a clean, dry and steady level section of bench top with the drive unit's front panel facing you.

## 3. INTRODUCTION

This section gives the general information about the **ELECTROLAB** ERD-03 (USP 3) and ERD-07 (USP 7) instrument and its features.

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### About ERD-03 and ERD-07:

- The USP method 3 and 7 are the perfect R&D tools for tablets, granules, pellets and powders which require multiple media change in combination with test run duration of 999 hours max.
- With USP method 3 and 7, samples are loaded inside so the disintegrated particles remain inside when the test station moves from one row of vessels to the next row (from one kind of media to the next one). Due to this method of testing, up to 24 media changes can be performed automatically.
- Operation involves programming the drain hold time, dips hold time, dips rate in dpm. In ERD-03 (USP 3), on the up stroke, the bottom mesh in the inner tube moves upward to contact the product and on the down stroke the product leaves the mesh and floats freely within the inner tube. Thus the action produced carries the product being tested through a moving medium.
- The microcontroller based stepper motor drive ensures a precise stroke height of 100 mm for ERD-03 (USP 3) method and 20 mm for ERD-07 (USP 7) method & rate of dips per minute in range of 5 to 50 dpm which can be validated by tachometer.
- Twenty individual protocols can be programmed, stored, recalled for each test. 24 programmable sampling intervals can be set.

## Features:

- ERD-03 (USP 3) complies to current USP Apparatus 3 specifications  
ERD-07 (USP 7) complies to current USP Apparatus 7 specifications
- Ideal for extended release products or any dosage form requiring release profiling at multiple pH levels
- Select between multiple configurations of rows, vessels and vessel volume.
- Bath Alignment on only two pins.
- Touch screen with graphical display for user friendly operation
- Facilitates manual and auto sampling
- 20 programmable protocols with 24 sample intervals
- Dip rate ranges between 5 to 50 dpm with an accuracy of  $\pm 5\%$
- Programmable hold, drain time and programmable dip rate in each row
- The glass syringes eliminate adsorption and offers a high accuracy of dosing
- Online validation of dpm and temperature.
- Rugged clear acrylic water bath
- Dual level security with password
- PC & LAN Connectivity allows centralized printing, storing and sharing of data
- Retractable curtain to prevent media loss by evaporation
- Performs key operation like filtering, storing and replacing withdrawn samples with fresh media.
- No routine calibration or maintenance
- Supports 10ml and 25ml syringes
- The arm movement meets the automated sampling requirements of collection
- The 4-way motorized valve offers unprecedented system flexibility and the capability to deal with tricky media

## 4. INSTALLING THE INSTRUMENT

In this section the installation procedure of **ERD-03 (USP 3)** and **ERD-07 (USP 7)** is described in brief details.

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### Filling of bath:

- Pour water up to the marked water level bath, during this the water enters through outlet tube thereby priming the circulation pump and heater unit. (This is essential to avoid dry run of pump and heater unit.)
- Use ultra pure water when possible to minimize scale and mineral buildup, use algacide to inhibit mold & bacterial growth.
- Check all connections for leakage.

### Installation of media vessels along with tray:

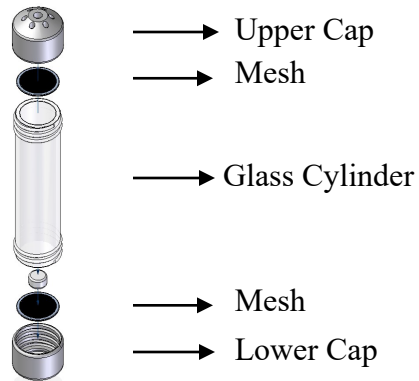
- The instrument consists of various configurations of rows (depending on vessel capacity) where vessel tray with different media change over can be performed automatically.

i.e. 2 Rows: 1000 ml vessel capacity  
6 Rows: 100ml / 300ml vessel capacity  
12 Rows: 50ml (only for ERD-07 USP 7)

- Fill vessel with respective media and insert vessels in the tray.
- With the help of tray holder place the trays on water bath as number marked on bath tray.  
**Note: Ensure that the tray holders are not lifted in upward direction when placed on the bath.**
- The media vessel needs to be installed immediately before starting the test.

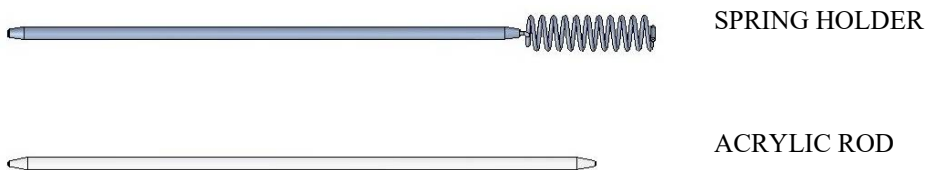
**Note: 1. Insert all filled vessels in the tray where test needs to be performed.**  
**2. If vessels are placed in position without media, they will float and damage drive mechanism.**  
**3. Place all vessel trays on bath even though test is not performed on that tray position.**

### **Assembly of reciprocating cylinder – ERD-03 (USP 3):**



- Insert mesh into the upper & lower cap.
- Tighten the lower cap to the glass cylinder & then place the test sample in the cylinder.
- Fix the upper cap to the cylinder.

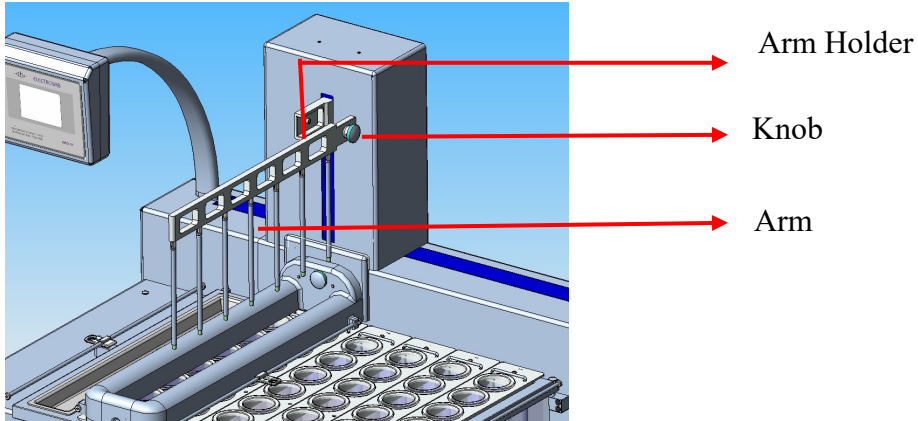
### **Assembly of reciprocating holder – ERD-07 (USP 7):**



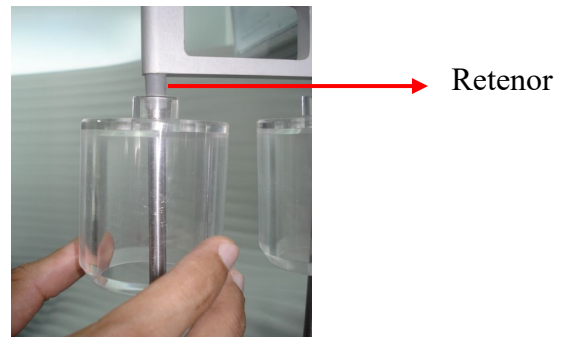
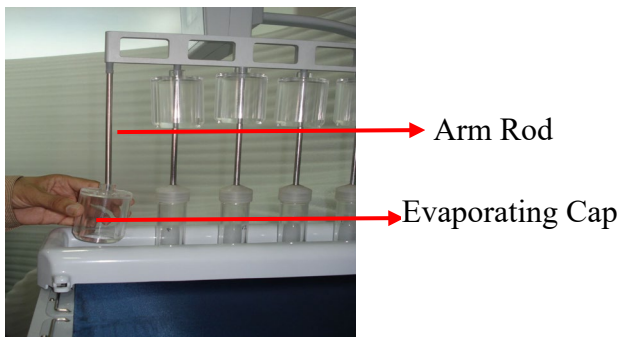


## Installation of Arm – ERD-03 (USP 3):

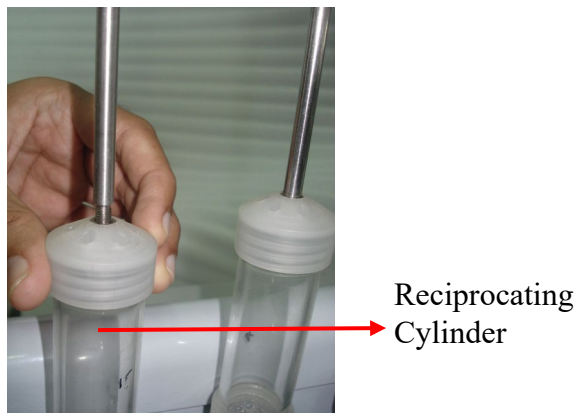
- Insert arm to arm holder and tighten it with the help of knob present on the arm by rotating it in clockwise direction.



- Insert evaporating cap in the arm rod, twist evaporating cap slightly to hold it on retenor.

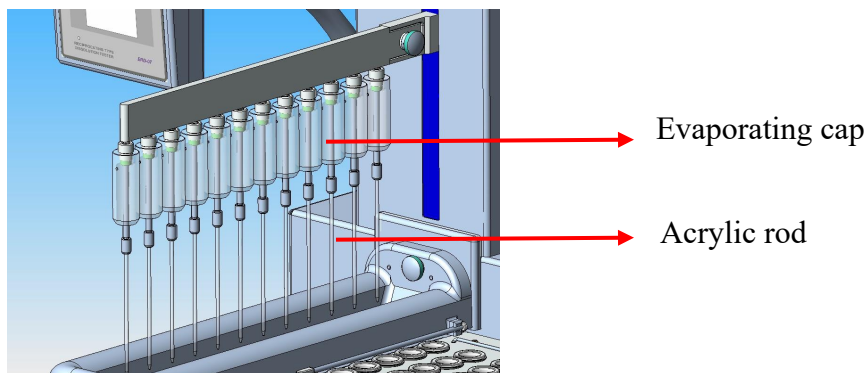
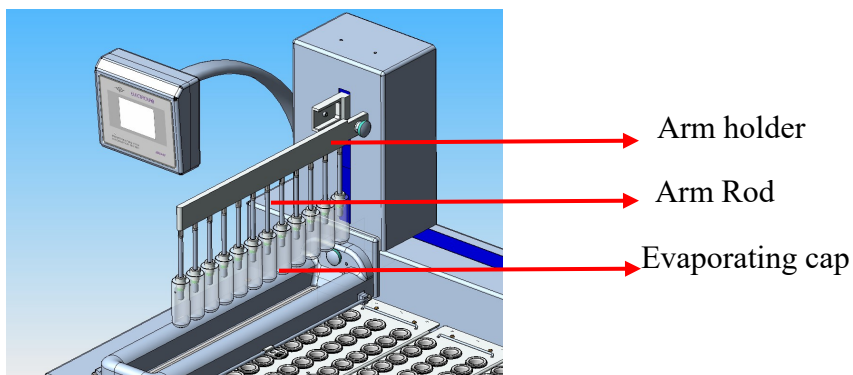


- Place assembled reciprocating cylinder with test sample placed in it at the end of arm rod & rotate it in anticlockwise direction to fully tighten it.

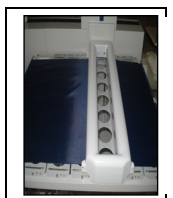


**Installation of Arm – ERD-07 (USP 7):**

- Insert arm to arm holder and tighten it with the help of knob present on the arm by rotating it in clockwise direction.
- Insert evaporating cap in the arm rod. Attach the acrylic rod/spring holder to the arm rod and tighten it.

**Covering with evaporation curtain:**

- After assembling the tray vessels and arm, cover the vessels with the evaporation curtain.



## 5. OPERATING THE INSTRUMENT

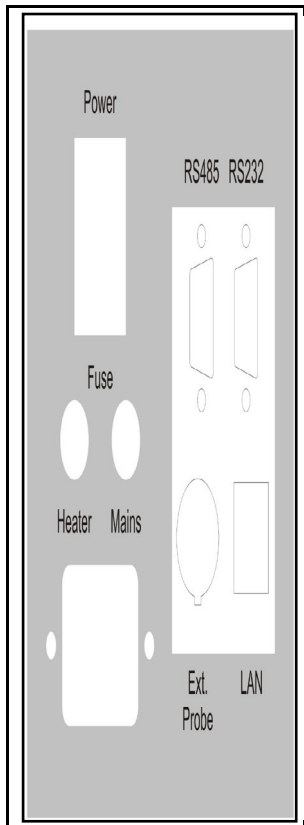
In this section operating procedure of **ERD-03 (USP 3)** and **ERD-07 (USP 7)** is described in brief details.

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### Front Panel Description:

- **ERD-03 (USP 3)** and **ERD-07 (USP 7)** are provided with touch screen graphical display.
- The 'Alt' tab in alphanumeric keypad is used for entering numeric digits.
- The red line indication on the tab indicates the keys are disabled.

### Rear Panel Description:



## System Operation:

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

- After the system set up is over, switch on the power.
- After Power On, the instrument would initialize itself; the welcome screen will flash for 3 seconds.
- Logo screen will be flashed & 'ARM MOVING HOME' indication screen will appear in case the arm is not initialized to home position i.e. parked above the bath & stopped above the waste tray.

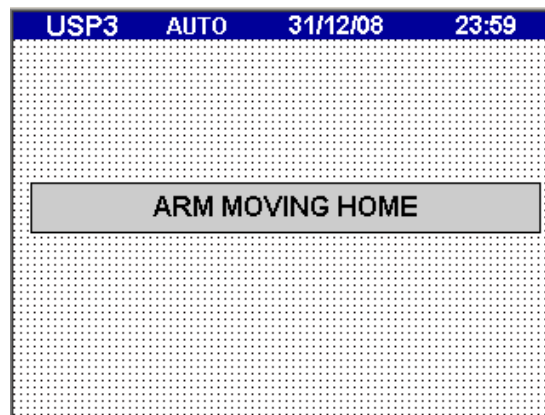
### DISPLAY



WELCOME SCREEN



LOGO SCREEN

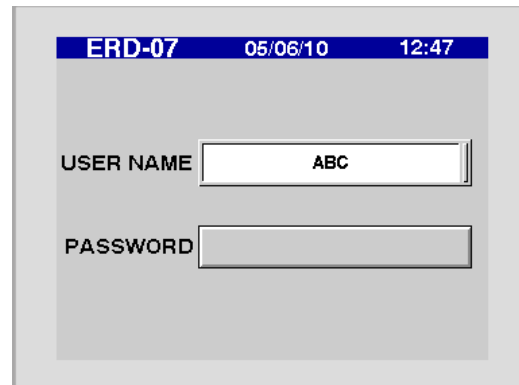


**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

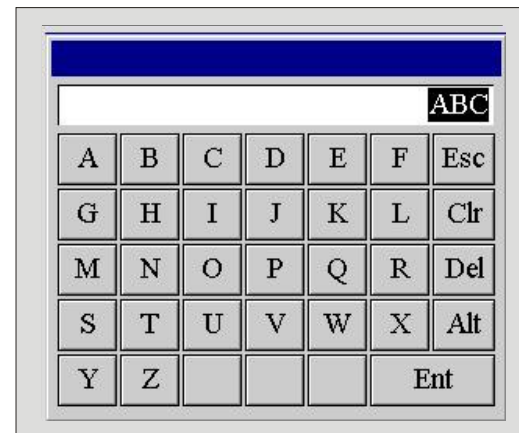
### OPERATION

- Once the arm initializes itself, if security is enabled Login screen will be displayed else Idle screen will be displayed. By default security is disabled.
- At first installation, login with  
Admin **username : ABC**  
**password : 123456**
- Press tab for username and enter username (alpha numeric entry)
- Press tab for password and enter the password (numeric entry). Password can be maximum of six numbers.
- If username or password is incorrect an **error screen** will be displayed

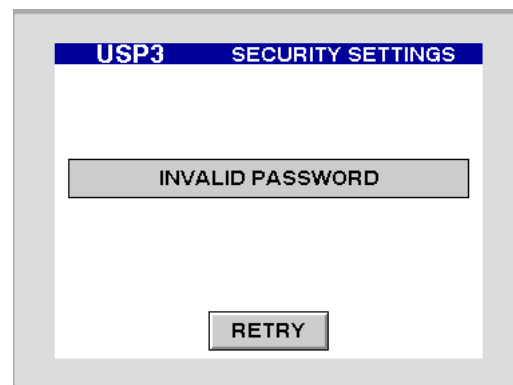
### DISPLAY



The login screen for ERD-07 displays the device name, date (05/06/10), and time (12:47) in a blue header bar. Below this, there are two input fields: 'USER NAME' with the text 'ABC' and 'PASSWORD' which is currently empty.



An on-screen numeric keypad is shown. It features a grid of buttons for letters A-Z, numbers 0-9, and function keys like Esc, Clr, Del, Alt, and Ent. The letter 'A' is highlighted, and the text 'ABC' is visible in the top right corner of the keypad area.



The error screen for USP3 displays 'SECURITY SETTINGS' in a blue header bar. The main content area shows the message 'INVALID PASSWORD' in a grey box. At the bottom, there is a 'RETRY' button.

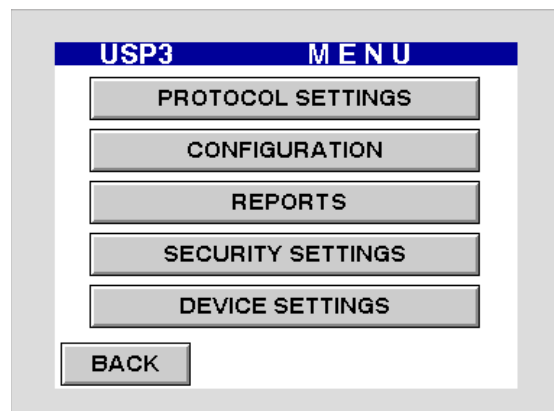
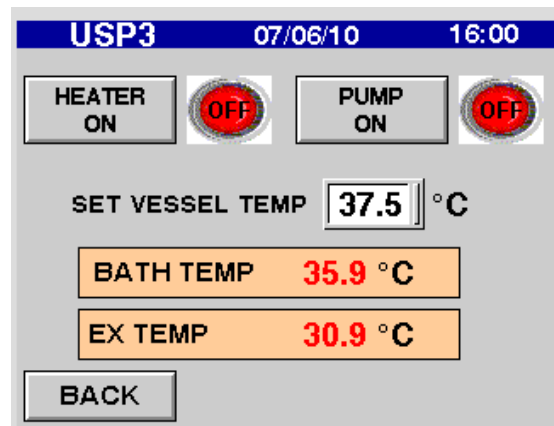
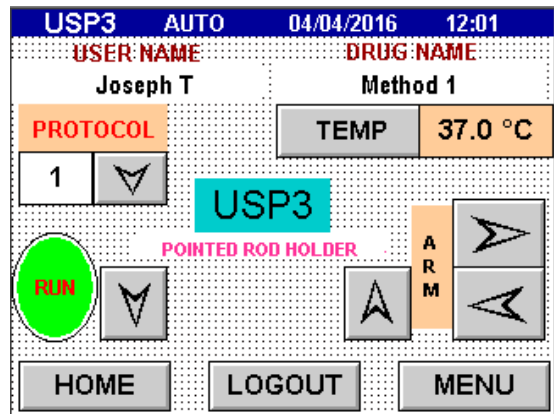
## PROTOCOL SETTING

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

- Once the user has logged in, an idle screen will be displayed. Idle screen displays the current status of the instrument.
- It will indicate Date, Time, Bath Temperature, and current Protocol number, etc.
- ENGAGE CAPS for automation purpose, to hold & release the vessel caps.  
When tray position is detected then Up & Down key will be appear in idle screen.
- In configuration if Auto mode is selected then ENGAGE CAPS key will be appeared on the screen & in Manual mode ENGAGE CAPS key will disappeared.
- Manual Temperature Control:**  
Press **TEMP** to enter manual temperature control.
- ARM MOTION:**  
Arm can be moved manually to Right or Left & Top or Bottom.  
To bring the arm back to home position press **HOME** tab.
- Press **RUN** to start the test
- Press **MENU** to enter device menu
- Press **BACK** to go back to Idle screen

### DISPLAY



**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

#### MENU <PROTOCOL SETTINGS>

- Press **Protocol Settings** in menu to view or edit protocols or monographs.
- Select 1 of 20 protocols by pressing numeric field of protocol no.
- The respective protocol details needs to be entered as mentioned below:

(1) Vessel Capacity -100ml, 300ml, 1000ml  
-50ml (Only for ERD 07 USP 7)

(2) Drug Name -16 character (alphanumeric)

**Note: For numeric characters press Alt key.**

(3) Vessel Temperature - 20.0°C to 40°C

### DISPLAY

The screenshot shows a menu interface with a blue header bar containing 'USP3' and 'MENU'. Below the header, there are five rectangular buttons stacked vertically: 'PROTOCOL SETTINGS', 'CONFIGURATION', 'REPORTS', 'SECURITY SETTINGS', and 'DEVICE SETTINGS'. At the bottom left of the menu area is a 'BACK' button.

The screenshot shows the 'USP3 PROTOCOL SETTINGS' screen. It has a blue header bar with 'USP3' and 'PROTOCOL SETTINGS'. The screen contains four input fields: 'PROTOCOL No.' with the value '3', 'VESSEL CAPACITY' with a dropdown menu showing '1000 ml', 'DRUG NAME' with the text 'XYZ', and 'VESSEL TEMP' with the value '35.0' and a unit indicator '°C'. At the bottom left is a 'BACK' button and at the bottom right is a 'NEXT' button.

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

- (4) Dip hold time - 0 to 9 mm(min): 0 to 59 sec(ss)
  - (5) Drain time(After sampling)- 0 to 9 mm(min): 0 to 59 sec(ss)
  - (6) Power fail – 1 to 40 mins
  - (7) Total Samples – 1 to 24
  - (8) Sample number- Press numeric field of sample number to edit the respective sample  
i.e. Sample time – 0 to 999 hrs: 0 to 59 mins  
Row No. – 1 to 6 (ERD 07 USP 3)  
1 to 9 (ERD 07 USP 7)  
Dip rate – 5 to 50 dips/min
- Press **EXIT** tab to exit from protocol settings and menu screen will be displayed.

### DISPLAY

USP3			PROTOCOL SETTINGS		
DIP HOLD TIME	0	:	10	MM : SS	
DRAIN TIME	0	:	10	MM : SS	
POWER FAIL	20			MIN	
MESH SIZE	0	/	40		
TOP / BOTTOM					
BACK		CANCEL		NEXT	

USP3			PROTOCOL SETTINGS		
SAMPLE NUMBER	1	TOTAL SAMPLES	6		
SAMPLE TIME	0	:	3	HH : MM	
ROW NUMBER	1			1 - 6	
DIP RATE	35			5 - 50	
BACK		CANCEL		NEXT	

USP3			PROTOCOL SETTINGS		
SAMPLE NUMBER	1	TOTAL SAMPLES	2		
SAMPLE TIME	0	:	2	HH : MM	
ROW NUMBER	2			1 - 6	
DIP RATE	25			5 - 50	
BACK		CANCEL		MEDIA DETAILS	



**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

- Press **MEDIA DETAILS** to edit the media name & volume for different rows.
- Press **SAVE** tab after editing the media details and menu screen will be displayed.
- Press **SAVE** tab, set parameters will be saved.
- Press **CANCEL**, set parameters will not be saved.
- Press **BACK**, previous screen will be displayed.
- In sampling info the details of the sample can be edited i.e. sample collect, Rinse volume.

**Note: Maximum total sample can be withdraw upto 30ml from each vessel.**

**Only admin has rights to edit protocol whereas users can view the set protocol.**

### DISPLAY

USP3 PROTOCOL SETTINGS		
ROW	MEDIA NAME	VOLUME
1	ABC	100
2	DEF	100
3	GHI	100
4	JKL	100

BACK CANCEL NEXT

USP3 PROTOCOL SETTINGS		
ROW	MEDIA NAME	VOLUME
5	MNO	100
6	PQR	100

BACK CANCEL NEXT

USP3	AUTO	31/12/08	23:59
SAMPLE COLLECT	10.0	ml	1 - 25
ALIQOT VOL	10.0	ml	1 - 25
RINSE VOL	3.0	ml	3 - 10
REPLENISHMENT	YES		

BACK CANCEL SAVE

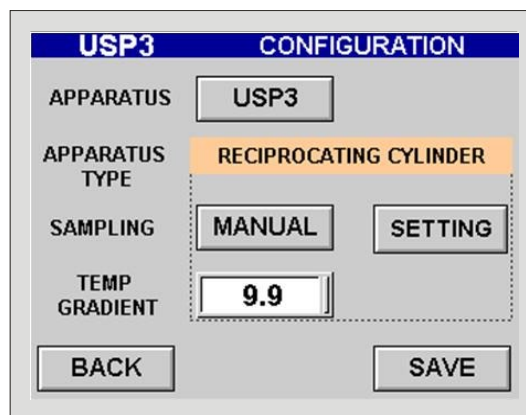
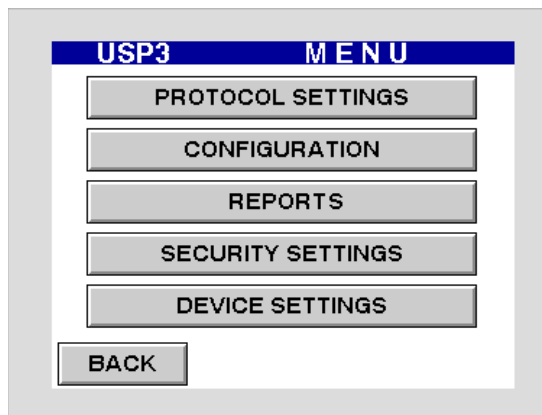
**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

## OPERATION

### MENU <CONFIGURATION>

- Press **CONFIGURATION** tab in menu screen to enter configuration menu.
- If user selected AUTO mode in configuration then sampling details screen visible in the protocol setting.
- User can set the sampling type either **MANUAL** or **AUTO** mode.  
If **AUTO** mode is selected then setting key will be enabled.

## DISPLAY



**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

- If setting key is pressed, User can see the Rinse method type, Pump type, Syringe Capacity, Syringe pump & Sample collector version number.
- User can set the sampling condition whether to take sample @ halt time or take sample @ run time.
- The temperature gradient can be set from 0.0 to 1.5
- Press **BACK** to go to previous screen & if **SAVE** tab is pressed menu screen will be displayed.

**Note: Only admin has rights to access configuration menu.**

### DISPLAY

The screenshot shows the 'USP7' configuration screen. At the top, it displays 'USP7', 'AUTO', the date '31/12/08', and the time '23:59'. Below this, there are two main columns of settings. The left column has buttons for 'SAMPLING CONDITION', 'RINSE METHOD', 'PUMP', 'SYRINGE CAPACITY', 'SP VERSION', and 'SC VERSION'. The right column shows the current settings: 'TAKE SMPL @ RUN' (with a dropdown arrow), 'RINSE BY PURGE', 'SYRINGE', '10 ml', '9999', and '9999'. At the bottom, there are 'BACK' and 'SAVE' buttons.

The screenshot shows the 'USP3 CONFIGURATION' screen. At the top, it displays 'USP3' and 'CONFIGURATION'. Below this, there is a numeric input field showing '0.5'. Above the field, it says '0.0 ~ 1.5'. Below the field is a numeric keypad with buttons for digits 1-9, 0, a decimal point, and function keys 'Esc', 'Clr', 'Del', and 'Ent'. To the right of the keypad is a 'SAVE' button.

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

## OPERATION

### **MENU <REPORTS>**

- The last test report can be printed.
- Print protocol key is used for to print the current protocol information.
- PRINT LAST TEST REPORT key is used for to print the last conducted test.

### **MENU <DEVICE SETTINGS>**

- Press **DEVICE SETTINGS** tab in menu screen.
- In Device settings user can edit Time & Date.
- Press **CLOCK SETTINGS** tab to set current date, time etc.
- User can set the communication type for printing, ETHERNET either RS 232.
- Select ETHERNET for LAN & RS 232 for Print / PC.
- Press **BACK** to go to previous screen & if **SAVE** tab is pressed menu screen will be displayed.

**Note:** Only admin can access device settings.

## DISPLAY

USP7 REPORTS

PRINT PROTOCOL 99

PRINT LAST TEST REPORT

BACK

USP7 DEVICE SETTINGS

TIME / DATE CLOCK SETTINGS

COMMUNICATION TYPE ETHERNET

ERD 37 VERSION 4.6

HMI VERSION 4.6

BACK

Set Time and Date

Current Time (hh:mm:ss): 13:13:10

Current Date (yy/mm/dd): 10/06/05

Current Day of Week: Sat

Hour: 13

Minute: 13

Second: 6

Year: 10

Month: 6

Day: 5

Day of Week: Sat

RTC Adjustment (sec./day): 0.00

Set

Set & Exit

Cancel

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07 (USP 7)**.

### OPERATION

- Press **SECURITY SETTINGS** tab from menu screen.
- The security screen will be displayed where user can change password, view/edit users or disable security.

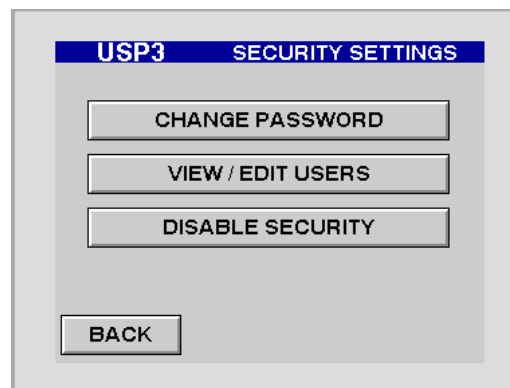
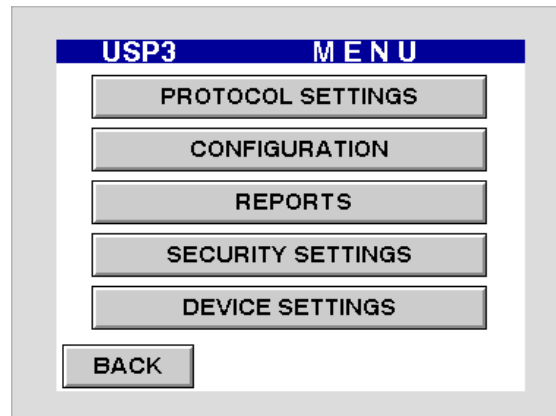
#### **MENU<SECURITY SETTINGS>[CHANGE PASSWORD]**

- Press alphanumeric field of old & new password to enter the admin or user password which needs to be edited.

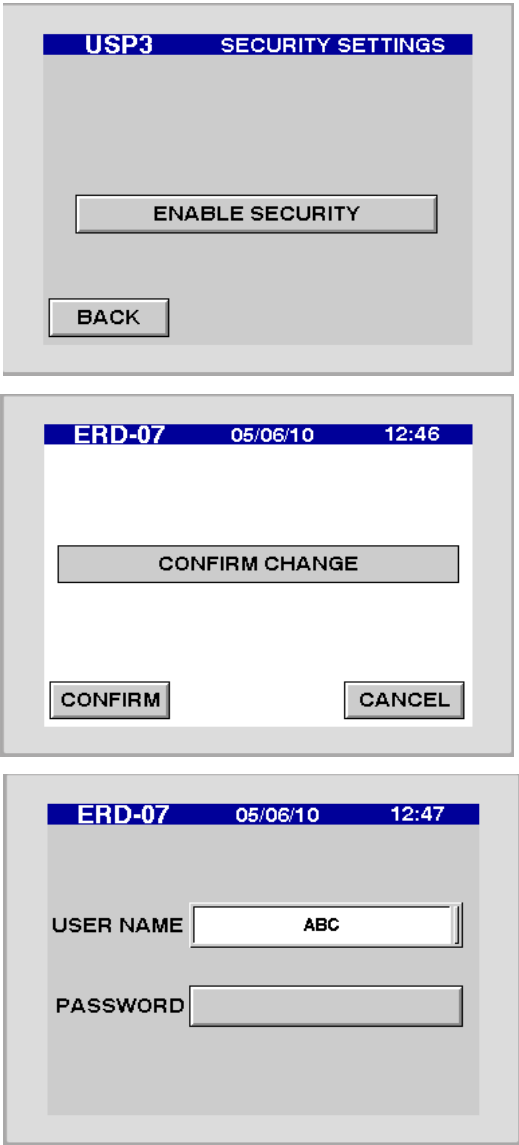
**Note: Only admin has rights to change his or her password and other user's password whereas user can change his or her respective passwords.**

- Press **SAVE** tab 'Password change successful' screen will be displayed & if **BACK** is pressed it will go back to the previous screen.

### DISPLAY



**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

<u><b>OPERATION</b></u>	<u><b>DISPLAY</b></u>
<p><b>MENU&lt;SECURITY SETTINGS&gt;</b></p> <ul style="list-style-type: none"> <li>• ERD-07 comes with an access and security to allow access to be controlled, all users must identify themselves. This is done by issuing user name and password.</li> <li>• ERD-07 has dual security settings i.e. Admin(0) &amp; users (8)</li> </ul> <p><b>MENU&lt;SECURITY SETTINGS&gt;[ENABLE SECURITY]</b></p> <ul style="list-style-type: none"> <li>• Press on <b>ENABLE SECURITY</b> tab, the confirmation screen will be displayed.</li> <li>• Press <b>CONFIRM</b> tab to confirm the change done or cancel.</li> <li>• Once security is enabled login screen with user name &amp; password will be displayed.</li> <li>• After login screen is displayed, idle screen will be displayed.</li> </ul>	 <p>The display section contains three screenshots of the ERD-07 security settings interface. The first screenshot shows the 'USP3 SECURITY SETTINGS' screen with a blue header bar containing 'USP3' and 'SECURITY SETTINGS'. Below the header is a large grey button labeled 'ENABLE SECURITY' and a smaller grey button labeled 'BACK'. The second screenshot shows the 'ERD-07 05/06/10 12:46' confirmation screen with a blue header bar containing 'ERD-07', '05/06/10', and '12:46'. Below the header is a large grey button labeled 'CONFIRM CHANGE', and at the bottom are two smaller grey buttons labeled 'CONFIRM' and 'CANCEL'. The third screenshot shows the 'ERD-07 05/06/10 12:47' login screen with a blue header bar containing 'ERD-07', '05/06/10', and '12:47'. Below the header are two input fields: 'USER NAME' with the text 'ABC' and 'PASSWORD'.</p>

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

<u><b>OPERATION</b></u>	<u><b>DISPLAY</b></u>
<p><b>MENU&lt;SECURITY SETTINGS&gt;[CHANGE PASSWORD]</b></p> <ul style="list-style-type: none"> <li>Press alphanumeric field of old &amp; new password to enter the admin or user password which needs to be edited.</li> </ul> <p><b>Note: Only admin has rights to change his or her password and other user's password whereas user can change his or her respective passwords.</b></p> <ul style="list-style-type: none"> <li>Press <b>SAVE</b> tab 'Password change successful' screen will be displayed &amp; if <b>BACK</b> is pressed it will go back to the previous screen.</li> </ul>	<div data-bbox="865 409 1421 821"> <p><b>USP3      MENU</b></p> <p>PROTOCOL SETTINGS</p> <p>CONFIGURATION</p> <p>REPORTS</p> <p>SECURITY SETTINGS</p> <p>DEVICE SETTINGS</p> <p>BACK</p> </div> <div data-bbox="865 840 1375 1222"> <p><b>USP3      SECURITY SETTINGS</b></p> <p>CHANGE PASSWORD</p> <p>VIEW / EDIT USERS</p> <p>DISABLE SECURITY</p> <p>BACK</p> </div> <div data-bbox="865 1241 1375 1554"> <p><b>USP3      SECURITY SETTINGS</b></p> <p>OLD PASSWORD <input type="text"/></p> <p>NEW PASSWORD <input type="text"/></p> <p>CONFIRM PASSWORD <input type="text"/></p> <p>BACK      SAVE</p> </div> <div data-bbox="865 1593 1375 1976"> <p><b>USP3      SECURITY SETTINGS</b></p> <p>PASSWORD CHANGE SUCCESSFUL</p> <p>CLOSE</p> </div>

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07 (USP 7)**.

### OPERATION

**MENU<SECURITY SETTINGS>[View/Edit User]**

- Press numeric field of user number from 1 to 8 whose user name needs to be edited.
- After selection of user no. view or edit user name.
- After entering password of respective user, press **SAVE** tab the confirmation screen will be displayed.
- Press **CONFIRM** to confirm the change done or **CANCEL**.

**Note: Only admin has rights to view or edit users.**

### DISPLAY

The screenshot shows a screen titled "USP3 SECURITY SETTINGS". It contains three input fields: "USER NUMBER" with the value "0", "USER NAME" with the value "ABC", and "PASSWORD" which is empty. At the bottom, there are two buttons: "BACK" and "SAVE".

The screenshot shows a screen titled "USP3 SECURITY SETTINGS". It features a numeric keypad with buttons for digits 1-9, 0, and function keys "Esc", "Clr", "Del", and "Ent". Above the keypad is a small display showing "0 ~ 8". To the right of the keypad are three empty input fields. At the bottom right, there is a "SAVE" button.

The screenshot shows a screen titled "ERD-07" with a date/time header "05/06/10 13:08". In the center, there is a box containing the text "CONFIRM CHANGE". At the bottom, there are two buttons: "CONFIRM" and "CANCEL".



**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

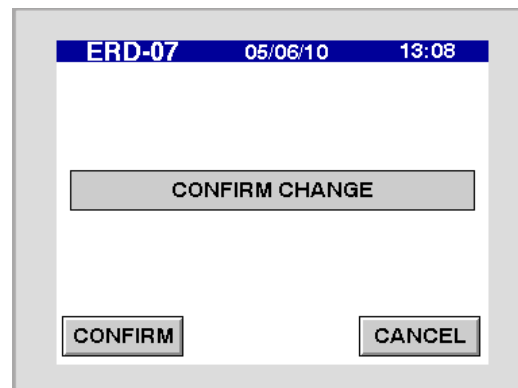
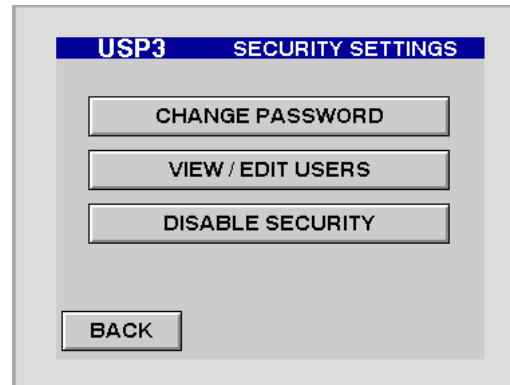
### OPERATION

#### **MENU <SECURITY SETTINGS>[DISABLE SECURITY]**

- Press **DISABLE SECURITY** to allow all users to access the instrument without login.
- Confirmation screen will be displayed.
- Press **CONFIRM** to confirm the change done or **CANCEL**.

**Note: Only admin has rights to disable security**

### DISPLAY



## RUN CYCLE FOR MANUAL MODE

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

- Press **RUN** on Idle screen after loading the set protocol.
- The run screen will be displayed, with an indication 'Waiting to achieve bath temperature'.
- Once bath temperature is achieved to set temperature then **START** key is enabled.

**NOTE: Instrument must be turned ON/OFF before every test.**

### DISPLAY

USP3 AUTO 31/12/08 23:59

USER NAME: USER1 DRUG NAME: ABCDEF

PROTOCOL: 1

TEMP: 37.0 °C

USP3

RECIPROCATING CYLINDER

A R M

HOME LOGOUT MENU

USP3 05/06/10 11:07

HEATER ON PUMP ON

BATH TEMP 36.4 °C

SET VESSEL TEMP 37.0 °C

WAITING TO ACHIVE BATH TEMPERATURE

CANCEL START VIEW PROTOCOL

USP3 07/06/10 15:57

HEATER OFF PUMP ON

BATH TEMP 36.6 °C

SET VESSEL TEMP 36.1 °C

INSTRUMENT READY FOR TEST  
LOAD APPARATUS WITH SAMPLE

CANCEL START VIEW PROTOCOL

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

### OPERATION

- Run screen will be displayed with detailed information about Bath temperature, Elapsed drain time, Indication about next sample & Total elapsed time.
- The indication displays 'Please wait arm moving' after completion of sample as arm moves to another tray for next sampling.

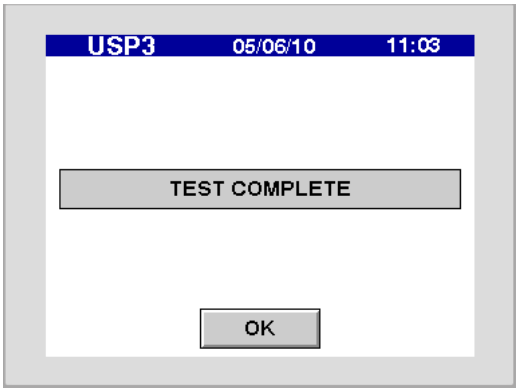
### DISPLAY

USP3		AUTO		04/04/2016		12:01	
SAMPLE 1 / 6							
EX TEMP 37.1 °C				BATH TEMP 37.0 °C			
ELAPSED DRAIN TIME						0 : 5	
STOP				VIEW PROTOCOL			

USP3		AUTO		04/04/2016		12:01	
EX TEMP 37.1 °C				BATH TEMP 37.1 °C			
DIP RATE 10				SAMPLE 1 / 4			
NEXT SAMPLE AFTER						0 : 0 : 50	
TOTAL ELAPSED TIME						0 : 1 : 10	
STOP				ROW 1		VIEW PROTOCOL	

USP3		05/06/10		10:57	
PLEASE WAIT ARM MOVING					
STOP					

**\*Note:** The screen will display **USP 7** instead of **USP 3** for **ERD 07(USP 7)**.

<u><b>OPERATION</b></u>	<u><b>DISPLAY</b></u>
<ul style="list-style-type: none"><li>After test over ‘Test Complete’ indication screen will be displayed.</li></ul>	

## RUN CYCLE FOR AUTOMATION MODE

**\*Note:** The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).

### OPERATION

#### IDLE SCREEN <RUN>[RUN TEST]

- Press **RUN** on Idle screen after loading the set protocol.
- The run screen will be displayed, with 3 cycle stage RUN TEST, VALIDATION CYCLE & CLEANING CYCLE.  
Press **CANCEL** to go back to the previous screen.
- A.R. Number & Batch Number will be displayed after pressing the **RUN TEST** key.
- Using Enter key, A.R. Number & Batch Number can be added upto 10 digit.
- Press **SAVE** to begin test & press **CANCEL** to go back to the previous screen.

### DISPLAY

USP3		AUTO		31/12/08		23:59	
USER NAME				DRUG NAME			
USER1				ABCDEF			
PROTOCOL		TEMP		37.0 °C			
1				USP3			
RECIPROCATING CYLINDER		A R M					
HOME		LOGOUT		MENU			

USP3		AUTO		31/12/08		23:59	
RUN TEST							
VALIDATION CYCLE							
CLEANING CYCLE							
CANCEL							

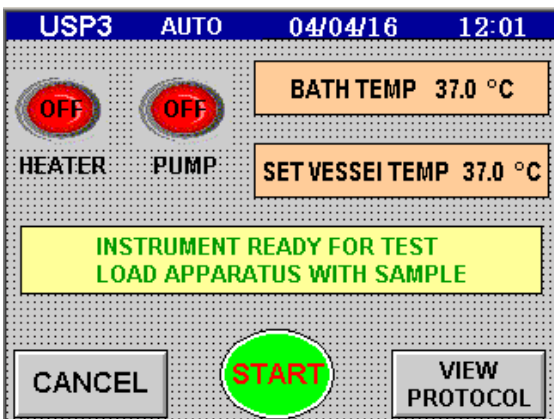
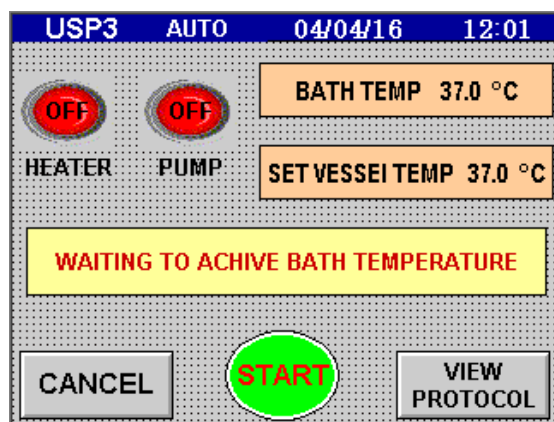
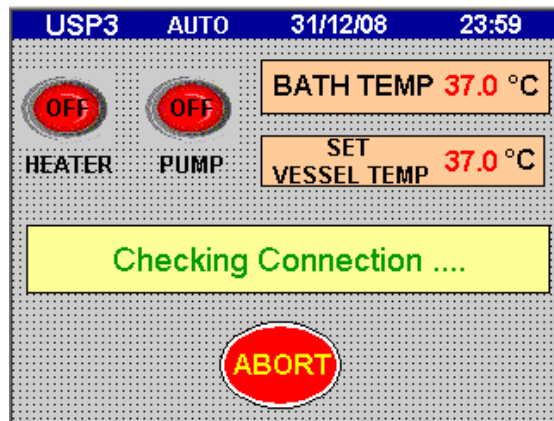
USP3		AUTO		31/12/08		23:59	
A. R. NUMBER		AAAAAAAAAA					
BATCH NUMBER		AAAAAAAAAA					
Press 'SAVE' to begin test Press 'CANCEL' to exit							
CANCEL				SAVE			

**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

- If **RUN TEST** key is pressed the RUN screen will be displayed with an indication “**Checking Connection**”.
- If connection is OK & still some problem in syringe pump or in sample collector then relevant error message will be displayed on run screen.
- If checking connection having some problem or any error message on the run screen then **START** key is disabled.
- After 30 seconds idle screen will be appeared on the HMI.
- If connection is OK with no error message then the run screen will be displayed with an indication, “**WAITING TO ACHIEVE BATH TEMPERATURE**”.
- Once bath temperature is achieved to set temperature then **START** key will be enabled.

### DISPLAY

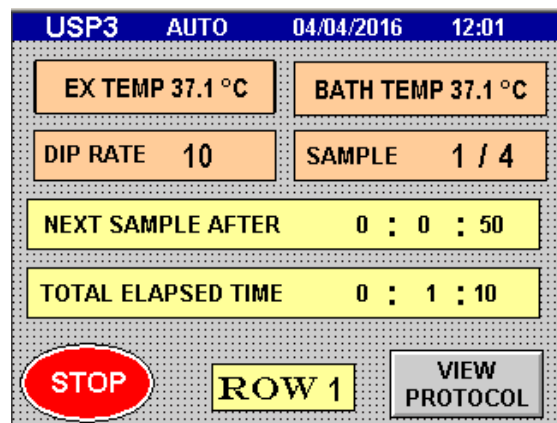
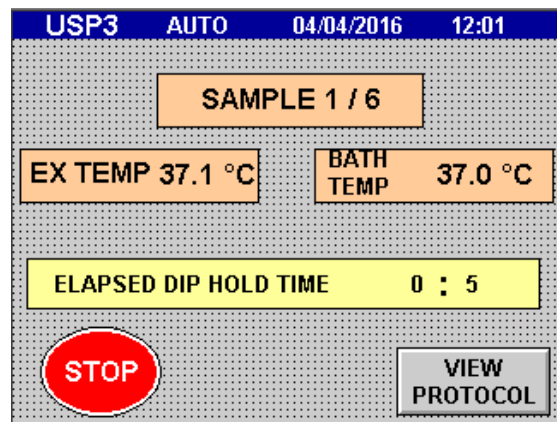


**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

- When **START** key is pressed arm goes to run mode & finding the current tray position setting which was set in the protocol setting.
- If tray position is achieved then arm goes to run mode (Dip hold state).
- In Dip hold state, arm will goes to bottom of the position & servo motor will release the caps.
- After Dip hold time is over then arm will goes to the cycle state & it will appear on the HMI run screen.
- Run screen will display the information of the current sample as bath temperature, external temperature, current sample's dip rate, current sample number, total elapsed time, next sample time & current tray position.

### DISPLAY



**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

- After the sample time is completed, sampling test will be in progress & arm waiting for the sample at the bottom position at least 2 to 3 min (Depending upon the volume & aliquot volume loaded in the current protocol)

- After sampling is completed arm will goes to drain state.

**NOTE : After the sample completed, arm should be holds the cap & goes in the upper direction till the top opto cut.**

- After the drain time is over arm will perform the next sampling test as per the earlier steps.

### DISPLAY

USP3		AUTO		04/04/2016		12:01	
EX TEMP 37.1 °C				BATH TEMP 37.0 °C			
DIP RATE 10				SAMPLE 1 / 6			
Sampling in Progress ...							
TOTAL ELAPSED TIME				0 : 2 : 0			
STOP		ROW 1		VIEW PROTOCOL			

USP3		AUTO		04/04/2016		12:01	
SAMPLE 1 / 6							
EX TEMP 37.1 °C				BATH TEMP 37.0 °C			
ELAPSED DRAIN TIME				0 : 5			
STOP		VIEW PROTOCOL					

USP3		AUTO		31/12/08		23:59	
ELAPSED HALT TIME				0 : 50 MM:SS			
ELAPSED DIP HOLD TIME				0 : 0 MM:SS			
A R M		➤ ➤ ➤		STOP		A R M	
ABORT						RESUME	

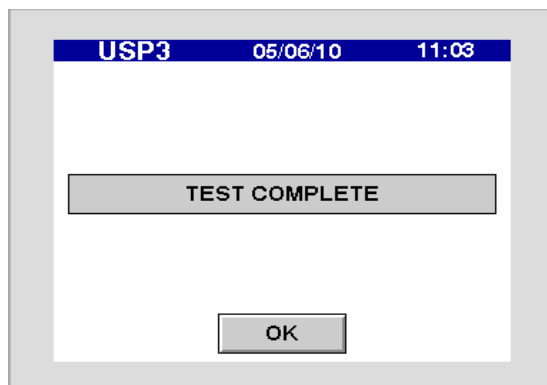
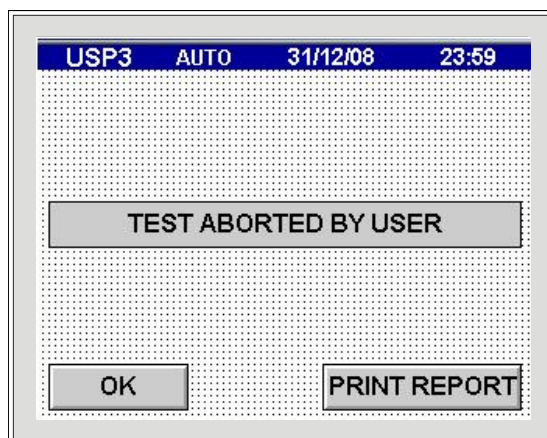
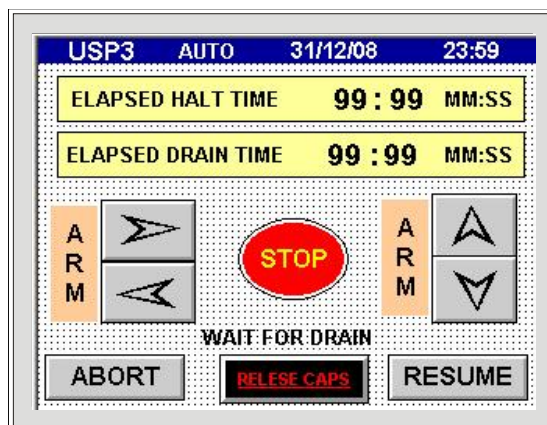


**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

- In between the test, user can be stop the test by using the **STOP** key, then halt screen will appear on the screen.
- User can move the arm Up & Down direction. If the cannulas are engage & arm at top position then drain time will start. After the drain time is over then right & left key will appear on the screen.
- When **RESUME** key is pressed, the arm will goes at appropriate tray position & then dip hold state. After the dip hold time is over it will goes to in cycle state & the run screen will appear on the HMI.
- When **ABORT** key is pressed arm will holds the caps & then it will goes to the drain state.
- After aborting the test user can be print the report of the last test.
- After test over 'Test Complete' message will be displayed on the screen.
- When **OK** key is pressed, arm will go to home position.

### DISPLAY



**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

#### **IDLE SCREEN <RUN>[VALIDATION CYCLE]**

- Press **RUN** on Idle screen after loading the set protocol.
- The run screen will be displayed, with 3 cycle stage RUN TEST, VALIDATION CYCLE & CLEANING CYCLE.  
Press **CANCEL** to go back to the previous screen.
- If **VALIDATION CYCLE** key is pressed the RUN screen will be displayed with an indication “**Checking Connection**”.
- After pressing the **VALIDATION CYCLE** key, the screen will be displayed the BATH TEMP, SET VESSEL TEMP & the indication of the heater and pump.

**NOTE : For checking the validation, fill the first row with water & empty second row for replenishment volume.**

### DISPLAY

USP3		AUTO		31/12/08		23:59	
USER NAME				DRUG NAME			
USER1				ABCDEF			
PROTOCOL		TEMP		37.0 °C			
1		▼		USP3			
RUN		RECIPROCATING CYLINDER		ARM		▶	
				ARM		◀	
HOME		LOGOUT		MENU			

USP3		AUTO		31/12/08		23:59	
RUN TEST							
VALIDATION CYCLE							
CLEANING CYCLE							
CANCEL							

USP3		AUTO		04/04/2016		12:01	
OFF		OFF		BATH TEMP 37.0 °C			
HEATER		PUMP		SET VESSEL TEMP 37.0 °C			
Checking for validation, Fill the first row with water and empty second row for Repl vol.							
CANCEL		START					

**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

- When **START** key is pressed arm will goes to first tray of bottom position, then syringe pump takes sample from the test vessel & purge into the sample collector.
- As per the protocol setting,

**For Example,** Sample volume = 10 ml

Aliquot Volume = 10 ml

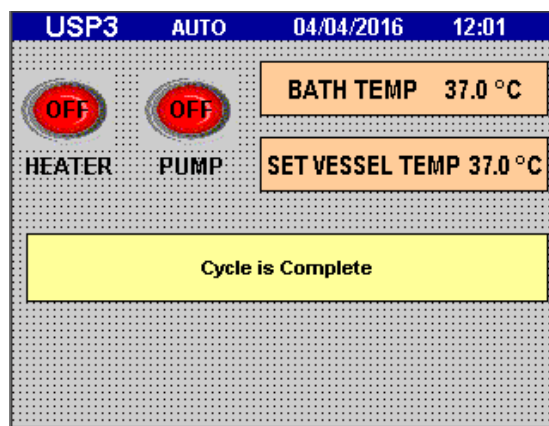
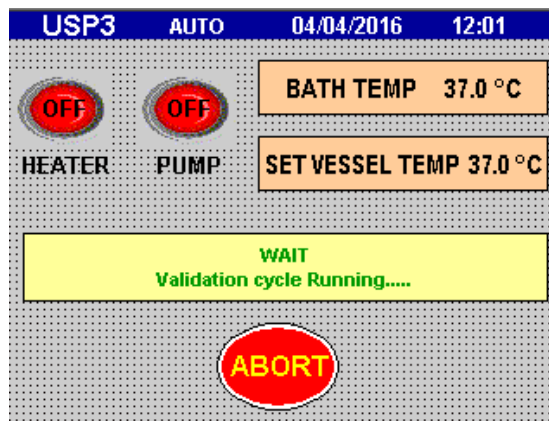
Rinse Volume = 3 ml

Then the Rinse volume (3 ml) collected in to the first row of the sample collector, Aliquot volume (10 ml) collected in the second row of the sample collector

**NOTE : Replenishment is not available.**

- After the aliquot sample is collected in sample collector, validation cycle is completed & arm will goes to home position.

### DISPLAY



**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

#### **IDLE SCREEN <RUN>[CLEANING CYCLE]**

- Press **RUN** on Idle screen after loading the set protocol.
- The run screen will be displayed, with 3 cycle stage RUN TEST, VALIDATION CYCLE & CLEANING CYCLE.  
Press **CANCEL** to go back to the previous screen.
- If **CLEANING CYCLE** key is pressed the RUN screen will be displayed with an indication “**Checking Connection**”.
- After pressing the **CLEANING CYCLE** key, the screen will be displayed the BATH TEMP, SET VESSEL TEMP & the indication of the heater and pump.

**NOTE : Fill the replenishment vessel with cleaning media and empty the first row vessel.**

### DISPLAY

USP3		AUTO		31/12/08		23:59	
USER NAME				DRUG NAME			
USER1				ABCDEF			
PROTOCOL		TEMP		37.0 °C			
1		⌵		USP3			
RUN		RECIPROCATING CYLINDER		ARM		⌵	
HOME		LOGOUT		MENU			

USP3		AUTO		31/12/08		23:59	
RUN TEST							
VALIDATION CYCLE							
CLEANING CYCLE							
CANCEL							

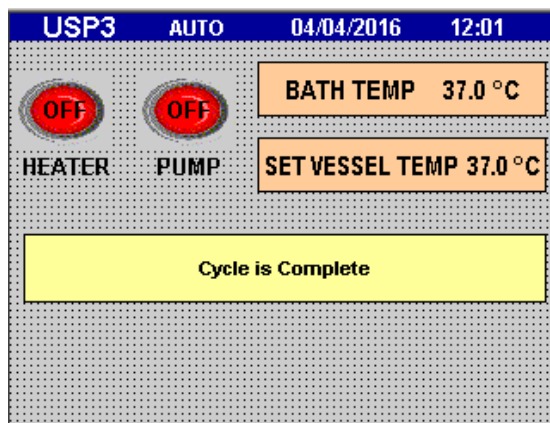
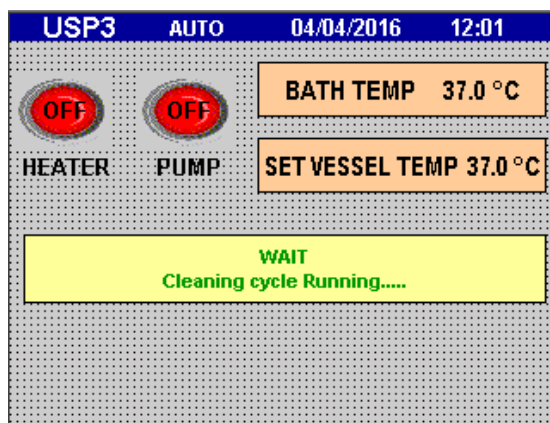
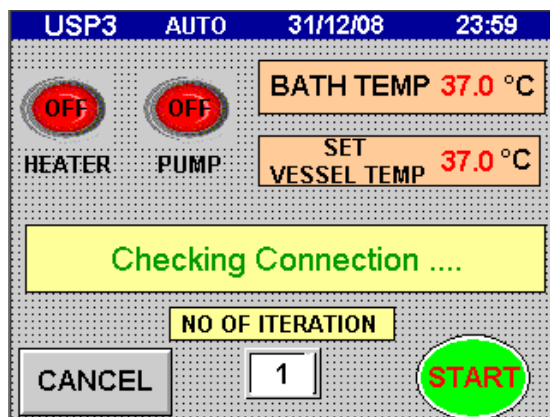
USP3		AUTO		31/12/08		23:59	
OFF		OFF		BATH TEMP 37.0 °C			
HEATER		PUMP		SET VESSEL TEMP 37.0 °C			
Fill the replenishment vessel with cleaning media and empty the first row vessel							
NO OF ITERATION							
CANCEL		1		START			

**\*Note: The screen will display USP 7 instead of USP 3 for ERD 07(USP 7).**

### OPERATION

- The RUN screen will be displayed with an indication “Checking Connection”.
- After pressing the **START** key cleaning cycle will be running & on this screen current bath temperature, set vessel temperature, indication of the heater and pump will displayed.
- After the all PTFE tubes are cleaned by the cleaning media then cleaning cycle is completed & arm will goes to home position.

### DISPLAY



## 6. SPECIFICATIONS

### ERD-03 (USP 3) SPECIFICATION

<b>Material of Construction</b>	:	SS 316
<b>Water Bath</b>	:	Clear Acrylic Molded Water Bath (44 liter capacity)
<b>Vessel</b>	:	1000ml glass vessels (6 nos.), 300ml glass vessels (42 nos.), 100ml glass vessels (42 nos.)
<b>Display</b>	:	Touch screen
<b>Heater</b>	:	250 Watts, 230 V AC, S. S 304
<b>Mains Fuse</b>	:	1 Amp
<b>Heater Fuse</b>	:	6 Amp
<b>No. of dips rate</b>	:	5 to 50 dpm
<b>Stroke Height</b>	:	100 mm
<b>Temperature Range</b>	:	20.0°C to 40.0°C
<b>Temperature Accuracy</b>	:	± 0.2°C
<b>Dimension</b>	:	795 mm (L) X 675 mm (W) X 780 mm (H) (Approx.)

### ERD-07 (USP 7) SPECIFICATION

<b>Material of Construction</b>	:	SS 316
<b>Water Bath</b>	:	Clear Acrylic Molded Water Bath (44 liter capacity)
<b>Vessel</b>	:	1000ml glass vessels (6 nos.), 300ml glass vessels (42 nos.), 100ml glass vessels (42 nos.), 50ml glass vessels (144 nos.)
<b>Display</b>	:	Touch screen
<b>Heater</b>	:	250 Watts, 230 V AC, S. S 304
<b>Mains Fuse</b>	:	1 Amp
<b>Heater Fuse</b>	:	6 Amp
<b>No. of dips rate</b>	:	5 to 50 dpm
<b>Stroke Height</b>	:	20 mm
<b>Temperature Range</b>	:	20.0°C to 40°C
<b>Temperature Accuracy</b>	:	± 0.2°C
<b>Dimension</b>	:	795 mm (L) X 675 mm (W) X 780 mm (H) (Approx.)



## 7. 1000ml Accessories Attachment

- Remove the curtains for fixing the 1000ml attachment.
- Rotate the screw knob anticlockwise & remove it as shown below.

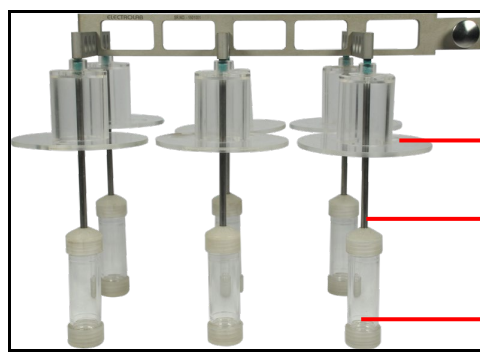
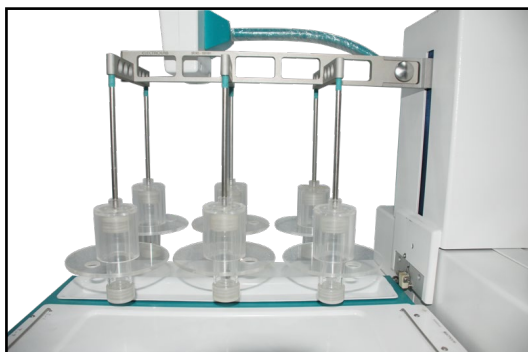


- The vessel trays should be placed as shown below.



Vessel Tray

- Attach 1000ml accessories as shown in below.



Evaporating  
Cap

Arm

Reciprocating  
Cylinder

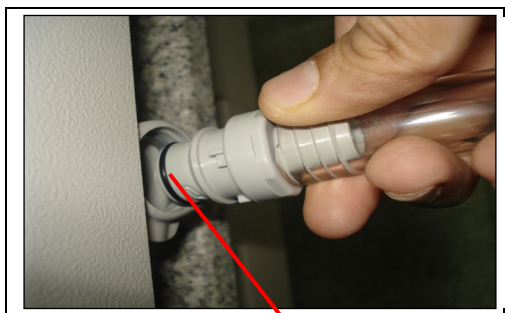
## 8. MAINTAINING THE INSTRUMENT

In this section maintenance of **ERD 03 (USP 3)** and **ERD 07 (USP 3)** is described in brief details.

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### Removal of water from water bath:

- Insert the outlet tube to the outlet knob present at the bottom on front side of instrument.



- Press the button present adjacent to the outlet knob.
- After removal of water clean the tank with solvents like Deconex 12 basic as the temperature of bath changes there might be fungal growth which may cause contamination of sample.



**Cleaning of Media Vessels:**

- Wash the media vessel after every test or while using another media with a suitable solvent.

**Cleaning of Reciprocating Cylinder- ERD 03 (USP 3):**

- Refer assembly of reciprocating cylinder to separate each component.
- Wash cylinder with suitable solvent.

**Cleaning of Reciprocating Holder- ERD 07 (USP 7):**

- Wash rod with suitable solvent.

**Also Note\*:** When the vessels used on dissolution tester are non genuine/ mixed make, there is possibility of missing a sample from the respective vessel/vessels. It is more likely when the media volume is lower like 500ml. Due to the uncontrolled dimensions the media level of the respective vessel may not allow the sampling probe to be in the media at proper position to take the sample.