

BIOMate2000 A

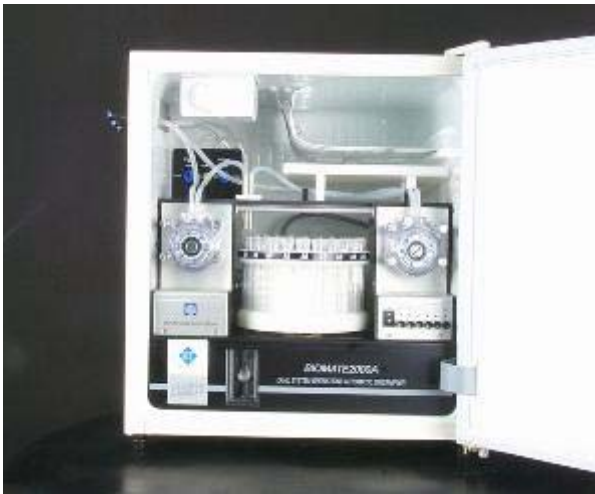
AUTOMATIC BIOSAMPLER

USER'S MANUAL

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1.

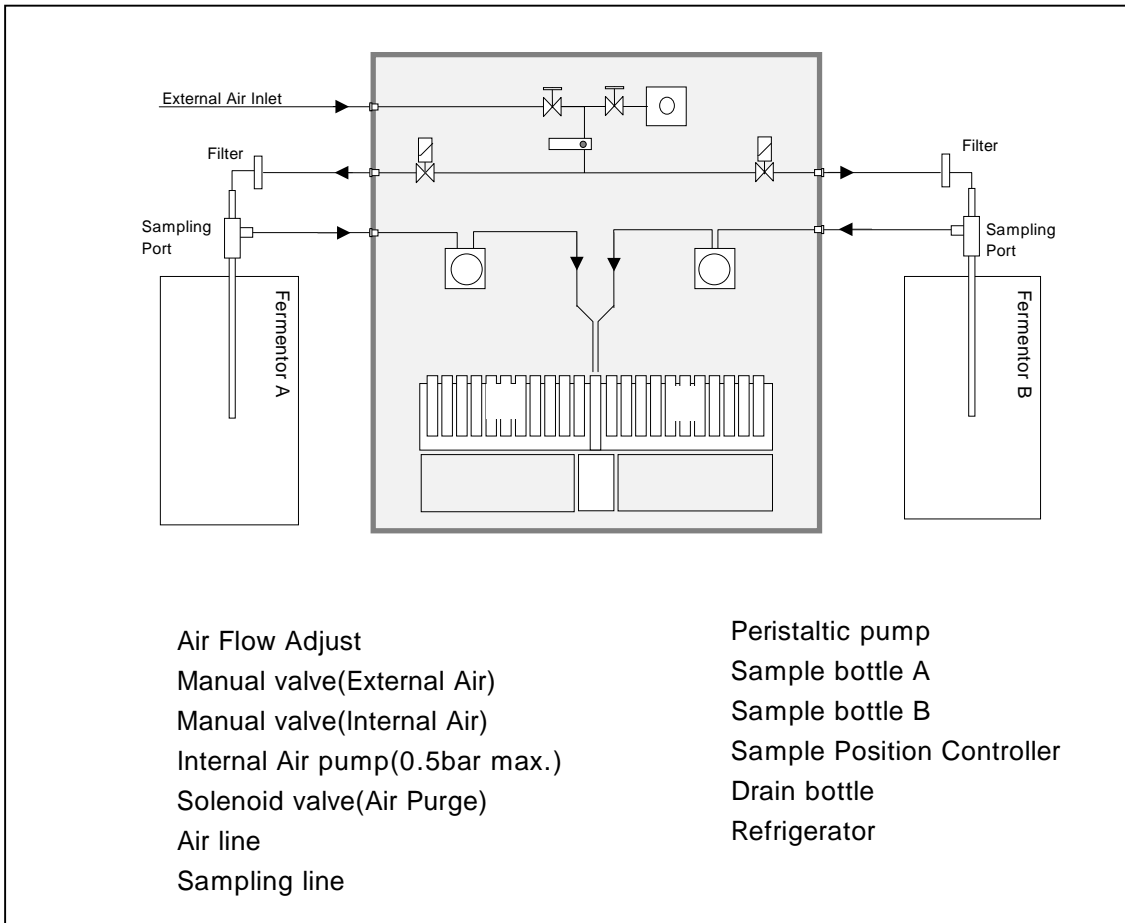
12	1 (173965)	KAIST	Biomate1A	96
	가			1
98	2	Biomate2000A	(0239944)

Biomate2000A

Dual

- 1.
- 2.
3. 1 (dead volume) 1ml
4. Dual System Operation
- 5.
6. Remote sampling and Alarm
7. On-line Error Detection
- 8.
- 9.
10. 가

2.



2.1 Pumping Air

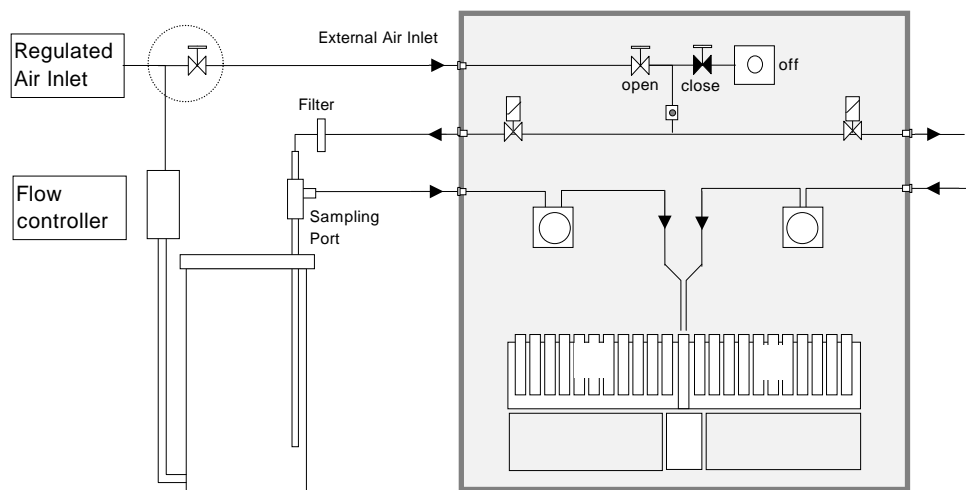
2.1.1 Pumping

- 1) Pumping motor pump head
- 2) Pumping motor ON/OFF
72RPM (64rpm/50Hz , 72rpm/60Hz)
- 3) Pumping timer(T1) motor
pumping 가
- 4) T1 ()

2.1.2 Air

- 1) Air pump
- 2) Air pump air ON/OFF filtering air
purge OFF
- 3) Biomate2000
air
가 air
air

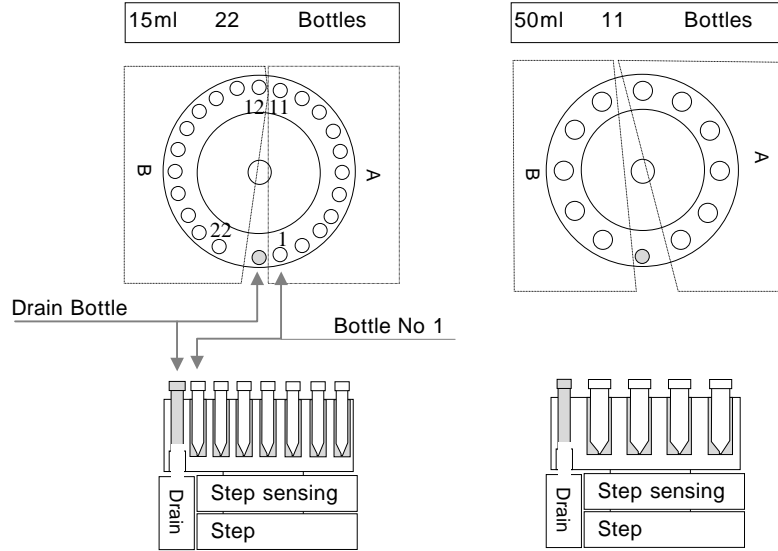
External Air



2.2 Sample bottle Loading

- 1) bottle 15ml 50ml 가
- 2) Drain bottle drain port()가 ,
1 3~7
가
- 3) bottle 15ml 22 , 50ml 11 dual
system 11 6(5)
- 4) step step
. 30
alarm

5) alarm bottle 30 bottle 가 bottle
alarm bottle 가 bottle



3. PUMPING

Biomate2000 pumping motor 가

. Sampling pumping purging

 sampling

 drain

 pumping

4.

Biomate2000

CPU reset 7

가 가

 purge

5.

가 가

pumping bottle

6. Alarm

6.1

- | | | | | |
|----------------------------|---|------|--------------------|--------|
| 1) Bottle | : | Step | Home | Bottle |
| 2) HomeSns(Home Position) | : | 30 | Home | |
| 3) StepSns(Step Position) | : | 30 | Step | |
| 4) SmpMtrA(Sample Motor A) | : | | (ULN2803 & Relay)가 | |
| 5) SmpMtrB(Sample Motor B) | : | | (ULN2803 & Relay)가 | |
| 6) AirPump | : | | (ULN2803 & Relay)가 | |
| 7) AirVlvA(Air Valve A) | : | | (ULN2803 & Relay)가 | |
| 8) AirVlvB(Air Valve B) | : | | (ULN2803 & Relay)가 | |

6.1.1 Bottle Alarm

Bottle bottle
30 . 30 가
가 () bottle
running

(A 7 Step Bottle)

Sampling A - 7 RtryExt
GoToStep Err:Bottle

- 1) Rtry(Retry) : 30 step bottle Rtry
clear , step .
- 2) Ext (Exit) : Ext clear .

6.1.2 Home Sns(Home Sensing)

30 (Home) , 2

:

Sampling A - 7 RtryExt
GoToHome Err:HomeSns

- 1) Rtry(Retry) : clear .
- 2) Ext (Exit) : Ext clear .

6.1.3 StepSns(Step Sensing)

30 Step , 2

:

Sampling A - 7 RtryExt
GoToStep Err:StepSns

- 1) Rtry(Retry) : clear .
- 2) Ext (Exit) : Ext clear .

6.1.4 SmpMtr(Sampling Motor)

Sampling motor 가 ON OFF
 OFF error clean air

:

Sampling A-7	RtryExt
Sampling	Err:SmpMtrA

- 1) Rtry(Retry) : clear ON OFF
- 2) Ext (Exit) : Ext clear

6.1.5 AirPump(Air Pump)

Air pump 가 ON OFF OFF
 error air valve OFF step
 (Air valve OFF pumping motor OFF). ON error
 pumping motor OFF

:

Sampling A-7	RtryExt
Sampling	Err:AirPump

- 1) Rtry(Retry) : clear ON OFF
- 2) Ext (Exit) : Ext clear

6.1.6 AirVlv(Air Valve)

Air valve 가 ON OFF OFF error
 pumping motor OFF air pump ON clean air
 ON error pumping motor OFF

:

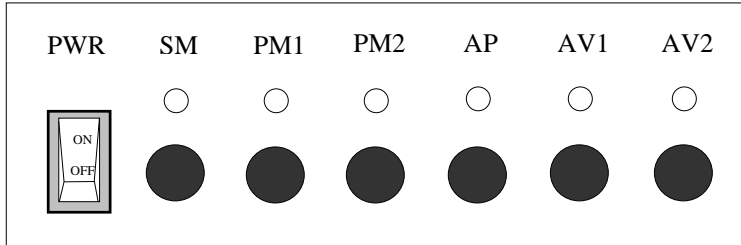
Sampling A-7	RtryExt
Sampling	Err:AirVlvA

- 1) Rtry(Retry) : clear On Off
- 2) Ext (Exit) : Exit clear

7. OPERATION

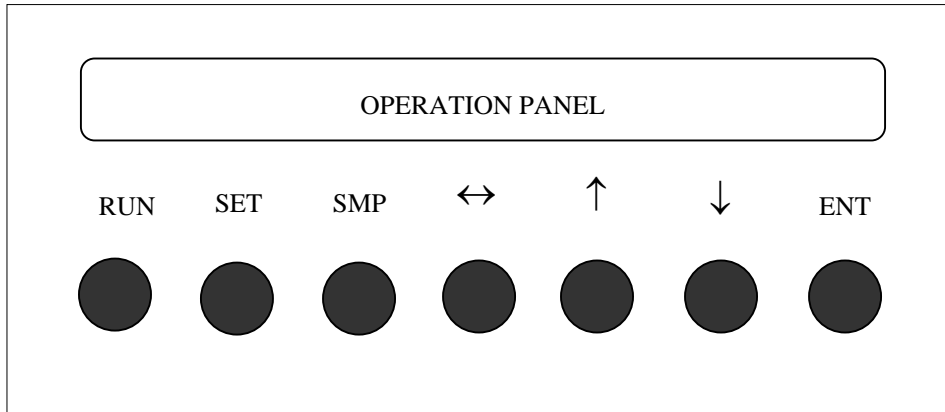
7.1

7.1.1



1. PWR	· ON/OFF
2. SM	· Stepping Motor ON/OFF · SM Push Stepping Motor 가 .
3. PM1 / PM2	· Pumping Motor ON/OFF · PM1/PM2 Push Pumping Motor(A,B)가 . · Sample Volume
4. AP	· Air
5. AV1 / AV2	· Air Valve ON/OFF

7.1.2 OPERATION

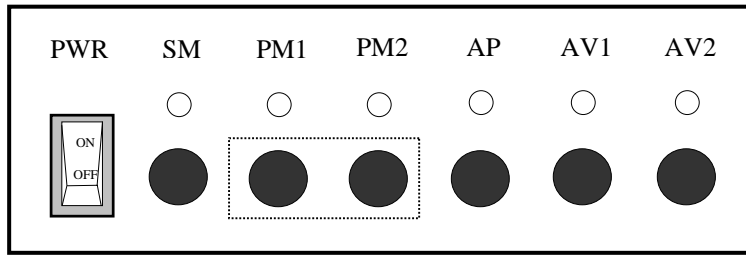


	Display	
1. RUN 1) 2)	Select Run Menu StartABD StopABD Ext	StartA : A StartB : B StartD : A&B StopA : A StopB : B StopD : A&B Ext : Exit ()
2. SET 1) 2) 3)	Select Set Menu rcpAB VolAB Ext	rcpA : A receipe rcpB : B receipe VolA : A Volume VolB : B Volume Sys : Ext : Exit ()
3. SMP 1) 2) 3)	Select Smp Menu datAB smpAB pgAB Ext	datA : A datB : B smpA : A smpB : B pgA : A pgB : B Ext : Exit ()
4. ↔ (MOVE)		
5. ↑ (UP)	가	
6. ↓ (DOWN)		
7. EXT		

7.2

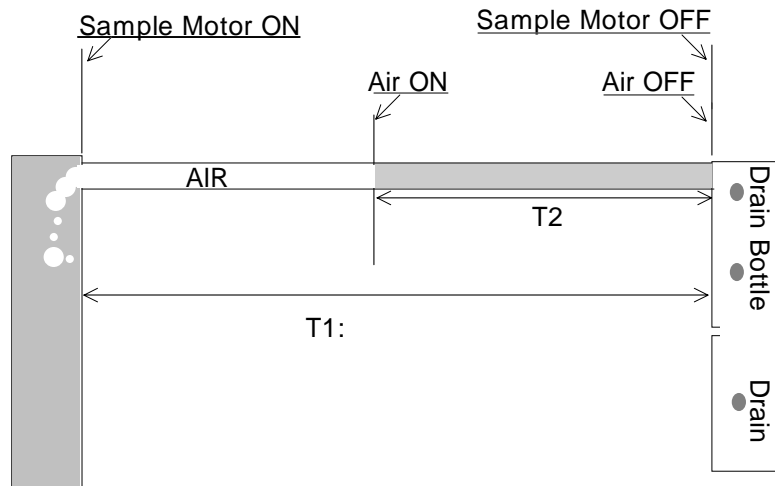
7.2.1 1 :

- 1) drain bottle 가 .
- 2) Pumping Air 가 가 .
- 3) T1 .
 - PM1 (or PM2) ON 가 (Pumping)
 - 3~7 drain .



4) T2

- (1) SM ON bottle .
 - (2) PM1 (or PM2) ON bottle .
- (T2) Clean Air 가 Pumping purge (Volume) 가 . (purge



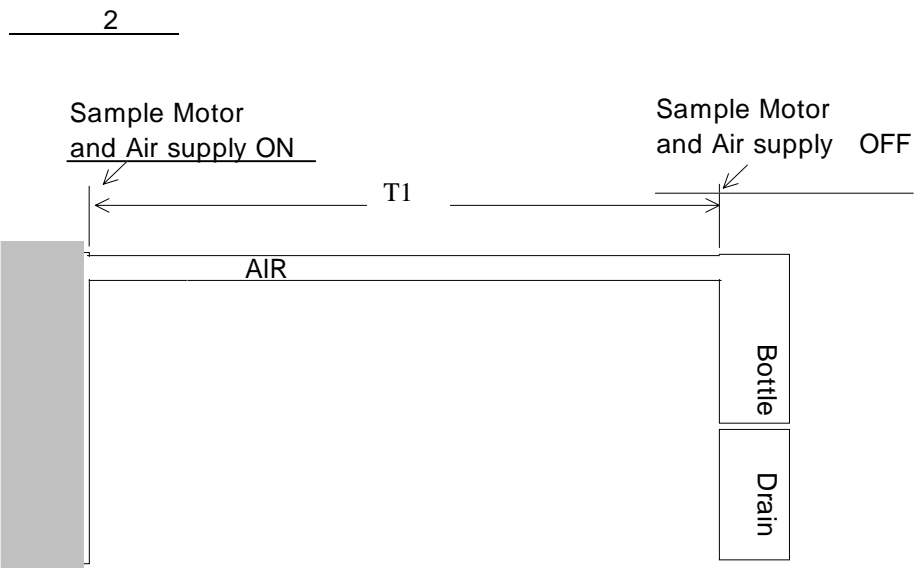
* Drain ()

* 1 (drain) 3~7 (0.3 Mℓ)

가

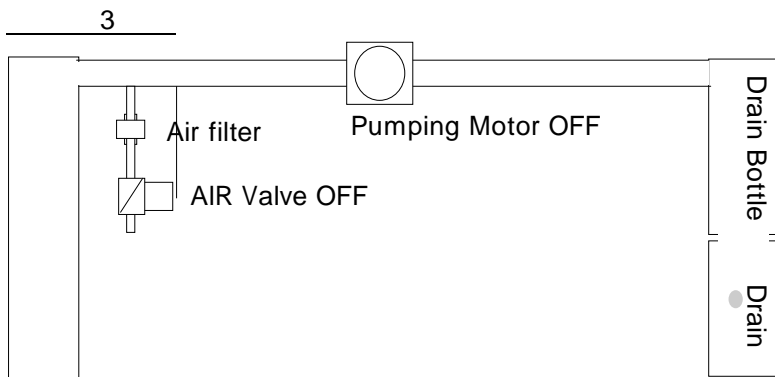
7.2.2 2 :

- 1) Step Motor bottle
 - 2) Pumping Motor Air 가 ON T1 bottle Clean Air
- (가)



7.2.3 3

- 1) 2 가 Step Motor 가 ON drain bottle
- 2) Pumping Motor Air OFF



7.3

1) Biomate2000A

POWER ON

Menu 가 Display

```

Biomate2000A      Set
15ml   Dual   Loc   Ext
    
```

←→ Key : 15ml, Dual, Loc, _Ext MENU

↑ ↓ Key : Data

15ml : Sample Bottle Size Data Key(↑↓)

50ml

Dual : Dual System Operation Data Key (↑↓)

A-Only (Single System Operation A)

B-Only (Single System Operation B) 가

Loc : System 가 Local mode Data Key (↑↓)

Rem (Remote mode) 가

Ext : Exit menu ENT Key

```

Biomate2000A      Set
Save? [Yes]
    
```

- Save? [Yes] ENT Key , data

Key (↑↓) Save? [No] ENT Key

2) System

SET Key

```

Select Set Menu
Rcp AB Vol AB Sys Ext
    
```

Menu Key (←→) Sys 8,4 1)

7.4 SAMPLING

SAMPLING RECEIPE 가

1) (A)

RUN Key

```
Select Run Menu
Start ABD Stop ABD Ext
```

Menu Key (←→)

Start A

ENT Key

```
Start A? [Yes]
```

ENT Key

```
Arun          00:00
Bstb          00:00
```

2) (B)

RUN Key

```
Select Run Menu
Starts BBD Stop ABD Ext
```

Menu Key (←→)

Start B

ENT Key

```
Start B? [Yes]
```

ENT Key

```
Arun          00:00
Brun          00:00
```

3) (Dual System)

Run Key .

Select Run Menu
Start ABD Stop ABD Ext

Menu Key (←→)

Start D .

ENT Key .

Start D? [Yes]

ENT Key .

Arun	00:00
Brun	00:00

7.5 RUNNING

)

Arun	1 2 3 4 5 6 7	15:20
Brun	1 2 3	09:00

Arun 1 2 3 4 5 6 7 15:20

System A 가 running

7

15 20 .

Brun 1 2 3 09:00

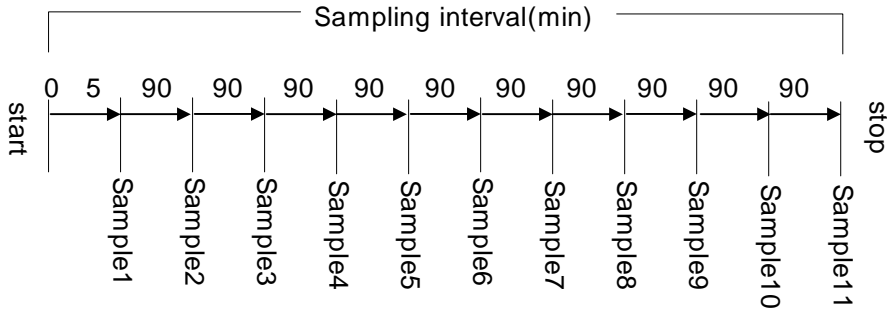
System B 가 running

3

9 .

7.6

1 (System A)



SET Key .

Select Set Menu
Rcp A Vol AB Ext

Menu Key (←→)

rcp A .

ENT Key .

Recipe A
Sample 0-1 00:05 Ext

Set Bottle No:1
Set Time :00:05

Menu Key (←→) Data
Bottle No(1)

Key (↑↓)
(5) .

Recipe A
Sample 1-b 01:30 Ext

Set Bottle No: b (2~11) ⇔ (a:10 /b:11)
Set Time :01:30 (90)

Menu Key (←→) Data
(1 30)

Key (↑↓)
Menu Key (←→) Bottle No (2~11)

Ext .

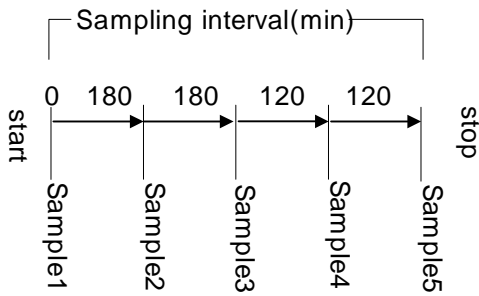
ENT Key .

Recipe A
Save? [Yes]

ENT Key .

Astb	00:00
Bxxx	00:00

2 (System B)



SET Key .

Select	Set	Menu
Rcp <u>AB</u>	Vol AB	Sys Ext

Menu Key (←→)

rcp B .

ENT Key .

Select	Set	Menu
Rcp AB	Vol AB	Sys Ext

Set Bottle No:1

Set Time : 00:00 (Start)

Menu Key (←→) Data
((Start

Key (↑↓)

Bottle No (1)

Recipe	B
Sample	1-3 03:00 Ext

Set Bottle No:3 (1-3)

Set Time : 03:00 (180)

Menu Key (← →) Data Key (↑ ↓) Bottle No(2,3)
 (180)

Recipe	B		
Sample	3-5	02:00	Ext

Set Bottle No:5 (3-5)
 Set Time : 02:00 (120)

Menu Key (← →) Data Key (↑ ↓) Bottle No (4,5)
 (120)

Recipe	B		
Sample	5-6	00:00	<u>Ext</u>

Set Bottle No:6 (5-6)
 Set Time : 00:00 (Stop)

Menu Key (← →) Data Key (↑ ↓) Bottle No (6)
 (0 = Stop) Menu Key (← →)

Ext
 ENT Key

Recipe	B		
Sample	5-6	00:00	Ext

ENT Key

Axxx		00:00	
Bxxx		00:00	

END

7.7 - (T1, T2 SETTING)

SET Key .

Select	Set	Menu
Rcp AB	Vol AB	Sys Ext

Menu Key (← →) VolA .

ENT Key .

Volume	A
T1 : 25s	T2 : 15s Ext

Menu Key (← →) Dats Key (↑ ↓) T1 T2 8.3.1

- T1 Set Time : 25sec (Test Value)
- T2 Set Time : 15sec (Test Value)

Menu Key (← →) Ext .

ENT Key .

Volume	A
Save ?	[Yes]

ENT Key .

Astb	00:00
Bxxx	00:00

END

7.8

A(B)

SMP Key .

Select Smp Menu
 dat AB smp AB pg AB Ext

Menu Key (←→) dat A .

ENT Key .

Sample Data A(B)
 1 2 3 4 5 6 7 8 9 a b 00:00 Ext

* Under Bar .

Menu Key (←→) Ext .

ENT Key .

Axxx	00:00
Bxxx	00:00

7.9

A 가 Stand-by

SMP Key .

Select Smp Menu
 dat AB smp AB pg AB Ext

Menu Key (←→) Smp A .

ENT Key .

Manual Sample A
 1 2 3 4 5 6 7 8 9 a b Ext

Menu Key (←→) Bottle Number .
ENT Key .

Manual Sample A
Sample 1 ? [Yes]

ENT Key .

Sampling A-1 []
GotoHome

Astb 00:00 []
Bxxx 00:00

A 가 running

SMP Key .

Select Smp Menu
dat AB smp AB pg AB Ext

Menu Key (←→) smp_A .
ENT Key .

Manual Sample A
1 2 3 4 5 6 7 8 Ext

* Bottle Number 가 (7 Auto Sampling)

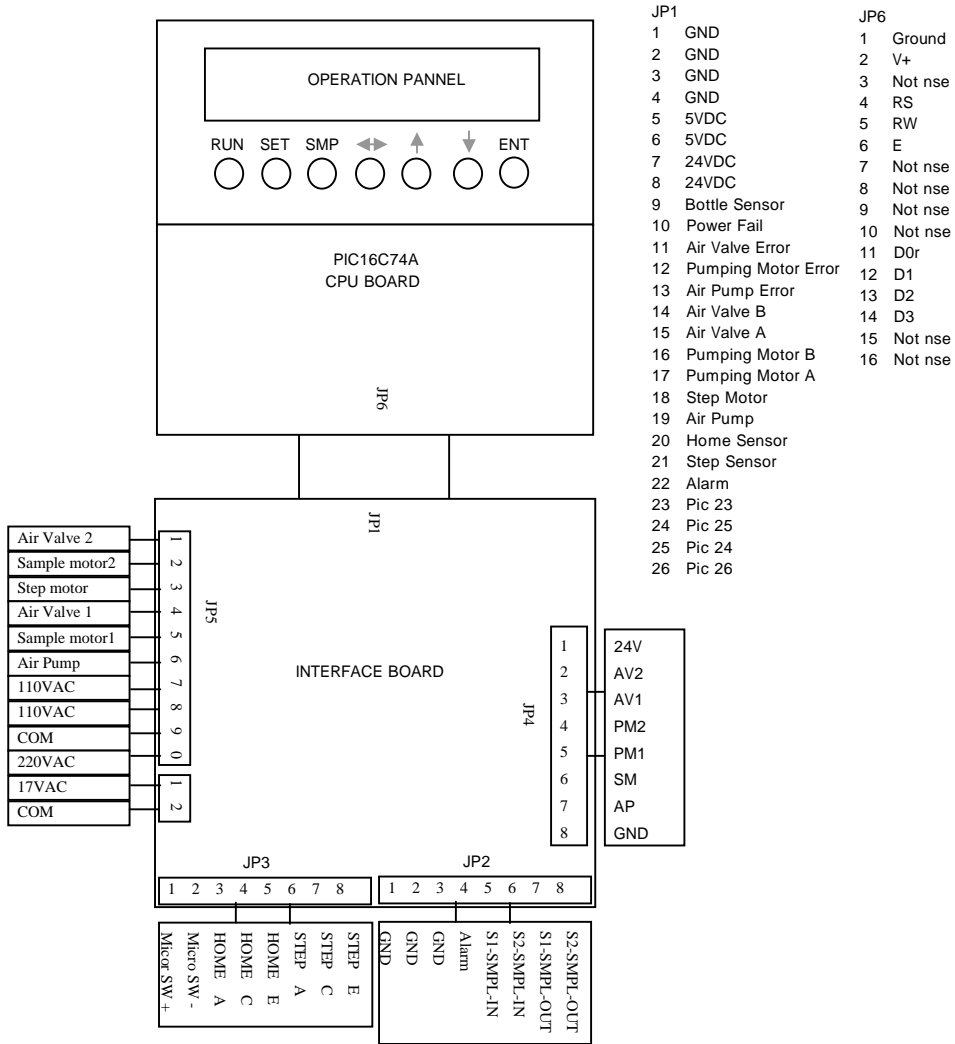
ENT Key .

Manual Sample A
Sample 8 ? [Yes]

ENT Key .

Sampling A-8 Goto Home	[]
---------------------------	----------------

Manual Sample A Sample 8 ? [Yes]	[- 8]
-------------------------------------	-----------------------------------



SYSTEM

