Operations Manual



Items:H2010 and H2012 (-E)

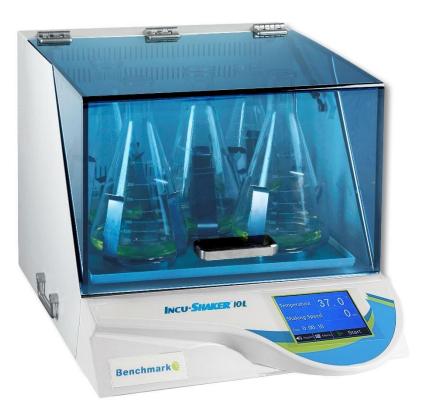




Table of Contents	PAGE
Precaution for safety	3
1. General information and and precautions	3
1.1 Precaution related to the power cable	3
1.2 Precaution for use	3
2 Feautures and specification	5
2.1 Feature	5
2.2 Specification	5
3. OPERATION	6-15
▶Booting	6
►Basic view screen	6
▷Temperature setting change	7
▷RPM setting change	7
▷Time setting change	7
▷The end of setting time	8
►Advanced mode	8
►Temperature calibration	9
►Temperature setting(Advanced screen)	9
▷Temperature setting change	9
Adjusting the Time of the Temperature	10
▷Adjusting the Alarm setting	10
▷Alarm off	11
►Shaker setting (Advanced)	11
▶ RPM setting change	11
▷Adjusting the Shaking Time	11
▷Alarm setting change	12
⊳Alarm off	12
►Temperature Step setting	13
▷Temperature, time setting	13
►Shaker Step setting	14
▷RPM, Time setting	14
►Step Cycle Ending Screen	15
4. Warning message & fuse replacement	15-16
►Fuse replacement	15
►Event view	16
⊳Door open message	16
▷Temperature/Shaker Alarm	16
▷Maintenance	16
▷Service and Contact	16

1. General Information and Precautions

Safety Symbols:



1.1. Precautions related to the power cable



Always allow at least 3cm between the power cable and the back wall to prevent the back wall from causing pressure on the power cable.



Always use the electrical plug that was supplied with this instrument.

Compliance



Never touch the power cord with wet hands. (This can result in electric shock.)



Never use a damaged power cord or power outlet.

Prohibition



In the event of smoke or a burning smell, immediately remove the power cord from the outlet.

plug

1.2. Precaution for use



Do not attempt to disassemble this instrument. If service is required, please contact your local representative.

disassemble



Never operate a flammable spray near this instrument. (This can result in a fire hazard.)

Prohibition



Always use caution when using flammable substances such as benzene, alcohol

and LP gas. (Failure to do so can result in a fire hazard.)



Prevent foreign substances from contacting the door seal. (The inflow of outside air can negatively impact the temperature in chamber.)



Permissible ambient temperature range for transport: -10°C to 60°C.

Compliance

ALWAYS ensure that the instrument is connected to an outlet with specifications thatCompliancematch those of the serial number label.

(Over-voltage or under-voltage can damage the product and result in poor performance.)



When installing the instrument, always allow a distance of at least 30cm from the back wall. <u>Install</u> the unit in the way that the power plug is easily accessible and can be easily pulled in case of danger.



Install the instrument on a flat and stable surface, free from vibration and in a well-ventilated location. (If the surface is not level, it can cause an excessive vibration of the product.)

2. Feature & Specification

2.1 Features

- Magnetic induction drive & Brush less DC motor provides less vibration and maintenance.
- No interference with uniformity for cell culture by BLDC motor
- User friendly, intuitive LCD touch panel
- Moisture resistant structure by Epoxy coated
- Automatic stop function Once LID opens, shaker automatically stops for safety and convenience
- Once-piece construction with acrylic cover
 Transparent acrylic cover allows internal viewing without disturbance
- Stable and Low Noise Shaking Blushless DC motor and beltless drive system for shaker minimizes noise and vibration
- Non-volatile memory for operation.
- Easy Platform Installation

Very simple way to place holder or spring rack platform on the shaker. And Optional accessories available for most common laboratory vessels

2.2 Specification

1) Dimension (Exterior H2010) : 51(W) X 65(D) X 47(H) cm/ 20(W) X 26(D) X19(H) in. (Exterior H2012) : 51(W) X 79(D) X 56(H) cm / 20(W) x 31(D) x 22(H) in (Internal H2010 & H2012): 49.5(W) X 49.5(D) X 28(H) cm / 19.5(W) X 19.5(D) X 11(H) in. (Platform H2010): 23.5(W) x 29.2(D) cm / 9.5(W) X 11.5(D) in.

(Platform H2012): 45(W) x 45(D) cm / 17.8(W) x 17.8(D) in.

2) Temperature range : H2010: Ambient +5°C to 60°C

H2012: Ambient -15°C to 60°C

- 3) Temperature accuracy: ±0.1°C at 37°C
- 4) Temperature uniformity: ±0.25%
- 5) Speed Range: 30~300 RPM
- 6) Shaking orbit: 19mm (3/4")
- 7) Circulation Fan: Convection Fan
- 8) Timer: Digital -1 min. to 47hr 59mm. (1 min. increments)
- 9) Motor: Beltless DC Magnetic Induction Drive
- 10) Weight: H2010: 120lbs/51kg

H2012: 170 lbs/78kg

11) Electrical: 120V or 230V, 50~60Hz / 200W

3. Operation





Press the power switch into the ON position, the display illuminates and the booting screen is displayed for 2 seconds before showing the "Basic View" screen.

NOTE: If the shaker has been powered off before the completion of a run, the unit will automatically power on to the previous settings. 6

Basic View Screen

- (a) HEAT LED: indicates if the heater is activated
- BRUN LED: indicates if the shaker is running.
- © Time setting: Indicates the set or remaining time.
- (To adjust, TOUCH the time value.)
- ④ Temp setting: Displays the current temperature.
- To set the desired temperature, TOUCH the temperature value.
- Image: RPM setting: Displays the set or current RPM
- To set the desired shaking speed, TOUCH the RPM value.
- ① Alarm ON/OFF: Alarm rings according to the condition
- TOUCH to toggle the alarm on or off. → Alarm ON → Ala



Manu : TOUCH to activate the main mer

control dart or to stop the shaker.

Start	Stop
Chaker and Indiantee	that time has every

③Shaker end: Indicates that time has expired and the shaker has stopped



Temperature setting change

TOUCH the temperature value, The numbers become red
 "SET MODE" is displayed (flashes)

ⓒ Input the desired value by pressing UP(▲)/DOWN(▼) buttons NOTE: Press and hold the buttons to increase or decrease the value quickly.

④ Apply: To store the newly set value TOUCH (Or wait 5 seconds for the value to store automational)

Exit: If you press
 Exit fter changing any values, the values
 are not saved and the saved the previous screen

RPM setting change

(a) TOUCH the RPM value, The numbers become red

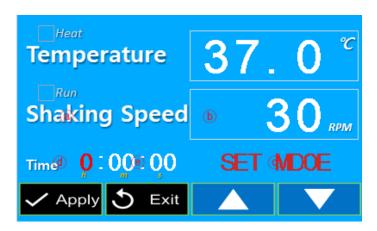
(b) "SET MODE" is displayed (flashes)

ⓒ Input the desired value by pressing UP(▲)/DOWN(▼) buttons NOTE: Press and hold the buttons to increase or decrease the value quickly.

④ Apply: To store the newly set value TOUCH Apply (Or wait 5 seconds for the value to store automatically)

(Or wait 5 seconds for the value to store automatically) (e) Exit: If you press D Exit after changing any values, the values are not saved and the screen returns to the previous screen





Time setting change

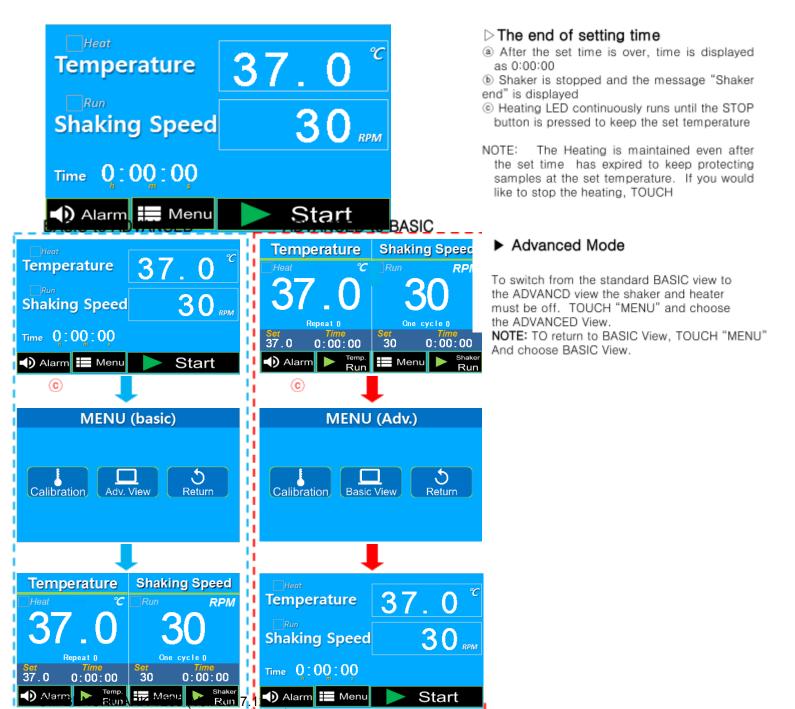
TOUCH the time value, The numbers become red
 "SET MODE" is displayed (flashes)

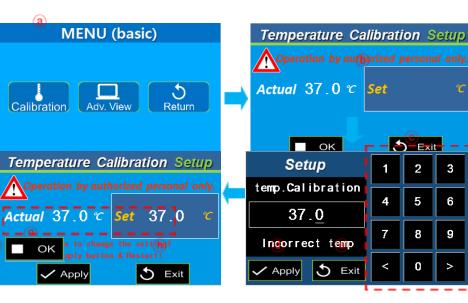
ⓒ Input the desired value by pressing UP(▲)/DOWN(▼) buttons NOTE: Press and hold the buttons to increase or decrease the value quickly.

④ Apply: To store the newly set value TOUCH
Apply

(Or wait 5 seconds for the value to store automatically) (a) Exit: If you press (b) Exit kit or changing any values, the values are not saved and the screen returns to the previous screen

NOTE: The time can not be adjusted during a run. To change the time during a run, you must TOUCH . Change the time value and press and.





5 Exit

00:00:00

8

D

7

<

9

Adva	nced
Temperature	Shaking Speed
- Hear	Run RPM
37.0	30 🛋
Repeat 0	One cycle0
Ser Time 37.0 - 0:00:00	Set Time 30 0:00:00
Temperat	ure Setup
<i>Temp</i> 37.0 ℃ _{Set}	Time +
Actual 37.0 ल	Alarm set 1.0 ±C
🗱 Step 🗸	Apply 5 Exit

Tomporatura	Shaking Speed
Temperature	Shaking Speed
_Heat ${\mathscr C}$	Run RPM
27 Ai	
31.0	30
Repeat 0	One cycle0
<u>Set Time _</u> 37.0 0:00:00	Set Time 30 0:00:00
Alarm 🕨 ^{Temp.} Run	Menu Shaker Run

	521	C			
Setup	1	2	3		
Temp Set	4	5	6		
<u>3</u> 7.0					
Range:4.0~70.0 C	7	8	9		
Apply S Exit	<	0	>		
	i				
Temperatu	ire Se	tup_	<u>_</u>		
7emp 37.0 ℃ set	Temp 37.0 c Time set 00:00:00				
Actual 37.0 ε	Alarm ^{Set}	1.0	±℃		
Setup	1	2	3		
Temp Timer					

Temperature Setup

37 0 %

Actual 37.0 °

Time

Alarm 1.0

Tempearture calibration

It is a second secon and press

Press the rectangular "Set "C" box.

Input the calibrated (measured) value by using key pads and TOU 🖊 Apply

④ Apply: When you ,the changed setting values are saved a 🗖 ок creen turns to the previous screen.

If you press button, the changed setting values are n S Exit and the screen turns to the previous screen.

 When you press
 in the second sec button, the message is displayed as the 🗸 Applyangular part

When you press APPLY button, the calibrated value is applied and the screen turns to the MENU b If you press. the calibrated value is not saved and the screen turns to MENU

①The last calibrated value of set "C is continuously displayed until the power is turned off and on

Please measure the temperature of the inside of equipment by using a deliberate temperature measuring instrument before starting temperature calibration. At this moment, the temperature of the

inside of equipment should be stabilized. If you Temperature setting (Advanced screen) and

Temperature setting charige alibrated one

In TOUCH the temperature value, the screen turns to the temperature setting screen

TOUCH the "Temp Set" Value to adjust the set temperature.

Input the desired value by using the key pads in the setup screen

④ Apply: When you press, the changed setting values are saved and the screen turns to the previous screen

Exit: If you press, button, the changed setting values are not saved and the screen turns to the previous screen

① Apply: You must press to apply new setting NOTE: The temperature setting range of this instrument is 4~70°C. When selecting a value out of this range and pressing , the message "Incorrect range" is displayed.

Adjusting the Time of the Temperature

a TOUCH the temperature value, the screen turns to the temperature settings screen.

DUCH the "Time Set" value to adjust the set time of the heater.

© Input the desired value by using the key pads in the setup screen

④ Apply: When you press, the changed

setting values are saved and the screen turns to the previous screen.

Exit: If you press button, the changed setting values are not saved and the screen turns to the previous screen

lemp limer	
<u>0</u> 0:00:00	
Format=99h59m5	



mat=99h59m59s

5 Exit

Temperature Shaking S	peed	Ten	nperatui	re Se	tup	
Beat ⁶ Run 30	RPM	Temp 37	.0 ° 7	ime et 0	0:00):0(
Repeat 0 One cycle Set Time Set 1 37.0 0:00:00 30 0:1	0 ////////////////////////////////////	Actual 3	.00	\ larm et	1.0	ŦĊ
♦ Alarm ► ^{Temp.} III Menu	Shaker Run	Setu	IP	1	2	3
		Temp. /	larm	4	5	6
		<u>0</u> 1.	0	4	5	
		range: 0.	1~10.0	7	8	9
		Apply	达 Exit	<	0	>
Temperature	19	. 3	С 			
Shaking Speed		0,	ерм			
Time 0,:00,:00						
🐠 Alarm 📰 Menu		Start				

Adjusting the Alarm setting

The alarm value is the difference between the set temperature and the measured (displayed) temperature. If the difference exceeds this value (once the temperature has been reached) the alarm will trigger.

(a) TOUCH the temperature value, the screen turns to the temperature settings screen.

b Touch the "Alarm Set" value to enter the alarm setup.

Input the desired value by using the key pads in the setup screen

 Ø Apply: When you press, the changed setting values are saved and the screen turns to the previous screen

 Exit: If you press button, the changed setting values are not saved and the screen turns to the previous screen

When putting the value out of the range and pressing, the message "Incorrect range" is displayed.

NOTE: With a set temperature of over 50C, an alarm value of +2.0 is recommended

Alarm Off

The alarm can be deactivate in both the BASIC View and the ADVANCED View by TOUCHING the key to toggle on or off.

Temp	Temperature		y Speed
Heat	°C	Run	RPM
37		3	0
Repeat 0		One cy	
Set 37.0	Time 0:00:00	30 Set	0:00:00
🜓 Alarm	Fremp. Run	📕 Menu	Shaker Run

Shaker Setup				
RPM 30 RPM	<i>Time * " ;</i> set 00:00:00			
Actual 30 RPM	Alarm _{Set}	10	±RPM	
Setup	1	2	3	
Shaker RPM	- 4	5	6	
<u>0</u> 30				
Range:30~300) rpr	7 1	8	9	
Apply S Exi	<	0	>	

Shaker setting (Advanced)

> RPM setting change

TOUCH the RMP Shaker value, the screen turns o the Shaker setting screen

TOUCH the "RPM Set" Value to adjust the set speed.

Input the desired value by using the key pads in the setup screen

Apply: When you press, the changed

etting values are saved and the screen turns to ne previous screen

Exit: If you press button, the changed setting values are not saved and the screen turns to the previous screen

The RPM setting range is 30~300rpm when entering a value out of this range and ressing, the message "Incorrect range" is isplayed.

	,						
Temperature	Shaking Speed			Shake	Setup	, b	
_ _{Heat} ♥	Run RPM		RPM Set	30 rpm	<u>Time</u> _{Set} 0	0:00	
Repeat 0	Cne cycle 0		A	20	Alerm	0 7 7 7	
Set Time 37.0 0:00:00	Set Time 30 0:00:00		Se	tup	1	2	3
Alarm 🕨 ^{Temp.} Run	Henu 🕨 Shaker Run		Shaker	Timer			
OM-BENCH	MARK T205 (Ver. 2	2017	00.0	0.00	4	5	6

Shaker setting (Advanced) Adjusting the Shaking Time

0

In TOUCH the RPM Shaker value, the screen turns to the Shaker setting screen

In TOUCH the "Time Set" Value to adjust the set shaking time.

© Input the desired value by using the key pads in the setup screen

Ø Apply: When you press, the changed setting values are saved and the screen turns to the previous screen

Exit: If you pressbutton, the changed setting

Tempe	erature	Shakin	g-Speedi
Heat	Ĉ	Run	RPM
37		3	0
Re	peat ()	— — Gma =	ycto (= _
Set 37.0	Time 0 : 00 : 00	Set 30	Time 0:00:00
🜓 Alarm	Run	📕 Menu	Bhaker Run

Shaker Setup				
RPM 30 RPM	0 RPM Time () () () Set - 00:00:00			
A	Alarm	10		
Setup	1	2	3	
RPM Alarm	4	5	6	
<u>1</u> 0 📵	4			
range: 1~30 rpm	7	8	9	
Apply 5 Exit	<	0	>	

Shaker setting (Advanced) Alarm setting change

The alarm value is the difference between the set speed and the measured (displayed) speed. If the difference exceeds this value (once the temperature has been reached) the alarm will trigger.

(a) TOUCH the RMP Shaker value, the screen turns to the Shaker setting screen

DUCH the "RPM Set" Value to adjust the set speed.

© Input the desired value by using the key pads in the setup screen

@ Apply: When you press, the changed setting values are saved and the screen turns to the previous screen

Exit: If you press button, the changed setting values are not saved and the screen turns to the previous screen

❀ The RPM setting range is 1~30rpm When selecting the value out of this range and Pressing, the message "Incorrect range" is displayed.



Time 00:00:00 017.12.12)

> Alarm Off

The alarm can be deactivate in both the BASIC View and the ADVANCED View by TOUCHING the key to toggle on/off.

Temperature Heat 2 37.0 Repeat 0 ST.0 0:00:00 Temperat	Shaking Speed Run RPM 30 One cycle 0 Set Time 30 0:00:00 Cure Setup			
Temp 37.0 °	<i>Time</i> * * * * * * * * * * * * * * * * * * *			
Agual 37.0 c	Alarm 1.0 ±°			
Temperature Step & Setup Alarm 1.0				
1 37.0 2	Time 0:00:00			
101				

0 10

Temperature step setting

>Temp, time setting

TOUCH the temperature value to enter the temperature setup screen.

(b) Select , the screen moves to the temperature step & setup screen

© You can select/link up to 4 desired temperatures. Choose each of the 4 desired temperatures by pressing on the value. (If less than 4 linked temperature is desire, leave the time and temperature values as "0" to skip.

Ince a temperature value is selected, use the keypad in the setup screen to select the desired temperature.

 Apply: When you press, the changed setting values are saved and the screen turns to the previous screen

(f) Exit: If you press button, the changed setting values are not

saved and the screen turns to the previous screen

 Once the desired temperatures have been chosen, adjust the time values by following the same steps.

b There are 3 modes available for Step Operation : "One cycle", "Repeat Cycle", "Step off"

NOTE: Repeat cycle will result in continuo repeating of all programmed steps until the stop button is pressed.

		Set 4	
Setup Temp Se	mno Set 3 et 2 ₂	3	
Temp Set 1			
37.0	4 5	6	
Range:4.0~70.0 C	7 8	9	
Setup Temp 2 1	nn ° Time	Timer r 3	
Temp 1 Timer	imer 2	3	
10:00:00	4 5	6	
Format=99h59m59s	7 8	9	
- Apply 5 Exit	< 0	>	
1 37.0 ℃ Time	10:00	:00	
2 <u>38.0</u> ℃ Time	20:00	:00	
<u> </u>			
Z → Repeat) Time		:00	► Shake > RPM,
立 ^手 off ✓ App		Exit	a TOU
Temperature Sh Heat ℃ TR	aking Sp	RPM	b Selec C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C
27 0	20		speeds the time
\mathbf{S}	30	- 1	@ Once
Repeat 0 Set Time Set	One cycle () <i>Tin</i>	ne 📕	RPM value Image: RPM
37.0 0:00:00 30		00:00	to the pr
Shaker Se	etup		① Exit: I saved ar
RPM 30 RPM Till Set Set	ກຂໍ້ "	0:00	9 Once
			the same
Actual 30 RPM All	^{arm} 10	±RPM	h There off"
Shaker Step. & Setup	Alarm	10	NOTE: F stop but
		0:00	
<u>()</u> (9	00:00		
3 0 RPM TIM			
Sha		4 RPM	
	2 RPM 2	3	
Shaker 1 RPM 030	4 5	6	
Range: 30~300 rpm	7 8	9	
	Shaker aker 3 Ti	4 Time mer	1
Shaker 1 Timer	2 Timer		
10:00:00		6	
	4 5		
Format=99h59m59s	4 5 7 8	9	
Format=99h59m59s	7 8	9 10	
Format=99h59m59s Shaker Step & Setup	7 8	10	
Format=99h59m59s Shaker Step & Setup 1 30 RPM Tim	7 8 Alam RPM ≠	10 10	
Format=99h59m59s Shaker Step & Setup	7 8 Alam RPM = 10:00 20:00	10 2.00 0.00	17,12,12)

Shaker step setting

RPM, time setting

OUCH the RPM Shaker value to enter the shaker setup screen.

Image: Boundary Select is the select of t

© You can select/link up to 4 desired shaking speeds. Choose each of the 4 desired speeds by pressing on the speed value. (If less than 4 linked speeds are desire, leave the time and speed values as "0" to skip.

@ Once a RPM step is selected, use the keypad in the setup screen to select the desired RPM value

 Apply: When you press, the changed setting values are saved and the screen turns to the previous screen

(f) Exit: If you press button, the changed setting values are not

saved and the screen turns to the previous screen

Ince the desired RPM speeds have been chosen, adjust the time values by following the same steps.

(b) There are 3 modes available for Step Operation : "One cycle", "Repeat Cycle", "Step off"

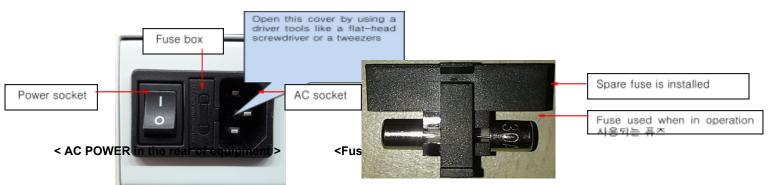
NOTE: Repeat cycle will result in continue repeating of all programmed steps until the stop button is pressed.



Step Cycle Ending Screen

(a) When the time for each step has expired, the "End" message is displayed
(b) "Set" displays the setting value of 1st step (Default value is displayed when Step Off)
Time is displayed as 0

Image: Staker Run ayed as the instrument can be restarted at any time.



The fuse is stored in the fuse box of the integral power inlet on the backside of the instrument.

► In the case you need to use the spare fuse, put a ¬-shaped tool, a flat-head screwdriver or a tweezers in the little U-shaped hole on the bottom of fuse box to open the cover, remove the installed fuse and replace it with the included spare.



\A/

NA/

Event view

Door open message When the door has been left open for opening the door, the message "Door" is displayed on the basic and advanced screen NOTE: The heater and shaker are automatically stopped when the door is open.

▷ Temperature/Shaker Alarm The message "low' or "high" is displayed on the display when the measured value is deviating from the set value.

Maintenance:

The platform of the Incu-Shaker should be cleaned regularly with a soft cloth dampened with water or alcohol. (Always ensure that the machine has been powered down prior to cleaning.

In the event of a spillage: Power down the unit, remove the platform and dry the internal chamber with a soft cloth. DO NOT attempt to operate the unit until the spillage had been properly dried.

Service and Contact

Service on the Incu-Shaker should only be performed by qualified service personnel. To request service or technical support, please contact Benchmark Scientific or your local benchmark Scientific representative.

