

STALWART

Operations Manual

SDB-2001

Dry Bath Incubator



File No.: MU01SM
File Version: Version 1.0

PREFACE

Thanks for choosing dry bath incubator. This operation manual describes function and operation of the instrument. In order to use the instrument properly, please read this manual carefully before operating the Instrument.

Opening Check

Please check the instrument and appendix with the packing list when you first open the packing case. If anything does not match with the packing list, please contact with the vendor or the producer.

Safety Warnings and Guidelines

1 Important Operation Information of The Security

Users should have an entire conception of how to use the instrument properly before operating it. Please read this operation manual carefully before using the instrument.



It is forbidden operating before read the operation manual. Read the guidelines and directions below and carry out the countermeasure according to them.

2 Security

To operation, maintenance and repair the instrument, please comply with the basic guidelines and the remarked warnings below. Otherwise, the instrument will suffer effect on the scheduled working life and also on the protection provided.



This product is a normal and an indoor using instrument.



Before operation, read the manual carefully. These units are designed for using in the laboratory environments by who're knowledgeable in safe laboratory practices.



The operator should not open or repair the instrument by himself. Otherwise, the instrument will lose the qualification of repair guarantee or cause accidents. The company will repair the instrument based on warranty description.



A.C. power's grounding should be reliable to safeguard against an electric shock. The 3-pin plug supplied with thermo-shaker's power cable is a safety device that should be matched with a suitable grounded socket.



The temperature of metal block will be very high during the normal operation. There will be scald or boiling of the liquid. It is strictly prohibited any part of the body touching the instrument from scald.



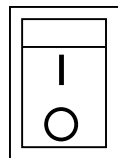
Close the test tube lid before put the tube into the block. Liquids may spill out in the block or onto the device if the tube lid is opened, which will damage the block or the device.



Make sure the voltage is complying with the voltage required. Make sure the rated electrical outlet load no lower than the demand. Power line should be replaced with the same type if it any damage. Make sure there is nothing on the power line. Hold the jack when pull out the power line. Do not pull the power line. Do not put the power line in ambulatory place.



The instrument should be put in the place where of low temperature, little dust, no water, no sunshine or hard light, and of good aeration, no corrosively gas or strong disturbing magnetic field, and far away from central heating, camp stove and other hot resource. Do not put the instrument in wet and dusty place. The vent on the instrument is designed for aeration. Do not wall up or cover the vent. The distance between each device should be more than 100cm when there is more than one instrument.



Main switch is on the rear of the device. Turn to “I” to power on the device, and Turn to “O” to power off the device.



Power off when operation finished. If long period do not use the instrument, pull off the connector plug, cover a cloth on the instrument to prevent from dust.



Pull the connector plug from the jack at once in the following case, and contact the vendor.

- There is some liquid flowing into the instrument;
- Drenched or fire burned;
- Abnormal operation: such as abnormal sound or smell;
- Instrument dropping or outer shell damaged;
- The function has obviously changed.

3 Instruments Maintenance

The well in the block should be cleaned by the cloth stained with alcohol to assure good heat translation between the block and the test tube and no pollution. If there are smutches on the instrument, clean them with cloth.



Power off when cleaning the instrument.
Do not drop the clean fluid in the well when cleaning.
Corrosive clean fluid is strongly prohibited.

Contents

Chapter 1: Introduction.....	- 1 -
Chapter 2: Specifications.....	- 2 -
1. The normal working condition.....	- 2 -
2. Basic parameters and performance.....	- 2 -
Chapter 3: Basic Operation Instruction.....	- 4 -
1. Construction.....	- 4 -
2. Operation panel.....	- 5 -
3. Button instruction.....	- 5 -
Chapter 4: Operation Guide.....	- 6 -
1. Temperature and time setting.....	- 6 -
2. Start and stop.....	- 7 -
3. Temperature calibration.....	- 7 -
4. The exchange of the metal block.....	- 10 -
Chapter 5: Error Analysis and Trouble Shooting.....	- 11 -
Annex 1: Wiring Diagram of SDB-2001 Dry Bath INCUBATOR.....	- 12 -

Chapter 1: Introduction

The dry bath incubator is a microprocessor-controlled thermostat device with high precision of temperature control. It is good for sample preparation parallelism. And it is used as an alternative to the traditional water bath devices. It is widely used in the cultivation, preservation and reaction of various samples. Its applications of industry include pharmaceutical, chemical, food safety, environment, quality inspection, etc.

Features

- 1. LCD display. Cool and compact designed appearance.**
- 2. Fast heating speed, uniform heating, accurate temperature control, high stability, low energy consumption and no noise.**
- 3. Built in temperature calibration function, automatic fault detection and buzzer alarm function.**
- 4. Built in over-temperature protection device, safe and reliable, enhance the service life of the machine.**
- 5. Product designed compact and tight, occupied little space, free and easy.**
- 6. Various blocks for convenient replacement, easy for cleaning and disinfection.**

Chapter 2: Specifications

1. The normal working condition

The room temperature: 5°C ~30°C

The relative humidity: ≤70%

The using power: 110V / 220V ~50/60Hz

2. Basic parameters and performance

Model	SDB-2001
Temp. Control Range	R.T.+5°C □150°C
Temp. Setting Range	5°C □150°C
Temp. Stability @40~100°C	≤0.5°C
Temp. Stability@>100°C	≤1°C
Block Temp.Uniformity @40°C	≤0.3°C
Block Temp.Uniformity @>100°C	≤0.5°C
Temp. Display Accuracy	0.1°C
Heating Speed	≤30min (20°C to 150°C)
Time Range	1min ~99h59min
Sample Capacity	1 standard block
Voltage	AC 220V / 110V
Power	200W
Fuse	250V, 2A/3A
Dimension	200 x 230 x 95mm
Net Weight	2.6kgs

Exchangeable blocks for DKT series

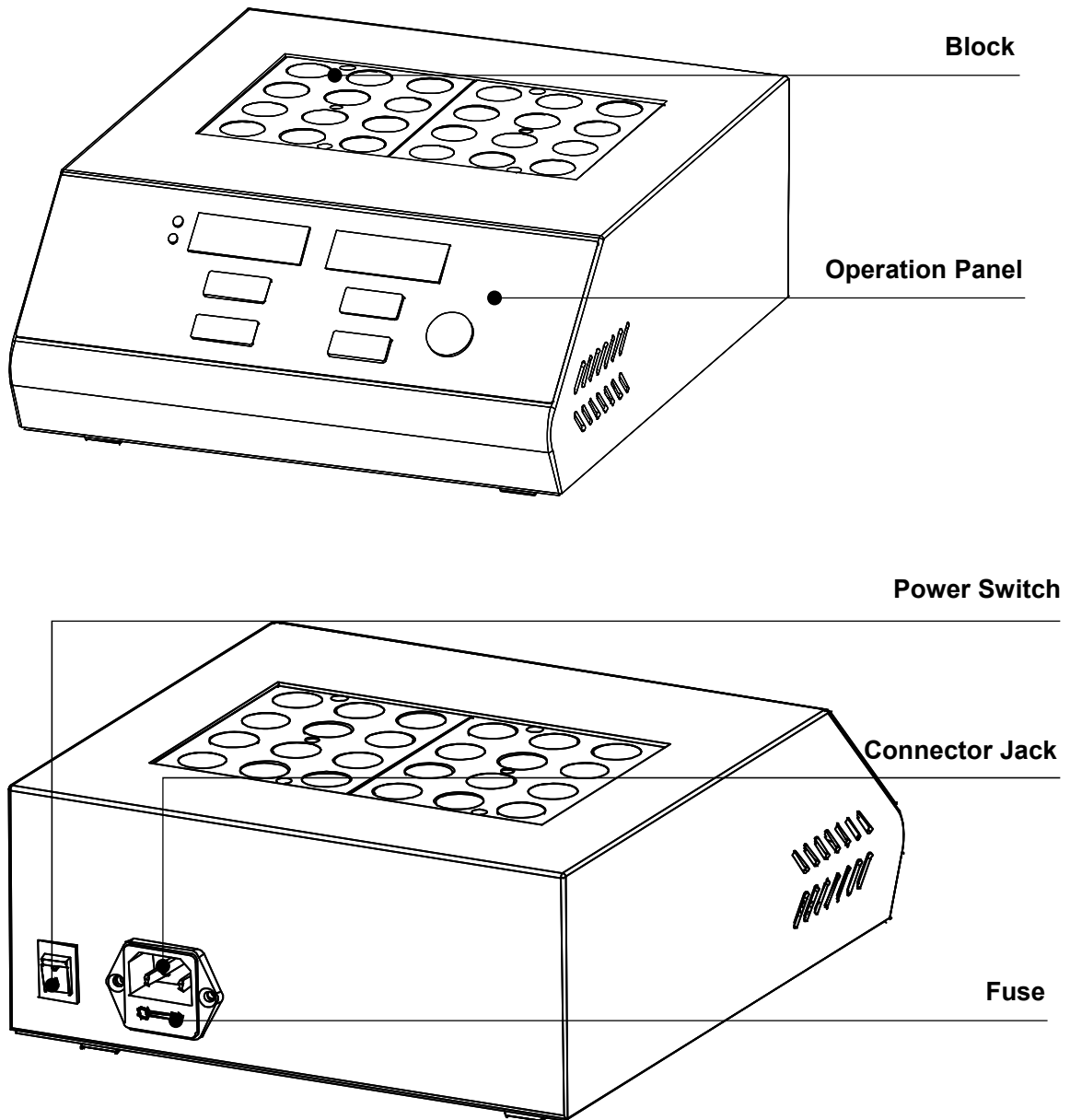
(Below types just for reference. It is subject to change with or without prior notice.)

Type	Description	Dimension (mm)
DT01	6mm x 42	95.5 x 76.5 x 50
DT02	7mm x 42	95.5 x 76.5 x 50
DT03	10mm x 20	95.5 x 76.5 x 50
DT04	12mm x 20	95.5 x 76.5 x 50
DT05	13mm x 20	95.5 x 76.5 x 50
DT06	15mm x 12	95.5 x 76.5 x 50
DT07	16mm x 12	95.5 x 76.5 x 50
DT08	19mm x 12	95.5 x 76.5 x 50
DT09	20mm x 6	95.5 x 76.5 x 50
DT10	26mm x 6	95.5 x 76.5 x 50
DT11	28mm x 4	95.5 x 76.5 x 50
DT12	40mm x 2	95.5 x 76.5 x 50
DT13	0.5ml x 42	95.5 x 76.5 x 50
DT14	1.5ml x 24	95.5 x 76.5 x 50
DT15	2.0ml x 24	95.5 x 76.5 x 50
DT16	0.2ml x 48	95.5 x 76.5 x 50
DT17	0.2ml x 96	78 x 114 x 26
DT18	96 micro-plate (no holes)	81 x 123 x 19
DT19	Customized	Customized

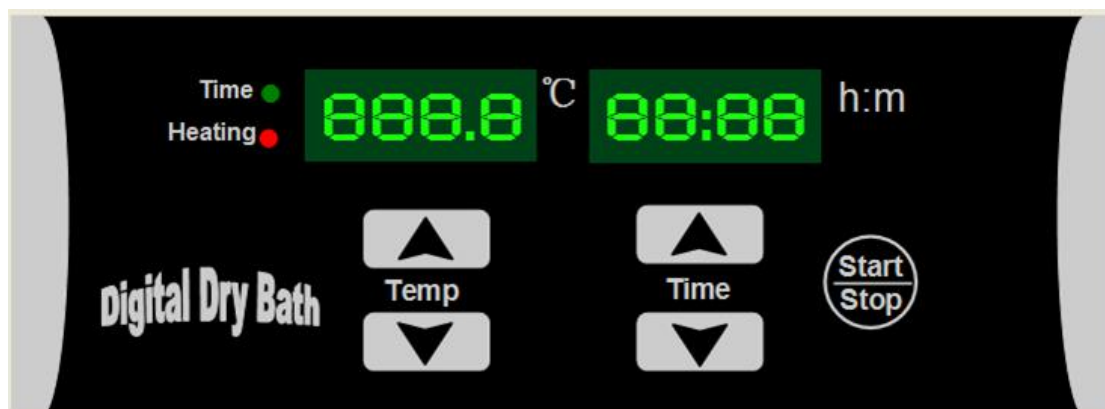
Chapter 3: Basic Operation Instruction

This chapter mainly describes the instrument's mechanical structure, the keyboard and functions of each key, as well as preparations before power on.(The picture is based on dkt200-2 for reference). Please learn this chapter well before the Thermo Shaker to be operated the first time.

1. Construction



2. Operation panel



3. Button instruction



Decreasing button: decrease the value set



Increasing button: increase the value set

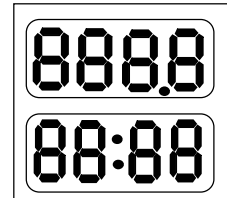
START/STOP

Run/stop button: start operation when press the button after setting the temperature and the time value. Press this button for 2 seconds to stop the instrument in operation.

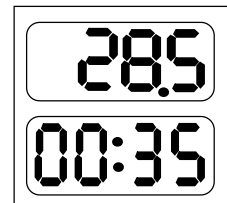
Chapter 4: Operation Guide

1. Temperature and time setting

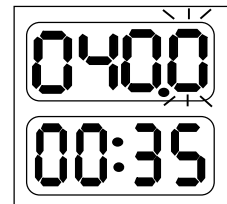
a) Power on, the LED displays “8 888.8” as the right chart. The instrument enter to the initial state with sound of “du...”.



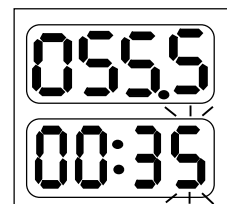
b) Two seconds later, the value changes to block current temperature and setting time of last operation. As the right chart, “28.5” is the block current temperature, and “00:35” is the last setting time which means 35 minutes.



c) Click ▲ or ▼ of TEMP , the temperature value changes to the setting value in last operation, and the last digital of the setting value flickering. Press ▲ or ▼ of TEMP to change the temperature setting value. Keep press will lead the value changing speed tens, hundreds, or thousands times fast. When the value reaches the target, release ▲ or ▼ key , the instrument automatically confirm and save the value.



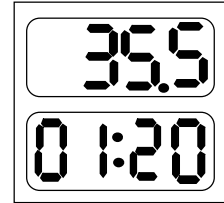
d). Click ▲ or ▼ of TIME key , the last digital of the time setting value flickers. Press ▲ or ▼ of TIME key to change the time setting value. Keep press will lead the value changing speed tens, hundreds, or thousands times fast. When the value reaches the target, release ▲ or ▼ key, the instrument automatically confirm and save the value.



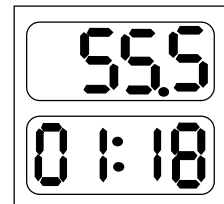
Notes: The time setting “00:00” means no the operation timing, the instrument runs continuously at the setting temperature.

2. Start and stop

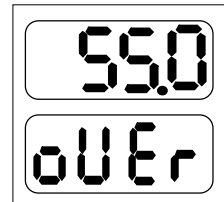
a) After accomplishment of temperature and time setting, click the Start/Stop key to start the instrument operation. The temperature rises with sound of “du...”



When the instrument is heating, the dot “.” of the temperature value flickers regularly. When the temperature reaches the setting value, the dot “.” stops flicker, and the colon “ : ” of the time value begin to flicker, meanwhile, the time is in the countdown.



When time is up, the operation stops with buzzer alarms. LCD displays current block temperature and time display is “oUeR” which means the operation is completed.



b) When the operation completes, the instrument goes to waiting interface. Press ▲ or ▼ key to reset the temperature and time, then, press start/stop to start a new operation. Press start/stop without any change of the setting to restart the operation.

c). Continuously press start/stop for 2 seconds during the operation to stop running. Press start/stop again to continue the operation.

3. Temperature calibration

The temperature of the Instrument has been adjusted before it is sold out. In case there is deviation between the actual temperature and the displayed temperature, you can do as follow for temperature calibration.

NOTICE:

- 1) The instrument has 2 calibration temperature points to ensure the veracity.

It is linearly adjusted on 40°C and 100°C. The temperature accuracy will be

within $\pm 0.5^{\circ}\text{C}$ after temperature calibration.

- 2) Both the environmental and the block temperature should be lower than 35°C when calibration.

Adjustment Methods:

- a) Power on the instrument, it enters into waiting interface. Make sure the current temperature in display is below 35°C . If the temperature is higher than 35°C , please wait until it down below 35°C .
- b) Inject olefin oil into one of block well, and then put a thermometer into this well (the precision of the thermometer should be 0.1°C and the temperature ball should be absolutely immersed into the olefin oil in the block well). Adiabatic material is needed on the block to separate it from the circumstance. (refer to below Figure A)

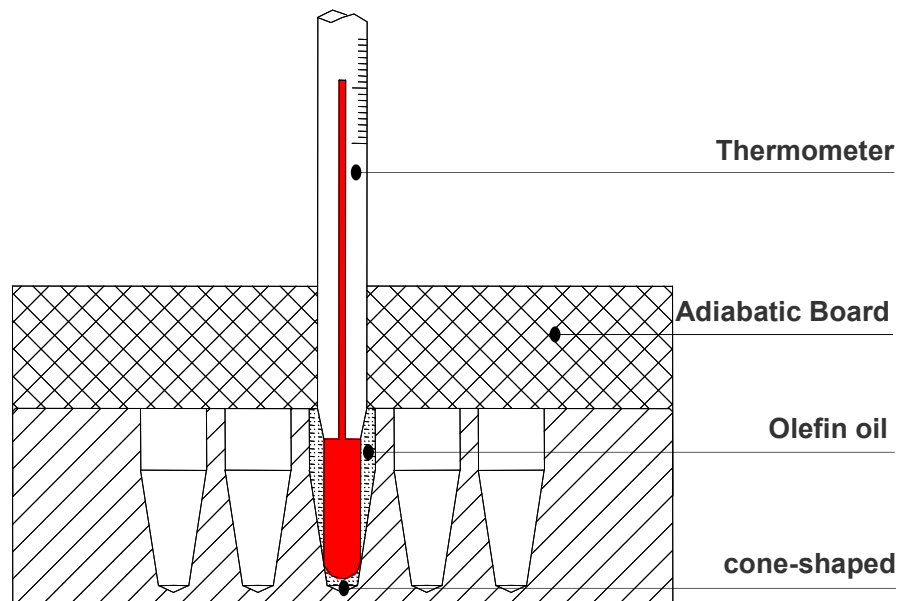
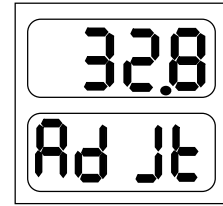


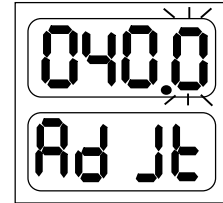
Figure A

NOTICE: To ensure the calibration precision, read the actual temperature value after the temperature reaches calibration points for at least 20 minutes.

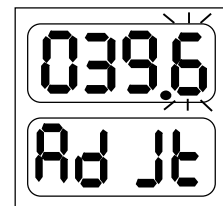
c). Press ▲ and ▼ key simultaneously to enter the temperature calibration interface as the right chart. LED display “ Ad Jt ” in the time display, the temperature display the current temperature and the program auto control the temperature to 40°C.



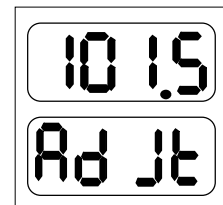
When the temperature reaches 40 °C, the decimal digit begins to flicker. Wait for at least 20 minutes, the actual temperature of thermometer is 39.6°C, press ▲ or ▼ key of temperature to amend the temperature value to 39.6, Press “Start/Stop” to confirm.



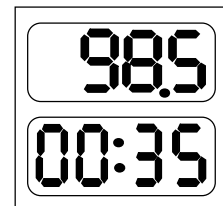
Program saves the value.
Temperature rises to 100°C automatically.



d). When the temperature reaches 100°C, the decimal digit begins to flicker. Wait for at least 20 minutes, the actual temperature of thermometer is 101.5°C, press ▲ or ▼ of temperature to amend the temperature value to 101.5, Press “Start/Stop” to confirm.



e). After temperature have been adjusted, press ▲ and ▼ key simultaneously to exit the temperature calibration and return to waiting interface.



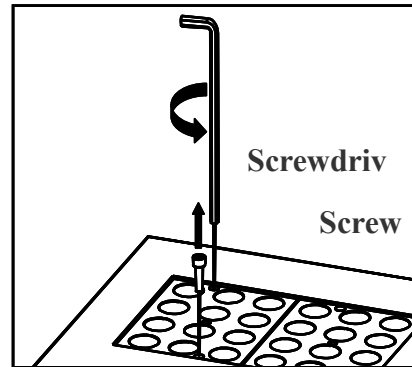
Notice

After temperature calibration, the temperature display is the same as the practical temperature of block.

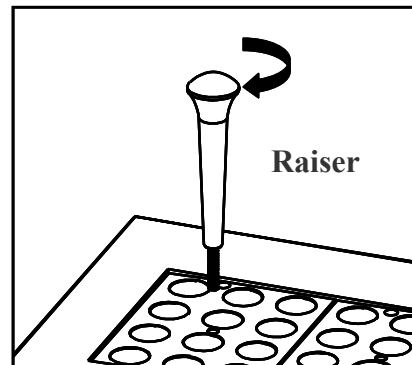
Press ▲ and ▼ key simultaneously during the calibration to exit the adjustment procedure, the calibration is invalid.

4. The exchange of the metal block

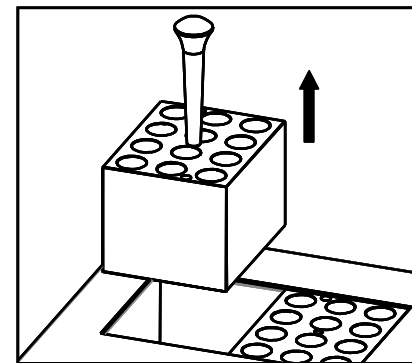
a) Pull out the two screws which fix the block to the heating board with the screwdriver.



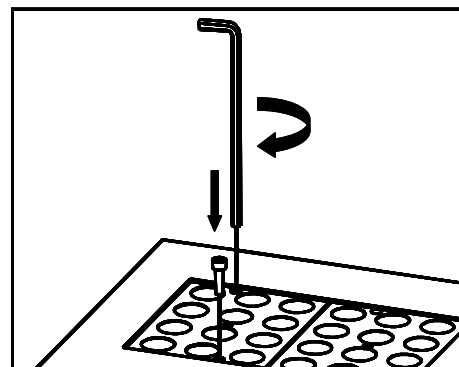
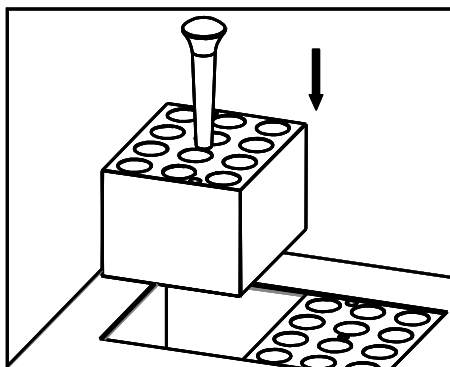
b) Fix the raiser in the center well of the block.



c) Pull out the raiser with the block.



d) Screw the raiser out from the block, then fix the raiser to another block needed. Put the block in the instrument and fix it with screws.



Notice: It is a little complicated to exchange the block, please be a bit patient.

Chapter 5: Error Analysis and Trouble Shooting

No.	Fault phenomenon	Cause analysis	Recovery processing
1	No signal on the display when power on	No power	Check the connection of power
		Broken fuse	Exchange fuse (250V 4A Φ 5x20)
		Broken switch	Exchange the switch
		Others	Contact to the seller
2	The actual and display temperature are quite different	Broken sensor or loose contact of the block	Contact to the seller
3	“ERR” in the display with the alarm of “du...”	Broken sensor or room temperature below zero.	Contact to the seller
4	No heating of the block	Broken sensor.	Contact to the seller
		Solid state relay damage	
		Broken heater	
5	Key invalid	Key broken	Contact to the seller

Annex 1: Wiring Diagram for SDB-2001

(Below diagram is just for reference. It is subject to change without prior notice.)

