

MaxQ 2000 CO₂ Plus

Digital CO₂ Resistant Shaker

Catalog # 88881101B, 88881102B, 88881103B, 88881104B Operation Manual 0000847



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Thermo Scientific CO₂ Resistant Shaker

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CO₂ Resistant Shaker Thermo Scientific

Table of Contents

Section 1	Unpacking and Installation	1-1
	Packing List	
	Universal (Aluminum) Platform Installation	
	18 inch (Aluminum) Platform Installation	
	Rubber Mat Platform Installation	
	Connections of the Instrument	
Section 2	Overview	2 -1
	Specifications	
	Environmental Conditions	
	Safety Tips	
	Storing the Signal Cable	
	Output Current of Control Box	
	Maximum Shaking Speed	2-5
Section 3	Operation	3 -1
	Operations on the Control Panel	
	Speed and Time Settings	
	Alarm System	
	Tuarin System	5-2
Section 4	Application	4- 1
Section 5	Safety Tips	5 -1
Section 6	Optional Accessories	6- 1
Section 7	Troubleshooting	7-1
Section 8	Warranty Information	8 -1

Thermo Scientific CO₂ Resistant Shaker

iii

Table of Contents

iv CO₂ Resistant Shaker Thermo Scientific

Section 1 Unpacking and Installation

- 1. Inspect contents upon receipt of the instrument, if the instrument is upside down, contact the manufacturer immediately.
- 2. Check packing list below. If there are any damaged or missing items, contact the manufacturer.
- 3. Place the instrument on a level and firm surface, to avoid vibration and noise.

Table 1-1. Packing List

Thermo Scientific Cat. No.	88881101B	88881102B	88881103B	88881104B	Picture
Model name on carton box label	MaxQ 2000 CO2 Plus, 100-240V, for USA	MaxQ 2000 CO2 Plus, 100-240V, various plugs	MaxQ 2000 CO2 Plus Package, includes 88881101B Shaker, Universal Platform and Flask Clamp Starter Kit	MaxQ 2000 CO2 Plus Package, includes 88881102B Shaker, Universal Platform and Flask Clamp Starter Kit	
Main Body	1	1	1	1	
Control Box	1	1	1	1	
General Power Adaptor	1	1	1	1	
US Plug	1	N/A	1	N/A	
CN Plug	N/A	1	N/A	1	() /

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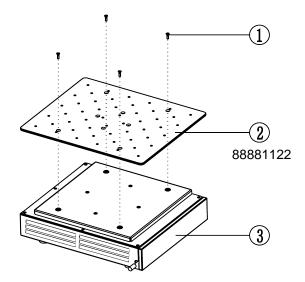
Table 1-1. Packing List (Continued)

Thermo Scientific Cat. No.	88881101B	88881102B	88881103B	88881104B	Picture
Model name on carton box label.	MaxQ2000CO2 Plus, 100-240V, for USA	MaxQ2000CO 2 Plus, 100-240V, various plugs	MaxQ2000CO2 Plus Package includes 88881101B Shaker, Universal Platform and Flask Clamp Starter Kit	MaxQ2000CO2 Plus Package includes (8881102B Shaker, Universal Platform and Flask Clamp Starter Kit	
EU Plug	N/A	1	N/A	1	
UK Plug	N/A	1	N/A	1	
Universal Platform (AL)	N/A	N/A	1	1	
100ml Flask Clamp	N/A	N/A	2	2	a Fa
250ml Flask Clamps	N/A	N/A	4	4	
500ml Flask Clamps	N/A	N/A	4	4	
1L Flask Clamps	N/A	N/A	2	2	
2L Flask Clamps	N/A	N/A	2	2	
Data Port	1	1	1	1	

1-2 CO₂ Resistant Shaker Thermo Scientific

Universal (Aluminum) Platform Installation

1. Place the instrument on a level and firm surface; it must be capable of supporting the weight and load of the instrument, and the impact force generated by the motion. Prepare related parts (see Figure 1-1).



- 1) M4x14 cross recessed countersink head screws
- 2) Universal (aluminum) platform
- 3) Main body of CO2 resistant shaker

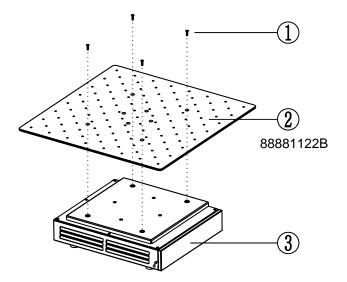
Figure 1-1. Universal Platform Installation Diagram

- 2. Install the horizontal universal platform on the fixed plate of the Main body, ensure all four mounting holes in the universal platform and the four threaded mounting holes are in alignment.
- 3. Fasten the universal platform and the fixed plate with four M4x14 cross recessed countersink head screws.

Thermo Scientific CO2 Resistant Shaker 1-3

18 inch (Aluminum) Platform Installation

1. Place the instrument on a level and firm surface; it must be capable of supporting the weight and load of the instrument, and the impact force generated by the motion. Prepare related parts (see Figure 1-2).



- 1) M4x14 cross recessed countersink head screws
- 2) 18 inch (aluminum) platform
- 3) Main body of CO2 resistant shaker

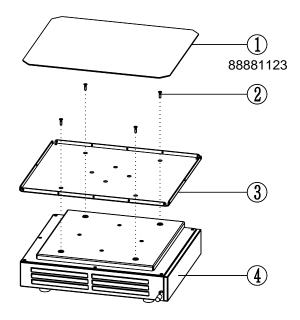
Figure 1-2. 18 inch Platform Installation Diagram

- 2. Install the horizontal universal platform on the fixed plate of the Main body, ensure all four mounting holes in the universal platform and the four threaded mounting holes are in alignment.
- 3. Fasten the universal platform and the fixed plate with four M4x14 cross recessed countersink head screws.

1-4 CO₂ Resistant Shaker Thermo Scientific

Rubber Mat Platform Installation

1. Place the instrument on a level and firm surface; it must be capable of supporting the weight and load of the instrument, and the impact force generated by the motion. Prepare related parts (see Figure 1-3).



- 1) Rubber mat
- 2) M4x10 cross recessed countersunk head screws
- 3) Platform
- 4) Main body of CO2 resistant shaker

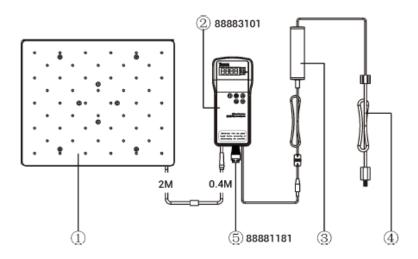
Figure 1-2. Universal Platform Installation Diagram

- 2. Install the horizontal platform on the fixed plate of the Main body; ensure all four mounting holes on the platform and the four threaded mounting holes are in alignment.
- 3. Fasten the platform and the fixed plate with four M4x10 cross recessed countersink head screws.
- 4. Place the rubber mat on the platform.

Thermo Scientific CO₂ Resistant Shaker 1-5

Connections of the Instrument

Refer to Figure 1-4 when connecting the instrument.



- 1) Main body of CO2 resistant shaker
- 2) Control box
 3) Power adapter
 4) Power cord
- 5) 4-20mA data port

Figure 1-4. Circuit Diagram

Note:

- 1) When diconnecting the control box from the main body, please cut off the power first.
- 2) No special cable needed to connect with 4-20mA data port. **\(\Delta\)**

1-6 CO₂ Resistant Shaker Thermo Scientific

Section 2 **Overview**

Specifications	Rotation SpeedSpeed Range30 to 1200 rpmSpeed Accuracy±5 rpmOrbit DiameterØ3mmMotion TypeOrbitalSpeed DisplayLED
	Load
	Maximum Load
	Timer
	Timer Range $0\sim99h$ 59min.Hour DisplayLEDMinute DisplayLED
	Dimensions (WxDxH)
	Main body 360 x 300 x 101mm (14.2 x 11.8 x 4.0 inch) Control Box
	Weight
	Net Weight (Main body)
	Power Supply
	Requirement
	Other
	Certification ROHS, WEEE, cCSAus, CE Mark, FCC, CA 65, REACH, ICES-001
	Noise level

Thermo Scientific CO2 Resistant Shaker 2-1

2-2

Environmental Conditions

Application Environment Conditions: Indoor use

Tempera	ture
Altitude	≤2,000 n
Humidit	7
CO ₂ Co	centration

Storage Environmental Conditions

Temperature	5°C to 60°C
Altitude	≤2,000m
Humidity 2	20% to 99%, Non-Condensing

Safety Tips

- 1. Unplug and unload before moving the unit.
- 2. This instrument uses a single-phase AC100 240V 50/60Hz power supply.
- 3. Remove the power supply when the instrument is in maintenance.
- 4. DO NOT clean the unit with flammable or corrosive liquid.
- 5. Use specified power supply.
- 6. Maximum load 10kg (22.05 lbs.) @≤150 rpm
- 7. To ensure proper operation, the unit must be free of surrounding obstructions.

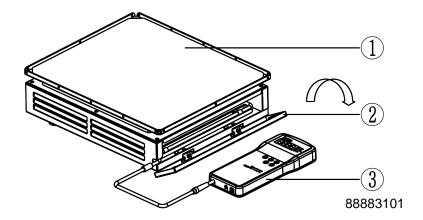
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2-3

Storing the Signal Cable

To store the signal cable, simply open the side plate on the main body. Refer to Figure 2-1. The signal cable can be placed inside.

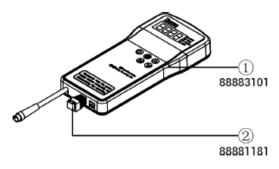
Caution When storing the cable, pay attention to closing the side plate door, to avoid pinching your fingers. \triangle



- 1) Main body of CO2 resistant shaker
- 2) Slide plate3) Control box

Figure 2-1. Storing the Signal Cable Diagram

Orbital Speed vs. Output Current Monitoring System



- Control box
 Data port

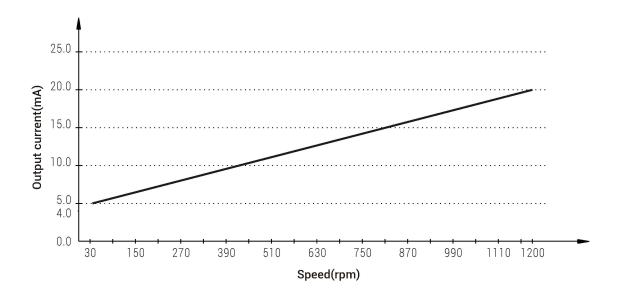
Figure 2-2. Output Current Monitoring System

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Orbital Speed vs. Output Current Monitoring System (Continued)

Table 2-1. Output current under different speed conditions

Speed (rpm)	Output current (mA)
0	4
30	4.8
1200	20



2-4 CO₂ Resistant Shaker Thermo Scientific

Maximum Shaking Speed

Table 2-2. Maximum Shaking Speed on Rubber Platform in Relation to Flask Size

Flas	Max Speed (rpm)	
Size	Liquid Volume	Max opeed (Ipin)
50ml	≤50ml	350
100ml	≤100ml	350
150ml	≤150ml	350
200ml	≤200ml	350
250ml	≤250ml	350
500ml	≤500ml	300
1000ml	≤1000ml	250
2000ml	≤2000ml	200
3000ml	≤3000ml	200
5000ml	≤5000ml	150

Table 2-3. Maximum Shaking Speed and Flask Capacity on Universal Platform

Flask Size		Max # of flasks	Max Speed (rpm)	
Size	Liquid Volume	per Universal Platform	max opeca (rpm)	
50ml	≤50ml	30	800	
100ml	≤100ml	15	800	
150ml	≤150ml	15	800	
200ml	≤200ml	15	780	
250ml	≤250ml	15	750	
500ml	≤500ml	9	700	
1000ml	≤500ml	4	650	
10001111	≤1000ml	4	550	
2000ml	≤1000ml	4	600	
20001111	≤2000ml	4	500	
3000ml	≤1500ml	3	450	
JUUUIIII	≤3000ml	3	400	
5000ml	≤2500ml	1	450	
Joodini	≤5000ml	1	400	

Thermo Scientific CO2 Resistant Shaker 2-5

2-6

Maximum Shaking Speed (Continued)

Note:

- 1) The flask clamps (≤2L) can be placed anywhere on the universal (aluminum) platform, even if the load is not balanced. ▲
- 2) Please refer to the "Liquid Volume" table in the specifications section for the maximum load. ▲

Table 2-4. Maximum Shaking Speed and Flask Capacity on 18 inch (aluminum) Platform

F	lask Size	Max # of flasks per	Max Speed (rpm)	
Size	Liquid Volume	18"x18" Platform		
50ml	≤50ml	49	650	
100ml	≤100ml	25	650	
150ml	≤150ml	25	650	
200ml	≤200ml	18	600	
250ml	≤250ml	18	550	
500ml	≤500ml	10	450	
1000ml	≤500ml	7	550	
10001111	≤1000ml	7	350	
2000ml	≤1000ml	4	480	
20001111	≤2000ml	4	250	
3000ml	≤1500ml	4	480	
30001111	≤3000ml	4	250	
5000ml	≤2500ml	2	300	
Joodini	≤5000ml	2	250	

Note:

- 1) The flask clamps (<2L) can be placed anywhere on the 18 inch (aluminum) platform, even if the load is not balanced. ▲
- 2) Please refer to the "Liquid Volume" table in the specifications section for the maximum load. ▲

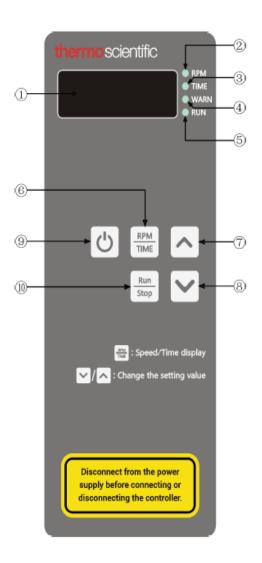
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Section 3 Operation

The unit has been designed with a "soft start/slow down" providing a smooth acceleration/deceleration during operation. This feature will decrease splashing of solutions from vessels during operation.

Warning The microprocessor control system may take 1 minute to synchronize the actual RPM of the universal (aluminum) platform to the desired RPM setting. Make sure that all the flasks and test tubes are firmly fixed on the universal platform and the flask clamps are fasten securely with the screws. ▲

Operations on the Control Panel



Thermo Scientific CO₂ Resistant Shaker

3-1

Operations on the Control Panel (Continued)

- 1) Display LED: Shows time or speed
- 2) RPM indicator light: LED shows current speed
- 3) TIME indicator light: LED shows current time.
- 4) WARN indicator light: Over-speed alarm.
- 5) RUN indicator light: The instrument is running.
- 6) RPM/TIME Key: While instrument is in operation, press to change time and speed display; when setting parameter, press to change minutes, hour or speed.
- 7) Up Arrow Key: Increases value. Hold for 3 seconds to increase rapidly.
- 8) Down Arrow Key: Decreases value. Hold for 3 seconds to decrease rapidly.
- 10) Run/Stop Key: The instrument is running or stopped.

Speed and Time Settings

Speed setting

- 1. Press RPM/TIME key. The speed indicator light is lit.
- 2. Press up and down arrow keys to access the speed setting state, speed value starts flashing.
- 3. Press up and down arrow keys to change the speed value. Speed increases or decreases. The minimum unit is 1rpm.
- 4. During settings, the unit will reset to current values if no value is input after three seconds.
- 5. Press "Run/Stop" key to run or stop.

Time setting

- 1. Press RPM/TIME key. The time indicator light is lit.
- 2. Press up and down arrow keys to access the speed setting state. Speed value starts flashing.
- 3. Press up and down arrow keys to change the time value. Time increases or decreases. The minimum unit is 1 minute or 1 hour.
- 4. During settings, the unit will reset to current values if no value is input after three seconds.
- 5. Press "Run/Stop" key to run or stop.

3-2 CO₂ Resistant Shaker Thermo Scientific

3-3

Speed and Time Settings (Continued)

Notes

- 1. When the shaker is running, the LED display will switch between the speed and timer function every 30 seconds automatically. Press RPM/TIME key to manually toggle between the speed and timer value.
- 2. In "timer mode" the LED display will show the remaining running time.
- 3. In "continuous mode" the LED display will show elapsed run time.
- 4. After the run is complete, the LED display will read "end". Press any key to place the shaker in standby mode.

Alarm System

Alarm System

- 1. During operation, the alarm will sound after 10 seconds if the unit has not begun shaking. In addition, the alarm will sound and stop for the speed over 1250 rpm after 2 seconds.
- 2. Once the shaker begins to alarm, the RUN indicator light will not be visible and the WARN indicator light will flash, and the unit will stop running.

Power failure recovery

When the power supply is cut off suddenly to the shaker, resulting in a power failure, the unit will automatically run at the previous set parameter upon power restoration.

Thermo Scientific CO₂ Resistant Shaker

Section 3

Operation

3-4 CO₂ Resistant Shaker Thermo Scientific

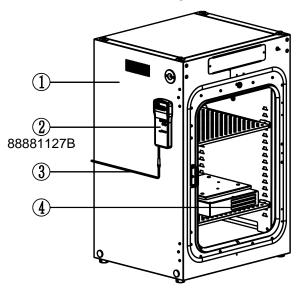
Section 4 Application

Application on Lab Benches

To operate the shaker outside of a CO₂ incubator, refer to Specifications in Section 2.

Application in CO₂ Incubator

Place the main body of the shaker in the CO₂ incubator, and use the signal cable to connect the control box through the access port of the CO₂ incubator. Refer to Figure 4-1.



- 1) CO2 Incubator
- 2) Control box
- 3) Power Cord
- 4) Main body of CO2 Resistant Shaker

Figure 4-1. Application in CO₂ incubator

Thermo Scientific CO₂ Resistant Shaker 4-1

Warning

- 1. Never put the control box in the CO2 incubator.
- 2. The back of control box is magnetized, and can be attached on the surface of the CO₂ incubator.
- 3. When the main body of CO₂ Resistant Shaker is in operation in the CO₂ incubator, keep a safe distance from the inner wall of the CO₂ incubator to avoid collisions.
- 4. The main body of the shaker should be connected to the control box wire through the access port of the CO₂ incubator.
- 5. If the cells are sensitive to vibrations, do not put them in the same incubator or on the shaker.
- 6. Never put the main body of CO₂ Resistant Shaker into the CO₂ incubator when it is High temperature sterilization.

4-2 CO₂ Resistant Shaker Thermo Scientific

Section 5 Safety Tips and Maintenance

Safety Tips

- 1. Confirm local power supply voltage before use the unit.
- 2. The unit must not be plugged into a power supply extension with other pieces of equipment.
- **3**. The data cable between the main body and control box cannot be extended.
- 4. Never modify the supplied power cables.
- 5. Service should only be performed by a qualified professional.
- 6. In the following situations, the power supply must be unplugged:
 - When the unit is moved.
 - When the control box is opened.
 - When a fuse is replaced.
 - When the equipment is not functioning properly.
 - When the equipment is not in use.

Maintenance

Surfaces can be cleaned with mild detergent and water. Liquid should not be allowed to enter inside the unit.

5-1

Thermo Scientific CO₂ Resistant Shaker

Section 5

Safety Tips and Maintenance

Clean spill

If accidental spillage of liquids or other materials occur on the platform, shut down the machine and clean up the liquids or other materials immediately.

Note If liquid has entered the unit, remove the platform and clean it. \triangle

- 1. Turn off the machine and unplug the power cord.
- 2. Remove the platform (with 4 screws).
- 3. Remove top plate (with 7 screws).
- 4. Use 70% ETOH to clean the inner area.
- 5. All allow the unit to dry for one hour, reassemble unit, and operate normally.

5-2 CO₂ Resistant Shaker Thermo Scientific

Section 6 Optional Accessories

Tabel 6-1. Universal (Aluminum) Platform

Description	Cat. No.	Dimensions (WxDxH) mm	Max. Qty.	Figure
50ml clamp	88881105	60×60×40	30	
100ml clamp	88881106	60×65×45	15	
150ml clamp	88881107	80×80×50	15	
200ml clamp	88881108	80×80×55	15	
250ml clamp	88881109	90×90×60	15	
500ml clamp	88881110	115×115×70	9	
1000ml clamp	88881111	130×130×75	4	
2000ml clamp	88881112	170×170×100	4	
3000ml clamp	88881113	200×200×140	2	
5000ml clamp	88881114	245×245×140	1	
500ml Infusion bottle clamp	88881115	100×100×95	6	
1000ml Infusion bottle clamp	88881116	125×125×125	4	
Funnel Clamp	88881117	N/A	2	OO
Fixed Tube rack 40ר14mm	88881118	265x120x140	2	G G G G G G G G G G G G G G G G G G G
Fixed Tube rack 40ר16mm	88881119	265x120x140	2	

Thermo Scientific CO₂ Resistant Shaker

6-1

Tabel 6-1. Universal (Aluminum) Platform (Continued)

Description	Cat. No.	Dimensions (WxDxH) mm	Max. Qty.	Figure
Adjustable Tube rack 40ר14mm	88881120	285x125x175	2	A
Adjustable Tube rack 40ר16mm	88881121	285x125x175	2	3,000000000
Universal (Aluminum) platform	88881122	360x300x5	1	
Rubber Mat platform	88881123	360x305x10	N/A	
96-well microplate holder	88881124	130x90x15	6	
Spring Wire Rack	88881125	350X240X80	1	
Sticky Mat	88881126	140×140	4	
Control Box	88883101	213×95×26	1	
General Power Adaptor	88881180	N/A	1	
US Plug	88881129	N/A	1	

6-2 CO₂ Resistant Shaker Thermo Scientific

6-3

Tabel 6-1. Universal (Aluminum) Platform (Continued)

Description	Cat. No.	Dimensions (WxDxH) mm	Max. Qty.	Figure
CN Plug	88881130	N/A	1	
EU Plug	88881131	N/A	1	
UK Plug	88881132	N/A	1	n n
Flask Clamp Starter Kit	88881133	N/A	1	100ml flask clamp x 2 250ml flask clamps x 4 500ml flask clamps x 4 1L flask clamps x 2 2L flask clamp x 2
Data port	88881181	41X41X41	1	

Thermo Scientific CO₂ Resistant Shaker

Tabel 6-2. 18 inch (Aluminum) Platform

Description	Cat. No.	Dimensions (WxDxH) mm	Max. Qty.	Figure
50ml clamp	88881105	60×60×40	49	
100ml clamp	88881106	60×65×45	25	
150ml clamp	88881107	80×80×50	25	
200ml clamp	88881108	80×80×55	18	
250ml clamp	88881109	90x90x60	18	
500ml clamp	88881110	115×115×70	10	
1000ml clamp	88881111	130×130×75	7	
2000ml clamp	88881112	170×170×100	4	
3000ml clamp	88881113	200×200×140	4	
5000ml clamp	88881114	245×245×140	2	
500ml Infusion bottle clamp	88881115	100×100×95	12	
1000ml Infusion bottle clamp	88881116	125×125×125	9	
Funnel Clamp	88881117	N/A	6	SO O
Fixed Tube rack 40ר14mm	88881118	265x120x140	4	
Fixed Tube rack 40ר16mm	88881119	265x120x140	4	

6-4 CO₂ Resistant Shaker Thermo Scientific

6-5

Tabel 6-2. 18 inch (Aluminum) Platform (Continued)

Description	Cat. No.	Dimensions (WxDxH) mm	Max. Qty.	Figure
Adjustable Tube rack 40ר14mm	88881120	285x125x175	4	000000000
Adjustable Tube rack 40ר16mm	88881121	285x125x175	4	,00000000
18 inch (Aluminum) platform	88881122B	457x457x6	1	
Rubber Mat platform	88881123	360x305x10	N/A	
96-well microplate holder	88881124	130x90x15	10	
Spring Wire Rack	88881125	350X240X80	1	
Sticky Mat	88881126	140×140	9	
Control Box	88883101	213×95×26	1	
General Power Adaptor	88881180	N/A	1	
US Plug	88881129	N/A	1	

Thermo Scientific CO₂ Resistant Shaker

Tabel 6-2. 18 inch (Aluminum) Platform (Continued)

Description	Cat. No.	Dimensions (WxDxH) mm	Max. Qty.	Figure
CN Plug	88881130	N/A	1	
EU Plug	88881131	N/A	1	
UK Plug	88881132	N/A	1	
Flask Clamp Starter Kit	88881133	N/A	1	100ml flask clamp x 2 250ml flask clamps x 4 500ml flask clamps x 4 1L flask clamps x 2 2L flask clamp x 2
Data port	88881181	41X41X41	1	

6-6 CO₂ Resistant Shaker Thermo Scientific

Section 7 Troubleshooting

To troubleshoot the unit, refer to the table below. If your problem persists, contact your local sales/service representative.

Table 7-1. Troubleshooting

Error	Cause	Solution	
	Power disconnected	Connect the power	
Indicator off No reaction	Power adapter failure	Replace power adapter	
	Switched off	Switch on	
No vetetion of pletform	Sensor failure	Contact local sales/service	
No rotating of platform	Main-board failure	Contact local sales/service	
	The unit has been placed on uneven surface	Place the unit on level and sturdy surface.	
Loud noise	Platform loose	Fasten platform	
	Accessories loose	Fasten accessories	
Other	Keep record for maintenance		

Thermo Scientific CO₂ Resistant Shaker 7-1

Section 7

Troubleshooting

7-2 CO₂ Resistant Shaker Thermo Scientific

8-1

THERMO FISHER SCIENTIFIC STANDARD PRODUCT WARRANTY

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period. During the first two (2) years, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's ed for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters and gaskets are excluded from this expense, labor included. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contactwarranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo Fisher Scientific postage paid and replacement parts are shipped FOB destiTHIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY. Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation and preventive maintenance. If equipment service is required, please call your Technical Services Department at 1-800-438-4851 (USA and Canada) or 1-740-373-4763. We're ready to answer your questions on equipment warranty, operation, maintenance, service and special application. Outside the USA, contact your local distributor for warranty information.

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Thermo Scientific CO₂ Resistant Shaker

Section 8

Warranty Information

8-2 CO₂ Resistant Shaker Thermo Scientific

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