*fisher*brand

Operations Manual

Heating/Cooling Mini Shaker

fisher scientific
part of **Thermo Fisher Scientific**

This manual covers the model shown below

EU Model	Voltage	Description
15544080	200-240V, 50/60Hz	Heating/Cooling Mini Shaker 230V

Before using this product, read this entire operation manual carefully. Users should follow all of the operational guidelines contained in this manual and take all necessary safety precautions while using this product. Failure to follow these guidelines could result in potentially irreparable bodily harm and/or property damage.

Caution all internal adjustments and maintenance must be performed by qualified service personnel.

Material in this manual is for information purposes only. Fisher Scientific is committed to a continuing program of product development and improvement, and reserves the right to change information, such as specifications, appearance, and dimensions, described in this document without notice. Fisher Scientific makes no representations or warranties with respect to this manual. In no event shall Fisher Scientific be held liable for any damages, direct or incidental, arising out of or related to the use of this manual.

No part of this manual may be reproduced or transmitted in any form or by any means, including photocopying, recording, or using information storage and retrieval systems, for any purpose other than the purchaser's own use, without the express written permission of the manufacturer.

Any other product names and services identified in this manual are trademarks or registered trademarks of their respective owners. No such use, or the use of any trade name, is intended to convey endorsement or other affiliation with Fisher Scientific.

Contents

Section 1 Inspection and Installation
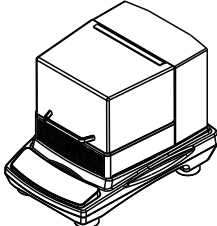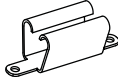
1. Inspect package and contents upon receipt of the instruments. If the package is severely damaged or if there are any missing pieces, please contact the manufacturer immediately.
2. Unpack the instrument, ensure all parts of the instrument and accessories are not missing or damaged. Make sure to take out all the components before discarding the package. If there are any missing or damaged pieces, please contact the manufacturer immediately.
3. Place the instrument on a level and firm surface to avoid vibration and noise.

1.1 Packing List

Table -1 Packing List

Description	EU Cat. No.	Figure
Heating/Cooling Mini Shaker 230V	15544080	
96-well Microplate Clamp (Installed)	3	
Screw Driver	1	
Power Cable EU Plug	1	
Power Cable UK Plug	1	
Socket Head Wrench	1	

1.2 Connections

Power Cable

Main Body

1.3 Structure Diagram

Top Transparent Cover

Hinge

Platform

96-well Microplate Clamp

House

Control Panel

Foot×4
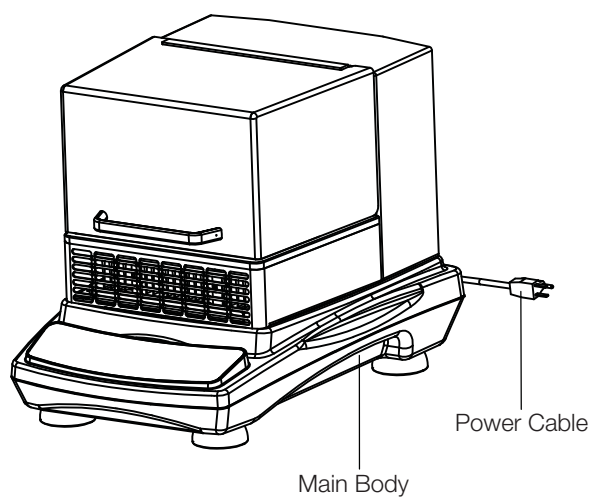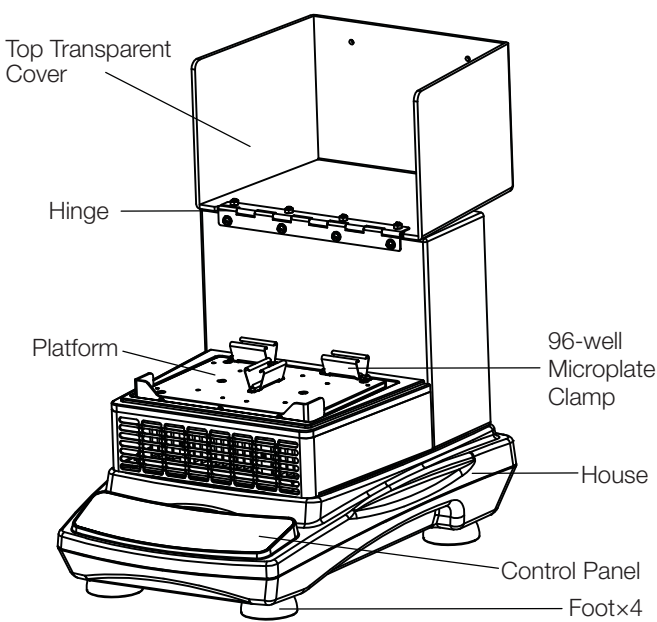
Section 2 Overview

2.1 Specifications

Category Number

Description	EU Cat. No.
Heating/Cooling Mini Shaker	15544080

Rotation Speed

Speed Range	150 to 1200rpm (Micro-well plate mounted)
	150 to 600rpm (Metal module mounted)
Speed Accuracy	±2% of set speed up to 300rpm ±5% 301 to 1200rpm
Orbit Diameter	∅3mm
Display Mode	LED
Display Accuracy	1rpm

Note: Maximum speed may vary with load or unbalanced load placement.

Load

Maximum Capacity	5X50ml Conical Bottom Tube Block X 2
Maximum Load (Centered on tary)	1.9 kg(4.19lb)

Temperature

Temperature Range	Ambient Temperature -10°C ~ 65°C (lowest 5 °C)
Temperature Fluctuation	±0.5°C@37°C
Temperature Uniformity	±0.5°C@37°C

Time

Timing Range	1s to 9999min.

Size

Overall Dimensions	415×290×307mm(16.3×11.4×12.1in)
Platform Dimensions	186×145mm(7.3×5.7in)
Package Dimensions	510×410×415mm(20.1×16.1×16.3in)

Power Supply

Requirement	200-240V, 50/60Hz, 160W

Weight

Net Weight	22Kg(48.5lb)
Gross Weight	25Kg(55.1lbs)

Others

Noise Level	< 60dB without load*
Certificate	RoHS, WEEE, CE Mark

*1 meter away from the running instrument.

2.2 Environmental Conditions

Application Environmental Conditions: Indoor use

Temperature	5 to 40°C（41 to 104°F）
Humidity	20% to 85%,
Altitude	≤2,000 m

Storage Environmental Conditions

Temperature	0 to 60°C（36 to 124°F）
Humidity	20% to 90%, non-condensing
Altitude	≤2,000 m

2.3 Safety Instructions

Please read the entire instruction manual before operating the Heating/Cooling Mini Shaker.

⚠ **WARNING DO NOT** use the Heating/Cooling Mini Shaker in a hazardous atmosphere or with hazardous materials for which the unit was not designed. Also, the user should be aware that the protection provided by the equipment may be impaired if accessories used are no provided or recommended by the manufacturer, or are used in a manner not specified by the manufacturer.

CAUTION ! To avoid electrical shock, completely cut off power to the unit by disconnecting the power cord from the unit or unplug from the wall outlet. Disconnect unit from the power supply prior to maintenance and service. Any spills should be removed promptly. Bio hazard spills should be cleaned using approved liquid promptly. Solvent spills are a fire hazard. Stop the unit immediately, and DO NOT operate until clean up is complete and vapors have dissipated.
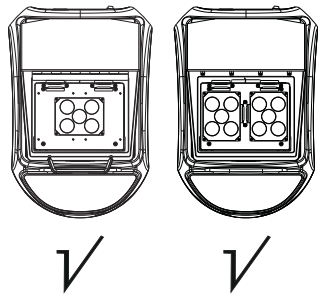**DO NOT** immerse the unit for cleaning.
DO NOT operate the unit if it shows signs of electrical or mechanical damage.
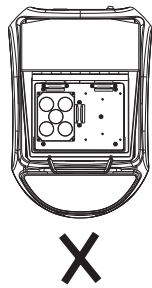
Position of Loads

Please place loads symmetrically during operation.

Symmetrical Placement

Asymmetric Placement

⚠ It may affect the normal operation of the instrument or even cause damage if placing the loads in the ways shown in the figures.

Application areas of this Heating/Cooling Mini Shaker include gel colorization/decolorization, sample cleaning, antibody staining, hybridization, immunoprecipitation, blot, and small volume tissue culture.

2.4 Capacity and Speed

Load Type	Liquid Capacity	Max. Speed
96-well Microplate	1/2-well deep	1200rpm
96-well Microplate	2/3-well deep	800rpm

Load Type	≤Capacity Per Tube Rack	Max. Qty.	Max. Speed
20×1.5ml MCT Block	1.5ml×20	2	
20×2ml MCT Block	2ml×20	2	
12×15ml Centrifuge Tube Block	15ml×12	2	600rpm
5×50ml Conical Bottom Block	50ml×5	2	
9×21mm tube block	20ml×9	2	

Note: The rotation speed is inversely proportional to the load. When the instrument is running, it is recommended to adjust the rotation speed from low to high step by step and run the instrument at an appropriate speed to avoid spillage of liquids.

Section 3 Operation

This chapter covers the control panel and its operation.

3.1 Control Panel
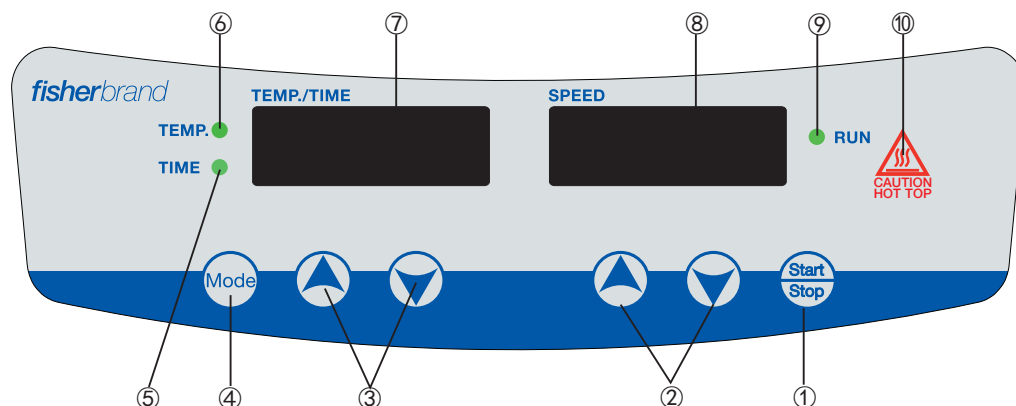
①. Start/Stop button: Start or stop the instrument.

②. SPEED Buttons: UP/DOWN arrow buttons below the SPEED window are used to increase/decrease the set speed of the instrument.

③. TEMP./TIME Buttons: UP/DOWN arrow buttons below the TEMP./TIME window are used to increase/decrease the temperature and time setting of the instrument.

④. Mode button: Switch modes between time and temperature settings.

⑤. TIME indicator: The light is on when the instrument is in time setting mode or displaying time/timer.

⑥. TEMP. indicator: The light is on when the instrument is in temperature setting mode or displaying temperature.

⑦. TEMP./ TIME window: The window displays time or temperature. When displaying time, setting ＜100min, will display 1s~99min59s, and Setting ≥100min, display 100min~9999min.

⑧. SPEED window: The window displays speed.

⑨. RUN indicator: The light is on when the instrument is running, and off when the instrument is in standby.

⑩. CAUTION HOT TOP warning indicator: Illuminate when the air temperature of the chamber is above 50˚C.

3.2 Installation

1. Connect all the components according to the figures shown on page 4 of this manual. Use grounded power outlet.

2. Press the power switch "I" side and switch on the instrument.

3.3 Settings

3.3.1 Temperature/Time Selection

Press "(Mode)" to display temperature or time at the TEMP./TIME window, and the indicator will be lightened.

3.3.2 Temperature Setting

Press "(Mode)" to display time at the TEMP./TIME window, press "(▲)" or "(▼)" below the window, the temperature indicator will flash and enter the temperature setting mode, then press again to adjust the temperature setting. If you don't do any operation for 3s, the instrument will save and exit setting mode after flashing 3 times.

3.3.3 Time Setting

Press "(Mode)" to display time at the TEMP./TIME window, press "(▲)" or "(▼)" below the TEMP./TIME window, the TIME indicator will flash and enter the time setting mode, then press "(▲)" or "(▼)" below the TEMP/TIME window to adjust the time setting.

3.3.4 Continuous Mode

Press "(Mode)" to display time at the TEMP./TIME window, press "(▲)" or "(▼)" below the TEMP./TIME window, the TIME indicator will flash and enter the time setting mode, set the running time to 0, which means running continuously. Press "(Start Stop)" and start operating, the max running time display is 9999min, and longer operation running time will not reflect to time display.

3.3.5 Timer Mode

Press "(Mode)" into time display (the TIME indicator is lighting), and then press "(▲)" or "(▼)" below the TEMP./TIME window to set timer as any value except 0, press "(Start Stop)" to start instrument. When the time elapses to 0, the instrument stops. The buzzer beeps five times, at the same time, the SPEED window displays "End", and flashes five times.

3.3.6 Speed Setting

Press "▲" or "▼" below the SPEED window to enter into the speed setting mode, press "▲" or "▼" below the SPEED window to adjust the speed setting.

3.3.7 Temperature Calibration

Instrument is in standby, press "Mode" over 6s then release, the instrument enters the temperature calibration. TEMP./TIME window displays the setting temperature, SPEED window displays the calibration temperature.

Press "▲" or "▼" below the TEMP./TIME window to check pre-set temperature points of setting temperature and calibration temperature.

Adjust calibration temperature for pre-set temperature points:
1. Press "▲" or "▼" below TEMP./TIME window, to select the temperature point.
2. Press "Mode", both windows are flashing, press "▲" or "▼" below SPEED window to adjust calibration temperature.
3. Press "Mode" again after setting to save the parameters.
4. Repeat 1, 2, 3 for adjust calibration temperature for other pre-set temperature points.

Add 1 more calibration temperature point:
1. Press "Mode".
2. Press "▲" or "▼" below TEMP./TIME window, and set the new temperature point, at the same time, SPEED window displays the same temperature as calibration temperature.
3. Press "▲" or "▼" below SPEED window to adjust calibration temperature.
4. Press "Mode" again after setting to save the parameters.

Exit Calibration mode: Press "Mode" over 6s, exit the calibration mode.

Note:

Not recommend setting more than 5 temperature points, when achieves 5, please clean up all set temperature points before adding new temperature point.

Clean-up all set temperature points and add more temperature points:
1. Press "Start Stop" over 6s then release, TEMP./TIME window displays 00.0℃, SPEED window displays 00.0. This is a clean-up of all set parameters.
2. Repeat "Add 1 more Calibration temperature point" step 1, 2, 3, 4 to add more temperature points.

Example 1: Adjust calibration temperature for pre-set temperature points.

If the setting temperature is 37℃, and the actual temperature is 36℃, and calibrate it to 37℃：
1. Press "Mode" over 6s then release, enters calibration mode.
2. Press "▲" or "▼" below TEMP./TIME window, and select the temperature point as 37℃. At the same time SPEED window displays pre-set calibration temperature, for example 38.2℃.
3. Press "Mode", both windows are flashing, press "▲" or "▼"

below SPEED window to adjust calibration temperature to 39.2℃ [38.2℃+(37℃-36℃)].
4. Press "Mode" again after setting to save the parameters.
5. Press "Mode" over 6s then release, exit calibration mode.

Example 2: Adjust calibration temperature for pre-set temperature points.

If the setting temperature is 37℃, and the actual temperature is 39℃, and calibrate it to 37℃：
1. Press "Mode" over 6s then release, enters calibration mode.
2. Press "▲" or "▼" below TEMP./TIME window, and select the temperature point as 37℃. At the same time SPEED window displays pre-set calibration temperature, for example 38.2℃.
3. Press "Mode", both windows are flashing, press "▲" or "▼" below SPEED window to adjust calibration temperature to 36.2℃ [38.2℃+(37℃-39℃)].
4. Press "Mode" again after setting to save the parameters.
5. Press "Mode" over 6s then release, exit calibration mode.

Example 3: Add 1 more Calibration temperature point.

If add a new calibration temperature point 45℃, and calibration it.
1. Press "Mode" over 6s then release, enters calibration mode.
2. Press "Mode", both windows are flashing.
3. Press "▲" or "▼" below TEMP./TIME window, and set the new temperature point 45℃, at the same time, SPEED window displays 45℃ as calibration temperature.
4. Press "Mode" and save the parameters.
5. Press "Mode" over 6s then release, exit calibration mode.
6. Test the instrument and get the actual temperature is 45℃, for example 46.1℃.
7. Press "Mode" over 6s then release, enters calibration mode.
8. Press "▲" or "▼" below TEMP./TIME window, and select the temperature point as 45℃. At the same time SPEED window displays the calibration temperature 45℃.
9. Press "Mode", both windows are flashing, press "▲" or "▼" below SPEED window to adjust calibration temperature to 43.9℃ [45℃+(45℃-46.1℃)].
10. Press "Mode" again after setting to save the parameters.
11. Press "Mode" over 6s then release, exit calibration mode.

Finish Operation

After operation finishes, press the power switch off, unplug the instrument and store it according to the storage guide.

Power Recovery

If the power supply is cut off suddenly while the instrument is in operation, the unit will automatically run at the previously set parameter upon power restoration. The display window will flash. Press any button to stop flashing.

Alarm System

Exceed the speed limit: After entering the operation mode for 10s, if the actual speed of the instrument is 0 or more than 1200rpm, the instrument will alarm immediately.

Err1: After entering the operation mode for 10s, and the instrument runs steadily (Running stability means that the actual speed of the instrument is within the set value of ±10rpm and lasts for 2s). If the speed exceeds the set speed of ±20rpm, the instrument stops running and buzzes to alarm, and "Err1" is displayed in the SPEED window.

Err2: When the temperature in the instrument exceeds the set temperature of 3℃ and exceeds 3 minutes, the instrument buzzing alarm, the SPEED window shows "Err2".

End of timer: The instrument buzzing alarm, the "End" is displayed in the SPEED window.

When the instrument alarms, press any key, the instrument is back to the standby mode.

3.4 Installation and Application of Accessories

1. Place the Microplate diagonlly on the platform, place the microplate under the 96-well Microplate Clamp and slide the microplate into place. You are ready to use it (shown in figure 1).
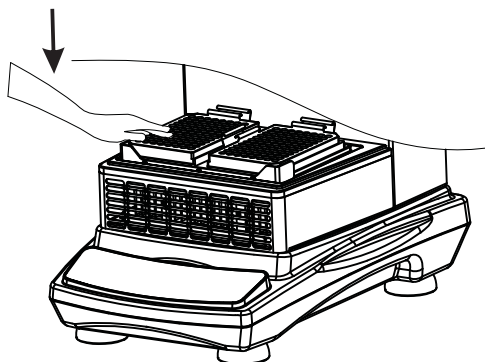
Figure 1

2. Place the tube block at the corresponding area on the platform, and fasten with the 4 screws by a screw driver (shown in figure 2).
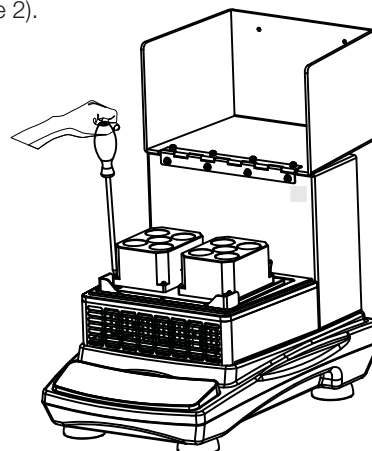

Figure 2

⚠ It is recommended to set the rotation speed below 600rpm with tube bolcks.

Replacement of Top Transparent Cover(S)

1. Remove: Remove 4 screws connected by hinge and shell with screwdriver and remove transparent cover components.
2. Installation: The hinge mounting hole on the accessory of the new transparent cover components to the shell mounting hole. The screw is tightened with a screwdriver and the accessory of the transparent lid is fixed on the instrument.
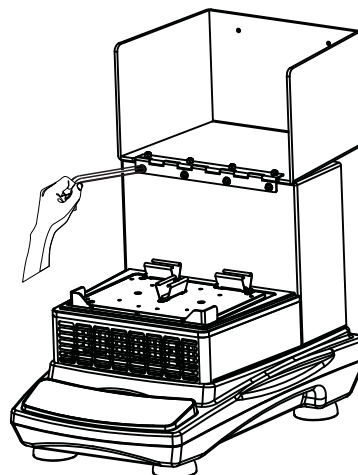
Section 4 Safety Tips and Maintenance

Safety Tips

1. Use independent power supply.
2. Check if the local power supply voltage is suitable for use.
3. Do not drag the power supply cable when unplugging.
4. Do not use non-specified power cable or damage cable.
5. Service should only be performed by a qualified professional.
6. The power supply must be unplugged under the following situations:
   (1). When the unit is moved
   (2). When the electrical cabinet or the moving component is opened
   (3). When the equipment is malfunctioning
   (4). When the equipment is not in use

Maintenance

1. This instrument uses brushless DC motor. It is maintenance free and has a long service time, high quality, and low noise level.
2. Surface can be cleaned with a mild detergent and water.
3. Please install fuses inside the power socket following the steps shown the figures below. Two fuses are installed inside the power socket. One is installed for working and the other is the backup.

| Step 1 | Step 2 | Step 3 | Step 4 | Step 5 |
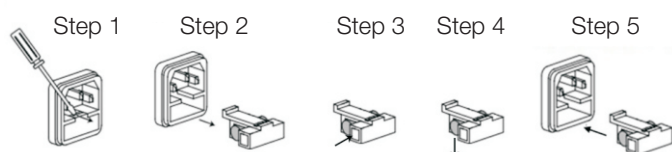
Clean Spill

If accidental spillage of liquids caused by mishandling or contained breakage occurs on the surface of the instrument, please shut down the instrument and clean up the liquid immediately.
If the liquid has already spilled into the unit, cut off the power supply first and immediately clean up the liquid at the surface of the instrument. Place the instrument in a ventilated and dry environment for 24 hours before reuse. If the instrument is not functioning after drying for 24 hours, please contact Fisher Scientific Customer Service.

Warning: Disassembling/Assembling without a qualified professional's guidance may cause malfunctioning of the instrument.

Section 5 Troubleshooting

Please refer to the following table to troubleshoot if any malfunction occurs. If the problem still exists, contact your local sales representative.

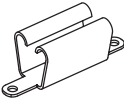| Error	Cause	Solution
Cannot start instrument, LED display window off	Power disconnected	Connect the power
	Power switch off	Switch on
No shaking of the platform	Over-weighted or unbalanced load	Adjust the weight and position of load, decrease rotation speed
	Electrical malfunction	Contact Fisher Scientific
	Mechanical malfunction	Contact Fisher Scientific
Loud noise	Collision between load and transparent lid	Adjust position of the load
	Clamping accessories loose	Fasten screws
Other	Keep record for maintenance	
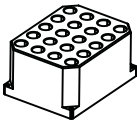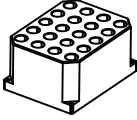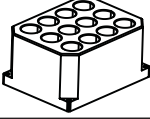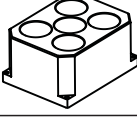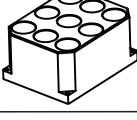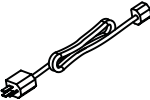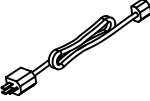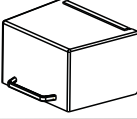
Note:

Err1 — Speed alarm

Err2 — Temp. alarm

If Err1/Err2 occurs, please contact Fisher Scientific Customer Service for solutions.

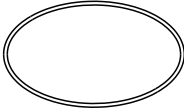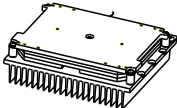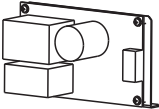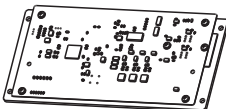# Section 6 Accessory List

Description	EU Cat. No.	Dimensions	Max. Qty	Figure
20×1.5ml MCT Block	15584080	102×78×51mm	2	
20×2ml MCT Block	15594080	102×78×51mm	2	
12×15ml Centrifuge Tube Block	15504090	102×78×51mm	2	
5×50ml Conical Bottom Block	15514090	102×78×51mm	2	
9×21mm Tube Block	15524090	102×78×51mm	2	
Power Cable EU Plug	15564120	250VAC, 16A, 1.8m	1	
Power Cable UK Plug	15574120	250VAC,13A, 1.8m	1	
Top Transparent Cover (S) with 4 screws	15544090	212×249×142mm	1	
96-well Microplate Clamp	15865911	54×19×19mm	3	
Screw GB/T9074.4 M3×6	16268420	2 ea/bag	/	
Inner HEX Screw M4X8	16278420	4 ea/bag	/	
Screw GB/T818 M3×12	16288420	4 ea/bag	/	

Section 7 Warranty

When used in laboratory conditions and according to these operation instructions and maintenance, this product is warranted for 24 months against defective materials or workmanship. The 24 month warranty period begins from the delivery date of this product. For product quality or performance issues within Warranty and Spare part repair service after the warranty expires, please contact Fisher Scientific Customer Service.

Section 8 Spare Part List

Description	EU Cat. No.	Dimensions	Max. Qty	Figure
Belt	88861219	∅ 201(mm)	1	
Temperature Control Parts	88861224	176X160X52(mm)	1	
Cross Flow Fan	88861225	200X60X60(mm)	1	
Power Supply Parts	88861226	130X77X60(mm)	1	
PCB Parts	88861229	210X100X35(mm)	1	

Europe

Austria:
+43(0)800-20 88 40
at.fishersci.com

Belgium:
+32(0)56 260 260
be.fishersci.com

Denmark:
+45 70 27 99 20
fishersci.dk

Germany:
+49(0)180 5258221
de.fishersci.com

Ireland:
+959(0)1 885 5854
ie.fishersci.com

Italy:
+39 02 950 59 478
it.fishersci.com

Finland:
+358(0)9 8027 6280
fishersci.fi

France:
+33(0)388 67 14 14
fishersci.fr

Netherlands:
+31(0)20 4887 70 00
nl.fishersci.com

Norway:
+47 22 95 59 59
fishersci.no

Portugal:
+351 21 425 33 50
pt.fishersci.com

Spain:
+34 002 239 303
es.fishersci.com

Sweden:
+46 31- 68 94 30
fishersci.se

Switzerland:
+41(0)56 618 41 11
ch.fishersci.com

UK:
+44(1)1509 555 500
fisher.co.uk

Find out more at **eu.fishersci.com**

fisher scientific
part of **Thermo Fisher Scientific**