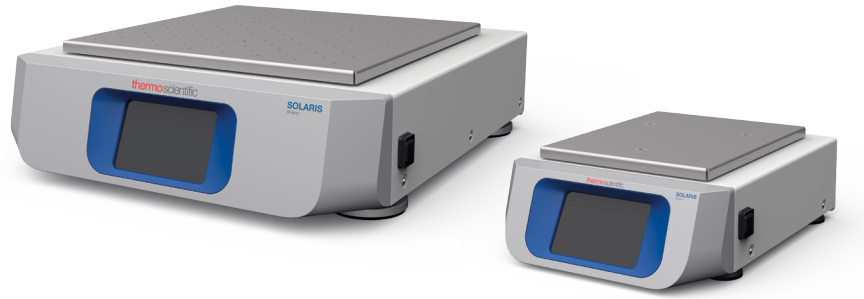
thermoscientific



Thermo Scientific Solaris 2000 / 4000

Instruction Manual

70900190-b • 04 / 2019

ThermoFisher SCIENTIFIC

Contents

Preface 6
Intended Use 6
Signal Words and Symbols 6
Symbols used on Shaker and Accessories 6
Symbols used in the Instruction Manual 7
Safety Instructions 7

1. Technical Specifications 11
1. 1. Technical Data 11
Thermo Scientific Solaris 2000 Shaker 11
Thermo Scientific Solaris 4000 Shaker 12
1. 2. Accessories 13
1. 2. 1. Platforms 13
1. 2. 2. Clamps 14
1. 2. 3. Test Tube Racks 16
1. 3. Directives and Standards 18
1. 4. Product Overview 19
1. 4. 1. Solaris 2000 19
1. 4. 2. Solaris 4000 19
1. 4. 3. Connections 20

2. Transport and Set Up 21
2. 1. Unpacking 21
Items Supplied 21
2. 2. Location 22
2. 3. Transporting 23
2. 4. Leveling 23
2. 5. Mains Connection 24
2. 6. Initial Startup 24
2. 7. Storage 27
2. 8. Shipping 27

3. Operation 28
3. 1. Power on / off 28
3. 2. Graphical User Interface 28
3. 2. 1. Status 28
3. 2. 2. Settings 30
3. 2. 3. Programs 33
3. 3. Accessories 41
3. 3. 1. Platform Installation 41
3. 3. 2. Clamp and Vessel Installation 44
3. 3. 3. Test Tube Rack Clamp Installation 46
3. 3. 4. Microplate / Deepwell-Plate Installation 47
3. 4. Loading and Normal Use 48
Loading 48
Normal Use 49

4. Maintenance and Care 52
4. 1. Basics 53
Inspection of Accessories 53
4. 2. Cleaning 54
Touchscreen 54
4. 3. Disinfection 55
4. 4. Decontamination 55
4. 5. Autoclaving 56
4. 6. Service 57
4. 7. Shipping and Disposal 57

5. Troubleshooting 58

List of Figures

Figure 1: Overview Solaris 2000 19
Figure 2: Overview Solaris 4000 19
Figure 3: Rear View (left: Solaris 4000, right: Solaris 2000) 20
Figure 4: Set up clearance of 8 cm (3 in) 22
Figure 5: How to carry a shaker 23
Figure 6: Initial startup 24
Figure 7: Initial startup - language 25
Figure 8: Initial startup - unit name 25
Figure 9: Initial startup - region 25
Figure 10: Initial startup - set date display format 26
Figure 11: Initial startup - set date 26
Figure 12: Initial startup - set time 26
Figure 13: Initial startup - installation instruction 26
Figure 14: Home Screen of the Graphical User Interface (GUI) . . 28
Figure 15: Settings 30
Figure 16: Speed setpoint 30
Figure 17: Orbit calculator 31
Figure 18: Orbit calculated 31
Figure 19: Calculate custom sized orbit 31
Figure 20: Time Mode 32
Figure 21: Menu Bar Customization 33
Figure 22: Files and Info 33
Figure 23: Programs 34
Figure 24: Create program 34
Figure 25: Add step 35
Figure 26: Delete program 35
Figure 27: Program quick view 36
Figure 28: Program complete 36
Figure 29: Select programs for import 36
Figure 30: Program import complete 37
Figure 31: Select programs for export 37
Figure 32: Program export complete 37
Figure 33: Event Log 38
Figure 34: Filter event log 38

Figure 35: Select event log for export 39
Figure 36: Insert USB drive for export 39
Figure 37: Charts 40
Figure 38: Example of an universal platform 42
Figure 39: Universal platform installed on a Solaris 2000 (left) and a Solaris 4000 (right) shaker 42
Figure 40: Dual Stack Platform Assembly 43
Figure 41: Dual stack platform on a Solaris 4000 shaker 44
Figure 42: Clamp details with 2 springs. 45
Figure 43: Test Tube Rack Clamp Assembly 46
Figure 44: Microplate / Deepwell-plate assembly 47
Figure 45: Example for a well loaded platform 48
Figure 46: Example for a poorly loaded platform. 49
Figure 47: Solaris 2000 – Normal Use 50
Figure 48: Solaris 4000 – Normal Use 51

List of Tables

Table 1: Technical Data Solaris 2000 11
Table 2: Technical Data Solaris 4000 12
Table 3: Available platforms 13
Table 4: Available clamps for Solaris 2000 platforms 14
Table 5: Available clamps for Solaris 4000 platforms 15
Table 6: Available test tube racks for Solaris 2000 platforms 16
Table 7: Available test tube racks for Solaris 4000 platforms 17
Table 8: Directives and Standards 18
Table 9: Items Supplied 21
Table 10: Autoclavability of materials 56
Table 11: Troubleshooting 59

Preface

Intended Use

A device used in research and manufacturing to shake solutions in a 2D orbit while controlling speed and time in applications.

This shaker must be operated by trained personnel only.

Signal Words and Symbols

Signal Word	Degree of Hazard
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Inidicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related.

Symbols used on Shaker and Accessories

Observe the information contained in this instruction manual to keep yourself and your environment safe.

	Refer to instruction manual
	Disconnect mains plug
	General hazard

Symbols used in the Instruction Manual

Observe the information contained in the instruction manual to keep yourself and your environment safe.

	General hazard		Electrical hazard
	Biological hazard		Danger of cuts
	Hazard caused by flammable materials		Indicates information considered important, but not hazard-related.

Safety Instructions

WARNING

Not following these safety instructions can lead to hazardous situations that, if not avoided, could result in death or serious injury.

- Observe the safety instructions.
- The shaker is to be used for its intended use only. Improper use can cause damage, contamination, and injuries with fatal consequences.
- The shaker must be operated by trained personnel only.
- It is the obligation of the operator to make sure, that the proper personal protective equipment is used. Mind the “Laboratory Biosafety Manual” of the World Health Organization (WHO) and the regulations in your country.

WARNING

Damage from wrong power supply.

Make sure that the shaker is plugged only into sockets which have been properly grounded.

WARNING

Risk from handling hazardous substances.

When working with corrosive samples (salt solutions, acids, bases), the accessories and the shaker have to be cleaned thoroughly.

- The shaker is neither inert nor protected against explosion. Never use the shaker in an explosion-prone environment.
- Do not shake toxic or radioactive materials or any pathogenic micro-organisms without suitable safety precautions.
- If shaking any hazardous materials mind the "Laboratory Biosafety Manual" of the World Health Organization (WHO) and any local regulations. When shaking microbiological samples from the Risk Group II (according to the "Laboratory Biosafety Manual" of the World Health Organization (WHO)), aerosol-tight biological seals have to be used. Look on the internet page of the World Health Organization (www.who.int) for the "Laboratory Biosafety Manual". For materials in a higher risk group, extra safety measures must be taken.
- If toxins or pathogenic substances have contaminated the shaker or its parts, appropriate disinfection measures have to be taken ("Decontamination" on page 55; „Disinfection" on page 55).
- If a hazardous situation occurs, turn off the power supply to the shaker and leave the area immediately.

WARNING

Damage to health from infectious substances.

If an accidental spill places liquids or other materials under the platform, immediately power off the shaker, unplug it, and remove the platform ("Platforms" on page 13).

Clean up the spill following your regular laboratory procedures. Use proper personal protective equipment.

WARNING

Damage to health from shaking explosive or flammable materials or substances.

Do not shake explosive or flammable materials or substances.

CAUTION

Cutting injuries from glass shards.

A disengaged platform and accessories, like clamps, can lead to broken glass if vessels fall off the shaker.

Make sure that the platform and accessories are installed properly by using the correct tools and screws. Make sure that the clamps are capable to hold the load of the vessel and sample at chosen speed. Clamps with your individually configured load may have lower speed capability than the stability limitation of the shaker. Refer to "3. 4. Loading and Normal Use" on page 48.

Pay attention to any unusual sound. This can indicate a disengaged platform or accessories.

CAUTION

Damage to device or malfunction due to a damaged touchscreen.

- Do not operate the device if the touchscreen is damaged.
- Power off the shaker. Disconnect the mains plug. Have the touchscreen replaced by an authorized service technician.

CAUTION

Biological harm due to broken or leaking vessels.

Improperly installed accessories can lead to spilled samples.

- Make sure that accessories are installed properly by using the correct tools and screws.
- Make sure that accessories fit reasonably on the platform.
- Always use a vessel with an accessory that fits its size.
- Vessels must be intact and installed properly.

CAUTION

Safety can be impaired by improper loading and damaged accessories.

- Always make sure that the load (accessories and samples) is distributed as equally as possible, especially when operating a dual stack platform.
- Do not use accessories which show signs of corrosion or cracks. Contact customer service for further information.
- Use only shakers which have been loaded properly.
- Never overload the shaker.
- Make sure the accessories are installed properly before operating the shaker. Follow the instructions in section „Accessories“ on page 41.

CAUTION

Physical harm caused by ignoring operative basics.

- Never operate the shaker without a properly installed platform.
- Never use the shaker if parts of its exterior are damaged or missing.
- Do not move the shaker while it is running.
- Do not lean on the shaker.
- Never load or unload the shaker until it has come to a complete stop and this has been confirmed on the touchscreen.
- Do not put anything on the shaker while it is running.
- Do not touch the platform or any accessories on the shaker while it is running.
- The shaker housing is not to be opened by the operator.

NOTICE

Protection may be impaired by incompatible accessories.

Use only accessories for this shaker which have been approved by Thermo Fisher Scientific. For updated lists check www.thermofisher.com.

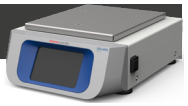
NOTICE

To shut down the shaker:

Press the STOP key. Turn off the shaker at the main switch. Pull out the power supply plug. In an emergency disconnect the power supply.

1. Technical Specifications

1. 1. Technical Data

Thermo Scientific Solaris 2000 Shaker	
Speed Range	15–525 rpm
Running Time	99 h 59 min (1 min increment) or continuous mode
Noise Level at max. Speed	62 dB (A) (1m in front of the unit at 1.6 m height)
Maximum Load (incl. Platform, Accessories and Samples)	25 kg (55 lbs)
Electrical Connection	100–240 V, 50 / 60 Hz
Power Consumption	60 W

Environmental Conditions	
For Storage and Shipping	Temperature: -10 °C to 55 °C Humidity: 15% to 85%
For Operation	Use in interior spaces Altitudes of up to 3000 m above sea level Temperature: 5 °C to 40 °C Humidity: 20% to 80%, non-condensing.
Pollution Degree	2
Overvoltage Category	II
IP	20

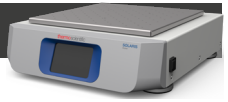
Interfaces	**USB**	**Ethernet**
	2x USB-A 2.0	RJ45

Dimensions	**Length**	**Width**	**Heigth**
	47 cm (18.5 in)	37 cm (14.5 in)	15 cm (5.5 in)

Weight	20.9 kg (46,0 lbs)

Table 1: Technical Data Solaris 2000

Thermo Scientific Solaris 4000 Shaker



Speed Range	15–525 rpm
Running Time	99 h 59 min (1 min increment) or continuous mode
Noise Level at max. Speed	62 dB (A) (1 m in front of the unit at 1.6 m height)
Maximum Load (incl. Platform, Accessories and Samples)	43 kg (95 lbs)
Electrical Connection	100–240 V, 50 / 60 Hz
Power Consumption	80 W

Environmental Conditions	
For Storage and Shipping	Temperature: -10 °C to 55 °C Humidity: 15% to 85%
For Operation	Use in interior spaces Altitudes of up to 3000 m above sea level Temperature: 5 °C to 40 °C Max. relative humidity 80% up to 31 °C; decreasing linearly to 50% relative humidity at 40 °C
Pollution Degree	2
Overvoltage Category	II
IP	20

Interfaces	**USB**	**Ethernet**
	2x USB-A 2.0	RJ45

Dimensions	**Length**	**Width**	**Heigth**
	65 cm (25.6 in)	58 cm (22.8 in)	18 cm (7 in)

Weight	75.1 kg (165.5 lbs)

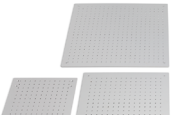
Table 2: Technical Data Solaris 4000

1. 2. Accessories

CAUTION

Protection may be impaired by incompatible accessories.
Use only accessories for this shaker which have been approved by Thermo Fisher Scientific.

For updated lists check www.thermofisher.com.



1. 2. 1. Platforms

Platform	Art. No.
Solaris 2000	
Thermo Scientific Solaris 12x14 Universal Platform	SK1214
Thermo Scientific Solaris 12x14 Dual Stack Universal Platform	SK1214D
Thermo Scientific Solaris 12x14 Dual Stack Universal Platform Upgrade Kit	SK1214DK
Thermo Scientific Solaris 18x18 Universal Platform	SK1818
Thermo Scientific Solaris 18x18 Dual Stack Universal Platform	SK1818D
Thermo Scientific Solaris 18x18 Dual Stack Universal Platform Upgrade Kit	SK1818DK
Thermo Scientific Solaris 18x24 Universal Platform	SK1824
Solaris 4000	
Thermo Scientific Solaris 18x30 Universal Platform	SK1830
Thermo Scientific Solaris 18x30 Dual Stack Universal Platform	SK1830D
Thermo Scientific Solaris 18x30 Dual Stack Universal Platform Upgrade Kit	SK1830DK
Thermo Scientific Solaris 36x24 Universal Platform	SK3624
Spare Kits	
Clamp Spare Kit (Screws)	SK1001
Platform Spare Kit for SK2000 (Platform Screws, Tool, Thread Locker)	SK0100
Platform Spare Kit for SK4000 (Platform Screws, Tool, Thread Locker)	SK0101

Table 3: Available platforms

1. 2. 2. Clamps

For Solaris 2000 Platforms

	Art. No.	Universal			Dual Stack	
		12x14	18x18	18x24	12x24	18x18
Microplate / Deep-Well Plate	30175	5	10	14	8	20
10 ml Erlenmeyer	30150Bl	72	113	157	140	226
25 ml Erlenmeyer	30151	42	64	80	80	124
50 ml Erlenmeyer	30152Bl	42	64	80	80	124
125 ml Erlenmeyer	30153	15	32	40	30	52
250 ml Erlenmeyer	30154Bl	9	16	24	16	32
300 ml Erlenmeyer	30155	9	16	20	16	32
500 ml Erlenmeyer	30156Bl	9	16	20	16	32
1 l Erlenmeyer	30157Bl	4	9	10	8	16
2 l Erlenmeyer	30158	3	5	6	–	–
4 l Erlenmeyer	30159	1	4	4	–	–
6 l Erlenmeyer	30160	1	2	2	–	–
2800 ml Fernbach Flask	30162	1	4	4	–	–
Low form culture Flask 2,5 l	30161	1	1	2	–	–
Adhesive mat 9x9	300349	–	–	–	–	–
Adhesive mat 14x14	88881126	–	–	–	–	–

Table 4: Available clamps for Solaris 2000 platforms

For Solaris 4000 Platforms

	Art. No.	Universal		Dual Stack
		18x30	36x24	18x30
Microplate / Deep-Well Plate	30175	18	24	34
10 ml Erlenmeyer	30150Bl	203	187	402
25 ml Erlenmeyer	30151	112	187	220
50 ml Erlenmeyer	30152Bl	112	187	220
125 ml Erlenmeyer	30153	46	83	92
250 ml Erlenmeyer	30154Bl	28	40	56
300 ml Erlenmeyer	30155	28	40	56
500 ml Erlenmeyer	30156Bl	28	40	56
1 l Erlenmeyer	30157Bl	14	20	28
2 l Erlenmeyer	30158	6	11	12
4 l Erlenmeyer	30159	6	8	–
6 l Erlenmeyer	30160	3	6	–
2800 ml Fernbach Flask	30162	6	8	12
Low Form Culture Flask 2,5 l	30161	3	6	6
Adhesive Mat 9x9	300349	–	–	–
Adhesive mat 14x14	88881126	–	–	–

Table 5: Available clamps for Solaris 4000 platforms

1. 2. 3. Test Tube Racks

For Solaris 2000 Platforms

	Art. No.	Universal			Dual Stack	
		12x14	18x18	18x24	12x24	18x18
Half Size						
10–13 mm, Red, 6 x 6 Array	30181	8	12	15	14	24
14–16 mm, Orange, 6 x 6 Array	30183	5	9	11	9	17
17–20 mm, White, 4 x 5 Array	30185	7	11	14	13	21
21–25 mm, Blue, 4 x 4 Array	30187	6	9	11	10	17
26–30 mm, Green, 3 x 3 Array	30189	6	9	12	11	18
Micro Centrifuge, 1.5 ml, Blue, 4 x 6 Array	30191	6	10	13	11	19
Full Size						
10–13 mm, 6 x 12 Array	30180Bl	3	7	10	6	13
14–16 mm, 6 x 12 Array	30182	3	4	6	6	8
17–20 mm, 4 x 10 Array	30184	3	5	7	6	8
21–25 mm, 4 x 10 Array	30186	2	3	5	4	6
26–30 mm, 3 x 8 Array	30188	3	4	6	5	8
1.5 mL Micro Centrifuge, 8 x 12 Array	30190	3	5	7	6	9

Table 6: Available test tube racks for Solaris 2000 platforms

For Solaris 4000 Platforms

	Art. No.	Universal		Dual Stack
		18x30	36x24	18x30
Half Size				
10–13 mm, Red, 6 x 6 Array	30181	21	32	40
14–16 mm, Orange, 6 x 6 Array	30183	14	20	26
17–20 mm, White, 4 x 5 Array	30185	18	20	34
21–25 mm, Blue, 4 x 4 Array	30187	14	22	25
26–30 mm, Green, 3 x 3 Array	30189	15	24	30
1.5 ml Micro Centrifuge, Blue, 4 x 6 Array	30191	18	24	34
Full Size				
10–13 mm, 6x12 Array	30180Bl	14	20	26
14–16 mm, 6x12 Array	30182	9	12	16
17–20 mm, 4x10 Array	30184	9	15	18
21–25 mm, 4x10 Array	30186	7	9	13
26–30 mm, 3x8 Array	30188	7	10	13
1.5 ml Micro Centrifuge, 8x12 Array	30190	9	12	17

Table 7: Available test tube racks for Solaris 4000 platforms

1. 3. Directives and Standards

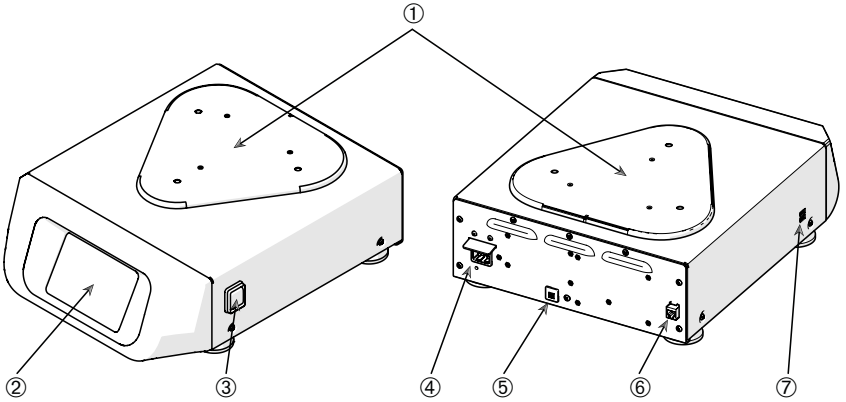
Region	Directive	Standards
Europe	2006/42/EC Machinery Directive 2014/35/EU Low Voltage (Protective Goals) 2014/30/EC Electromagnetic Compatibility (EMC) 2011/65/EC RoHS Directive on the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment	EN 61010-1 3rd Edition IEC 61010-2-051 3rd Edition EN 61326-1 Class B EN ISO 14971 EN ISO 9001
North America		ANSI/UL 61010-1 3rd Edition IEC 61010-2-051 3rd Edition IEC 61326-1 Class B CFR 47 FCC 15 EMC EN ISO 14971 EN ISO 9001
Japan		IEC 61010-1 3rd Edition IEC 61010-2-051 3rd Edition IEC 61326-1 Class B EN ISO 14971 EN ISO 9001

Table 8: Directives and Standards

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

1. 4. Product Overview

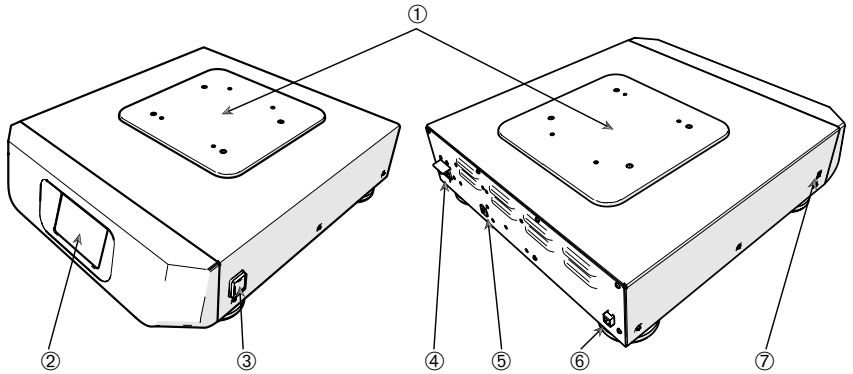
1. 4. 1. Solaris 2000



① Platform Mounting Plate; ② Graphical User Interface (GUI) Display;
③ Power Supply Switch; ④ Mains Connection; ⑤ Fuse; ⑥ Ethernet; ⑦ USB

Figure 1: Overview Solaris 2000

1. 4. 2. Solaris 4000



① Platform Mounting Plate; ② Graphical User Interface (GUI) Display;
③ Power Supply Switch; ④ Mains Connection; ⑤ Fuse (resettable); ⑥ Ethernet; ⑦ USB

Figure 2: Overview Solaris 4000

1. 4. 3. Connections

① Mains Connection; ② Fuse; ③ Ethernet

Figure 3: Rear View (left: Solaris 4000, right: Solaris 2000)

Mains Connection

The shaker requires a 100–240 V, 50 / 60 Hz power source. Power supply cables are supplied.

WARNING Damage from wrong mains supply or power supply plug. Make sure that the shaker is plugged only into sockets which have been properly grounded. Do not operate the shaker with a damaged or an inadequately rated power supply cable.

The mains plug must be freely accessible at all times.

To eliminate hazard of electrical shock, make sure the surface around the shaker is dry. In the event of accidental spilling or splashing of liquids, disconnect the shaker from the power source, clean up and neutralize the spilled liquids before continuing.

Disconnect the shaker from the power source when not in use.

Fuse

The fuse can be resetted if it has tripped. The fuse will trip if overvoltage occurs. The shaker will not operate again until the fuse is pushed back in its proper position.

Ethernet

The shaker has a RJ45 ethernet connection, which can be used to connect to a Local Area Network (LAN). Use only equipment conform to the IEC 60950-1 standard with the RJ45 ethernet connection. The RJ45 ethernet connection is prepared for future use when an according update of the software will be available.

USB

The shaker has 2 USB-A 2.0 ports, which can be used with an USB drive. Use only equipment conform to the IEC 60950-1 standard with the USB ports.

2. Transport and Set Up

It is your responsibility to make sure that the shaker is set up properly.

NOTICE

The shipping carton should be inspected upon delivery. When received, carefully examine for any shipping damage before unpacking. If damage is discovered, the delivering carrier should specify and sign for the damage on your copy of the delivery receipt.

Open the carton carefully making certain that all parts ("Table 9: Items Supplied") are accounted for before packaging materials are discarded. After unpacking, if damage is found, report it to the carrier and request a damage inspection.

Important: Failure to request an inspection of damage within a few days after receipt of shipment absolves the carrier from any liability for damage. You must call for a damage inspection.

2. 1. Unpacking

Use the packing list when unpacking to verify that the complete unit has been received. Do not discard packing materials until all is accounted for.

Items Supplied

Item	Quantity
Shaker	1
Power Supply Cable	1
Universal Platform	1
Screws for Platform	3
Thread Locker	1
Manuals print en	1
Manuals on USB	1

Table 9: Items Supplied

If any items are missing, contact Thermo Fisher Scientific.

2. 2. Location

CAUTION Protection can be impaired due to reduced stability of plastic exposed to ultraviolet rays. Do not subject the shaker and plastic accessories to direct sunlight or other sources of ultraviolet rays.

Put the shaker on a level table or bench capable of supporting the weight of the shaker with any accessories and samples while in operation. Place the shaker near an electrical outlet that matches the nameplate requirements. Allow clearance around the unit for free air convection, accessory attachments and user convenience.

Mind the following requirements for setting up the unit:

- The shaker requires a clear area of 8 cm (3 in) for proper ventilation on all sides.

  WARNING Hazardous substances must be kept out of this zone while shaking.

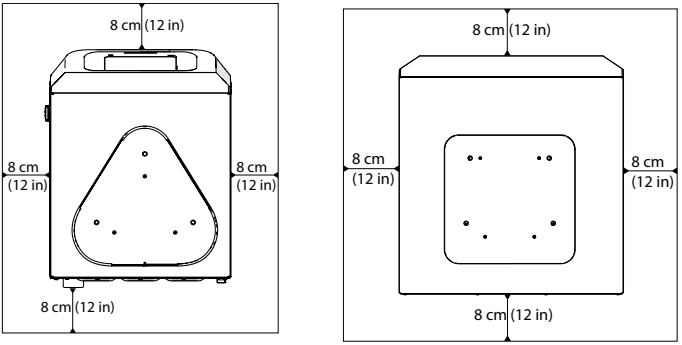


Figure 4: Set up clearance of 8 cm (3 in)

- The supporting surface must:
  - » be clean,
  - » be stable, solid, rigid and free of resonance,
  - » be suitable for horizontal set up of the shaker,
  - » hold the weight of the shaker.
- The shaker is to be operated only indoors.
- The shaker is not to be exposed to heat and strong sunlight.
- The set up location must be well ventilated at all times.
- The mains plug must be freely accessible at all times.

2. 3. Transporting

CAUTION Phyiscal harm caused by dropping the shaker. Always lift the shaker from both sides. Never lift the shaker by its front panel or an installed platform.

CAUTION Safe use of the shaker is impaired after transport or storage in humid conditions. Let the equipment dry out for at least 2 h before operating.

NOTICE Always remove the platform and other accessories before moving the shaker. If you do not remove the platform, you might damage the platform mounting plate or the shaking mechanism.

Impact can damage the unit.

Transport the shaker in an upright position and if possible in original packaging.

Due to its weight, the Solaris 4000 shaker must be carried by two people.

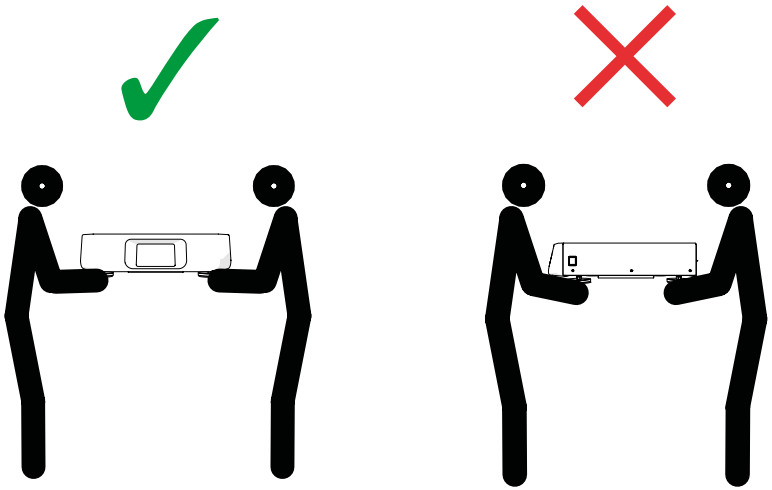


Figure 5: How to carry a shaker

2. 4. Leveling

The shaker cannot be leveled by itself. The shaker requires a leveled supporting surface for proper setup.

NOTICE Do not put anything between the shaker feet and the supporting surface to level the shaker.

2. 5. Mains Connection

The shaker requires a 100–240 V, 50 / 60 Hz power source. Power supply cables are supplied.

WARNING Damage from wrong mains supply or power supply plug. Make sure that the shaker is plugged only into sockets which have been properly grounded. Do not operate the shaker with a damaged or an inadequately rated power supply cable.

To connect the shaker to the power supply follow this procedure:

1. Turn off the power supply switch located on the right side.
2. Make sure that the cable specification agrees with the safety standards of your country.
3. Make sure that the voltage and frequency are the same as the figures on the rating plate.

The mains plug must be freely accessible at all times.

To eliminate hazard of electrical shock, make sure the surface around the shaker is dry. In the event of accidental spilling or splashing of liquids, disconnect the shaker from the power source, clean up and neutralize the spilled liquids before continuing.

Disconnect the shaker from the power source when not in use.

2. 6. Initial Startup

Complete the following steps before using the unit:

1. Power on the unit, the thermo scientific logo is displayed. Tap **Start Setup**.

Figure 6: Initial startup

2. Select the desired language on the Language screen. Tap **Next**.

Figure 7: Initial startup - language

3. Enter the unit name on the Unit Name dialog box. Tap **Next**.

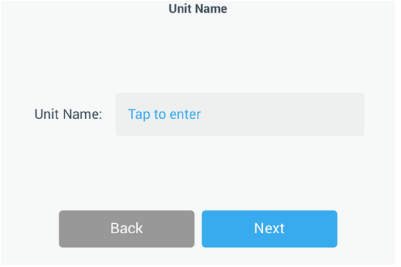


Figure 8: Initial startup - unit name

4. Enter city and country in the text field. You can also select from a list of suggestions displayed while making your entry. Tap **Next**.

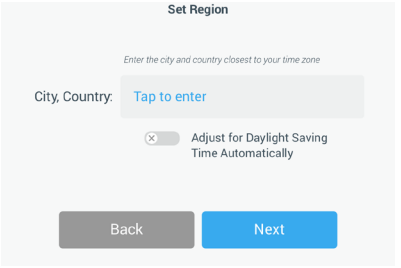


Figure 9: Initial startup - region

5. Select the desired date format. Tap **Next**.

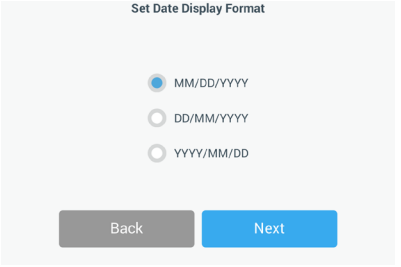


Figure 10: Initial startup - set date display format

6. Select the current date. Tap **Next.**

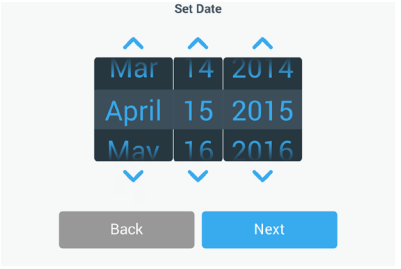


Figure 11: Initial startup - set date

7. Select the desired time format and set the current time. Tap **Next**.

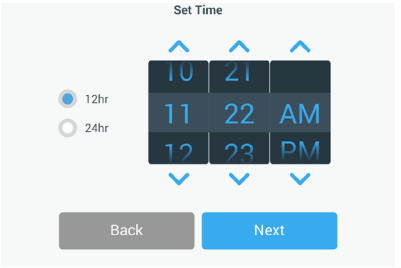


Figure 12: Initial startup - set time

8. An Installation Instruction window is displayed. Tap **Next**.

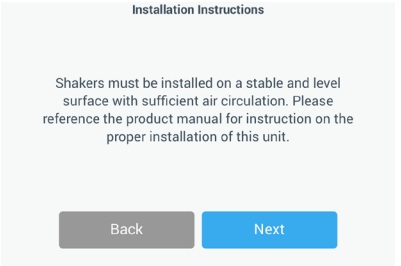


Figure 13: Initial startup - installation instruction

9. Setup is complete. Tap **Finish**.

2. 7. Storage

CAUTION

When you remove the shaker and accessories from use, clean and, if necessary, disinfect or decontaminate the full system. Do not leave the shaker and acessories in an undefined state of contamination. If you are unsure of the process contact the Thermo Fisher Scientific customer service ("Cleaning" on page 54, "Disinfection" on page 55 and "Decontamination" on page 55).

- Before storing the shaker and the accessories, it must be cleaned and, if necessary, disinfected and decontaminated.
- Shaker and accessories must be completely dry before storage.
- Keep the shaker in a clean, dust-free location.
- Keep the shaker on its feet.
- Do not store the shaker in direct sunlight.

2. 8. Shipping

CAUTION

Before shipping the shaker and accessories you must clean and, if necessary, disinfect or decontaminate the full system. Do not leave the shaker and acessories in an undefined state of contamination. If you are unsure of the process contact the Thermo Fisher Scientific customer service ("Cleaning" on page 54, "Disinfection" on page 55 and "Decontamination" on page 55).

Before shipping the shaker:

- The shaker must be clean and decontaminated.
- You must confirm the decontamination with a decontamination certificate. A decontamination certificate can be retrieved from the Thermo Fisher Scientific customer service.

3. Operation

3. 1. Power on / off

Push the power switch at the right side to power the shaker on (I) or off (0).

The touchscreen shows the Thermo Scientific logo while booting.

When ready, the touchscreen shows the current status of the shaker.

3. 2. Graphical User Interface

The Home Screen below is the default screen:

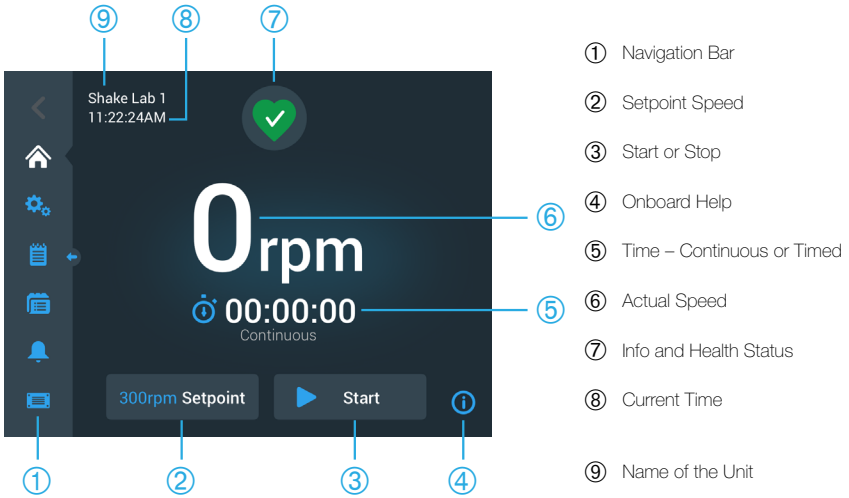


Figure 14: Home Screen of the Graphical User Interface (GUI)

To start the shaker with the set parameter press the Start button. To stop the shaker at any time press the Stop button.

3. 2. 1. Status

When the shaker is in good health, the touchscreen display shows a green heart icon in the Info and Health Status area (⑦ in Figure 14). Tapping the green heart icon opens the status screen. The status screen provides a full set of information on the shaker.

Alert

When an alert is issued, the touchscreen display shows a yellow bar on top of the current screen. After a short time, the yellow alert bar goes away. Only the yellow triangle indicates that alerts exists for the shaker, The triangle icon has a blue circle with a white border that shows the number of active alerts. Tapping the triangle icon in the Info & Health Status area (⑦ in Figure 14) opens a screen listing all alerts that are currently active. The latest alert appears expanded to let you view the full details. You can scroll through the list and tap on any list item to expand it and read more.

Alarm

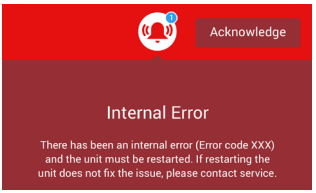
When an alarm is issued, the shaker stops immediately to avoid damage to the samples and/or the unit itself. You must acknowledge the message on the touchscreen before you can continue operation.

When an alarm is issued, the touchscreen display shows a red bar on top of the current screen. The Info & Health Status area (⑦ in Figure 14) displays a red alarm bell enclosed by sound waves. Additionally, an audible alarm tone constantly sounds. This can be configured to be silent. (“Alarms and Alerts” on page 30)

Beneath the red alarm bar, a ticker-style message explains the root cause of the problem and provides instructions on how to handle the alarm. A Snooze button appears, allowing you to temporarily silence the alarm. When the alarm condition is not cleared within the snooze period, the audible alarm returns. The duration of the snooze period can be chosen in the settings

Error

When an error occurs, the shaker stops immediately to avoid damage to the samples and/or the unit itself. The screen is completely filled with a red error message.



You must correct the root cause and restart the shaker by powering it off and on before you can start operation again. Refer to “Troubleshooting” on page 58 for the list of error messages.

3. 2. 2. Settings

The second tab on the navigation panel is the Settings icon. The following screen appears when you select Settings:

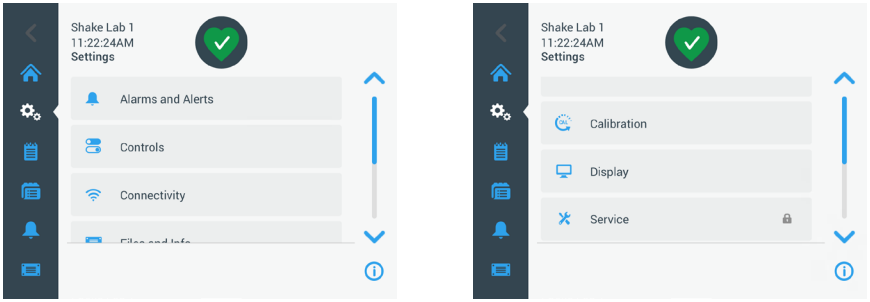


Figure 15: Settings

Alarms and Alerts

The Alarm Settings screen provides an option to set the high and low alarm setpoints.

Volume: You can change the volume of an alarm by dragging the slider to the left or right. This volume setting will affect alarms, alerts.

Snooze Timeout: You can set the snooze timer for 5 minutes, 10 minutes or 15 minutes. The default option is 10 minutes. Tap **Save** to save the changes.

Controls

Speed Setpoint: The speed setpoint must be between 15–525 rpm. Select the speed and tap **Save**.

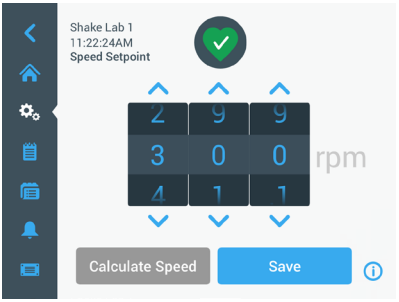


Figure 16: Speed setpoint

Orbit Calculator: The calculator enables you to determine the suggested set speed based on the changes to the orbit size when transitioning from one shaker to another.

1. Select the unit of measure in millimeters or inches.

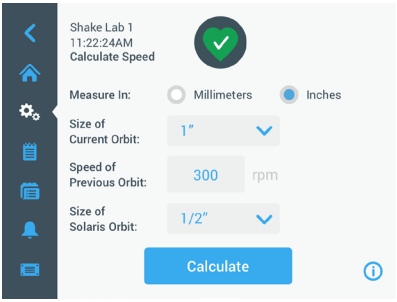


Figure 17: Orbit calculator

2. Select the size of the previous orbit. Tap **Calculate**. The following window appears calculating the speed.

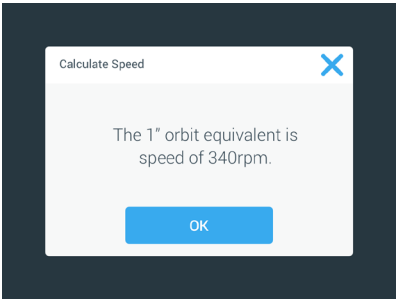


Figure 18: Orbit calculated

3. Tap **OK**.
4. You can calculate the suggested speed for a custom size of the orbit. To calculate custom speed, select Other**.** Enter the size of the orbit.

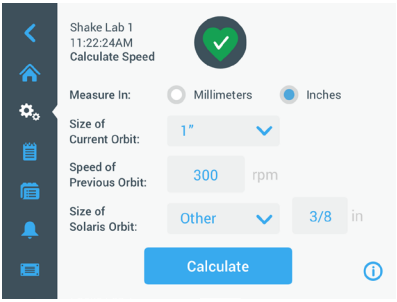


Figure 19: Calculate custom sized orbit

The Calculate Speed window appears displaying the speed for the size entered.

Time Mode: This feature allows you to display time in Continuous or Timed mode.

If you select timed mode, you can choose to display the elapsed time or remaining time.

Enter the hours and minutes box in the Set Time. Tap **Save**.

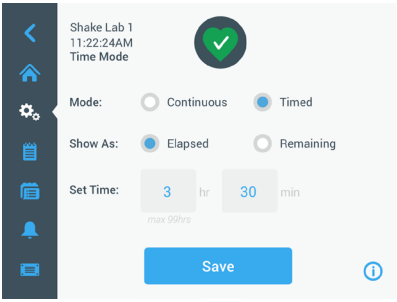


Figure 20: Time Mode

Auto Restart: This feature restarts the unit after a power outage. If the Auto Restart is set to **No**, the unit will not restart after a power outage.

Display

The display settings allows you to change various display options.

Brightness: To adjust the brightness level of the display use the slide control or the +/– buttons.

Language: To change the display language, tap the Language button and select the desired language.

Date: To set the date, tap the Date button.

Date Format: To set the date format, tap the Date Format button.

Time: To set the time and time format, tap the Time button.

Region: This is used to set the region the unit is operated.

Unit Name: To enter or change the unit name, tap the Unit Name button.

Menu Bar Customization: This is used to customize the bottom 2 icons in the main navigation bar.

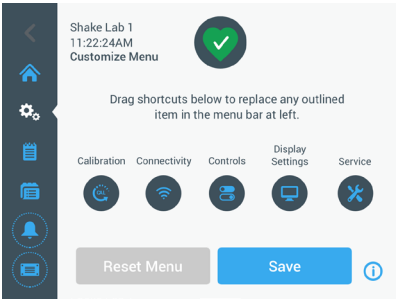


Figure 21: Menu Bar Customization

Sleep Mode: This is used to put the display to sleep after 15 minutes of inactivity.

Files and Info

This provides information of the serial number, H.M.I. (Human-Machine Interface), main controller and parameter. You can **factory reset** your settings from this screen. Resetting to factory defaults will erase all settings except event log and usage.

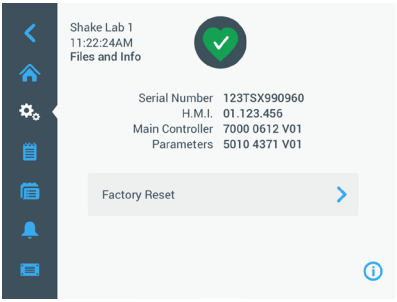


Figure 22: Files and Info

Service

The service settings are restricted and can be accessed by authorized service technicians. The authorized service technician can update the firmware.

3. 2. 3. Programs

Programs displays the list of programs. You can create, edit, delete, import and export a program. The following screen displays the programs created:

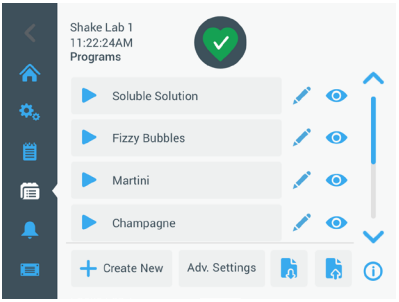


Figure 23: Programs

The eye icon allows you to view the program.

Creating a Program

You can create and store up to 99 programs.

1. Select **Create New** button.
2. Enter the name of the program.

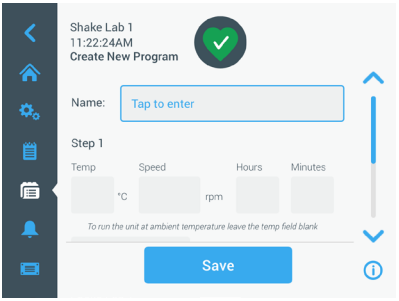


Figure 24: Create program

3. Enter the time and the speed. Enter the duration of the program in hours and minutes.

   To add an extra step in your program, scroll down and tap on the **Add Step** button
4. Tap **Save** to save the program.

Editing a Program

1. Tap the pencil icon ✎ beside the program you want to edit.
2. Edit the required fields. Tap **Save**. The program is saved with the new changes.
3. You can add a step by selecting **Add Step** at the bottom of the screen. Scroll the screen to see the **Add Step** button if there are more than 3 steps.

NOTICE If during shaking operation with several steps an alarm or an error message occurs the shaker will automatically stop. If an alert occurs shaking operation will continue.

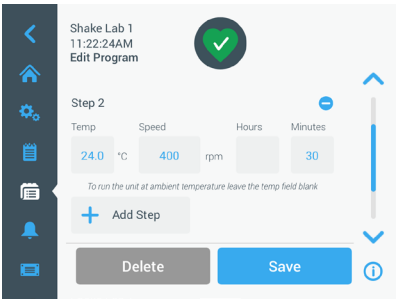


Figure 25: Add step

Deleting a Program

1. Tap the pencil icon beside the program you want to edit.
2. Tap **Delete**. A window appears asking for confirmation.

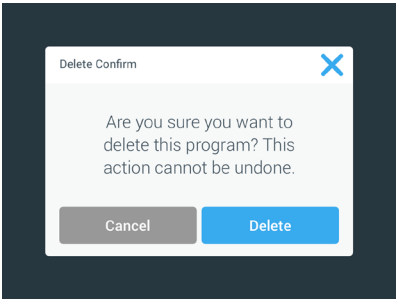


Figure 26: Delete program

3. Tap **Delete**. The selected program is deleted.

Run a Program

1. To run an existing program, select the program you want to run.
2. If you want to see the Quick view of the program, Tap on the eye icon beside the program.

3. A Program Quick view window appears.

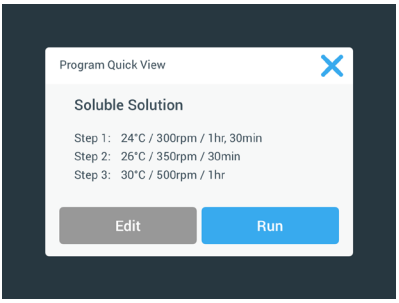


Figure 27: Program quick view

4. Tap **Run** to load the program on the Home screen.

   Depending on your chosen **Auto Run** settings the program starts immediately or will start when the **Start** button is tapped on the home screen.

5. When the program is complete, the following window appears. Tap **OK**.

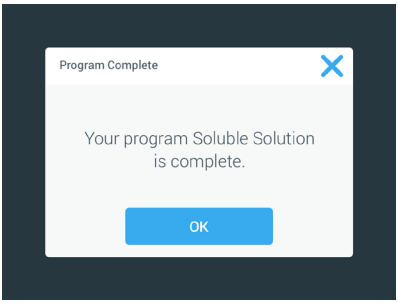


Figure 28: Program complete

Importing Programs

You can import the programs created in one shaker to another shaker. Ensure that a USB drive is connected.

The following screen shows all the programs saved.

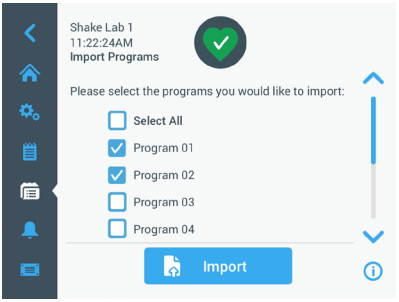


Figure 29: Select programs for import

Select the programs you want to import. Tap **Import**.

After the programs have been imported successfully, the following window appears. Tap **OK**. You may now remove the USB.

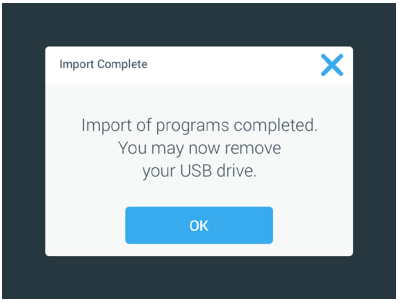


Figure 30: Program import complete

Exporting Programs

You can export programs from one shaker to another shaker. Ensure that a USB drive is connected.

The following screen is displayed if the USB is connected:

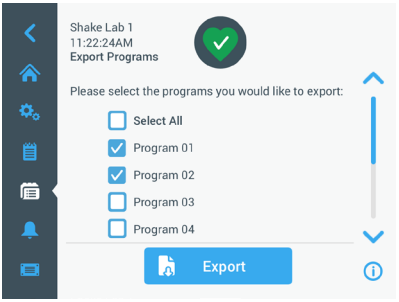


Figure 31: Select programs for export

Select the programs you want to export. Tap **Export**.

The following window appears when the export is completed. Tap **OK**. You may now remove the USB.

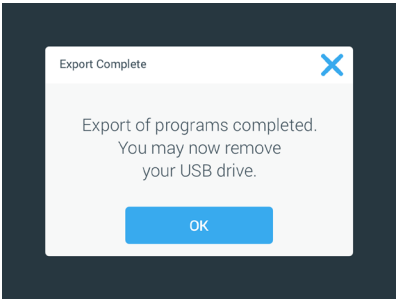


Figure 32: Program export complete

Event Log

The third tab on the navigation panel is the event log that contains a record of user and system events. The Event Log screen will be displayed once the Event Log icon is tapped.

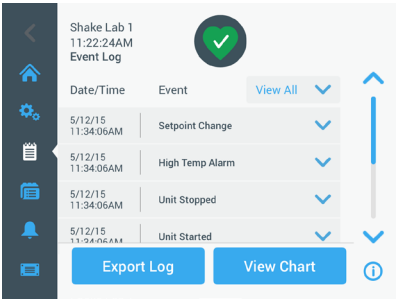


Figure 33: Event Log

This screen displays up to 50 recent events, with date time stamps for each event.

Additional information of an individual event can be viewed by selecting the event.

Select the dropdown to choose an event type.

The event types can be filtered and categorized into: Alarm, Alerts, Settings, Start/ Stop and Programs. When a filter is selected, the View All button on the right changes to Filter ON.

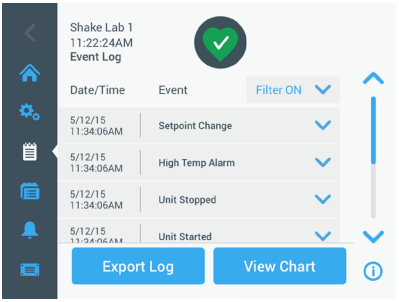


Figure 34: Filter event log

Export an event

1. Choose an event to be exported from Export dropdown list. Select the export format of the log or report.

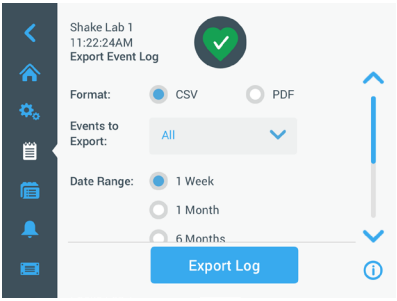


Figure 35: Select event log for export

2. A predefined or custom date range may be selected.
3. Export can be done using an USB drive. An USB drive must be inserted to store the log or report. Tap the **Export Log** button to download the log or report.

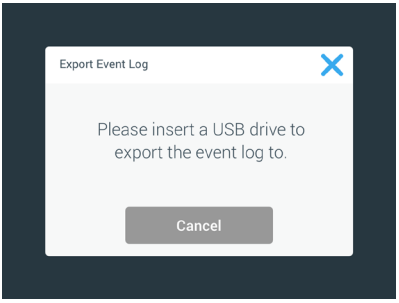


Figure 36: Insert USB drive for export

Charts

Charts display speed data in graphs. The X-axis displays the time and Y-axis displays the speed.

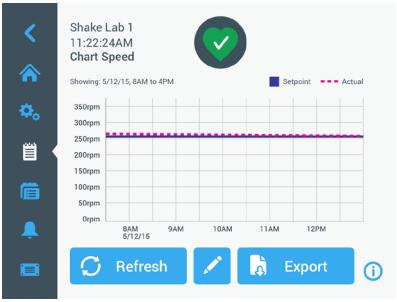


Figure 37: Charts

Editing the Chart

1. Tap **Edit** if you want to edit the chart.
2. You can select the date range and the time range.
3. Tap **Save** to save the changes or custom settings
4. Tap Export Chart Data to download speed chart. Export can be done using an USB drive. Ensure that an USB drive is inserted to export the data.

3. 3. Accessories

CAUTION

Physical and biological harm due to broken vessels.

Improperly installed accessories can lead to broken glass and spilled samples.

Make sure that accessories are installed properly by using the correct tools and screws.

Make sure that accessories fit reasonably on the platform.

Always use a vessel with the accessory that fits its size.

CAUTION

Cutting injuries from sharp edges.

Be cautious while handling with platforms and other accessories.

CAUTION

Fingers can be pinched by moving platform.

Never put your fingers on or below a platform while it is moving.

NOTICE It is your responsibility to make sure that the accessories are installed properly.

Installation procedures described apply to all shaker models listed in this instruction manual until otherwise stated.

Always use the tools and screws supplied with the accesory. If you loose some of these items you can re-order spare part kits listed (“Accessories” on page 13). Do not use tools or screws not supplied.

3. 3. 1. Platform Installation

CAUTION Cutting injuries from sharp edges. When changing a platform, grasp under the platform. Do not lift a platform by clamps mounted on it. Be cautious while handling with platforms and other accessories.

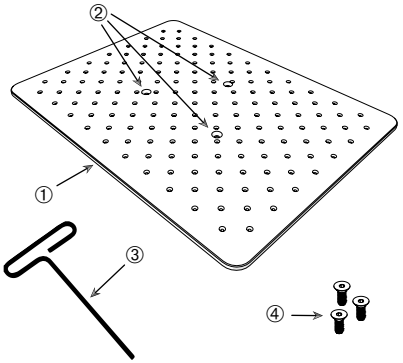
CAUTION Use only the screws and the locking tool supplied with the platform. Using other screws or wrong locking tools will lead to improper installation and therefore possibly can damage the shaker and accessories.

Always install a platform with **all** screws.

Always use the proper locking tool:

- 3/16” locking tool (GT530066) for all Solaris 2000 platforms
- 7/32” locking tool (GT530080) for all Solaris 4000 platforms

Universal Platforms



① – Platform
② – Mounting holes
③ – Locking tool
④ – Screws

Figure 38: Example of an universal platform

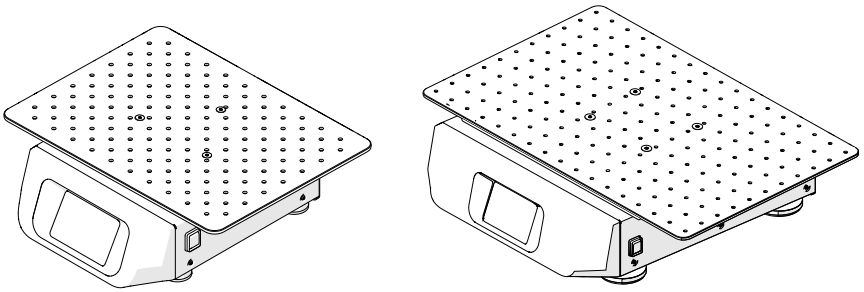
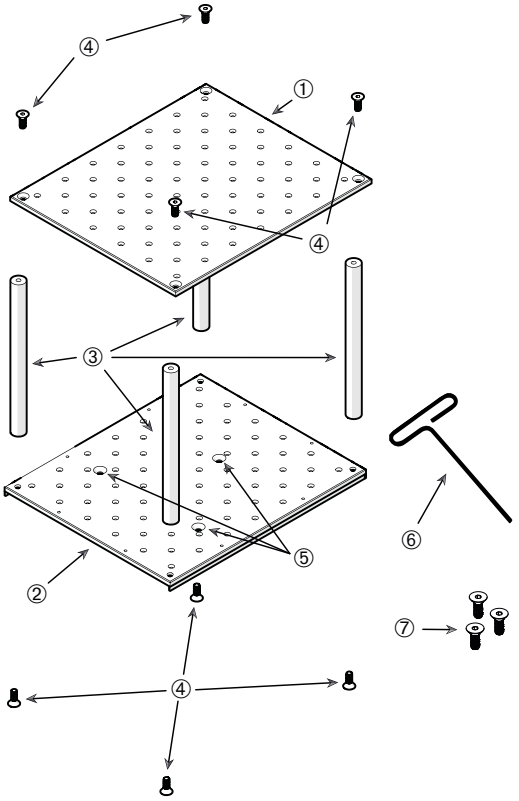


Figure 39: Universal platform installed on a Solaris 2000 (left) and a Solaris 4000 (right) shaker

1. Carefully position the platform horizontally over the shaker and its mounting points.

   Platforms for Solaris 2000 have 3 mounting holes, Platforms for Solaris 4000 have 4 mounting holes.
2. Put a drop of the thread locker to each screw thread before tightening.
3. Tighten the screws gently to secure the platform to the shaker. When the locking tool starts bending, stop tightening.

Dual Stack Platforms



① – Upper platform (no pinch protection)

② – Lower platform (with pinch protection)

③ – Pillars (4x)

④ – Screws for mounting the pillars (4x for upper platform and 4x lower platform)

⑤ – Mounting holes

⑥ – Locking tool

⑦ – Screws for connecting the platform to the platform mounting plate on the shaker

Figure 40: Dual Stack Platform Assembly

Connect the upper and the lower platform by mounting them with the 4 pillars in each corner. Mount the pillars with the proper screws from the upper and from the lower platform. Put a drop of the thread locker to each screw thread before tightening.

Tighten the screws gently to connect the pillar and the platforms. When the locking tool starts bending, stop tightening.

The lower platform is the one with the mounting holes for connecting it to the shaker. Make sure to have the lower platform on the bottom side when assembling.

NOTICE Before placing vessels on the platform assembly, make a final check to be sure that the platform assembly does not wobble.

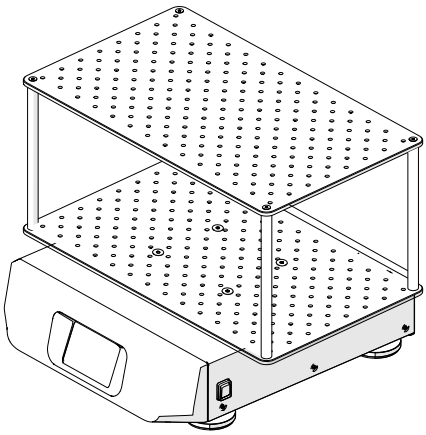


Figure 41: Dual stack platform on a Solaris 4000 shaker

1. Carefully position the assembled dual stack platform horizontally over the shaker and its platform mounting plate.

   Platforms for Solaris 2000 have 3 mounting holes, Platforms for Solaris 4000 have 4 mounting holes.
2. Put a drop of thread locker to each screw thread before tightening.
3. Tighten the screws gently to secure the platform to the shaker. When the locking tool starts bending, stop tightening.

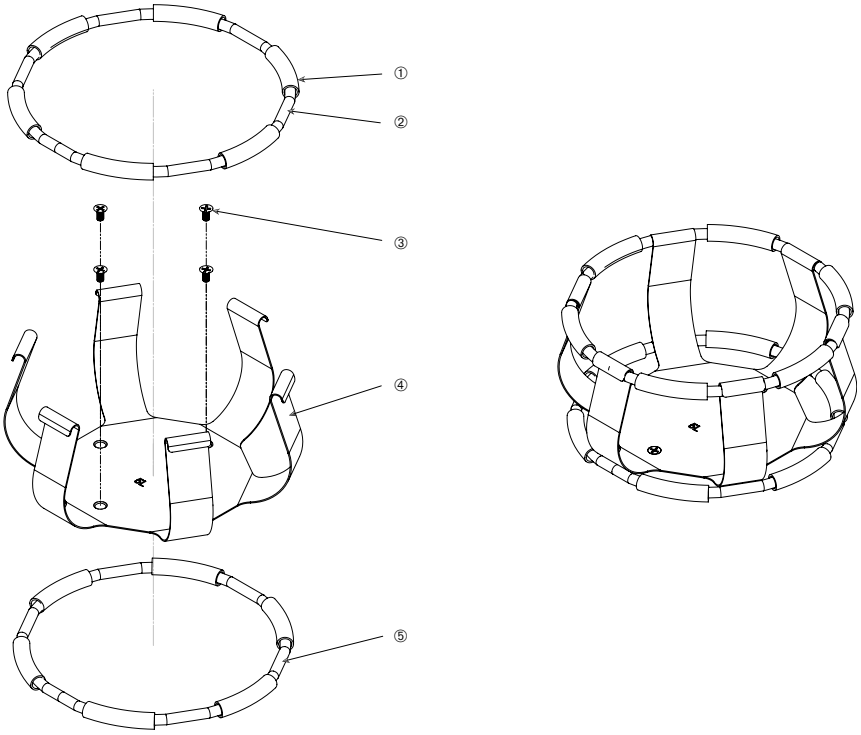
3. 3. 2. Clamp and Vessel Installation

CAUTION Biological harm due to broken or leaking vessels. Improperly installed accessories can lead to spilled samples. Make sure that accessories are installed properly by using the correct tools and screws. Make sure that accessories fit reasonably on the platform. Always use a vessel with an accessory that fits it size. Vessels must be intact and installed properly.

CAUTION Cutting injuries from sharp edges. Be cautious while handling with platforms and other accessories.

Clamps

Each clamp consists of a vessel clip, one or two springs depending on the clamp/ bottle size and screws for mounting it on the platform. Only use the screws supplied with the clamp.

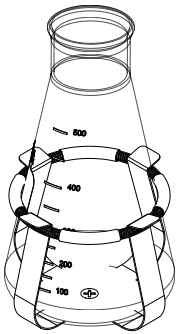


① spring tube ② spring ③ screws ④ clip leg ⑤ spring

Figure 42: Clamp details with 2 springs

1. If needed, attach the spring to the clip legs as shown in the illustrations.
2. Some clips use two springs. The rubber spring tubes are positioned between the clip legs as shown in the illustration. The second spring is installed around the base of the clip assembly after it has been mounted to the platform.
3. Attach the clip assembly to the platform with the screws provided.

Vessel



1. Carefully place the desired vessel in the clamp by first pulling the clamp spring far enough apart to enable the vessel base to be positioned inside the clamp. Gently slide the vessel into its proper position, securing it to the wider bottom of the clamp. The spring will hold the neck of the vessel securely in place.
   - » Each clamp contains a support spring located at the narrow top of the clamp.
   - » Depending on the size of the clamp, the clamp base may contain one or several screws necessary to secure the clamp to the platform. All screws provided with the clamp must be properly attached to the platform.
2. Make sure all vessel are securely clamped before powering on the unit.

   Wherever possible, vessel should contain a stopper to prevent hazardous substances being thrown out during the mixing action.

3. 3. 3. Test Tube Rack Clamp Installation

CAUTION Cutting injuries from sharp edges. Be cautious while handling with platforms and other accessories.

Each test tube rack clamp consists of 2 wire frames with a locking knob and 2 finger screws per wire frame for mounting it on the platform. Each test tube rack clamp comes pre-assembled with a test tube rack and foam insert(s). Always use the screws supplied with the clamp.

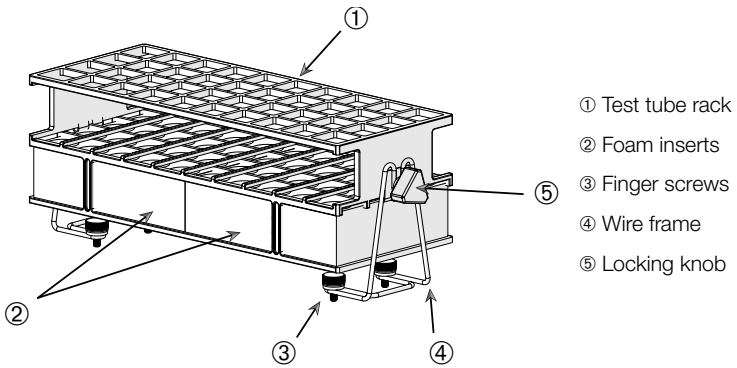


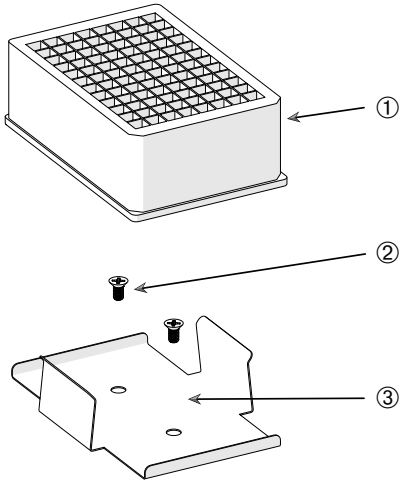
Figure 43: Test Tube Rack Clamp Assembly

1. Install the wire frames on the platform using the finger screws. Tighten the finger screws ③ until hand tight.
2. Set the required angle by using the locking knobs ⑤. Tighten the locking knobs until hand tight.

3. 3. 4. Microplate / Deepwell-Plate Installation

CAUTION Cutting injuries from sharp edges. Be cautious while handling with platforms and other accessories.

1. Place the microplate frame on the platform.
2. Mount the microplate frame to the platform using the screws supplied with the microplate / deepwell-plate set.
3. Insert the microplate or deepwell-plate into the microplate frame.
4. Make sure that the microplate or deepwell-plate sits tight by lifting it gently. If it sits tight, it is installed properly.



① Deepwell Plate

② Screw

③ Microplate Clamp

Figure 44: Microplate / Deepwell-plate assembly

3. 4. Loading and Normal Use

WARNING

Risk of fire due to triggered chemical reactions.

Do not operate the shaker at speeds that will cause the contents of vessels to be thrown out.

Increase speed slowly. Try with water before using chemicals.

CAUTION

Safety can be impaired by improper loading and damaged accessories.

- Make sure that the load (accessories and samples) is arranged symmetrically to the center of the platform. When operating a dual stack platform, make sure that the lower platform carries more load than the upper platform.
- Never overload the shaker. For maximum load refer to „Technical Data“ on page 11. The load contains the weight of the platform, accessories and samples installed on the shaker.
- Make sure that the accessories are installed properly before operating the shaker. Follow the instructions in section „Accessories“ on page 41.

Loading

Make sure that the load, including accessories and samples, is arranged symmetrically to the center of the platform. When operating a dual stack platform and not using the complete capacity: in order to achieve best performance load preferably the bottom plate and arrange the load symmetrically to the center of the platform.

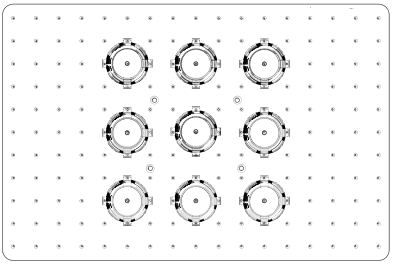


Figure 45: Example for a well loaded platform

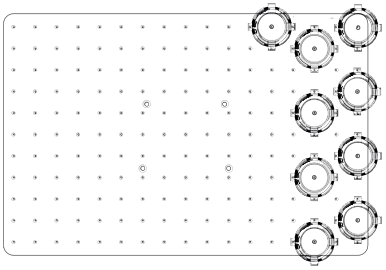


Figure 46: Example for a poorly loaded platform

NOTICE The maximum load contains the weight of the platform, accessories and samples installed on the shaker. Refer to "1. 1. Technical Data" on page 11 for details on maximum loading.

Normal Use

Information on speed-load limitation is given only as a guide to product use. Smooth operation with low or no vibration depends on multiple factors as fill level, type and condition of clamps, type of vessel, arrangement of vessels on platform, the surface the shaker is placed on and on the set speed.

Whenever setting up a new or unknown combination or whenever any of these parameters change: Increase speed above 175 rpm slowly and check for unwanted load vibration or movement of the shaker. It is your responsibility to operate the shaker safely.

Solaris shakers are specially designed for the use inside a range of lab equipment, including environmental chambers, incubators and lab refrigerators providing low heat output and low vibrations. Due to various specific environmental conditions including the stability of shelves and supports the user has the responsibility for safe operation when used inside any lab equipment. Increase speed slowly and check for unwanted instrument movement.

Safe Speed

The safe speed for any load on Solaris 2000 and Solaris 4000 shaker is 175 rpm. The load contains the weight of the platform, accessories and samples installed on the shaker. Refer to "Technical Data" on page 11 for details on maximum load.

Highest Speed

At the highest speed of 525 rpm the Solaris 2000 can be operated with a limited load of approximately 3 kg. The load contains the weight of the platform, accessories and samples installed on the shaker. Consider the speed capability of applied clamps and vessels that might not be suitable for that speed.

At the highest speed of 525 rpm the Solaris 4000 can be operated with a limited load of approximately 10 kg. The load contains the weight of the platform, accessories and samples installed on the shaker. Consider the speed capability of applied clamps and vessels that might not be suitable for that speed.

NOTICE Always mind that with rising speed clamps will start opening and deliver additional temporary vibration to the system due to greater vessel movement.

Charts

Following charts will guide you in setting up the best speed-load combination for your normal use. The green area shows speed-load combinations that cause none to minor vibration during shaking operation. The red area shows speed-load combinations that may cause strong vibration during shaking operation and can result in unwanted movement of the shaker. As these charts are for guidance only, you must pay attention when your speed-load combination comes closer to the red area.

Be aware that your specific application conditions may cause unwanted load or instrument behaviour before reaching the shown borderline. Increase the speed gradually to explore the behaviour of your specific load. The load contains the weight of the platform, accessories and samples installed on the shaker.

Solaris 2000

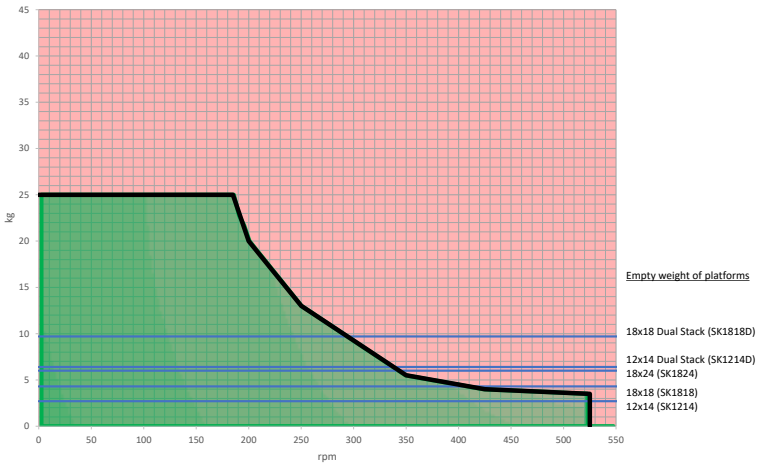


Figure 47: Solaris 2000 – Normal Use

Figure 48: Solaris 4000 – Normal Use

4. Maintenance and Care

WARNING

Risk from handling hazardous substances

- If shaking any hazardous materials mind the "Laboratory Biosafety Manual" of the World Health Organization (WHO) and any local regulations. When shaking microbiological samples from the Risk Group II (according to the "Laboratory Biosafety Manual" of the World Health Organization (WHO)), aerosol-tight biological seals have to be used. Look on the internet page of the World Health Organization (www.who.int) for the "Laboratory Biosafety Manual". For materials in a higher risk group, extra safety measures must be taken.
- If toxins or pathogenic substances have contaminated the shaker or its parts, appropriate disinfection measures have to be taken ("Decontamination" on page 55; „Disinfection" on page 55).
- If a hazardous situation occurs, turn off the power supply to the shaker and leave the area immediately.

WARNING

Damage to health from infectious substances

If an accidental spill places liquids or other materials under the platform, immediately power off the shaker, unplug it, and remove the platform ("Platforms" on page 13).

Clean up the spill following your regular laboratory procedures. Use proper personal protective equipment.

Any internal adjustments or repairs must be performed by an authorized service technician. The shaker housing is not to be opened by the user.

Follow any product information supplied with the according accessory stating specific details on how to maintain and clean it properly. Use the following information within this chapter only as guideline.

4. 1. Basics

For the sake of personal, environmental, and material protection, you must clean and if necessary disinfect the shaker and its accessories on a regular basis.

Thermo Fisher Scientific recommends cleaning and manually disinfecting your laboratory shaker at least once each month. Normal indoor air contains thousands of circulating microorganisms which can take up residence in your shaker, putting your cultures at risk.

Thermo Fisher Scientific recommends using 70% ethanol, or 70% isopropanol or 10% or less quaternary ammonium based disinfectant.

NOTICE The mechanism can be damaged by entering liquids. Do not allow liquids, especially organic solvents, to get in contact with the mechanism or the mechanism bearing. Organic solvents break down the grease in the mechanisms bearing.

NOTICE Not rated procedures or agents could deteriorate the materials of the shaker and lead to malfunction. Refrain from using any other cleaning or decontamination procedure, if you are not entirely sure that the intended procedure is safe for the equipment. Use only cleaning agents that will not damage the equipment. If in doubt contact the manufacturer of the cleaning agent.

- Pull out the power supply plug before cleaning, disinfecting or decontaminating.
- Remove installed accessories and platform(s) from shaker before cleaning, disinfecting or decontaminating.
- Use warm water with a mild detergent with a soft cloth to clean the materials. If in doubt contact Thermo Fisher Scientific. Rinse off with clean water and dry thoroughly.
- Never use caustic cleaning agents such as phosphoric acid, bleaching solutions or scrubbing powder.
- Use only disinfectants with a pH of 6–8.
- Clean up any spills immediately using a lint-free cloth dampened with a noncorrosive cleaner as instructed by the manufacturer of the cleaning agent.
- Spills can seep under the platform. If any spills get beneath the platform, uninstall the platform and clean up the spill.
- Check the shaker parts and remove any spilled growth media or debris.

Inspection of Accessories

NOTICE Do not run any shaker or accessories with signs of damage. It is recommend that you have accessories inspected on a regular basis as part of your routine service to ensure safety.

After thoroughly cleaning the accessories, they must be inspected for damage, wear and corrosion.

Metal Parts

In case of damage, such as corrosion, wear or cracks, the accessories must be removed from service immediately.

Plastic Parts

Check for signs of crazing, fading, bruising or cracking. In case of damage the inspected item must be removed from service immediately.

4. 2. Cleaning

NOTICE Before using any cleaning methods, users should check with the manufacturer of the cleaning agents that the proposed method will not damage the equipment.

NOTICE The mechanism can be damaged by entering liquids. Do not allow liquids, especially organic solvents, to get on the mechanism or the mechanism bearing. Organic solvents break down the grease in the mechanisms bearing. Wash the exterior of the unit with a soft cloth using a solution of mild soap and water, rinse off with clean water and dry thoroughly.

Suggested with every 3 months of constant use.

Refer to "Basics" on page 53 for proper cleaning of the shaker and the used accessories.

Touchscreen

To clean the touchscreen:

1. Pull out the power supply plug.
2. Clean the touchscreen using a dry microfiber cloth.
3. If necessary moisten the microfiber cloth with water and wipe the touchscreen again.

4. 3. Disinfection

WARNING Risk from handling hazardous substances. Do not touch infected parts. Hazardous infection is possible when touching the contaminated parts. Infectious material can get into the shaker when a vessel breaks or as a result of spills. In case of contamination, make sure that no one is put at risk. Disinfect the affected parts immediately.

NOTICE Equipment can be damaged by inappropriate disinfection methods or agents. Make sure that the disinfection agent or the method will not damage the equipment. In doubt contact the manufacturer of the disinfection agent. Observe the safety precautions and handling instructions for the disinfection agents used.

1. Wipe all parts and areas with 70% ethanol as required by the level of disinfection you need. Do not wet any areas with exposed electronics.
2. Allow to air dry.

You are responsible that the level of disinfection is achieved according to your requirements.

4. 4. Decontamination

WARNING Risk from handling hazardous substances. Do not touch contaminated parts. Exposure to contamination is possible when touching the contaminated parts. Contaminated material can get into the shaker when a tube breaks or as a result of spills. In case of contamination, make sure that no one is put at risk. Decontaminate the affected parts immediately.

NOTICE Equipment can be damaged by inappropriate decontamination methods or agents. Make sure that the decontamination agent or the method will not damage the equipment. If in doubt contact the manufacturer of the decontamination agent. Observe the safety precautions and handling instructions for the decontamination agents used.

The following method is suggested by Thermo Fisher Scientific.

1. Wipe all parts and areas with 70% ethanol. Do not wet any areas with exposed electronics.
2. Allow to air dry.

You are responsible that the level of decontamination is achieved according to your requirements.

4. 5. Autoclaving

NOTICE Never exceed the permitted temperature and duration when autoclaving. No chemical additives are permitted in the steam.

Before autoclaving:

- Disassemble all accessories.
- Thoroughly rinse off any trace of chemicals or detergents. Include a final rinse with distilled water.

Follow this table to check autoclavability:

Item	Autoclavable	Specifications
Shaker	No	-
Platform	Yes	135 °C, 20 min
Clamp (without spring tubes)	Yes	135 °C, 20 min
Test Tube Rack Clamp – Metal Parts	Yes	135 °C, 20 min
Test Tube Rack Clamp – Plastic Parts (Nalgene™ ResMer™)	Yes	121 °C, 20 min
Test Tube Rack Clamp – Plastic Parts (Nalgene Unwire™)	No	-
Test Tube Rack Clamp – Foam Inserts	No	-
Microplate Clamp	Yes	135 °C, 20 min
Adhesive Mat	No	-

Table 10: Autoclavability of materials

Make sure that the necessary sterility is achieved according to your requirements.

Appearance and color may change slightly after autoclaving.

4. 6. Service

Thermo Fisher Scientific recommends having the shaker and accessories serviced once per year by an authorized service technician. The service technician checks the following:

- electrical equipment
- suitability of set-up site
- safety system
- used accessories
- fixation of clamps and platforms and other accessories on the shaker

Before service, shaker and accessories should be thoroughly cleaned and decontaminated to ensure that full and safe inspection can be completed.

Thermo Fisher Scientific offers inspection and service contracts for this work. Any necessary repairs are performed for free during the warranty period and afterwards for a charge. That is only valid if the shaker has been maintained by an authorized Thermo Fisher Scientific service technician.

4. 7. Shipping and Disposal

WARNING Damage to health from infectious substances. When removing the shaker and accessories from use for disposal you have to clean and if necessary disinfect or decontaminate them. If in doubt contact the Thermo Fisher Scientific customer service.

For the disposal of the shaker mind the regulations in your country. Contact the Thermo Fisher Scientific Customer Service for the disposal of the shaker. For contact information check the back page of this manual or visit www.thermofisher.com.

Mind the information on transport and shipping (“Transporting” on page 23, “Shipping” on page 27).

5. Troubleshooting

NOTICE If an error message shows that is not listed in this table, a service technician must be contacted.

No.	Description	Solutions
Errors		
1–150	An internal error occurred	An internal error occurred. Please power off and on the unit. If the error message still shows, contact a service technician.
Alerts		
4	Power Resumed and Autorestart Enabled	A power outage occurred during the last run. After the power has been restored the run has been resumed automatically.
5	Watchdog Timeout occurred	The system has been reset due to an internal error. Please check your samples and/or settings.
Alarms		
3	Autorestart after power outage failed	A power outage occurred during the last run. Auto restart could not be executed successfully.
4	Shaker walking away (Motion detection)	Shaker motion detected. Please check that the shaker is installed correctly and/or your settings and/or load (accessories and samples) on the platform.
5	Drive acceleration too slow. Desired set speed cannot be reached.	The desired set speed could not be reached within time. Please check your settings and/or load (accessories and samples) on the platform.
12	Drive start up error - no speed signal received.	Shaker platform is blocked. Please check if enough space is available around platform and/or reduce load (accessories and samples) on platform. Afterwards press START again on the shaker. If the error message still shows, contact a service technician.

No.	Description	Solutions
24	Speed measurement error during a run.	Abnormal speed change detected. Please check load (accessories and samples) and/or clamps on the shaker platform. Afterwards press START again on the shaker. If the error message still shows, contact a service technician.
	Speed comparison failed.	Shaker platform has been blocked during run. Please check if enough space is available around platform and/or reduce load (accessories and samples) on the platform. Afterwards press START again on the shaker. If the error message still shows, contact a service technician.
26	Speed measurement detected unexpected standstill during run.	Make sure that enough space is available around the platform and/or reduce load (accessories and samples) on the platform. Make sure that the fuse on the back of the shaker has not tripped ("Fuse" on page 20). Afterwards press START again on the shaker. If the error message still shows, contact a service technician.
82	Motor current measurement detects overload.	Motor overcurrent detected. Do not load or unload platform while running. Reduce speed or adjust load (accessories and samples) on platform.
83	Motor current measurement out of boundaries.	Motor overcurrent detected. Do not load or unload platform while running. Reduce speed or adjust load (accessories and samples) on platform.

Table 11: Troubleshooting

Index

A

Accessories 13, 41
Alarms 30
Alerts 30
Autoclaving 56
Auto Restart 32

B

Brightness 32

C

Care 52
Charts 40
Clamps 14
Cleaning 54
Connections 20
Controls 30

D

Date 32
Decontamination 55
Directives 18
Disinfection 55
Display 32
Disposal 57
Dual Stack 43

E

Ethernet 20
Event Log 38

F

Files and Info 33
Fuse 20

H

Highest Speed 49

I

Inspection of Accessories 53
Intended Use 6
Items Supplied 21

L

Language 32
Leveling 23
Loading 48
Location 22

M

Mains Connection 20
Maintenance 52
Menu Bar Customization 32
Metal Parts 54
Microplate / Deepwell-Plate 47

N

Normal Use 48, 49

O

Operation 28
Orbit Calculator 31

P

Plastic Parts 54
Platform Installation 41
Platforms 13
Product Overview 19
Programs 33

R

Region 32

S

Safe Speed 49
Service 57
Settings 30
Shipping 27, 57
Signal Words and Symbols 6
Sleep Mode 33
Snooze Timeout 30
Speed Setpoint 30
Standards 18
Startup 24
Storage 27
Symbols used in the Instruction Manual 7

T

Technical Data 11
Technical Specifications 11
Test Tube Rack Clamp 46
Test Tube Racks 16
Time 32
Time Mode 32
Transporting 23
Troubleshooting 58

U

Unit Name 32
Universal Platforms 42
Unpacking 21
USB 20
User Interface 28

V

Volume 30

thermo scientific

en

Manufactured for

Thermo Electron LED GmbH

Zweigniederlassung Osterode

Am Kalkberg, 37520 Osterode am Harz

Germany

Made in USA

Thermo Scientific Solaris 2000

Thermo Scientific Solaris 4000

70900190 is the original instruction manual.
This instruction manual is a translation of the original instruction manual.

thermofisher.com/shaker

Shown pictures within the manual are examples and may differ considering the set parameters and language.

Australia
+61 39757 4300

Austria
+43 1 801 40 0

Belgium
+32 53 73 42 41

China
+800 810 5118
or +400 650 5118

France
+33 2 2803 2180

Germany national toll free
0800 1 536 376

Germany international
+49 6184 90 6000

India
+91 22 6716 2200

Italy
+39 02 95059 552

Japan
+81 3 5826 1616

Netherlands
+31 76 579 55 55

New Zealand
+64 9 980 6700

Nordic/Baltic/CIS countries
+358 10 329 2200

Russia
+7 812 703 42 15

Spain/Portugal
+34 93 223 09 18

Switzerland
+41 44 454 12 12

UK/Ireland
+44 870 609 9203

USA/Canada
+1 866 984 3766

Other Asian Countries
+852 2885 4613

Countries not listed
+49 6184 90 6000

ThermoFisher SCIENTIFIC