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# New Brunswick™ Innova® 2000/2050 Shaker

**Operating manual**

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# 1 Operating instructions

## 1.1 Using this manual

- Carefully read this operating manual before using the device for the first time.
- Also observe the operating manual enclosed with the accessories.
- The operating manual should be considered as part of the product and stored in a location that is easily accessible.
- When passing the device on to third parties, be sure to include this operating manual.
- If this manual is lost, please request another one. The latest version can be found on our website www.eppendorf.com (international) or www.eppendorfna.com (North America).

## 1.2 Danger symbols and danger levels

### 1.2.1 Hazard symbols

| | | | |
|---|---|---|---|
|  | **Electric shock** |  | **Hazard point** |
|  | **Crushing** |  | **Material damage** |
|  | **Heavy loads** |  | **Explosion** |

### 1.2.2 Degrees of danger

The following degree levels are used in safety messages throughout this manual. Acquaint yourself with each item and the potential risk if you disregard the safety message.

| | |
|---|---|
| **DANGER** | *Will* lead to severe injuries or death. |
| **WARNING** | *May* lead to severe injuries or death. |
| **CAUTION** | May lead to light to moderate injuries. |
| **NOTICE** | May lead to material damage. |

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## 1.3 Symbols used

| Example | | Meaning |
|---|---|---|
| | ▸ | You are requested to perform an action. |
| | 1.<br>2. | Perform these actions in the sequence described. |
| | • | List. |
| |  | References useful information. |

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# 2 Safety

## 2.1 User profile



**CAUTION!**

- This equipment must be operated as described in this manual. If operational guidelines are not followed, equipment damage and personal injury can occur. Please read the entire Operating Manual before attempting to use this unit.
- Do not use this equipment in a hazardous atmosphere or with hazardous materials for which the equipment was not designed.
- Eppendorf is not responsible for any damage to this equipment that may result from the use of an accessory not manufactured by Eppendorf.

## 2.2 Warnings for intended use



**WARNING! Heavy!**

- Do not attempt to lift the Innova 2000/2050 Shaker by yourself.
- Ask for assistance or use suitable equipment when raising or handling the device.



**WARNING! Risk of explosion and injury or death!**

- Do not use equipment with flammable substances or organisms with flammable by-products.



**WARNING! Risk of electric shock and/or damage to the device!**

- Use a grounded power supply.



**WARNING! Risk of electric shock and/or damage to the device!**

- Before cleaning device, turn off and unplug from mains/power supply.



**WARNING! Risk of electric shock when replacing fuses!**

- Turn off shaker and disconnect from mains/power supply.



**CAUTION!**

- A minimum load is required to safely operate the Innova 2000/2050.
- Without a minimum load there is risk of instability that may cause serious injuries.

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# 3 Product description

## 3.1 Main Illustration

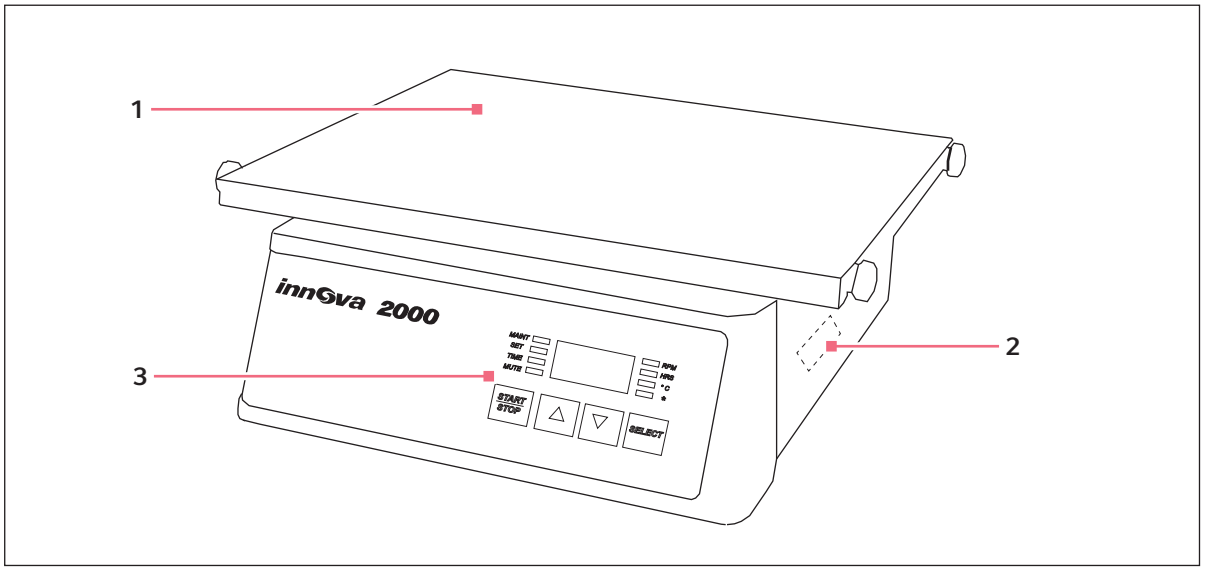



Fig. 3-1: Innova 2000/2050 front view

**1 Platform**

**2 Temperature/monitor RTD probe and bracket**
Optional

**3 Control panel**

Unless otherwise indicated, all drawings represent both Innova 2000 and Innova 2050 models.

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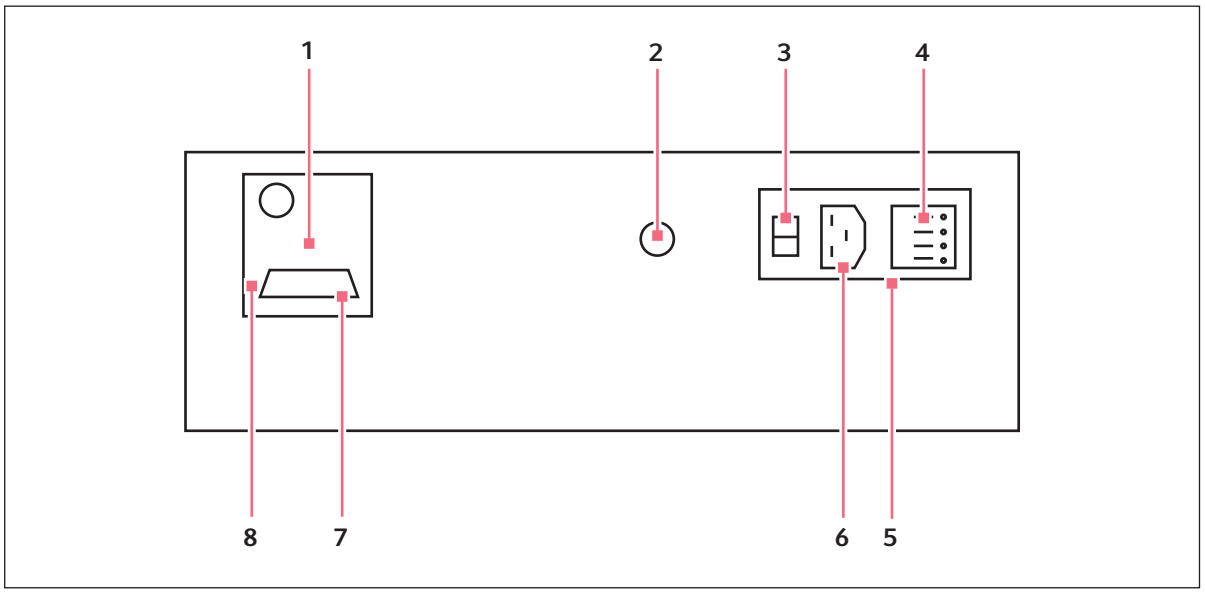



Fig. 3-2: Innova 2000/2050 rear view

**1 RTD connectos**
Optional

**2 Fuse**
Control circuit

**3 On/Off switch**

**4 Voltage selector**

**5 Universal power module**

**6 Power cord connection**

**7 Chart recorder connection**
Optional

**8 Cover plate**

## 3.2 Features

The Innova 2000/2050 is a portable benchtop shaker utilizing a triple eccentric counterbalanced drive to provide horizontal plane rotary motion in a 19 mm (3/4 in) circular orbit. A Proportional/Integral (PI) microprocessor controller with instantaneous digital feedback controls the speed over a range of 25 – 500 RPM.

### 3.2.1 Operation

The shaker may be operated either continuously or in a timed mode via a programmable timer for shaking periods of 0 hr 1 min – 99.9 hr. A Temperature Monitoring option is available for the measurement, display and documentation of sample temperature.

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### 3.2.2 Alarms

The Innova 2000/2050 is equipped with audible and visible alarms that alert the user to the following conditions:

- The end of a timed run
- Deviation of shaking speed outside the tolerance limits

### 3.2.3 Platforms and accessories

To accommodate customer needs, a wide variety of platforms can be used with the Innova 2000/2050. Dedicated platforms are available for a variety of flask sizes. Universal platforms are also available (see *Platforms on p. 31)*.

## 3.3 Universal power module

The power module contains a voltage card and fuse holder which are used to select the appropriate voltage and fusing. This universal power entry system adapts to worldwide power requirements. Voltage and fusing has been set prior to shipment. Innova shakers are available in 100 V, 120 V, 220 V and 240 V configurations that accommodate both 50 and 60 Hz frequencies.



**WARNING! Risk of electric shock and/or damage to device!**

- Do not plug the shaker into a power source until you check the voltage and frequency settings.
- Check the voltage selection on the power entry module against the serial tag located either on the side or rear of the device.

## 3.4 Control panel

The control panel is located on the front of the instrument. It serves as the operator interface, and consists of:

- A START/STOP key
- An up arrow (▲)
- A down arrow (▼)
- A SELECT key
- A 3-digit LED display that provides numeric values, and some letter codes
- 4 function indicator lights
- 4 status indicator lights

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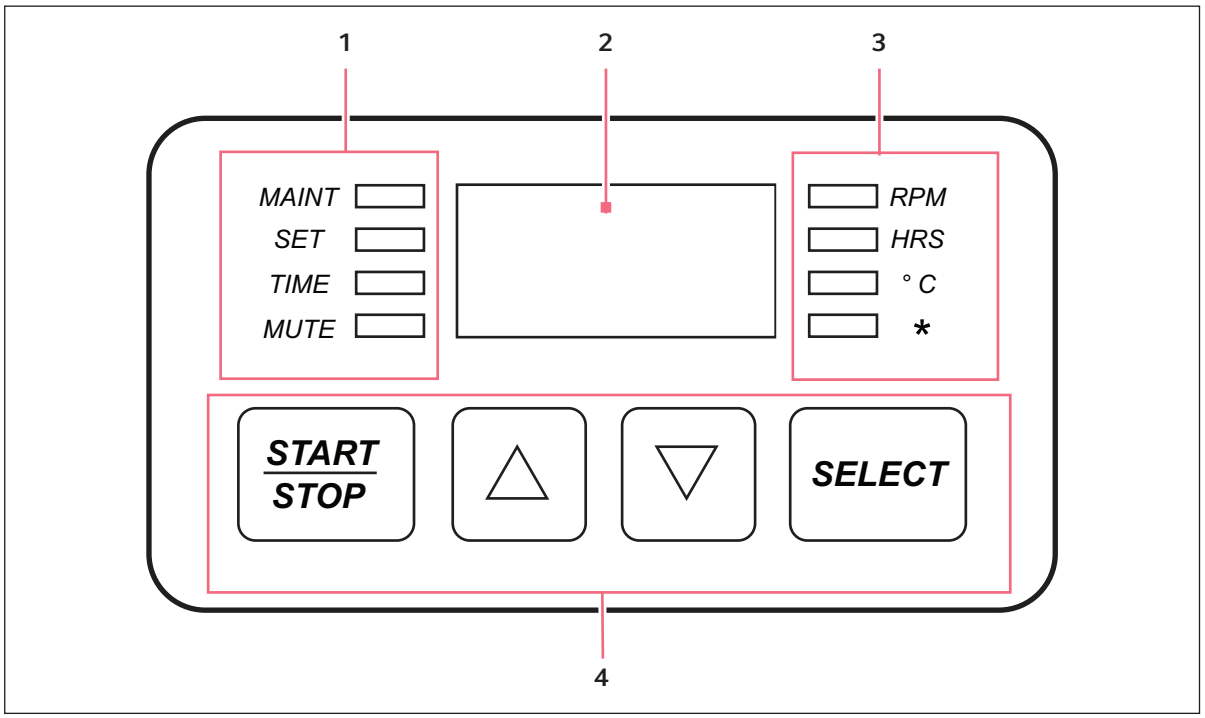



Fig. 3-3: Control panel

**1 Status indicators**

**2 LED display**

**3 Function indicators**

**4 Keypad**

### 3.4.1 LED display

The Innova control panel has a 3-digit LED display. During normal shaker operation, the display will indicate:

- Shaker status (ON/OFF)
- Shaking speed
- Setpoints
- Hours remaining (timed run)
- Measured temperature (when temperature/monitor option is installed)

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### 3.4.2 Keypad

| | |
|---|---|
| **START/STOP** | • Starts and stops the drive<br>• Activates or stops timer when timed run is desired |
| **▲▼Keys** | • Adjusts the setpoint of a displayed parameter up or down<br>• Used to enter the SET mode for setpoint changes |
| **SELECT** | • Changes the displayed parameter<br>• Temperature (°C) cannot be selected unless the temperature/remote monitoring option is installed. |

### 3.4.3 Status indicators

| | |
|---|---|
| **MAINT** | • Illuminates after 10000 hours of use. Indicates need for routine maintenance (see *Routine maintenance on p. 25)* |
| **SET** | Illuminates to indicate that:<br>• Shaker is in SET mode<br>• Setpoints are being displayed<br>• Setpoints can be altered |
| **TIME** | • Illuminates to indicate that the timer is in operation |
| **MUTE** | • Illuminates to indicate that the audible alarm is disabled |

### 3.4.4 Function indicators

| | |
|---|---|
| **RPM** | Revolutions per minute shaking speed |
| **HRS** | Time remaining |
| **°C** | Temperature function (only activated of the temperature/monitor option is installed) |
| * | This function is not active in the Innova 2000/2050 |

## 3.5 Platform assemblies

Neither the Innova 2000 nor the 2050 can be used without a platform. One must be purchased and installed on your shaker prior to operation (see *Platforms on p. 31)*.

The Innova 2000 can be used with a wide range of New Brunswick 28 cm x 33 cm (11 in × 13 in) platforms, which will accept a variety of clamps for flasks, test tubes, etc (see Tab.  on p. 31).

The Innova 2050 can accommodate an even wider range of New Brunswick 30.5 cm × 40.6 cm (12 in x 16 in) platforms, which will accept a variety of clamps for flasks, test tubes, etc (see Tab.  on p. 31).

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## 3.6 Heavy duty construction

### 3.6.1 Bearings

Innova shakers employ sealed lubricated ball bearings of the highest quality. Sealed bearings minimize the generation of airborne particles that could be disadvantageous in clean rooms or controlled environment areas.

### 3.6.2 Motor

The Innova 2000/2050 Shaker uses a brushless ball bearing DC motor. This low profile motor provides high torque along with quiet, efficient operation and low maintenance. The motor has a rating of 1/20 horsepower.

### 3.6.3 Triple eccentric drive

The drive mechanism utilizes a counterweight system to stabilize the rotary motion produced during operation. When the workload moves in one direction, opposing forces are generated to stabilize the shaker. This action will help eliminate the problem of "walking" which may occur with less precisely balanced instruments. Vibration is minimized and the life of the unit is extended.

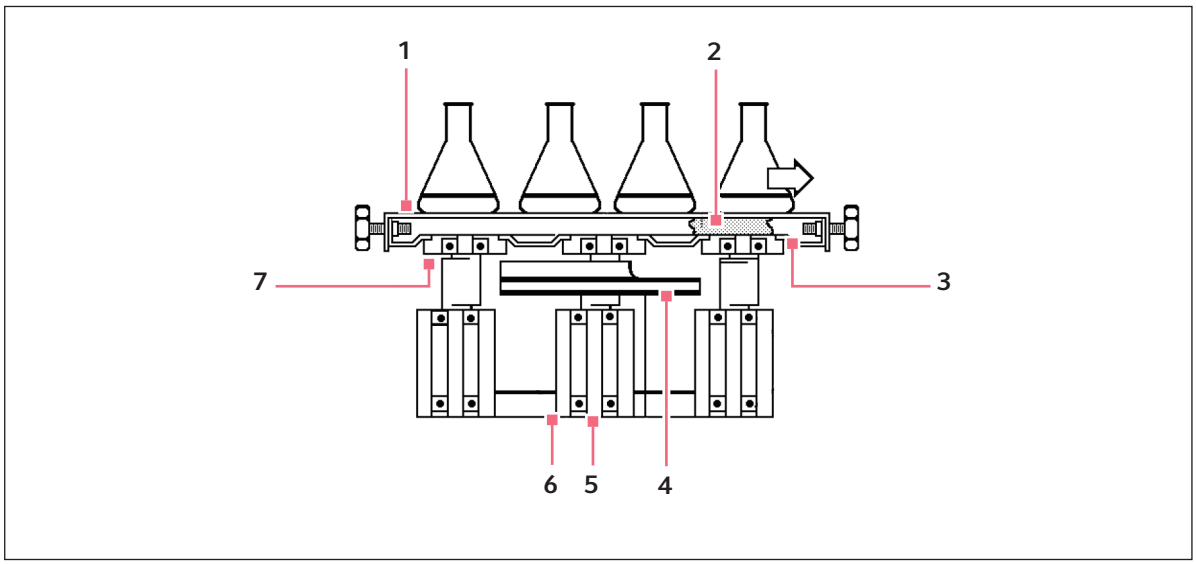



Fig. 3-4: Counterbalanced drive mechanism

**1 Platform**
**2 Spongepad**
**3 Sub-platform**
**4 Pulley with counterweight**
**5 Eccentric drive shaft**
**6 Lower bearing housing**
**7 Upper bearing housing**

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## 3.7 Electronic boards

The main control board for Innova shakers has the following functions:

- Non-volatile memory for storage of key parameters during power interruption;
- Speed sensing, electronic commutation, and power control for the brushless DC drive motor;
- Maintains an elapsed running time clock;
- Contains firmware for shaker control as well as recognition of an expansion connector for option modules;
- Provides an operator interface via displays, audible alarm, and connection to the keypad module (keypad buttons and display graphics).

The optional Temperature Monitor module is designed to “piggyback” onto the main board via an expansion connector. It has the following functions:

- Control of analog power supplies;
- Signal conditioning of RTD sensor readings;
- Provide remote monitoring capabilities by supplying analog outputs for speed and temperature that are compatible with chart recorders and analog data acquisition systems.

## 3.8 Optional features

### 3.8.1 Temperature/monitor option

A Temperature/Monitor Option is available for installation on the Innova 2000/2050. The ambient temperature or the temperature of the liquid in any vessel can be measured using the RTD electronics-based measuring device supplied with this option.

When the option is installed, the LED will display the measured temperatures in 0.1 °C increments. This option also allows the connection of a chart recorder so that shaking speed and temperature can be documented. The analog output for shaking speed is 0 – 5 V: 1 V per 100 rpm. For temperature, the output is 0 – 5 V (0.05 V per °C).

The output can also be connected to a data logging computer with an analog data acquisition card.

### 3.8.2 Capacity upgrade option

It is possible to significantly increase the capacity of an Innova 2000 shaker with an available capacity upgrade package (M1190-9910). This option will simply and easily convert an Innova 2000 to an Innova 2050.

This package consists of a 30.5 cm x 40.6 cm (12 in x 16 in) subplatform to replace the 25 cm x 33 cm (11 inch x 13 inch) subplatform, and the appropriate counterweight and hardware.

Large capacity Innova 2050 platforms must be used with the increased capacity configuration (see *Platforms on p. 31)*.

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# 4 Installation

## 4.1 Unpacking

When you unpack the unit, inspect it carefully for any apparent damage that may have occurred during transit. Report any damage to the carrier and to Eppendorf Service Department.

Verify against the packing list that you have received everything; report any missing items to your Eppendorf representative.

Do not discard the crate or packing material.

## 4.2 Checking voltage configuration

**WARNING! Risk of electric shock and/or damage to device!**

- Do not plug the shaker into a power source until you check the voltage and frequency settings.

Determine the voltage of your unit by checking the voltage selector and the label on the rear of the unit, and confirm that the correct electrical service package is included with the unit.

## 4.3 Space requirements

It is essential that the unit be situated in an area where there is sufficient space for the shaker and platform to clear walls and other potential obstructions during operation.

The dimensions, including a platform but excluding glassware, are:

| Model | Width | Depth | Height |
|---|---|---|---|
| Innova 2000 | 35 cm (14 in) | 36 cm (14 ¼ in) | 13.9 cm (5 3/8 in) |
| Innova 2050 | 43 cm (17 in) | 36 cm (14 ¼ in) | 13.9 cm (5 3/8 in) |

The required surface area required for operation is:

| Model | Width | Depth |
|---|---|---|
| Innova 2000 | 43 cm (17 in) | 43 cm (17 in) |
| Innova 2050 | 50 cm (20 in) | 50 cm (20 in) |

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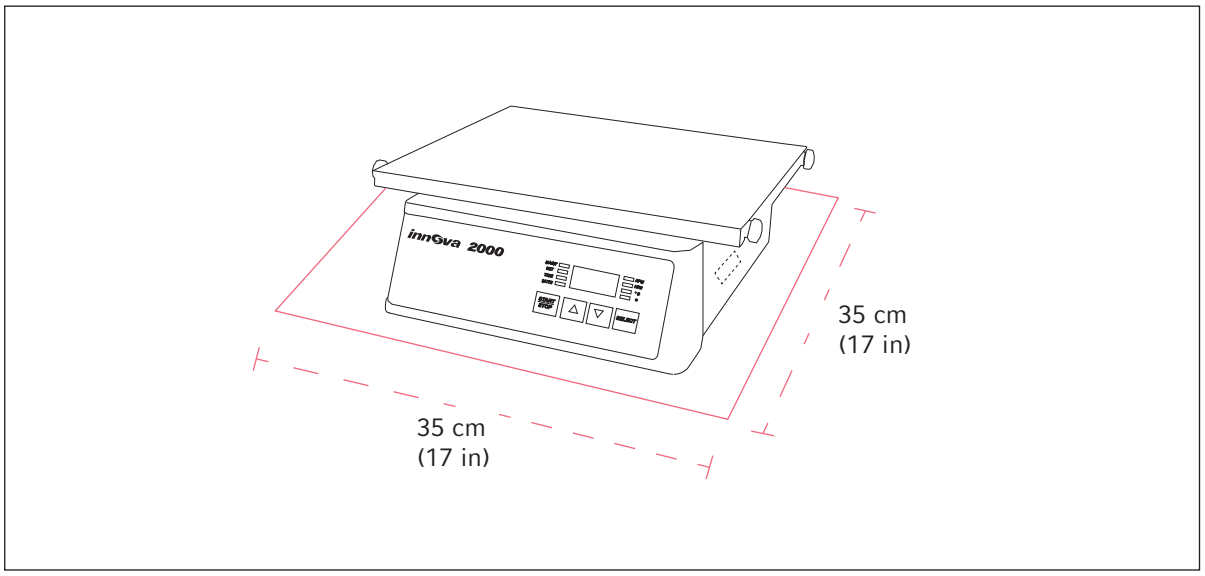



Fig. 4-1: Innova 2000 operating space

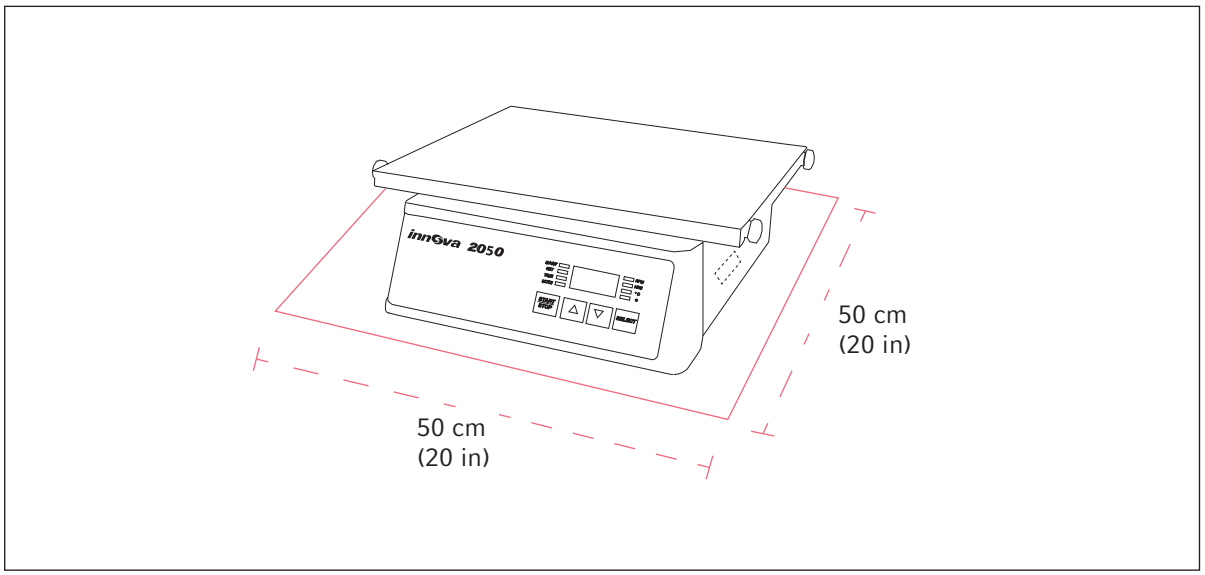



Fig. 4-2: Innova 2050 operating space

**WARNING!**

- Do not position the equipment so that it is difficult to operate the disconnecting device (main plug).
- For service reasons and for cases of emergencies, sufficient space must be provided for easy access to the main power cord/power switch (located at the back of the unit).

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## 4.4 Electrical connections



**WARNING! Risk of electric shock and/or damage to device!**

- Use a grounded power supply.



**CAUTION!**

- A detachable main power cord has been provided with your unit.
- Only use the cord provided with the unit.

Before making electrical connections, be sure to follow these instructions:

1. Check the voltage selector in the Universal Power Module at the rear of the unit to ensure that it is set to the appropriate voltage.
2. Remove the CAUTION label from the universal power module.
3. Make sure the power switch on the back of the unit is set in the OFF position.

   **ONLY THEN:**
4. Connect the power cord to the universal power module and to a grounded electrical outlet.

## 4.5 Install the platform

A platform (purchased separately) must be installed on the unit prior to use.



**NOTICE! Risk of damage to device!**

- Never run shaker without a platform.

1. Set the mains/power switch to off.
2. Place the platform on the subplatform. Make sure that all four slots are seated over the four knob screw-shafts. Be sure to use a platform of the proper size for your particular shaker.
3. Tighten the four knobs to secure the platform.

## 4.6 Install flask clamps



**WARNING!**

- Do not overfill flasks (i.e., more than 50% of the flask volume).

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If you have purchased flask clamps for use with a universal platform, they will require installation. . All clamps are shipped complete with hardware.

1. Clamps are installed by securing the base of the clamp to the platform with the correct type and number of screws (see *Clamp hardware on p. 34)*.

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# 5 Operation

## 5.1 Getting started

To start the instrument, turn the ON/OFF switch on the back of shaker to the ON position.

If the shaker is running, the LED display will track the speed as it accelerates to the last entered setpoint.

The shaking action may be stopped or started by pressing the START/STOP key on the control panel.

## 5.2 Continuous/unlimited run

1. If the LED displays OFF, press the START/STOP key.
2. Press the SELECT key to illuminate RPM.
3. Press either ▲or ▼to enter SET mode (SET indicator will illuminate).
4. Set the speed by using the ▲or ▼key until the desired setpoint is displayed.
   Holding the ▲or ▼key will cause the setting to change more rapidly.

The setpoint may be changed at any time during a run without stopping the shaker by following steps 2 – 4. During speed changes, the alarm may sound until the speed returns to within 5 rpm of the setpoint.

## 5.3 Checking setpoints

To check any setpoint:

1. Press the SELECT key to illuminate the desired indicator.
2. Press either ▲or ▼to enter the SET mode and display the current setpoint.

Holding the ▲or ▼key for more than 0.5 s causes the setpoint to change. Should this occur, resetting will be necessary.

## 5.4 Timed functions

The shaker may be programmed to stop automatically after a preset time period of 0.1 to 99.9 hr. There must be power to the shaker in order to set the timer. However, a timed run can be initiated while the unit is either shaking or stopped.

### 5.4.1 Setting the timer

1. Press the SELECT key to light HRS.
2. Press either ▲or ▼to enter the SET mode, then set a time period of 0.1 – 99.9 hr.
3. While SET light is illuminated, press the START/STOP key to program the time (and start the run).

The TIME indicator will illuminate and remain on for the duration of the run. At the end of the timed run:

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- The display will read OFF
- The time indicator will flash
- The audible alarm will sound

The setpoint may be changed during a run without stopping the shaker by following steps 1 and 2 above.

### 5.4.2 Canceling the timer

To cancel the timer **without** stopping the shaker:

1. Press the SELECT key to illuminate HRS.
2. Press either ▲or ▼to enter the SET mode, then immediately press the START/STOP key.
   The Time indicator will go out and the display will read “OFF”.

## 5.5 Alarm functions

Innova shakers have an audible alarm which is activated at predetermined times. It is possible to deactivate and reactivate the alarm, according to your needs.

### 5.5.1 Stopping the alarm

When the alarm sounds, you can stop it by pressing the SELECT key and changing to any other function.

### 5.5.2 Deactivating the alarm

The alarm may be deactivated in the following way:

1. Press SELECT to illuminate HRS.
2. **Simultaneously** press the ▲and ▼keys.
   The SET and MAINT indicators will flash.
3. While the SET and MAINT indicators are flashing, press the START/STOP key.
   The MUTE indicator will illuminate to advise that the audible alarm is deactivated.

### 5.5.3 Reactivating the alarm

The alarm may be reactivated in the following way:

1. Press SELECT to illuminate HRS.
2. **Simultaneously** press the ▲and ▼keys.
   The SET and MAINT indicators will flash.
3. While the SET and MAINT indicators are flashing, press the START/STOP key.
   The MUTE indicator will extinguish to advise that the audible alarm is active.

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The shaker may be stopped or started by pressing the START/STOP key. When starting, the unit will automatically return to the last function and speed setting.
The audible alarm will sound until the speed is within 5 rpm of the setpoint.

The alarm will **not** sound while the shaker is accelerating immediately following turning on the power.

## 5.6 Total running time

The control modules of the Innova shakers keep track of the time the shaker has been on, tracking the hours of usage.

To display the accumulated running time:

1. Select HRS using the SELECT key.
2. Simultaneously press the ▲and ▼keys.
   The SET and MAINT indicators will flash and the accumulated running time will be displayed in hundreds of hours (i.e., “02” equals 200 hours; “102” equals 10,200 hours). This display will continue for 10 seconds and then default to the previous mode readout.

After 10,000 hours of operation, the MAINT indicator will light. Preventive maintenance is recommended at this point. The Eppendorf Service Technician will deactivate the light when the technician performs the required maintenance.

## 5.7 Temperature monitor option

This option consists of an internal electrical interface, an RTD temperature probe and an analog output for chart recorder or data acquisition system. When this option is installed, either the ambient temperature or the temperature of any vessel on the shaker platform can be measured with the probe:

1. Remove the probe from its holder and insert it into the vessel to be monitored.
2. Use the SELECT key to indicate °C.

The °C indicator will only function when the temperature/monitor option is installed.

Since the Temperature Monitor option does not provide temperature control, any attempt to enter a temperature setpoint results in *Err* (“Error”) being displayed.

## 5.8 Recorder adaptation

To record speed or temperature, an auxiliary recorder (not supplied, but available from Eppendorf) can be used. The recorder should have the following capabilities:

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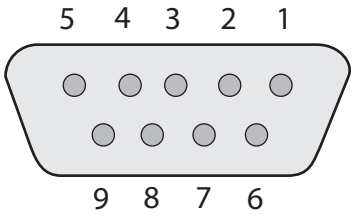



Fig. 5-1: Recorder connector as seen from the rear of the unit

- For speed, each channel should have signal conditioning that accepts 0 – 5 V input.
- For temperature, each chanel should have a signal conditioning that accepts 0 – 5 V input
- A mating connector is required on the recorder cable (not supplied, but available from Eppendorf). This is a 9-pin male D subminiature connector, AMP Amplimite HDP-20 series or equivalent.

| Pin number | Signal name | Scale |
|---|---|---|
| 6 | Speed | 1 V = 100 rpm |
| 2 | Ground | |
| 7 | Temperature | 1 V = 20 °C |
| 3 | Ground | |

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# 6 Maintenance



**WARNING!**

- Before performing any service, turn off the power, using the ON/OFF switch on the rear panel, and disconnect the power cord.

## 6.1 Routine maintenance

No routine maintenance is required for the Innova 2000/2050 Shaker.

The MAINT indicator light illuminates at the end of 10000 hours of use. At that time, contact your local Eppendorf Service Engineer, or call the Eppendorf Service Department. This periodic maintenance will keep your unit in premium condition.

## 6.2 Cleaning external and internal surfaces



**WARNING! Personnel injury and equipment damage!**

- When cleaning the unit, always turn off the shaker and disconnect the power cord from the power supply.

The unit may be cleaned using a damp cloth or any standard household or laboratory cleaner to wipe down its outer surfaces. Do not use abrasive or corrosive compounds to clean this instrument, as they may damage the unit.

## 6.3 Fuse replacement



**WARNING! Risk of electric shock when replacing fuses!**

- Turn off shaker and disconnect from mains/power supply.



**CAUTION!**

- A detachable main power cord has been provided with your unit.
- Only use the cord provided with the unit.

To replace fuses (without changing the fusing arrangement):

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1. Disconnect the unit from the power source.
2. Using a small screwdriver, remove the cover/fuse block located on the rear of the unit.
3. Remove the old fuse.
4. Insert a new one of the same type.
5. Replace the cover/fuse block into the power module.

Spare fuses are supplied with the unit.

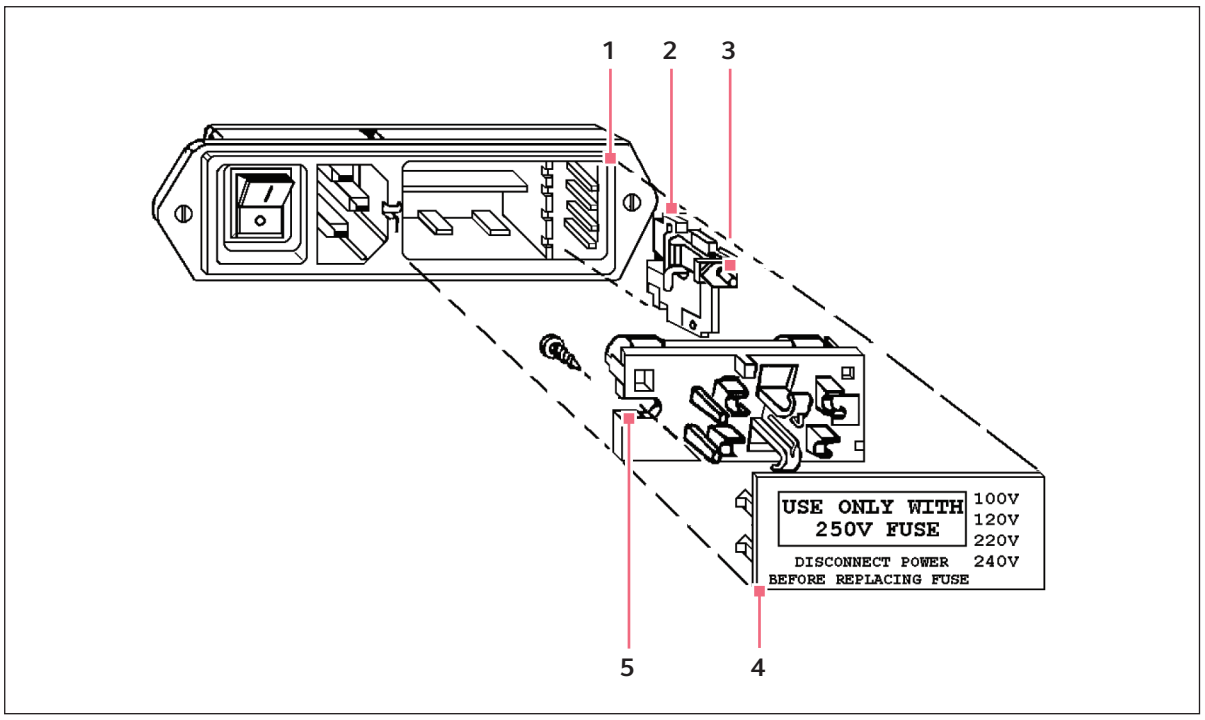



Fig. 6-1: Power entry module

**1 Housing**
**2 Voltage selector card**
**3 Indicator pin**
**4 Cover**
**5 Fuse block**

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# 7 Technical data

## 7.1 Specifications

### 7.1.1 Innova 2000

Tab. 7-1: Shaking

| | |
|---|---|
| **Speed** | 25 – 500 rpm |
| **Control accuracy** | ±1 rpm |
| **Indication** | 3-Digit LED, in 1 rpm increments |
| **Stroke/Orbit** | 1.9 cm (¾ in) |
| **Setpoint and control** | Digital adjustment with PI microprocessor control and instantaneous visual feedback. |
| **Operating ambient** | 0 – 60 °C, 90 % humidity, non-condensing. Up to 2000 m |
| **Timer** | Programmable shaking periods from 0.1 to 99.9 hours by a digital timer that shuts off at the end of period and energizes status light.<br>Timer counts down and digital display indicates remaining time. Can be deactivated for continuous operation. Additionally, unit will display total accumulated running time for service information. |
| **Alarms** | Warning signal (audible and visual) indicates when shaking speed deviates more than 5 rpm from setpoint and when timed operation has expired. Audible alarm can be deactivated/activated by the operator. |
| **LED display** | Indicates speed, running time alarm conditions, and displays readout of internal clock (actual accumulated operating time). |
| **Automatic restart** | Automatic restart after power is restored, indicated by flashing display. |
| **Setpoint retention** | All setpoints and operating status are retained in non-volatile memory. |
| **Drive** | Triple-eccentric counterbalanced ball bearing drive. |
| **Drive motor** | 1/20 hp 3-phase brushless ball bearing DC motor. |
| **Electrical requirements** | 100 / 120 / 220 / 240 VAC, 50/60 Hz.<br>35 VA universal power entry system adapts to U.S. or international needs. |
| **Electrical protection** | Main fuses in power entry module. Control circuits provided with separate fuse. |
| **Dimensions** | Width: 35.5 cm (14 in) with knobs<br>Depth: 37 cm (14 ½ in)<br>Height: 13.7 cm (5 ⅜ in) |
| **Platform** | 28 × 33 cm (11 × 13 cm)<br>Interchangeable without tools. |
| **Weight** | Net: 15 kg (33 lb)<br>Gross: 19 kg (41 lb) |
| **Cabinet** | Heavy gauge steel, phosphate coated and texture painted. |
| **Remote monitoring (optional)** | 0 – 5 V chart recorder output for speed: 1 V per 100 rpm. Accuracy ±25 mV. |
| **Temperature monitor (optional)** | RTD digital temperature monitor displays individual flask or ambient temperature in 0.1 °C increments. Chart recorder output provided. |

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At 25 – 400 rpm, the unit will perform to specifications with up to ±10 % line voltage fluctuation. To attain speed accuracy at 401 – 500, the line voltage cannot be lower than 5 % of the rated voltage.

The Innova 2000 can be upgraded to a larger capacity platform with a kit that converts this shaker to an Innova 2050. This kit can be installed in the field.

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### 7.1.2 Innova 2050

Tab. 7-2: Shaking

| | |
|---|---|
| **Speed** | 25 – 500 rpm |
| **Control accuracy** | ±1 rpm |
| **Indication** | 3-Digit LED, in 1 rpm increments |
| **Stroke/Orbit** | 1.9 cm (¾ in) |
| **Setpoint and control** | Digital adjustment with PI microprocessor control and instantaneous visual feedback. |
| **Operating ambient** | 0 – 60 °C, 90 % humidity, non-condensing. Up to 2000 m |
| **Timer** | Programmable shaking periods from 0.1 to 99.9 hours by a digital timer that shuts off at the end of period and energizes status light.<br>Timer counts down and digital display indicates remaining time. Can be deactivated for continuous operation. Additionally, unit will display total accumulated running time for service information. |
| **Alarms** | Warning signal (audible and visual) indicates when shaking speed deviates more than 5 rpm from setpoint and when timed operation has expired. Audible alarm can be deactivated/activated by the operator. |
| **LED display** | Indicates speed, running time alarm conditions, and displays readout of internal clock (actual accumulated operating time). |
| **Automatic restart** | Automatic restart after power is restored, indicated by flashing display. |
| **Setpoint retention** | All setpoints and operating status are retained in non-volatile memory. |
| **Drive** | Triple-eccentric counterbalanced ball bearing drive. |
| **Drive motor** | 1/20 hp 3-phase brushless ball bearing DC motor. |
| **Electrical requirements** | 100 / 120 / 220 / 240 VAC, 50/60 Hz.<br>35 VA universal power entry system adapts to U.S. or international needs. |
| **Electrical protection** | Main fuses in power entry module. Control circuits provided with separate fuse. |
| **Dimensions** | Width: 43.4 cm (17 in) with knobs<br>Depth: 37 cm (14½ in)<br>Height: 13.7 cm (5⅜ in) |
| **Platform** | 30.5 × 40.6 cm (12 × 16 in)<br>Interchangeable without tools. |
| **Weight** | Net: 16 kg (35 lb)<br>Gross: 19.5 kg (43 lb) |
| **Cabinet** | Heavy gauge steel, phosphate coated and texture painted. |
| **Remote monitoring (optional)** | 0 – 5 V chart recorder output for speed: 1 V per 100 rpm. Accuracy ±25 mV. |
| **Temperature monitor (optional)** | RTD digital temperature monitor displays individual flask or ambient temperature in 0.1 °C increments. Chart recorder output provided. |

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At 25 – 400 rpm, the unit will perform to specifications with up to ±10 % line voltage fluctuation. To attain speed accuracy at 401 – 500 rpm, the line voltage cannot be lower than 5 % of the rated voltage.

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# 8 Ordering information

## 8.1 Platforms

Tab. 8-1: Innova 2000 platforms

| Part number | Number of clamps | Description<br>28 x 33 cm (11 x 13 in ) Platform |
|---|---|---|
| AG2-UT | --- | Utility Carrier |
| AG2-00 | --- | Utilility Tray |
| M1001-0240 | --- | Universal Platform |
| AG2-10 | 60 | for 10 ml Erlenmeyer flasks |
| AG2-25 | 32 | for 25 ml Erlenmeyer flasks |
| M1190-9915 | 20 | for 50 ml Erlenmeyer flasks |
| M1190-9916 | 12 | for 125 ml Erlenmeyer flasks |
| M1190-9917 | 8 | for 250/300 ml Erlenmeyer flasks |
| M1190-9918 | 6 | for 500 ml Erlenmeyer flasks |
| AG2-TA25 | 18 | Test Tube Rack, Slant |

Tab. 8-2: Innova 2050 platforms

| Part number | Number of clamps | Description<br>30.5 x 40.6 cm (12 x 16 in) Platform |
|---|---|---|
| M1190-9907 | --- | Utility Carrier |
| M1190-9908 | --- | Utilility Tray |
| M1190-9900 | --- | Universal Platform |
| M1190-9901 | 86 | for 10 ml Erlenmeyer flasks |
| M1190-9902 | 48 | for 25 ml Erlenmeyer flasks |
| M1190-9903 | 33 | for 50 ml Erlenmeyer flasks |
| M1190-9904 | 20 | for 125 ml Erlenmeyer flasks |
| M1190-9905 | 12 | for 250/300 ml Erlenmeyer flasks |
| M1190-9906 | 8 | for 500 ml Erlenmeyer flasks |
| M1190-9911 | 6 | for 1 L Erlenmeyer flasks |
| M1190-9912 | 3 | for 2 L Erlenmeyer flasks |

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## 8.2 Accessory flask clamps

All clamps listed are made of stainless steel.

| Catalog number | Clamp type |
|---|---|
| ACE-105 | 10 mL Erlenmeyer |
| ACE-255 | 25 mL Erlenmeyer |
| ACE-505 | 50 mL Erlenmeyer |
| ACE-125S | 125 mL Erlenmeyer |
| ACE-250S | 250 mL Erlenmeyer |
| ACE-500S | 500 mL Erlenmeyer |
| ACE-1000S | 1.0 L Erlenmeyer |
| ACE-2000S | 2.0 L Erlenmeyer |
| ACE-4000S | 4.0 L Erlenmeyer |
| ACE-6000S | 6.0 L Erlenmeyer |
| ACFE-2800S | 2.8 L or 2800 mL Fernbach |
| ACSB-500S | 500 mL Media Bottles |
| ACSB-1000S | for 1 L Media Bottles |

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## 8.3 Service parts

| Model | Part number | Description | Quantity |
|---|---|---|---|
| Innova 2000/2050 | P0380-3830 | 0.2 A / 250 V / Time Delay - Fuse | 1 |
| | P0380-3410 | 1.0 A / 250 V Time Delay / 5 × 20 mm - Fuse | 1 |
| | EF-104 | 1.0 A / 250 V / Time Delay - Fuse | 1 |
| | P0420-1610 | 10 VA Transformer | 1 |
| | M1190-5300 | 80 VA Transformer | 1 |
| | P0320-0340 | 4100 uF Capacitor | 1 |
| | P0460-4091 | Diode Bridge | 1 |
| | P0360-4040 | 130 V Varistor | 2 |
| | M1190-5320 | Small Motor Assembly | 1 |
| | M1190-9940 | Main Control PCB | 1 |
| | M1190-5000 | Membrane Sw. Panel | 1 |
| | P0460-2200 | Power Entry Module | 1 |
| | P0720-2053 | Power Cord 120 V 10 A | 1 |
| | P0720-2021 | Power Cord 220 V | 1 |
| | P0180-0020 | Bearing, Shielded, lower | 6 |
| | M1190-6340 | Bearing Assembly | 3 |
| | R-243 | Drive Belt | 1 |
| | M1190-6330 | Bearing Housing Assembly | 1 |
| | H-1386 | Knob | 4 |
| | M1194-8000 | Stainless Steel RTD (optional) | 1 |
| Innova 2000 only | M1190-9501 | Foam Pad | 1 |
| Innova 2050 only | M1190-9502 | Foam Pad | 1 |

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## 8.4 Clamp hardware

Eppendorf flask clamps are used on a variety of shaker platforms. Flat Phillips and flat head screws of different lengths and thread pitch are used to secure the clamp. The following tables identify the proper screw for your shaker application by reference to the head style.

Tab. 8-3: 10 – 500 mL clamp hardware application chart

| Description | Part number | Qty. | Application |
|---|---|---|---|
| 10-24 x 5/8 (15.87 mm) flat Phillips (+) head screw | S2116-3101 | 1 | 19.05 mm (3/4 in) thick wood platform |
| 10-24 x 5/16 (7.9 mm) flat Phillips (+) head screw | S2116-3051 | 1 | 7.9 mm (5/16 in) thick aluminum, phenolic and stainless steel platforms |
| 10-32 x 5/16 (7.9 mm) flat slotted (-) head screw | S2117-3050 | 1 | All stainless steel platforms |

Tab. 8-4: 1 – 6 Liter clamp hardware application chart

| Description | Part number | Qty. | Application |
|---|---|---|---|
| 10-24 x 5/8 (15.87 mm) flat Phillips (+) head screw | S2116-3101 | 5 | 19.05 mm (3/4 in) thick wood platform |
| 10-24 x 5/16 (7.9 mm) flat Phillips (+) head screw | S2116-3051 | 5 | 7.9 mm (5/16 in) thick aluminum, phenolic and stainless steel platforms |
| 10-32 x 5/16 (7.9 mm) flat slotted (-) head screw | S2117-3050 | 5 | All stainless steel platforms |

The 1 – 6 liter chart also applies to 2800 mL Fernbach flask clamps.

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# 9 Transport, storage and disposal

## 9.1 Disposal

In case the product is to be disposed of, the relevant legal regulations are to be observed.

**Information on the disposal of electrical and electronic devices in the European Community:**

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2012/19/EU pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. To document this, they have been marked with the following identification:



Because disposal regulations may differ from one country to another within the EU, please contact your supplier if necessary.

In Germany, this is mandatory from March 23, 2006. From this date, the manufacturer has to offer a suitable method of return for all devices supplied after August 13, 2005. For all devices supplied before August 13, 2005, the last user is responsible for the correct disposal.

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# Declaration of Conformity

The product named below fulfills the requirements of directives and standards listed. In the case of unauthorized modifications to the product or an unintended use this declaration becomes invalid.

**Product name:**

Innova® 2000 and 2050

including accessories

**Product type:**

Benchtop open air shaker

**Relevant directives / standards:**

2006/95/EC: EN 61010-1

2004/108/EC: EN 61000-6-1, EN 61000-6-4

2011/65/EU

2012/19/EU

**Management Board**

**Portfolio Management**

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