OHAUS®

Instruction Manual

Shaker, Reciprocating, SHRC0719DG
16 kg, Analog, Shaker, Heavy Duty, SHHD1619AL
16 kg, Digital, Shaker, Heavy Duty, SHHD1619DG
23 kg, Analog, Shaker, Heavy Duty, SHHD2325AL
23 kg, Digital, Shaker, Heavy Duty, SHHD2325DG
45 kg, 25 mm Orbit, Digital, Shaker, Heavy Duty, SHHD4525DG
45 kg, 50 mm Orbit, Digital, Shaker, Heavy Duty, SHHD4550DG
68 kg, 25 mm Orbit, Digital, Shaker, Heavy Duty, SHHD6825DG
68 kg, 50 mm Orbit, Digital, Shaker, Heavy Duty, SHHD6850DG

EN - English 1
FR - Français 11
ES - Español 22
IT - Italiano 33
DE - Deutsch 44
PT - Português 55
NL - Nederlands 66
NO - Norsk 72
DA - Dansk 78
SV - Svenska 84
FI - Suomi 90
HU - Magyar 96
PL - Polski 102
CZ - Czech 108
KR - Korean 113
JP - Japanese 124

Revision 6
14/09/17

Table of Contents

Package Contents	1
Service Information	1
Installation	2
Maintenance & Servicing	2
Intended Use	2
Environmental Conditions	2
Equipment Disposal	3
Safety Instructions	3
Standards & Regulations	3
Specifications	4-5
Analog Operating Instructions	6
Digital Control Panel	7
Digital Operating Instructions	8-9
Troubleshooting	10
Platform Usage Chart	11
Flask Clamp Platform Capacity	12-13
Test Tube Rack Platform Capacity	14-15

Package Contents

Reciprocating or Heavy Duty Shaker
Non-skid rubber mat
Power Cord
Instruction manual
Warranty card

Service Information

If the troubleshooting section does not resolve or describe your problem, contact your authorized OHAUS service agent. For service assistance or technical support in the United States call toll-free 1-800-672-7722 ext. 7852 between 8:00 AM and 5:00 PM EST. An OHAUS product service specialist will be available to provide assistance. Outside the USA, please visit our web site, www.ohaus.com to locate the Ohaus office nearest you.

Serial Number: _____

Date of Purchase: _____

Supplier: _____

Installation

Upon receiving the Ohaus Heavy Duty or Reciprocating Shaker, check to ensure that no damage has occurred during shipment. It is important that any damage that occurred in transport is detected at the time of unpacking. If you do find such damage the carrier must be notified immediately.

After unpacking, place the shaker on a level bench or table, away from explosive vapors. Ensure that the surface on which the unit is placed will withstand typical heat produced by the unit and place the unit a minimum of six (6) inches from vertical surfaces. Always place the unit on a sturdy work surface.

The Heavy Duty or Reciprocating Shaker is supplied with a power cord that is inserted into the IEC connector on the back of the unit first, then it can be plugged into a properly grounded outlet. The 120V unit plugs into a 120 volt, 50/60 Hz source. The 230V unit plugs into a 230 volt, 50/60 Hz source.

Maintenance & Servicing

The Heavy Duty or Reciprocating Shaker is built for long, trouble-free, dependable service. No lubrication or other technical user maintenance is required. It needs no user maintenance beyond keeping the surfaces clean. However at least every three (3) months you should:

- Unplug the unit.
- Remove any accumulated dirt from the base and tray.
- Check all accessible items to make sure they are properly tightened.

The unit should be given the care normally required for any electrical appliance. Avoid wetting or unnecessary exposure to fumes. **DO NOT** use a cleaning agent or solvent on the front panel which is abrasive or harmful to plastics, nor one which is flammable. Always ensure the power is disconnected from the unit prior to any cleaning. If the unit ever requires service, contact your Ohaus representative.

Intended Use

These Shakers are intended for general laboratory use.

Environmental Conditions - Analog

Operating Conditions: Indoor use only.

*For use in CO2 environments, incubators, or cold rooms.

Temperature:	0 to 40°C (32 to 104°F)
Humidity:	maximum 80% relative humidity, non-condensing
Altitude:	0 to 6,562 ft (2000 M) above sea level

Non-Operating Storage:

Temperature:	-20 to 65°C (-4 to 149°F)
Humidity:	maximum 80% relative humidity, non-condensing

Installation Category II and Pollution Degree 2 in accordance with IEC 664.

Environmental Conditions - Digital & Reciprocating

Operating Conditions: Indoor use only.

*For use in CO2 environments, incubators, or cold rooms.

Temperature:	-10 to 60°C (14 to 140°F)
Temperature:	-10 to 40°C (14 to 104°F) (Heavy Duty Digital)
Humidity:	maximum 80% relative humidity, non-condensing
Altitude:	0 to 6,562 ft (2000 M) above sea level
Mains supply voltage:	Fluctuations are not to exceed 10 percent of the nominal supply voltage.

Non-Operating Storage:

Temperature:	-20 to 65°C (-4 to 149°F)
Humidity:	maximum 80% relative humidity, non-condensing

Installation Category II and Pollution Degree 2 in accordance with IEC 664.

***Avoid cold starts:** Unit is not designed to start after being in a cold room environment. Bring unit into cold room from a room temperature environment, operate and remove unit from cold room as soon as operation is complete.

Equipment Disposal

This equipment must not be disposed of with unsorted waste. It is your responsibility to correctly dispose of the equipment at life-cycle-end by handing it over to an authorized facility for separate collection and recycling. It is also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect the persons involved in the disposal and recycling of the equipment from health hazards.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment. By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health.

Safety Instructions

Please read the entire instruction manual before operating the Heavy Duty Shaker.

WARNING! DO NOT use the Heavy Duty Shaker in a hazardous atmosphere or with hazardous materials for which the unit was not designed. Also, the user should be aware that the protection provided by the equipment may be impaired if used with accessories not provided or recommended by the manufacturer, or used in a manner not specified by the manufacturer.

Always operate unit on a level surface for best performance and maximum safety.

DO NOT lift the unit by the tray.

CAUTION! To avoid electrical shock, completely cut off power to the unit by disconnecting the power cord from the unit or unplug from the wall outlet. Disconnect unit from the power supply prior to maintenance and servicing.

Spills should be removed promptly. **DO NOT** immerse the unit for cleaning.

DO NOT operate the unit if it shows signs of electrical or mechanical damage.

Standards & Regulations

Compliance to the following standards and regulations is indicated by the corresponding mark on the product.

Mark	Standards and Regulations
CE	OHAUS Corporation declares that the SHHD, SHLD, SHRC series shakers comply with directives 2011/63/EU, 2014/30/EU, 2014/35/EU and standards EN 50581, EN 61010-1, EN 61010-2-051, EN 61326-1. The full text of the EU declaration of conformity is available at the following internet address: www.ohaus.com/ce.
	This product complies with directive 2012/19/EU. Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. For disposal instructions in Europe, refer to www.ohaus.com/weee.
	EN 61326-1
TÜV SÜD C US	CAN/CSA C22.2 61010-1, CAN/CSA C22.2 61010-2-051 UL 61010-1, UL 61010-2-051

Global Notice
Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Canada Notice
This Class A digital apparatus complies with Canadian ICES-003.

FCC Notice
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.

Changes or modifications not expressly approved by Ohaus Corporation could void the user's authority to operate the equipment.

SPECIFICATIONS

16 kg, Shaker, Heavy Duty, SHHD1619

Overall dimensions LxWxH		16.3 x 14.0 x 5.9” (41.3 x 35.5 x 14.9 cm)
Tray dimensions LxW		13 x 11” (33 x 27.9cm)
Electrical	120 volts:	5 amps, 75 watts
	230 volts:	2.5 amps, 75 watts
Fuses		5mm x 20mm, 5 amp quick acting
Speed Range	Digital:	15 to 500 rpm
	Analog:	25 to 500 rpm
Speed Accuracy	Digital:	
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
Orbit		0.75” (19mm)
Capacity		16kg @ 75 rpm
		2.3kg @ 500 rpm
Timer	Digital:	1 second to 160 hours
	Analog:	1 to 120 minutes
Controls	Digital:	See page 7
Ship Weight		22.2 kg

Shaker, Reciprocating, SHRC0719

Overall dimensions LxWxH		16.3 x 14.0 x 5.9” (41.3 x 35.5 x 14.9 cm)
Tray dimensions LxW		13 x 11” (33 x 27.9cm)
Electrical	120 volts:	5 amps, 40 watts
	230 volts:	2.5 amps, 40 watts
Fuses		5mm x 20mm, 5 amp quick acting
Speed Range		20 to 300 rpm
Speed Accuracy		
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
Orbit		0.75” (19mm) Total Travel
Capacity		6.8 kg @ 300 rpm
Timer		1 second to 160 hours
Controls		See page 7
Ship Weight		22.2 kg

23 kg, Shaker, Heavy Duty, SHHD2325

Overall dimensions LxWxH		24.0 x 26.7 x 5.9“ (61.0 x 67.8 x 14.9 cm)
Tray dimensions LxW		18 x 24” (45.7 x 61 cm)
Electrical	120 volts:	5 amps, 75 watts
	230 volts:	2.5 amps, 75 watts
Fuses		5mm x 20mm, 5 amp quick acting
Speed Range	Digital:	20 to 500 rpm
	Analog:	25 to 500 rpm
Speed Accuracy	Digital:	
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
Orbit		1” (25 mm)
Capacity		23 kg @ 125 rpm
		4.5 kg @ 500 rpm
Timer	Digital:	1 second to 160 hours
	Analog:	1 to 120 minutes
Controls	Digital:	See page 7
Ship Weight		49.5 kg

Specifications cont'd

45 kg, Shaker, Heavy Duty

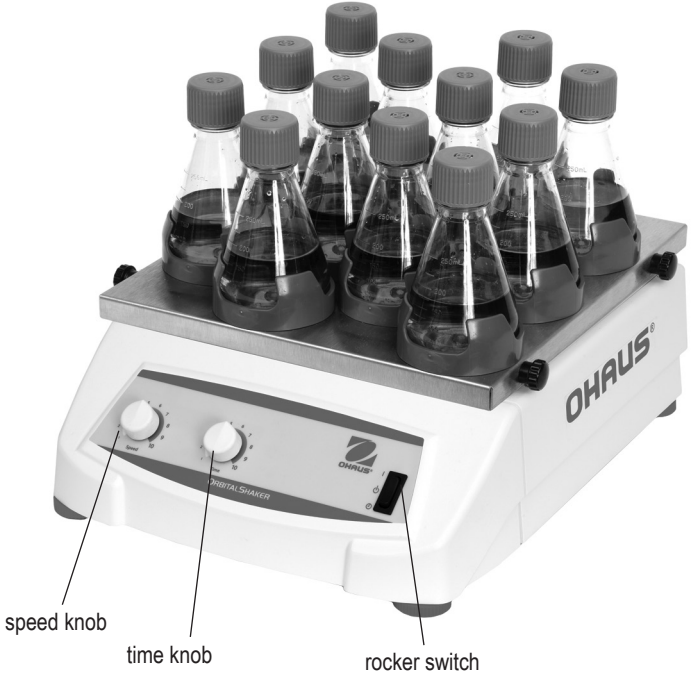
Overall dimensions LxWxH		28.7 x 26.7 x 6.7" (72.9 x 67.8 x 17.0 cm)
Tray dimensions LxW		24 x 24" (70 x 70cm)
Electrical	120 volts:	5 amps, 80 watts
	230 volts:	2.5 amps, 80 watts
Fuses		5mm x 20mm, 5 amp quick acting
Speed Range		10000-1 = 15 to 500 rpm
		10000-2 = 15 to 300 rpm
Speed Accuracy		
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
Orbit		10000-1 = 1" (25mm)
		10000-2 = 2" (50mm)
Capacity		45 kg @ 100 rpm *
		18 kg @ 300 rpm
Timer		1 second to 120 hours
Controls		See page 7
Ship Weight		90.9 kg

68 kg, Shaker, Heavy Duty

Overall dimensions LxWxH		29.3 x 36.0 x 6.7" (74.4 x 91.4 x 17.0 cm)
Tray dimensions LxW		24 x 36" (70 x 91.4cm)
Electrical	120 volts:	5 amps, 80 watts
	230 volts:	2.5 amps, 80 watts
Fuses		5mm x 20mm, 5 amp quick acting
Speed Range		15000-1 = 15 to 500 rpm
		15000-2 = 15 to 300 rpm
Speed Accuracy		
Above 100rpm		±1% of set speed
Below 100rpm		±1rpm
Orbit		15000-1 = 1" (25mm)
		15000-2 = 2" (50mm)
Capacity		68 kg @ 100 rpm *
		18 kg @ 300 rpm
Timer		1 second to 120 hours
Controls		See page 7
Ship Weight		104.5 kg

Analog Heavy Duty Shaker

*With optional platform and flask clamp



Analog Heavy Duty Shaker Operating Instructions

The Heavy Duty Shaker is used for general laboratory shaking needs.

16 kg, Shaker, Heavy Duty, SHHD1619

1. **Getting ready:**
   a. The speed knob should be at their extreme counter-clockwise position or at the #1 on the dial.
   b. Make sure the rocker switch is in the off position.
   c. Plug the cord into a properly grounded outlet.
2. **Setting speed:**
   a. To run push rocker to the on or position. Set speed knob to desired setting and adjust if necessary. Unit will run until you move the rocker switch to the off position. The microprocessor speed control slowly ramps to set speed to avoid splashing.
3. **Turning unit off:**
   a. To stop shaking function, turn the speed knob to the extreme counter-clockwise position and push the rocker switch to the standby position. The shaker should be kept in the standby position when not in use. To completely cut off power to the unit, disconnect the power cord from the unit or unplug from the wall outlet.

OPERATING TIPS

Centering your sample and even weight distribution on the tray helps with balance and stability.

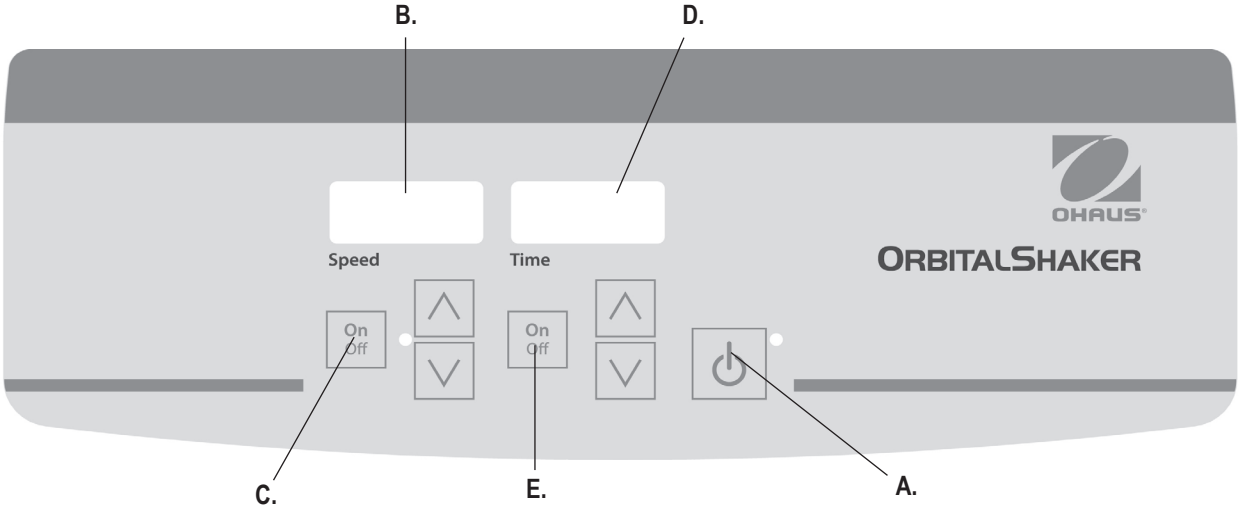
The shaker will automatically restart after a power interruption.

23 kg, Shaker, Heavy Duty, SHHD2325

1. **Getting ready:**
   a. The speed and time knobs have a built in on-off switch at their extreme counter-clockwise position. Turn both knobs to the off position.
   b. Make sure the rocker switch is in the standby position.
   c. Plug the cord into a properly grounded outlet.
2. **Setting speed:**
   a. To run in continuous mode, push rocker to the run position. Set speed knob to desired setting and adjust if necessary. Unit will run until you move the rocker switch to the standby position. The microprocessor speed control slowly ramps to set speed to avoid splashing.
3. **Setting time:**
   a. To run in timed mode, set timer and the speed knob to the desired settings. Press the rocker switch to the time position and release. The shaker will now run for the set time.
   b. To exit the timed mode turn the time knob to the extreme counter-clockwise position.
4. **Turning unit off:**
   a. To stop shaking function, turn the speed knob to the extreme counter clockwise position and push the rocker switch to the standby position. The shaker should be kept in the standby position when not in use. To completely cut off power to the unit, disconnect the power cord from the unit or unplug from the wall outlet.

OPERATING TIPS

Centering your sample and even weight distribution on the tray helps with balance and stability. As a safety feature, a built-in program will shut power off to the motor if the tray is prevented from rotating, or the unit is overloaded beyond its recommended weight capacity. To reset the unit, press the rocker switch to standby and then press the rocker switch to the on position. The shaker will automatically restart after a power interruption. Built-in memory maintains the last used speed and time settings during a power interruption.



Control Panel - Digital Heavy Duty Shaker

The front panel of the Heavy Duty Shaker contains all the controls and displays needed to operate the unit.

A. **Standby button/standby indicator light:** The standby indicator light will illuminate when the unit is plugged in. The unit will be in standby mode. Press the standby button to start the speed and time functions. The standby indicator light will shut off. Press the standby button again and the unit will once again be in standby mode.

B. **Speed display:** Displays the speed of the shaker.

C. **Up/down arrows:** For set-point control. On/off button starts/stops shaking function.

D. **Time display:** Displays accumulated time (continuous mode) or how much time is remaining (timed mode). The display range is from 0 to 9,999 minutes in one (1) second increments. The display will indicate minutes and seconds until the timer reaches 99 minutes and 59 seconds (99:59), then the display will automatically display minutes up to 9,999.

E. **Up/down arrows** for setpoint control. On/off button starts/stops the timer function.

Digital Heavy Duty Shaker Operating Instructions

The Digital Heavy Duty Shaker has been designed for the speed and time functions to work independently of one another. The speed can be re-set without re-setting the timer and the timer can be stopped and started without interrupting the shaking function.

1. **Getting ready:**
   a. Plug the cord into a properly grounded outlet. The standby indicator light will illuminate, verifying power to the shaker.
   b. Press the standby button to move the unit from standby mode. The standby indicator light will turn off and the speed and time displays will illuminate, displaying the previously used settings.

2. **Setting speed:**
   a. Press the up/down arrow below the speed display until you reach the desired speed. When you release the button, the display will blink off and then on indicating the new set speed has been accepted.
   b. Press the on/off button to start the shaking function. The indicator light below the speed display will illuminate and blink until the setpoint is reached. Once the set-point is reached the light will stop blinking and remain lit until shaking has ceased. The microprocessor controlled ramping feature slowly increases speed until the set-point is reached which helps to avoid splashing, and provides excellent low end control.
   c. Speed adjustments can be made without interrupting shaking by using the up/down arrows below the speed display. After the change has been made and you release the button, the display will blink off and then on indicating the new set speed has been accepted.
   d. To stop the shaking function press the on/off button below the speed display. The speed indicator light will turn off.

3. **Setting time to zero (0:00) and continuous mode:** Accumulated time.
   a. Press and hold the on/off button below the time display. After three (3) seconds, the display will indicate the previous set time.
   b. Simultaneously press both the up and the down arrows, the display will indicate zero (0:00). The unit time is now set to zero (0:00) minutes. Alternately, you can use the up/down arrows to get to zero (0:00).
   c. Press the on/off button below the time display. The display will indicate accumulated time. The up/down arrows will become inactive. To stop timer, press the on/off button again. **IMPORTANT:** This will **NOT** interrupt the shaking function. Press the on/off button below the speed display to interrupt the shaking function.
   d. To reset, press and hold the on/off button below the time display. After three (3) seconds the display will indicate the previous set time, which was zero (0:00).

4. **Setting timed mode:** Programmed time.
   a. Press the up/down arrows below the time display until you reach the desired time.
   b. Start this function by pressing the on/off button below the time display. The unit will run for the selected time, the up/down arrows will become inactive while the timer is running. The unit will stop shaking when time display reaches zero (0:00). Four (4) audible beeps will indicate the count down function is complete. The time display will default back to the set time. To repeat for the same time, simply depress the on/off button again.
   c. To interrupt an automatic timing cycle before it is completed, press the on/off button below the time display. The display will flash off and on to indicate the time function is on “hold”. **IMPORTANT:** This will **NOT** interrupt the shaking function. Press the on/off button below the speed display to interrupt the shaking function. Restart the timer by pressing the on/off button below the time display. Unit will continue counting down to zero (0:00). When the display reaches zero (0:00), you will hear the four (4) audible beeps that indicate the count down function is complete and the shaking function will cease.

5. **Turning unit off:**
   a. To turn the unit off, press the standby button. The speed and time displays will be blank, the standby indicator light will illuminate. The Heavy Duty Shaker should be kept in standby mode when not in use. To completely cut off power to the unit, disconnect the power cord from the unit or unplug from the wall outlet.

OPERATING TIPS

Centering your sample and even weight distribution on the tray helps with balance and stability. As a safety feature, a built-in program will shut power off to the motor if the tray is prevented from rotating, or the unit is overloaded beyond its recommended weight capacity. The shaker will automatically restart after a power interruption. Built-in memory maintains the last used speed and time settings during a power interruption.

LOAD SENSING FUNCTION (Digital Heavy Duty Shakers Model 16KG and up)

The Digital Heavy Duty Shaker is equipped with a load sensing function that can be activated by the user. This function provides protection against improper positioning of load and maximum load being exceeded. When activated, the unit will automatically sense improper load conditions and slow to a safe running speed, then display that speed followed by E04 on the speed display. The unit will also beep three (3) times every 60 seconds until the error is reset by pressing the speed on/off button. To activate the load sensing function use the following steps:

1. Place the unit in standby mode.
2. Press and hold the speed on/off button and press the standby button. The unit will beep two (2) times, confirming the function is enabled.
3. To restore normal operation, remove AC power to the unit for ten (10) seconds and then restore. If the E04 error occurs be sure the load is within the maximum specification and properly balanced (centered on tray) and/or reduce sample size/speed before restarting the unit. If the E04 occurs due to acceptable sample vibration or another vibration source, the vibration sensing function can be disabled as described above.

ADDITIONAL LOAD SENSING FEATURE

The Digital Heavy Duty Shaker Models 3750 and up, are equipped with an additional overload protection feature that lets the user know when the unit's set speed is higher than the achievable speed of the unit. The unit speed display will show an E7. The unit will also beep three (3) times every 60 seconds until the error is reset by pressing the speed on/off button.

To disable this feature perform the following steps:

1. Place the unit in standby mode by pressing the standby button.
2. Press and hold the speed up button and press on/off button. The unit will beep two (2) times, confirming the function is disabled.
3. To restore unit to normal operation, remove AC power to unit (unplug power cord from wall outlet) for ten (10) seconds and restart.

BEEPER PREFERENCE

To silence beeper operation (except for error codes), with the unit in standby mode, press and hold the time on/off button and press the standby button. To restore normal beeper operation, remove AC power to unit for ten (10) seconds and then restore.

CALIBRATION PROCEDURE (Digital Heavy Duty Shakers Model 16KG and up)

This procedure is used to self calibrate the Digital Heavy Duty Shaker. The tray should be free of any samples, vessels, and accessories prior to calibrating.

1. Turn unit on. Speed and time displays will be illuminated.
2. Press and hold the standby button and momentarily press the speed on/off button. The speed display should read "CAL".
3. The unit will run for approximately one (1) minute and automatically calibrate.

RS-232 SERIAL PORT (Digital Heavy Duty Shakers Model 16KG and up)

RS-232 serial port provides two-way communications for data logging and unit control. If you need additional details, please contact your local Ohaus representative or visit ohaus.com. If you need additional details, please contact your local Ohaus representative or visit ohaus.com.

Troubleshooting - Heavy Duty Shaker

Problem	Cause	Solution
Unit will not run	Mechanical obstruction Motor obstruction	Add or replace fuse as necessary. If problem persists, please contact your Ohaus representative for repair.
Unit is excessively noisy	Sensor fan misaligned Motor misaligned	Ensure that tray is secured tightly. If problem persists, please contact your Ohaus representative for repair.
Unit not shaking at proper speed	-	Perform speed calibration test on page 9. If problem persists, please contact your Ohaus representative for repair.
E3	Mechanical obstruction Drive system failure Ceased bearing Drive belt broken	Remove mechanical obstruction. If problem persists, the reason may be the drive system and should not be addressed by the end user. Contact your Ohaus representative for repair.
E4	Improper positioning of load Maximum load exceeded	Ensure the load is evenly distributed and does not exceed the maximum load capacity for the unit. See “Load Sensing Function” on page 9. If problem persists, please contact your Ohaus representative for repair.
E7	Unable to reach set speed	Reduce the speed setting or weight. This function can be disabled by following the instructions listed under “Additional Load Sensing Feature” on page 9. (NOTE: This function is only available on models 3750 and up and is not available on Model Heavy Duty Shaker 16Kg shakers.)
E8	Electronics error	This error cannot be fixed by the end user. Please contact your Ohaus representative for repair.

Ohaus Corporation
7 Campus Drive
Suite 310
Parsippany, NJ 07054 USA
Tel: +1 (973) 377-9000
Fax: +1 (973) 944-7177

With offices worldwide.
www.ohaus.com

SAP P/N: 30391120
P/N: 715301-00