

# **Operating Instructions**

## Laboratory Core Sand Mixer

Model 42111





Туре:	Laboratory Core Sand Mixer
Model:	42111
Part No.:	0042111-ASM 0042111-2-ASM
Serial Number:	

Name and address of manufacturer:

Simpson Technologies 2135 City Gate Lane Suite 500 Naperville, IL 60563

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#### 1 Introduction

Congratulations, you have just purchased an extremely reliable sand testing instrument that is backed by the professional technical support and years of proven sand technology experience of Simpson Technologies .

This laboratory equipment is constructed of quality materials and is the result of unsurpassed craftsmanship. The Simpson Laboratory Core Sand Mixer should be operated only when it is in perfect condition, in accordance with its designed purpose and being aware of possible hazards. Observe the safety instructions in Section 2 and operating instructions in Section 5.

#### 1.1 Application and Designated Use

This device is intended exclusively to prepare standard mixtures for the control of liquid and paste binders. Usage of other materials may be possible upon consultation with the Technical Service Department of Simpson Technologies.

Any other application outside the intended usage will be regarded as use not in accordance with its purpose; and, therefore, the manufacturer / supplier will not be held liable for any damage that might arise thereunder. The risk in this case will be exclusively that of the User.



#### 1.2 Organizational Measures

The Operating Instructions should be kept permanently in the vicinity of the operating site of the apparatus! In addition to these Operating Instructions, pay close attention to the common valid, legal and other binding regulations concerning accident prevention and environmental protection and instruct your staff accordingly.

The personnel operating the machine must have read and understood these Operating Instructions, especially the Safety chapter before commissioning the apparatus.

Wherever safety is concerned, do not modify, add parts to, or rebuild the device without the prior authorization from the manufacturer!

Spare parts must comply with the technical requirements set by the manufacturer. Compliance is always guaranteed when using original Simpson spares.



### 2 Safety



Before operating and/or performing maintenance or repair on Simpson Technologies designed and/or manufactured equipment, it is required that all personnel have read and understood the entire Operation Maintenance manual. If any questions exist, you must contact your supervisor or Simpson Technologies before taking further action.

If properly operated and maintained, your Simpson Technologies supplied equipment can provide many years of dependable and safe operation. Please follow all recommended safety, operating, and maintenance instructions. Furthermore, the introduction of any non-Simpson Technologies manufactured and/or approved parts to the equipment may create a hazardous situation. Never alter the equipment without prior consultation with Simpson Technologies .



DO NOT use this machine for purposes other than that for which it was intended. Improper use could result in death or serious injury.

#### 2 Safety



#### 2.1 Safety Signs and Labels

Simpson Technologies has incorporated the ANSI Z535.6 / ISO 3864-1-2 safety symbol only label format on all of its laboratory equipment. For the location of the safety labels on your equipment, refer to the "Location of Safety Decals" drawing in Section 7.

The harmonized ANSI Z535.6 format became an established safety label format since it not only fully meets the current ANSI Z535 standards, but also incorporates ISO 3864-2 symbology and hazard severity panels and thus, can be used for both the U.S. and international markets.



#### 2.1.1 Safety Alert Symbols



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. OBEY all safety messages that follow this symbol to avoid possible injury or death.



**DANGER!** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



The safety alert symbol used without a signal word to call attention to safety messages indicates a potentially hazardous situation which, if not avoided, could or may result in death or minor injury.



NOTICE indicates information used to address practices not related to personal injuries but may result in property damage.



This symbol indicates information containing important instructions concerning the use of the machine or directions for further procedures. Ignoring this information can lead to malfunction of the machine.

#### 2 Safety



#### 2.1.2 Safety Symbol Labels

For proper location of the following Safety Labels on the Simpson Laboratory Core Sand Mixer, see "Location of Safety Decals" in Section 7.



BLADE HAZARD (STC #214014)

This label is located above the mixer discharge door and on the mixer lid.

With the lid open or the discharge door open and receiving container removed; the blade inside the mixer is exposed. Do not insert hands, body parts or objects into the machine, as this could result in serious injury.

Verify that the safety switch on the lid that prevents the mixer from running when it is open and the safety switch on the receiving container that prevents the mixer from running when it is not in place are both functioning properly before operating the mixer. Follow **Lockout and Tagout** procedures before servicing.





HIGH ELECTRICAL VOLTAGE (STC #217958)

# This label is located on the motor junction box cover and on the back of the base to the left of the fuse box.

With electrical enclosure covers open, electrical terminals are exposed. A hazardous voltage is present, which can cause electric shock or burn, and could result in serious injury. Follow **Lockout** and **Tagout** procedures before servicing.





#### DO NOT OPERATE WITH GUARD REMOVED (STC #204582)

#### This label is located on the coupling guard.

Without the guard in place, the drive coupling is exposed. The running coupling could entangle long hair or loose cloth, and **crush** or **cut** body parts. Follow **Lockout** and **Tagout** procedures before servicing.





## READ AND UNDERSTAND ALL SERVICE MANUAL INSTRUCTIONS (STC #214081)

#### This label is located on the mixer base.

Before operating and/or performing any maintenance or repair on Simpson Technologies designed and/or manufactured equipment, it is required that all personnel read and understand the entire Operating Instructions manual. All protective guards shall be installed and all doors and panels closed before operating the equipment. If any questions exist, you must contact your Supervisor or Simpson Technologies before taking further action. Follow **Lockout and Tagout** procedures before servicing.



#### 2.2 Lockout and Tagout System Procedures

NOTICE

Whenever performing any type of maintenance or repair, whether in the form of cleaning, inspection, adjustment, mechanical or electrical maintenance, the equipment must be rendered into **Zero Mechanical State (ZMS).** 

Prior to any maintenance (routine or otherwise) or repair of equipment, a safety procedure should be established and maintained. This procedure should include training of personnel; identification and labeling of all equipment which is interlocked mechanically, electrically, through hydraulics, pneumatics, levers, gravity or otherwise; and a listing of the established lockout procedures posted on each piece of equipment.

The listing should be permanently attached to the machinery in a prominent area. The form at the end of this section may be used as an example of a listing that might be utilized. This form may be copied; the information filled/completed, and then sealed in a clear plastic laminate before being attached to the equipment.

"Lockout and Tagout" refers to specific practices and procedures to safeguard personnel from the unexpected energizing of machinery and equipment, or the release of hazardous energy during service or maintenance activities. This requires, in part, that a designated individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance, and that the authorized employee(s) lock or tag the energy-isolating device(s) to prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively.



#### 2.2.1 Lockout and Tagout Devices

When attached to an energy-isolating device, both lockout and tagout devices are tools used to help protect personnel from hazardous energy. The lockout device provides protection by holding the energy-isolating device in the safe position, thus preventing the machine or equipment from becoming energized. The tagout device does so by identifying the energy-isolating device as a source of potential danger; it indicates that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.



#### 2.2.2 Glossary:

**Authorized Person(s)** - Personnel who have been designated by his/her department to perform maintenance or service on a piece(s) of equipment, machinery or system, and are qualified to perform the work through proper training on the Lockout/Tagout procedures for the equipment, machinery or system.

**Lockout** - The placement of a lockout device on an energy isolating device, in accordance with an established procedure, to ensure that the energy isolating device and the equipment being control- led cannot be operated until the lockout device is removed.

**Lockout Device** - Any device that uses positive methods, such as a lock (either key or combination type), to hold an energy isolating device in a safe position, thereby preventing the energizing of machinery or equipment. When properly installed, a blank flange or bolted slip blind are considered equivalent to lockout devices.

**Tagout** - The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being control- led may not be operated until the tagout device is removed.

**Tagout Device** - Any prominent warning device, such as a tag and a means of attachment that can be securely fastened to an energy isolating device in accordance with an established procedure. The tag indicates that the machine or equipment to which it is attached is not to be operated until the tagout device is removed in accordance with the energy control procedure.

**Zero Mechanical State** - The mechanical potential energy of all portions of the equipment or machine is set so that the opening of pipes, tubes or hoses, and the actuation of any valve, lever or button, will not produce a movement which could cause injury.



#### **3** Short Description & Specifications

#### 3.1 Usage of the Laboratory Core Sand Mixer

The Simpson Laboratory Core Sand Mixer is an S-blade mixer with vertical shaft, suitable for mixing liquids or pastes with sand, for all core or self-setting mixtures.

#### 3.2 Description

The Laboratory Core Sand Mixer is designed to mix liquid binders with sand that is common to all chemically bonded sand mixtures. The mixer incorporates an "S" shaped mixing blade that completely mixes the complete sand mass.

The mixer has a mixing capacity of approximately 4 kg. (9 lbs.) or 3.7 liters (0.13 cu.ft.) of silica sand or similar chemicals and operates with a 0.559kw (0.75 HP) motor.

#### 3.3 Specifications

Specifications	Laboratory Core Sand Mixer
Power	120-230V, 50-60 Hz (Check name plate)
Fuses:	25 Amp (120V) PN: 207491
	16 Amp (230V) PN: 207409
	8x32mm (Qty: 2)
Motor	0.559KW (0.75HP)
Mixing Capacity	4 kgs. (9 lbs.)

#### 3.4 Dimensions and Weights (Approximate)

Dimensions/Weights	Laboratory Core Sand Mixer
Length	610 mm (24 in.)
Width	407 mm (16 in.)
Height	495 mm (19.5 in.)
Weight	66 kg (145 lbs.)



#### 4 Unpacking and Installation

#### 4.1 Unpacking



Your new Laboratory Equipment has been closely inspected before being shipped to your plant. However, damage can occur in route, so it is wise to inspect all equipment on arrival. Notify both the carrier and Simpson Technologies of any damage at once. Damage should be noted on the shipper's receipt before signing for receipt of the shipment.

The Simpson Laboratory Core Sand Mixer will be shipped and placed in one piece and is intended to be used as received; no further assembly/disassembly is required. Due to its weight, 66 kgs (145 lbs), proper lifting equipment, a forklift or dolly, is required for handling when positioning or relocating this instrument. Unpacking the unit may require two to three people due to the bulky dimensions of the machine and tight fitting crate. The approx. instrument dimensions are 610mm (24") x 407mm (16") x 495 mm (19.5"). The mixer is enclosed in and bolted to a reinforced crate for shipment. Its shipping weight in the crate is 78 kgs (170 lbs).

- 1. Remove the screws securing the sides of the crate from the bottom of the crate.
- 2. Remove the crate lid and top.
- 3. Remove the four bolts that hold the mixer to the bottom of the crate.
- 4. Carefully remove the apparatus from the packing crate.



Heavy lifting can cause injury. Use three-man lift or a mechanical lift to remove the laboratory muller from the shipping crate and onto the work bench.

5. Place the mixer on a sturdy table or work bench of suitable height close to an adequate-sized power source.

#### 4.2 Installation

The installation of the apparatus is the responsibility of the Client to include procuring and preparing the material required for this purpose.

The mixer should be located on a sturdy table or work bench of suitable height (recommended 100cm/36") that allows for ease of operation and the ergonomic loading and unloading of the machine. Anchoring is optional, but strongly recommended to prevent the unit from vibrating off of its platform. In order to guarantee effective performance, the mixer should be situated close to an adequate-sized power source.

The Laboratory Core Sand Mixer is intended for use by one operator at a time. It is used in a foundry sand or chemical laboratory with its controls (switches, timer, etc.) and mixing bowl leveled at approximately 100 cm (36 inch) table height. The operator can fill and discharge the mixer, set the timer and turn the unit on and off while observing proper ergonomic principles.



#### 4.3 Electrical Power Connection

Electrical Requirements:100 - 240 Volts, 50-60 Hz + Ground (5 $\Omega$  or less).

Fuses: 25 Amp (115V); 16 Amp (230V); 8x32mm (Qty: 2)



Connect the equipment to a grounded electrical outlet.

An electrical power supply cable is fitted to the 42111 Laboratory Core Sand Mixer without the line plug. A ground line plug, compatible with the wall receptacle configuration and above electrical requirements, should be installed by a qualified electrician.

1. Connect the equipment to a grounded electrical outlet.



Verify that the voltage marked on the serial number nameplate located on the side of the mixer base is the same as the electrical outlet to be used for the machine. Outlet must be properly grounded! Failure to follow safety procedures could result in serious injury.

 Ensure that the mixing blade does not scrape the bottom of the pan and has a minimal clearance of no more than 0.5 mm (0.20").



Whenever performing any type of maintenance or repair, whether in the form of cleaning, inspection, adjustment, mechanical or electrical maintenance, the equipment must be rendered into **Zero Mechanical State**.



#### 4.4 Airborne Noise Emission

Regarding airborne noise emission by the Laboratory Core Sand Mixer, any occurrence of motor or other noise will be lower than 70db. Therefore, the equivalent continuous A-weighted sound pressure level at the workstation does not exceed 70db(A).



#### 5 Operating Instructions



For more information on how to use and care for your Simpson Analytics equipment and accessories visit our Simpson Technologies channel on YouTube and search our library of videos. Subscribe to our channel to keep updated on new releases.



The machine is not designed to operate with the lid open. Attempting to operate this machine with the lid open or to perform maintenance of the unit with the power on or the unit plugged in is dangerous and could result in death or serious injury!

Follow **Lockout and Tagout** procedures before putting objects and/or hands inside the mixing bowl!



Wear appropriate Personal Protective Equipment (PPE), such as safety glasses or goggles when operating equipment!

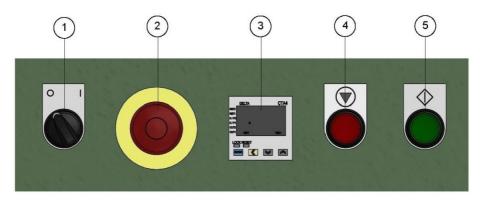
 With the mixer power switch off, load material into the mixer by lifting the lid and evenly dispersing the material along the bottom of the machine.



Material should not be put into the machine as to overload the motor or gearbox. Failure to follow this will void the warranty and will result in premature failure of the motor, gearbox, seals, etc.

- Close the lid of the machine and keep it closed at the same time as the receiver container in position until the cycle has been completed.
- 3. Turn the Power switch on.





**Figure 1: Control Panel** 

Item	Description
1	Power Switch
2	Emergency Stop Button
3	Digital Timer
4	Stop Button
5	Start Button

- 4. Set the timer to the desired mixing time (Item 3, Figure 1) by pressing the up or down arrow on the timer. The default setting is in seconds. To change this to minutes or hours, please refer to the OEM manual.
- 5. A good binder yield depends on a perfect distribution of it in the whole mass, in such a manner that all the sand particles are coated by the binder. The energy required depends on the type of binder and sands. Therefore, the mixing cycle for each system must be determined by trial.
- 6. Press the Start Button (Item 5, Figure 1).
- 7. Once the mixer stops, the mulling cycle is completed.



- 8. Open the discharge door by turning the handle from left to right.
- 9. Press the Start Button. The material should begin to be discharged into the container as the plows push the material out of the machine.



Be aware and ready to hit the Stop Button instantly at any time should something bind or another unexpected issue occurs. Never stick fingers or hands into the mixing bowl when machine is running or power is connected to the machine! Wear appropriate Personal Protective Equipment (PPE), such as safety glasses or goggles when operating equipment. Follow Lockout and Tagout procedures should service need to be performed on the inside of the machine!

- 10. Once the machine has adequately emptied, press the Stop Button.
- 11. Remove receiving container to empty the mix and clean it after emptying. To remove it, slightly raise up the receiving container to unhook the guide pin located at the rear of the receiving container and tilt the bottom of the receiving container towards you to be pulled away from the machine.
- 12. The machine is now ready to run another batch by following Steps 1-10.



If another batch of core sand is not going to be run immediately, it is recommended that the unit be cleaned with proper solvent to prevent build-up.



In order for the machine to operate the lid should be closed and the receiving container should be in place.



#### 6 Maintenance



For more information on how to use and care for your Simpson Analytics equipment and accessories visit our Simpson Technologies channel on YouTube and search our library of videos. Subscribe to our channel to keep updated on new releases.



Before performing any maintenance, the Laboratory Core Sand Mixer must be put into **Zero Mechanical State (ZMS)**. Follow **Lockout** and **Tagout** procedures before servicing!

Each day, completely clean accumulated resin, and sand from the interior of the unit.

#### 6.1 Gearbox

- The gearbox is supplied complete with synthetic oil, ISO VG320 lubricant for 10,000 hours of operation.
- During the operational life of the gearbox, check the oil level periodically. For proper oil level, refer to the sight glass.
- During the early stages of service, problems of lubrication may arise due to the high level of viscosity taken on by the oil and so it is wise to have a few minutes of rotation under no load.

#### 6.2 Fuses

Fuses: there are two slow blow 25 Amp (120V) or 16 Amp (230V) - IEC 269-3-1 31.5mm x 8.5mm fuses located in the back of the base of the mixer. These should only be replaced with similar amperage and sized fuses.





Figure 2: Fuse Holder

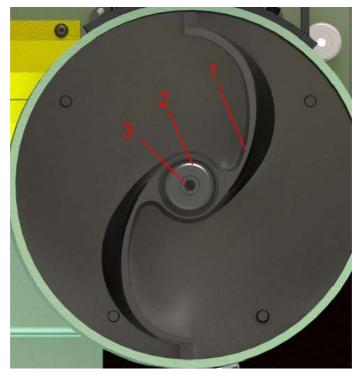
#### 6.3 Paddle Maintenance and Replacement

#### 6.3.1 Maintenance

Each month, check the clearance of the paddle from the side walls and bottom. Over time, they will begin to wear and will have to be replaced. As the paddle wears, the efficiency of the mixer will decrease while resin and sand will build up on the side walls and bottom.



#### 6.3.2 Changing the Paddle

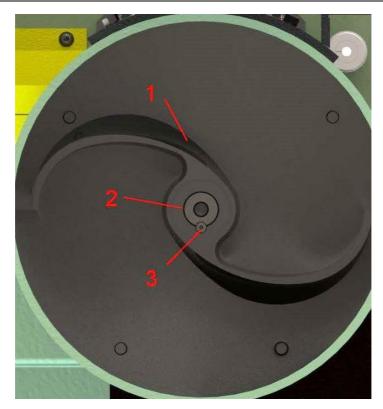


#### Figure 3

ltem	Description
1	Paddle
2	Spacer Cylinder
3	Hexagonal Bolt

- 1. Remove the hexagonal bolt from the top of the cylinder spacer.
- 2. Remove cylinder spacer.





### Figure 4

Item	Description
1	Paddle
2	Central Shaft
3	Кеу

3. Lift the Paddle vertically to remove it from the Central Shaft.





As the paddle is removed, the key will remain in the shaft keyway, or it may come out with the paddle and fall. *Be careful not to lose the key*.

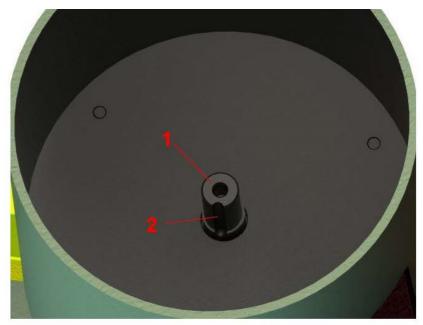


Figure !	5
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ltem	Description
1	Central Shaft
2	Кеуwау

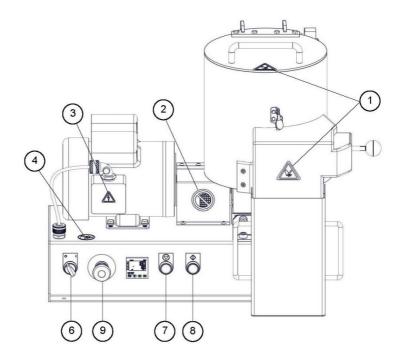
- 4. With key removed from shaft keyway, insert the new paddle onto the central shaft.
- 5. Align the keyway of the shaft with the keyhole on the paddle and reinsert the key.



- 6. Place the cylinder spacer back onto the shaft over the new paddle.
- 7. Reinsert and tighten the hexagon bolt through the cylinder spacer.
- 8. Check to ensure that the new paddle does not drag on the sides or bottom of the bowl.

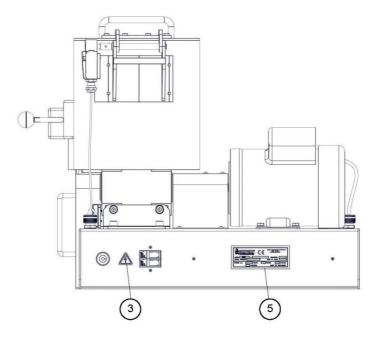


## 7 Apparatus Layout and Location of Safety Symbols



**Front View** 





#### **Rear View**

#### **Location of Safety Decals**

Item	Part No.	Description
1	214014	Blade Hazard
2	204582	Do Not Operate with Guard Removed
3	217958	High Electrical Voltage
4	214081	Read and Understand All Service Manual Instructions
5	5000-3	Equipment Name Plate (Supplied with Base)
6	207424-1	"Off" (Power) "On" Push Button Legend Plate
7	207424-2	"Stop" (Of Action) Push Button Legend Plate
8	207424-3	"Start" (Of Action) Push Button Legend Plate
9	214015	Emergency Stop Legend Plate



#### 8 Parts List / Ordering Parts / Returns

#### 8.1 Parts List

Simpson maintains a large inventory of common spare parts for all current Simpson Analytics products. The following table provides part numbers for common spare parts for this device. Contact Simpson Technologies with the part number and description when ordering.

Part No.	Description
004-101B	Paddle
207446	Magnetically Coded MCI Switch
207454	Hex Pin-In Insert Bit for Temper Screw
207456	STI Safety Switch



#### 8.2 Ordering Replacement / Spare Parts

The source of replacement parts for your Simpson Analytics equipment is just as important as the make of the equipment you purchase. ALWAYS order parts for your Simpson Analytics equipment directly from Simpson Technologies. To find the Simpson office closest to you please visit us on the internet at www.simpsongroup.com on the "Contact Us" page.

Parts may be ordered from the sales department via e-mail at parts@simpsongroup.com: When contacting our sales department to obtain a quotation on replacement parts or service please always include the equipment serial number, the description of the part and the part number. Your Simpson Technologies sales team representative will provide you with a quote on the items with current price and delivery times. When ordering, please always refer to the quote number on your order.

To arrange for calibration support or repair assistance please contact our customer service department at <a href="mailto:service@simpsongroup.com">service@simpsongroup.com</a>.



#### 8.3 Returned Goods Policy

Simpson Technologies strives to provide their customers with maximum follow up support and, in order to offer the most practical flexibility, the following conditions apply to returned goods. Adherence to these procedures will assure the most prompt and efficient service.

#### **RETURNS WILL BE CONSIDERED IN THE FOLLOWING SITUATIONS:**

- Products ordered in error by customer (subject to a restocking charge).
- Incorrect or defective products shipped to customer.
- The return of existing products for factory repair or upgrade.
- Products ordered correctly but which are unwanted or unsuitable (subject to a restocking charge).
- A Safety Data Sheet (SDS) must accompany material that is sent to Simpson Technologies for testing purposes. Simpson Technologies will NOT authorize the return of hazardous materials.



#### **RETURN PROCEDURE:**

- The customer must obtain a Return Material Authorization Number (RMA#) from Simpson Technologies prior to returning the goods.
- To obtain an RMA#, the customer should contact the Customer Service department by phone, fax, e-mail to <u>service@simpsongroup.com</u>. The material being returned must be identified and the reason for its return clearly specified. Once approved for return, Simpson Technologies will issue the customer an RMA form to be included with the shipment and with instructions on where and how to ship the goods.
- All returned goods are to be shipped with transportation charges PREPAID, unless otherwise agreed when the RMA# is assigned. If it has been predetermined that return goods are to be shipped COLLECT, Simpson Technologies will specify the desired routing.
- All returned shipments will be subject to inspection upon arrival at Simpson Technologies.
- Material returned without an RMA# may be refused and returned at customer's expense.



### 9 Decommissioning



Before doing any work, review the Safety Procedures in Section 2 and **Lockout** and **Tagout** all the power sources to the machine and peripheral equipment.

Failure to follow safety procedures could result in serious injury.

Use qualified personal and follow safety procedures, applicable local policies and regulations in decommissioning the Simpson Laboratory Muller and peripheral equipment.

**Electrical Power:** Disconnect the electrical power source and verify there is no power on all components being decommissioned.

#### WASTE DISPOSAL

The machinery and controls consist of:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic Components and circuit boards

Dispose of the parts in accordance with the applicable regulations.

**Oils and Grease:** Used oil and grease, which are no longer suitable for their intended use, must be transported to the relative collection point and disposed of in accordance with local regulations.

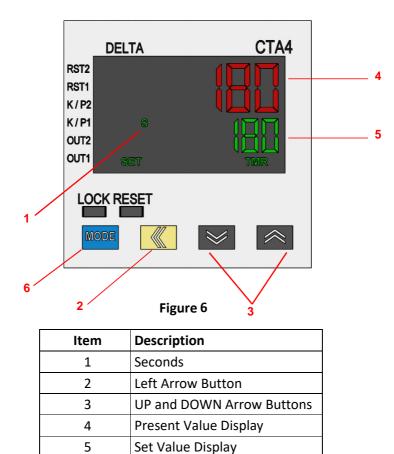


#### 10 Commercial Manuals

#### 10.1 Instructions Delta Electronics CTA4 Timer - Adjust Time Setpoint

- 1. Turn on power switch of the equipment.
- 2. The time unit for the Timer is in seconds.
- Press the yellow, left arrow button (Item 2, Figure 6) to enter the set mode. The first digit to the right column on the Set Value Display (Item 5, Figure 6) will begin to flash.
- 4. Press the UP or DOWN arrow buttons (Item 3, Figure 6) to set the first digit on the selected column.
- 5. Press the yellow, left arrow button to move the cursor to the next left and use the UP and DOWN arrow buttons to set the desired digit.
- 6. Repeat this process for as many columns and digits being utilized.
- 7. Once desired set value time is showing on the display, press the blue MODE button (Item 6, Figure 6) to set the time.
- 8. The unit is now ready to start.





Mode Button

6



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