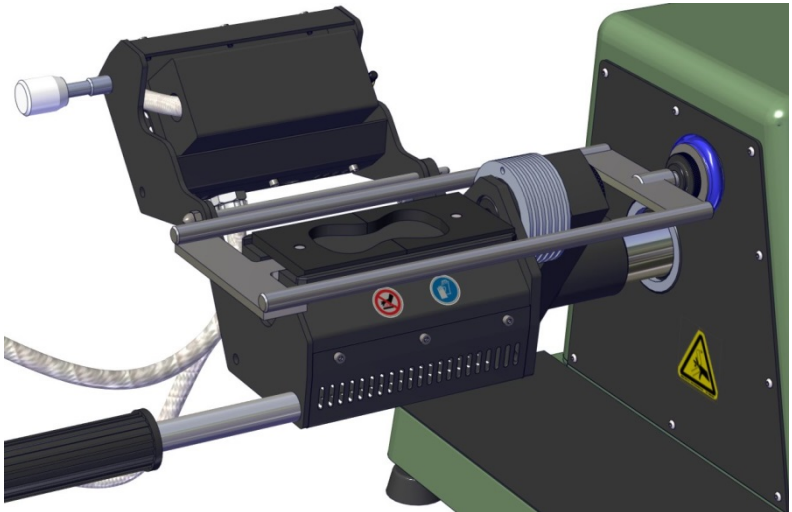

Operating Instructions

Hot Shell Tensile Accessory

Model 42104F



Type:

Hot Shell Tensile Accessory

Model:

42104F

Part No.:

0042104F-A-1A
0042104F-A-2A
0042104F-M-1A
0042104F-M-2A

Serial Number:

Name and address of manufacturer:

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

For other Simpson Technologies offices around the world and for our contact information please visit us on the internet at www.simpsongroup.com on the Contacts page.

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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 Hot Shell Tensile Accessory should be operated only when it is in perfect condition and in accordance with its designed purpose, with the operator aware of possible hazards. Observe the Safety instructions in Section 2 and Operating Instructions in Section 5.

1.1 Application and Designated Use

The Hot Shell Tensile Accessory, Model 42104F, is used to measure the hot tensile strength of shell sands used in metal casting. 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 hold 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 readily available at the place of operation. In addition to the operating instructions, the general legal regulations or other mandatory rules for prevention of accidents and environmental protection should be made known and be observed!

The personnel instructed to use this apparatus, before beginning work, should have studied and fully understood these Operating Instructions, in particular the Safety chapter.

No modifications, extensions or changes of design of the device that would impact safety requirements should be put into effect with prior consent of the supplier! Spare parts must conform to the technical specifications defined by the manufacturer. This is always guaranteed when using original spares.

2 Safety

2 Safety

NOTICE

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.

2.1 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 Nameplate and Decals" drawing in Section 10.

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 panel 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 to serious injury.



NOTICE *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.

2.1.2 Safety Symbol Labels



DO NOT TOUCH - HOT SURFACE

(STC #214045)

This label is located on the Heating Block Assembly

When the Hot Shell Tensile Accessory is ON, the Heating Plates are **hot**. Contact may result in serious burns to skin. **DO NOT TOUCH**. Follow **Lockout and Tagout** procedures and allow surface to cool before servicing.



ELECTRICAL SHOCK / ELECTROCUTION

(STC #214043)

This label is located on the rear panel of the control cabinet.

When the front panel or any other panels from the control panel or the heating block assembly are removed, electrical terminals are exposed. A hazardous voltage is present, can cause electric shock or burn, and will result in serious injury. Follow Lockout and Tagout procedures before servicing.



WEAR GLOVES / AVOID BURN

(STC #214044)

This label is located on the Heating Block Assembly

The Hot Shell Tensile Accessory heating plates and adjoining parts are extremely hot and should not be touched unless protective gloves are worn. Follow Lockout and Tagout procedures and allow surface to cool before servicing.



READ AND UNDERSTAND ALL SERVICE MANUAL INSTRUCTIONS

(STC #214042)

This label is located on the top panel, to the right and near the front of the control cabinet.

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 Safety

2.2 Safety System Procedure

NOTICE

*Whenever performing any type of maintenance or repair, whether in the form of cleaning, inspection, adjustment or mechanical 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.

"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 ordered 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 controlled 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 controlled 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 Short Description & Specifications

3.1 Description

The Hot Shell Tensile Strength Accessory, Model 42104F, is used to measure hot tensile strength of shell sands used in metal casting. The unit has electrical and mechanical connections to the Electronic Universal Sand Strength Machine, Model 42104.

After placing the Hot Shell Tensile Strength Accessory on the Electronic Universal Sand Strength Machine and adjusting the control cabinet to the desired cure time and test temperature, the core box is filled with coated shell sand. Excess sand is struck off the core box and the cure timer is activated. At the end of the desired cure time, the Electronic Universal Sand Strength Machine breaks the test specimen and records the tensile strength results in the digital display.

3.2 Specifications, Dimensions and Weights (Approximate)

Specifications	Hot Shell Tensile Control Panel
Length	210mm (8")
Width	150mm (6")
Height	230mm (9")
Weight	4 kg (9 lbs.)

Specifications	Hot Shell Tensile Heating Block Assembly
Length	280mm (11")
Width	150mm (6")
Height	150mm (6")
Weight	6.5 kg (14 lbs.)

4 Unpacking and Installation

4.1 Unpacking

NOTICE

Your new Laboratory Equipment has been closely inspected before being shipped to your plant. However, damage can occur en 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 Hot Shell Tensile Accessory, Model 2104F, is shipped in two primary pieces consisting of the Control Cabinet and Heating Block Assembly. Both pieces are designed to be assembled mechanically and electronically to the Electronic Universal Sand Strength Machine, Model 42014. No special lifting equipment for handling is required. The Control Cabinet weighs approximately 4 kg (9 lbs.), and the Heating Block Assembly weighs approximately 6.5 kg (14 lbs); both pieces are easily handled.



ONLY authorized personnel may unload and install this equipment. Two people may be required to unpack this instrument due to the bulky dimensions and tight fitting packing crate.

1. Remove any loose accessories/parts within from the shipping crate and place in a location away from any packaging material to assure that these items are not misplaced.
2. Carefully remove the Control Cabinet and Heating Block Assembly from the packing crate and place on stable bench.
3. Once removed from the crate, proceed by taking off any protective wrap and unpackage the protective material from the included accessories.
4. The packaging remains the property of the Customer and may be used for returning the apparatus if some repair is required.

4 Unpacking and Installation

4.2 Components

Your new Hot Shell Tensile Strength Accessory, Model 42104F, is shipped with the following accessories and installation components.

Please take a moment and identify that the following items are included:

- Main Cabinet Panel consisting of timing unit, temperature controller and power switch
- Heating Block Assembly consisting of the upper and lower heating blocks
- Lifting Handle
- Core tooling, two halves which form the test specimen
- Magnetic Tool Extractor
- Bridge with knurled bridge nut
- Hopper/striker
- Power cord
- Data Cable

If any of the above components are missing, contact your local Simpson Technologies office.

NOTICE

Do not store the device in the open and unprotected from atmospheric conditions. If this instruction is not followed, claims under guarantee will no longer be considered.

4.3 Installation

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

The Hot Shell Tensile Strength Accessory, Model 42104F, is designed as an accessory to the Electronic Universal Sand Strength Machine, Model 42104. In order to guarantee proper performance, the Hot Shell Tensile Accessory, Model 42104F, must be correctly installed/connected mechanically and electrically to the Electronic Universal Sand Strength Machine, Model 42104. Therefore, the Heating Block Assembly of the Hot Shell Tensile Strength Accessory will be mechanically attached to the strength machine, and the Control Cabinet for the Hot Shell Tensile Accessory will be located next to the sand strength machine. This accessory should be located on the same stable bench with the strength machine. The bench should have plenty of space for clear access to both the Control Cabinet and Heating Block Assembly of the Hot Shell Tensile Accessory, Model 42104F, and also the controls of the Electronic Universal Sand Strength Machine, Model 42104.

The Hot Shell Tensile Accessory is intended for operation by one operator. It is recommended for use in a foundry sand laboratory, with its operation display and programming buttons placed at a level for easy use and observation by the operator.



BURN HAZARD! *The Hot Shell Tensile Strength Accessory is extremely hot when the tester is in operation. Always use gloves and be cautious when working with or around the tester. **Hot** surfaces can **burn** hands and body parts.*

4 Unpacking and Installation

4.4 Electrical Power Connection

Electrical Requirements: 100 – 240 Volts, 50-60 Hz + Ground (5Ω or less).



Connect the equipment to a ground electrical outlet.

The Hot Shell Tensile Accessory can be manufactured to accept 110 Volt, 50-60 Hz or 220 Volt, 50-60 Hz electrical power. Refer to the specification name plate located on the back side of the Control Panel to verify the electrical requirements.



Before connecting this equipment to power, verify that the voltage marked on the serial number nameplate 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.

4.5 Set-up



Before attempting to connect the Hot Shell Tensile Accessory to the Electronic Universal Sand Strength Machine, turn off the Lock-Out air supply valve to the strength machine, switch the power switches to the off position and remove the electrical power cords from the wall receptacles on both the Hot Shell Tensile Accessory and the Electronic Universal Sand Strength Machine. Failure to follow safety procedures could result in serious injury.

4.5.1 Mechanically connecting the Hot Shell Tensile Accessory to the Electronic Universal Sand Strength Machine

1. Install the lifting handle (Figure 1, Item 3) into the threaded hole located on the front lower left corner of the lower heating block of the Heating Block Assembly (Figure 1, Item 2).
2. Remove the knurled screw (Assembly Drawing 42104MAN, Item 3) from the right side of the heating block assembly (Assembly Drawing 42104MAN, Item 1).
3. With the assistance of the lifting handle (Figure 1, Item 3), carefully slide the Heating Block Assembly into the mating hole located on the Moveable Clamp Arm (Drawing 42104MAN, Item 2) of the Electronic Universal Sand Strength Machine. Adjust the position of the Heating Block Assembly (Drawing 42104MAN, Item 1) so that the lower heating plate is flat with the base of the strength machine. This is accomplished by adjusting the support set screw and nut, on the rear of the Heating Block Assembly, to the Moveable Clamp arm of the Electronic Universal Sand Strength Machine (Figure 4.5.1.3). Install the knurled screw (Drawing 42104MAN, Item 3) back into the Heating Block Assembly and hand tighten to hold the Heating Block Assembly in position on the strength machine.

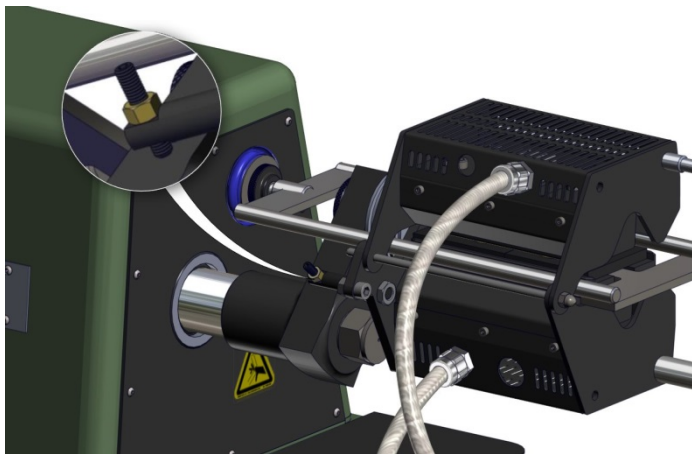


Figure 4.5.1.3

4 Unpacking and Installation

- Using the handle on the left side of the upper heating block, raise the upper heating block to the open position. Alternatively, if the test will be performed without the upper heating block, it will now be removed. First remove the pin holding the rear connecting rod of the Heating Block Assembly in place (Figure 4.5.1.4-1). While holding the upper portion of the Heating Block Assembly in place, remove the connecting rod by pulling the rod from the side opposite the Sand Strength Machine (Figure 4.5.1.4-2).

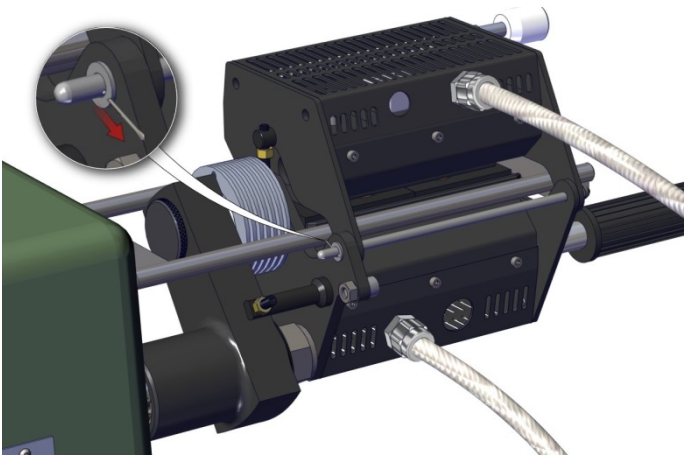


Figure 4.5.1.4-1 (Alternate Test Set-Up)

- Verify the voltage on the specification plate located on the back of the Hot Shell Tensile Accessory. Connect the power cord supplied with the tester into the power plug receptacle located on the back of the Hot Shell Tensile Accessory Control Cabinet (Figure 3, Item 1).



Some areas may require an electrical plug that is not supplied with the power cord to properly conform to the specific electrical outlet. These special electrical plugs will need to be purchased separately by the customer.

- Verify the proper voltage of the electrical outlet before plugging the power cord into the outlet. Connect power cord to the AC electrical outlet that is free of disturbances/fluctuation and is properly grounded.

NOTICE

It is highly recommended that a voltage stabilizer/filter (line conditioner) is installed between the electrical outlet and the inlet of the Hot Shell Tensile Accessory. This device will help to ensure the proper performance of the Hot Shell Tensile Accessory and Electronic Universal Sand Strength Machine. It will also help to eliminate/reduce potential premature failures of the electric heater used in the Hot Shell Tensile Accessory.

4.6 Airborne Noise Emission

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.

5.1 Performing a Hot Shell Tensile Strength Test

1. Turn on the air supply and verify the correct air pressure setting on the incoming air regulator to the Electronic Universal Sand Strength Machine.
2. Using the handle on the left side of the upper heating block, raise the upper heating block to the open position. Clean any loose sand from the contact surface of both the upper and lower heating block on the heating block assembly (Figure 1, Item 2). (If performing the alternate test, ignore raising the upper heating block and cleaning sand from the upper surface.) Coat both tooling jaws and the contact surfaces of the upper and lower heating blocks with a light coating of an appropriate release agent for use with shell coated foundry sands. Using the magnetic tool extractor, carefully place the right tooling jaw on the right locating pin located on the lower heating block (see Figure 5.1.1). Place the bridge (Figure 1, Item 8) and using the magnetic tool extractor, insert the left tooling jaw onto the lower heating block (see Figure 5.1.2).

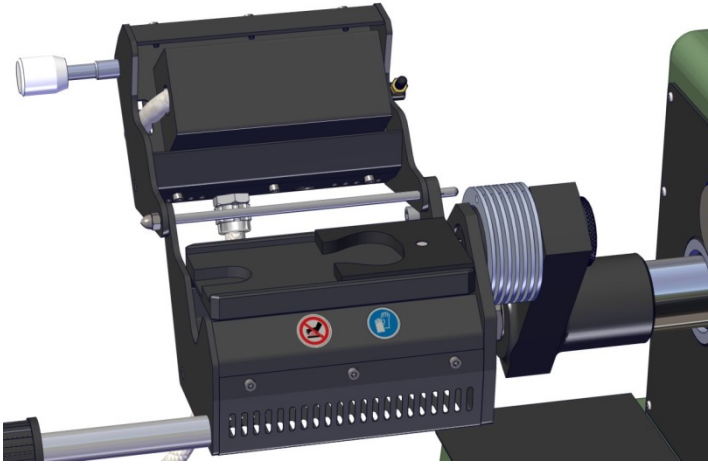


Figure 5.1.1

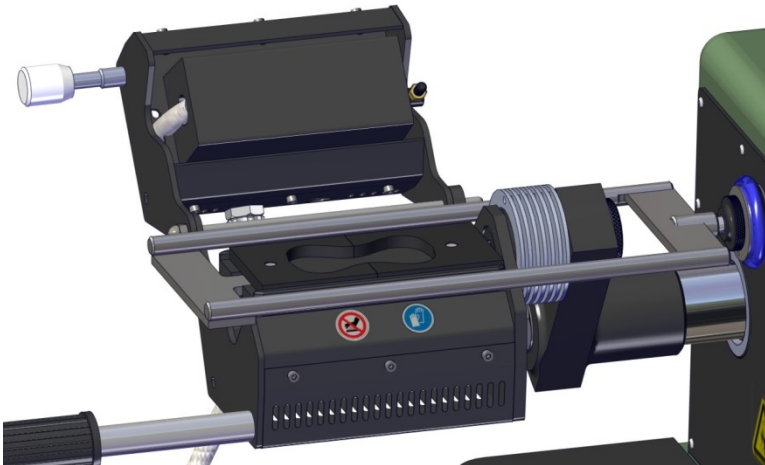


Figure 5.1.2

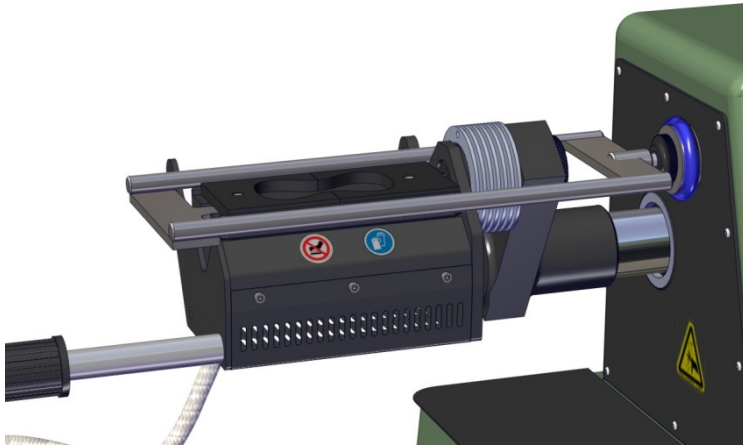


Figure 5.1.2 (Alternate Test)

3. Using the handle on the left side of the upper heating block, lower the upper heating block to the closed position (ignore if performing alternate test).
4. Turn the strength machine power switch to the on position (Figure 4, Item 1). A “HELLO” message will briefly appear on the digital display of the strength machine. This message will be replaced by numerals.
5. Turn the Hot Shell Tensile Accessory power switch located on the Control Cabinet to the on position (Figure 2, Item 4).
6. Set the operating temperature using the up and down buttons on the temperature controller located on the Control Cabinet of the Hot Shell Tensile Accessory (Figure 2, Item 1). When the desired set point temperature is shown in the “SV” digital display, press the set button on the temperature controller to enter this value.



For further information regarding the temperature controller, refer to the temperature controller manufacturer’s manual in Section 10 of this manual.



The AFS (American Foundry Society) standard condition for hot shell tensile test temperature is 450°F (232° C).

7. Before starting a test, allow time for the upper (if applicable) and lower heating blocks to reach and stabilize at the selected operating temperature. The SV temperature should equal the PV temperature displayed by the temperature controller.
8. Set the curing time using the timer located on the control panel of the Hot Shell Tensile Accessory (Figure 2, Item 2). To change the timer, press the left arrow until the desired number begins blinking. Use the up or down arrows to change the selected number to the desired value. Repeat these two steps until the desired curing time is set.



For further information regarding the timer, refer to the timer manufacturer's manual in Section 10 of this manual.



The AFS (American Foundry Society) standard condition for hot shell tensile test cure time is 3 minutes.

9. Adjust the knurled bridge nut located on the bridge (Figure 5.1.3) until the flat surface of the bridge nut facing the stationary clamp holder (Figure 5, Item 11) is approximately 1/16" (1mm) away from the surface of the stationary clamp holder.

NOTICE

The knurled bridge nut should never be positioned tight against the stationary clamp holder of the strength machine.

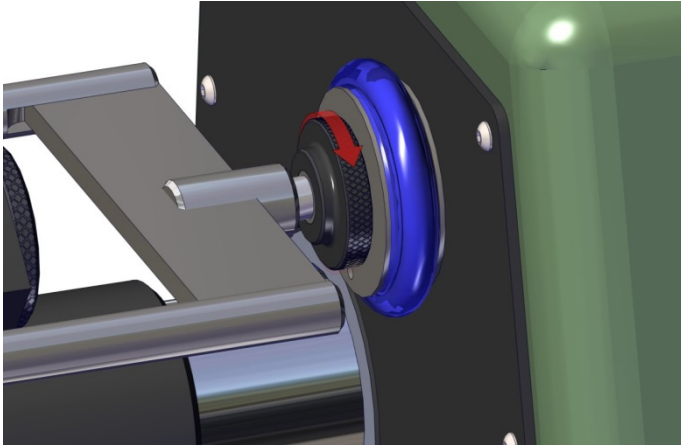


Figure 5.1.3

10. Press the “ES - TEST SELECTION” button on the strength machine (Figure 6, Item 13E) until the arrow pointing to “SHELL/HOT BOX TENSILE STR” illuminates.
11. Zero the digital display on the strength machine by pressing the “z-zero” Button (Figure 6, Item 13C). The digital display will read zero.
12. Fill the hopper on the hopper/striker (Figure 1, Item 6) with shell sand to be tested.
13. Using the handle on the left side of the upper heating block, raise the upper heating block to the open position (if performing test with both upper and lower heating blocks).
14. Rest the filled hopper/striker strike-off blade on the assembled tooling jaws parallel to and just beyond the longitudinal center line of the tooling.
15. Dump the shell sand from the hopper/striker into the cavity of the heated tooling. Quickly, strike off the excess sand from



BURN HAZARD! *The Hot Shell Tensile Strength Accessory is extremely hot when the tester is in operation. Always use gloves and be cautious when working with or around the tester. Hot surfaces can **burn** hands and body parts.*

16. Using the handle on the left side of the upper heating block, gently lower the upper heating block to the closed position (Figure 5.1.4). (Ignore for alternate test. See Figure 5.1.4 Alternate Test.)



Figure 5.1.4



Figure 5.1.4 (Alternate Test)

5 Operating Instructions

17. Start the cure timer by pressing the “START TIME” button located on the Hot Shell Tensile Accessory Control Cabinet (Figure 2, Item 3). After the pre-set cure time is complete, the Electronic Universal Sand Strength Machine will automatically start applying load to the sand tensile specimen. The strength machine will continue to increase the tensile load until sand specimen failure. The moveable clamp arm will return to home position and the tensile strength value will be displayed in the digital display (Figure 6, Item 13B). The units of measure will be displayed in PSI or N/cm² as programmed by the mode of operation switch (AFS or Metric).
18. After the tensile test is completed, using the handle on the left side of the upper heating block, gently raise the upper heating block to the open position (ignore for alternate test).
19. After raising the upper heating block and recording the strength value from the digital display, the “CD-CLEAR DISPLAY” button (Figure 6, Item 13D) must be pressed followed by pressing the “Z-ZERO” button (Figure 6, Item 13C). This button sequence is required to reset the strength machine for the next test.
20. Using the Magnetic Tool Extractor (Figure 1, Item 7) remove the left and right tooling jaws from the Heating Block Assembly. The broken sand specimen should remain in the tooling jaws when they are removed.
21. Place the left and right tooling jaws on a heat resistant surface and carefully remove the broken sand sample from each tooling piece. Do not use any metal objects to remove the broken sand specimen as this may damage the tooling. Clean any loose or adhering shell sand from the tooling jaws.
22. With the right and left tooling jaw removed from the Heating Block Assembly, proceed in cleaning any loose and adhering shell sand from the working surface of the upper (if applicable) and lower heating blocks. Cleaning can be done with a heat resistant soft-bristled brush.

23. After removing the broken sand specimens, clean both tooling jaws and coat both the tooling and the contact surfaces of the upper (if applicable) and lower heating blocks with a light coating of an appropriate release agent for use with shell coated foundry sands. Using the Magnetic Tool Extractor, carefully place the right tooling jaw on the right locating pin located on the lower heating block (see Figure 5.1.1). Place the bridge (Figure 1, Item 8) and, using the Magnetic Tool Extractor, insert the left tooling jaw onto the lower heating block (see Figure 5.1.2).



If the two halves of the tooling jaws do not come in contact (end to end) to form the proper test specimen, then adjust the knurled bridge nut counterclockwise to allow the left tooling jaw to move further right on the lower heating block.

24. Using the handle on the left side of the upper heating block, gently lower the upper heating block to the closed position. Before starting the next test, allow time for the upper and lower heating blocks to reach and stabilize at the selected operating temperature. The “SV” temperature should equal the “PV” temperature displayed by the temperature controller.
25. The strength machine is ready to run another hot shell tensile test.

6 Maintenance and Calibration

6 Maintenance and Calibration



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, turn off the Lock-Out air supply valve, remove the electrical power cord from the wall receptacle and allow the Heating Block Assembly to cool off to ambient temperature. The Hot Shell Tensile Accessory and Electronic Universal Sand Strength Machine must be put into Zero Mechanical State (ZMS). Follow **Lockout and Tagout** procedures before servicing.*



*Replace all panels before operating the machine. A hazardous voltage is present, can cause **shock** or **burn**, and will result in serious injury.*

6.1 Maintenance

1. Daily, remove any loose sand/dirt from the outside of the Control Cabinet and Heating Block Assembly.
2. When required, clean any shell resin build-up/residue from the working surfaces of the upper and lower heating plates and tooling using a light rubbing action with fine grade steel wool.

3. Every 6 months or when required, verify the position of the upper heating block in relation to the top surface of the tooling jaws installed onto the lower heating block. The upper heating block must not touch the sand specimen or tooling. The distance between the upper heating block and the sand specimen/tooling should be approximately $3/32''$ (2.5 mm). If required, use the adjusting screw located on the right side of the Heating Block Assembly (Figure 6.2.1) to adjust the location of the upper heating block relative to the lower heating block. (If performing the alternate test without the upper heating block, this step does not apply.)

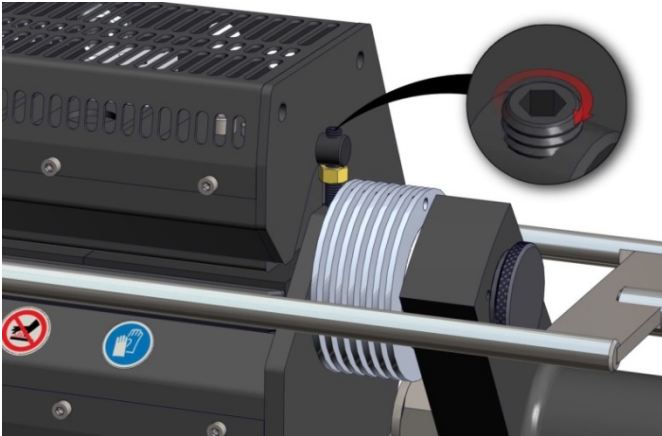


Figure 6.2.1

6 Maintenance and Calibration

6.2 Calibration

6.2.1 Force Calibration

The electronic load cell on the Electronic Universal Sand Strength Machine, Model 42104, should be calibrated once every six months. Refer to the operations manual for the Electronic Universal Sand Strength Machine for the equipment required and force calibration procedures.

6.2.2 Temperature

The actual temperature of the upper and lower heating block should be verified with a surface pyrometer. Make certain that the SV equals the PV temperature on the temperature controller (Figure 2, Item 1) before performing this check. Check the temperature on the surface of the upper and lower heating blocks at the point where the right and left tooling jaws join (sand specimen failure point).

7 Apparatus Layout

7.1 Hot Shell Tensile Accessory

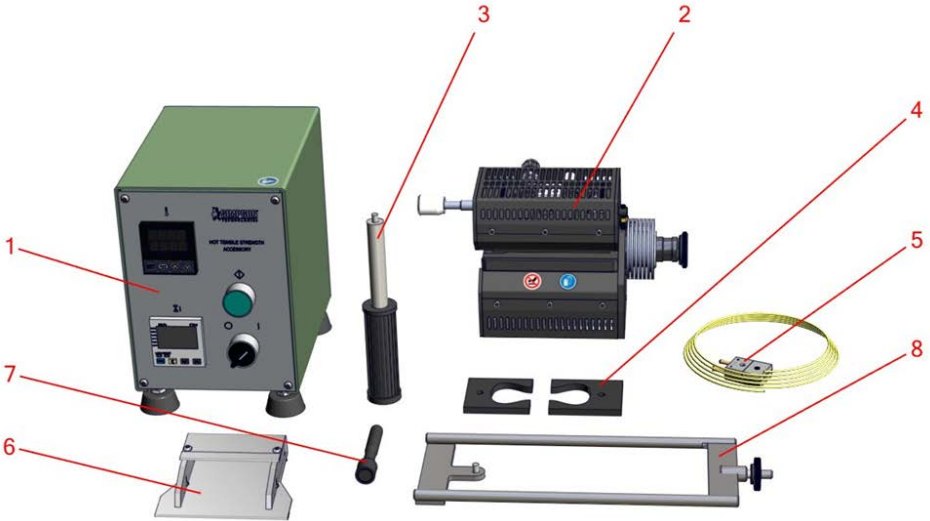


Figure 1: Hot Shell Tensile Accessory Components

Item	Description
1	Control Cabinet
2	Heating Block Assembly
3	Lifting Handle
4	Tooling - (2) Right and Left
5	Data Cable
6	Hopper / Striker
7	Magnetic Tool Extractor
8	Bridge



Figure 2: Front View - Control Cabinet

Item	Description
1	Temperature Controller
2	Timer
3	Start Button
4	Power Switch



Figure 3: Back View - Control Cabinet

Item	Description
1	Main Power Cord Inlet
2	(2) Power Connect to Heating Block Assembly
3	Thermocoupler Connection
4	Communication RS232 Port
5	Fuse Holder

7 Apparatus Layout

7.2 Reference Apparatus Layout - Electronic Universal Sand Strength Machine

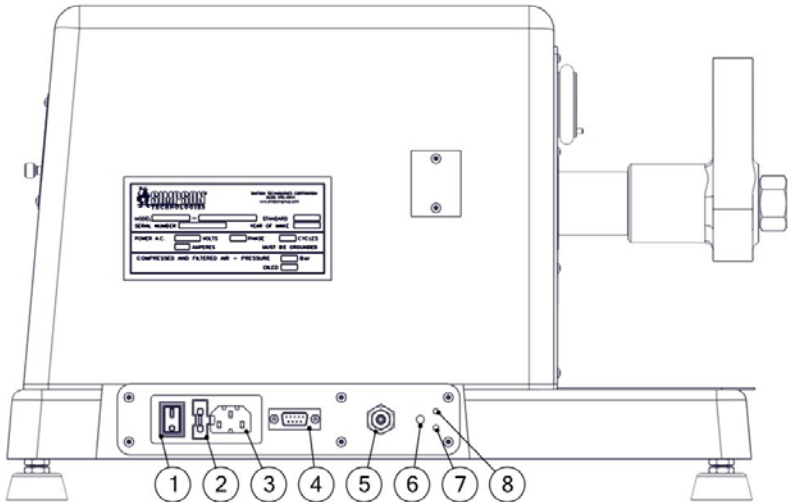


Figure 4: Back View - Electronic Universal Sand Strength Machine (Model 42104)

Item	Description
1	Power Switch
2	Fuse Holder
3	Power cord Receptacle
4	RS232 Port
5	Pneumatic Input
6	Vent Port
7	Vent Port
8	Vent Port

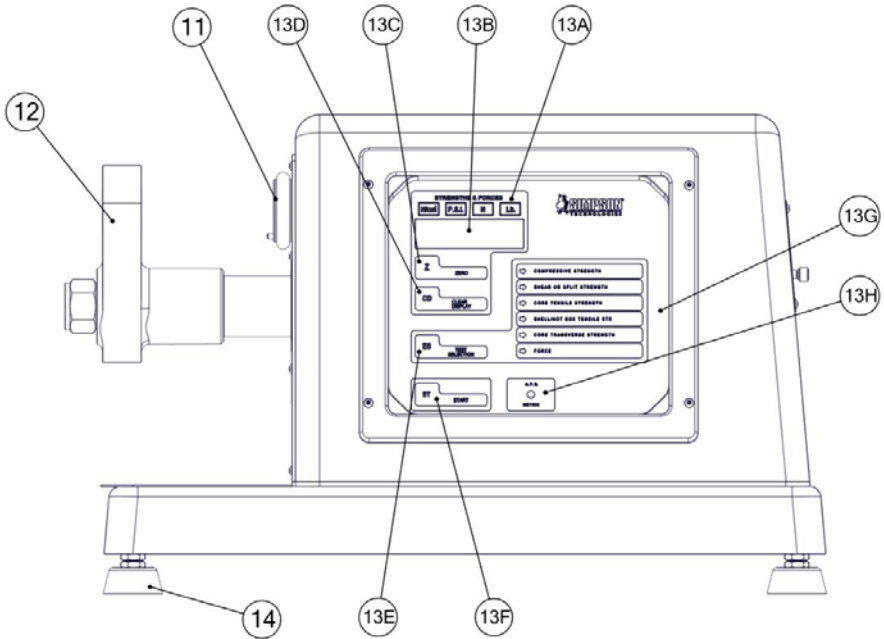


Figure 5: Front View - Electronic Universal Sand Strength Machine (Model 42104)

Item	Description
11	Stationary Clamp Holder
12	Moveable Clamp Arm
13	Electronic Panel
13A	Units of Measure Display
13B	Digital Display
13C	Zero Button
13D	Clear Display Button
13E	Test Selection Button
13F	Start Button
13G	Test Selection Indicator
13H	Standard Selector Switch
14	Adjustable Foot (4)

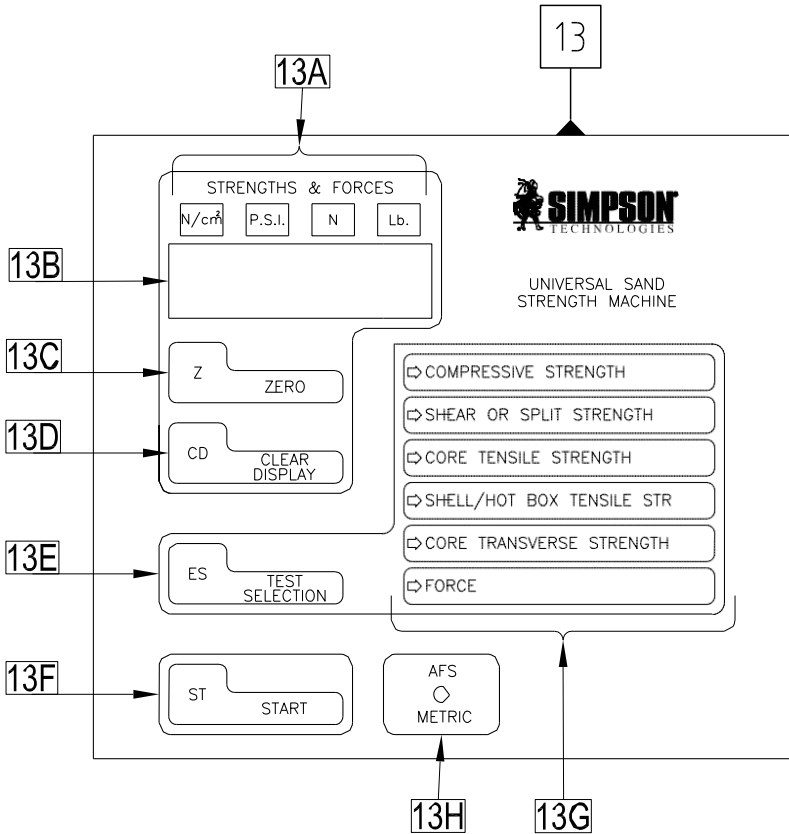


Figure 6: Electronic Panel Detail View - Electronic Universal Sand Strength Machine (Model 42104)

Item	Description
13A	Units of Measure Display
13B	Digital Display
13C	Zero Button
13D	Clear Display Button
13E	Test Selection Button
13F	Start Button
13G	Test Selection Indicator
13H	Standard Selector Switch

8 Parts List / Ordering Parts / Returns

8.1 Spare 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
0031-100	Heating Cartridge
206705	Heating Cartridge For 220V Unit
0031-101	Bridge
0031-102	Core Box Tooling (AFS)
215633	Core Box Tooling (Metric)
0031-110	Hopper / Striker
0031-111	Magnetic Tool Extractor

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 service@simpsongroup.com.

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 service@simpsongroup.com. 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 personnel and follow safety procedures, applicable local policies, and regulations in decommissioning the Hot Shell Tensile Accessory 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 consists of:

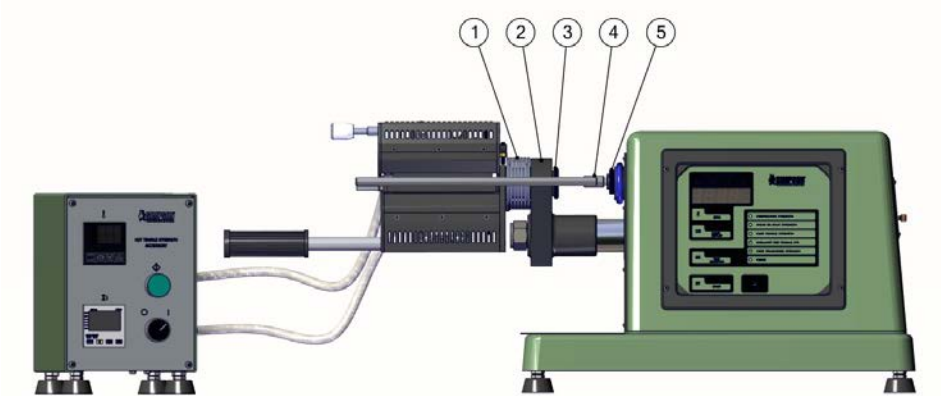
- Iron
- Aluminum
- Copper
- Plastic
- Electronic Components

Dispose of the parts in accordance with the applicable regulations.

10 Drawings

10 Drawings

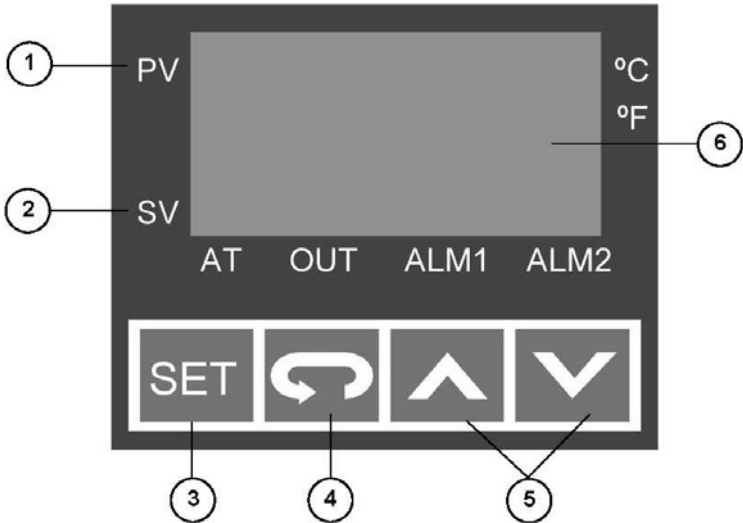
10.1 Assembly Drawing - 42104MAN: Hot Shell Tensile Accessory on Model 42104



11 Commercial Manuals

11.1 Instruction Delta Temperature Control DTB 4848 – Adjust Temperature

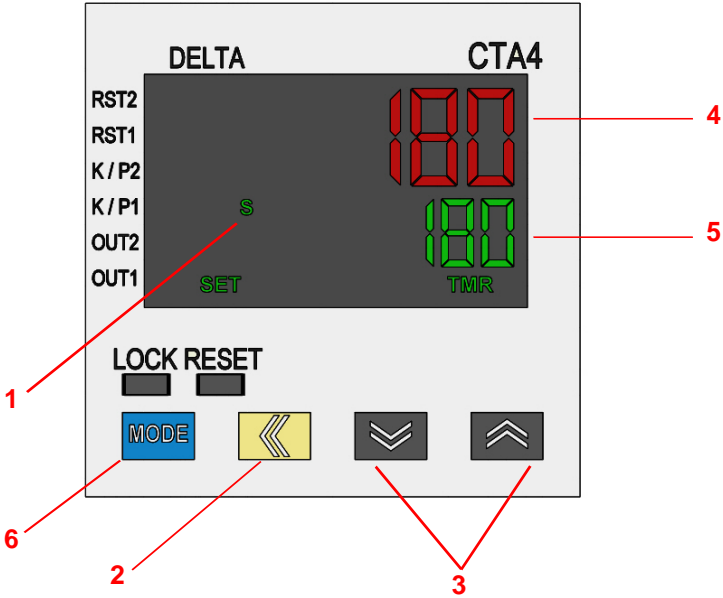
1. Turn on power switch of the equipment.
2. The Temperature Default is in °C.
3. To change the temperature Set Value “SV”, press either UP or DOWN arrow (Item 5).
4. The display LED’s for the Set Value “SV” will go from solid to flashing rapidly.
5. Use the UP or DOWN arrows (Item 5) to change the number to the desired value (Holding the buttons down continuously will result in rapid change of the value).
6. Once the desired value is established, press the set key (Item 3) to save the changes and the numbers will return to normal NON-FLASHING numbers.
7. The unit is now ready to start.



Item	Description
1	“PV” Process Value (Actual Temperature)
2	“SV” Set Value (Desired Temperature)
3	“SET” button, Use it to Save the Changes.
4	Select “FUNCTION” Button
5	UP and DOWN Arrow Buttons
6	Display Window (SV & PV)

11.2 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.
3. Press the yellow, left arrow button (Item 2) to enter the set mode. The first digit to the right column on the Set Value Display (Item 5) will begin to flash.
4. Press the UP or DOWN arrow buttons (Item 3) 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) to set the time.
8. The unit is now ready to start.



Item	Description
1	Seconds
2	Left Arrow Button
3	UP and DOWN Arrow Buttons
4	Present Value Display
5	Set Value Display
6	Mode Button

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In North America

Simpson Technologies

2135 City Gate Lane Suite 500

Naperville, IL 60563

USA

Tel: +1 (630) 978 0044

sandtesting@simpsongroup.com



In Europe

Simpson Technologies GmbH

Thomas-Eißer-Str. 86

D - 53879 Euskirchen,

Germany Tel: +49 (0) 2251 9460 12

sandtesting@simpsongroup.com

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