SIMPSON
A Norican Technology

Operating Instructions

Test Pieces Blower

Model 42109

Type:	Test Pieces Blower
Model Number:	42109
Part Number:	0042109-ASM 0042109-220-ASM 0042109-M-ASM
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 simpsongroup.com on the Contacts page.

This document is strictly confidential.

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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 Test Pieces Blower 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

The Test Pieces Blower, Model 42109, is intended exclusively for the preparation of test specimens made from chemically bonded foundry sands used for tensile and transverse strength testing. 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 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 personal 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 without 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.

1.3 Before First Use

NOTICE

When machine heaters are first used, some smoking may occur from the heater blocks. This is normal. This is the oils in the metal burning off and will subside after several hours of operation.

NOTICE

When the larger specimen tooling is used for hot box, the rubber seal on the one side of the tooling must be removed.

If the heaters are used on this machine for shell or hot box specimens, the gassing/purging device 42109B MUST be removed. Also, if the large specimen tooling is used for hot box, the rubber seal on the one side of the tooling must be removed.

NOTICE

The right heater must then be readjusted so the blowing hole of the sand cartridge aligns with the blowing hole of the tooling. If the heat deflection plate that is attached to the sand cartridge arm has been removed, it must be reinstalled onto the sand cartridge arm using the two supplied bolts.

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 is intended. Improper use could result in death or serious injury.

2.1 Safety Sign 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.

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 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.

2.1.2 Safety Symbol Labels

DO NOT TOUCH – HOT SURFACE

(STC #214045)

This label is located on the left heating plate of the Test Pieces Blower.

Both heating plates are extremely hot and can cause severe burn to body parts. Follow **Lockout and Tagout** procedures before servicing.

HAND CRUSH / FORCE FROM LEFT

(STC #214047)

This label is located on the pedestal that supports the pneumatic cylinder.

The left heating plate moves toward the right (stationary) heating plate to clamp the specimen tooling and can crush body parts. Follow **Lockout and Tagout** procedures before servicing.

WEAR PROTECTIVE GLOVES

(STC #214044)

This label is located on the right (stationary) heating plate.

The heating plates, the sand specimen and the specimen tooling are hot and may produce serious **burns** on unprotected skin. Follow safety working procedures when operating the Test Pieces Blower and **Lockout and Tagout** before servicing.

WEAR EYE PROTECTION

(STC #214075)

This label is located on the pedestal that supports the sand cartridge arm.

When operating the Test Pieces Blower, sand blows from the sand cartridge into the specimen tooling. Sand may blow-off to the surrounding area and may get into the eyes and may irritate or damage the eye. Follow **Lockout and Tagout** procedures before servicing.

ELECTRIC SHOCK / ELECTROCUTION

(STC #214043)

This label is located on the top of the unit on the back of the control panel.

With the top and side panels removed, the electrical power supply and 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.

EXPLOSION / RELEASE OF PRESSURE

(STC #217945)

This label is located on the top of the unit on the back of the control panel by the pneumatic tubing connection.

With pneumatic pressure present, disconnecting or cutting the pneumatic tubing will release the pressure contained within the tubing. Blown-out air with or without solid particles in the air stream may get into the eyes and may irritate or damage the eye. Follow Lockout and Tagout procedures before servicing.

READ AND UNDERSTAND ALL SERVICE MANUAL INSTRUCTIONS

(STC #214042)

This label is located on the pedestal that supports the sand cartridge arm.

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 maintenance (routine or otherwise) or repair of equipment, a safety procedure should be established and maintained. This procedure should include: Training of all personnel involved with the equipment; 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.

"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 a 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 or pieces of equipment, machinery or system. These individuals 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 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.

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, which 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 Application

The Test Piece Blower, Model 42109, is used to make standard tensile, transverse (except cold box) and hot distortion test pieces and has been designed to perform similar to plant conditions, since blowing is the most commonly employed ramming method for molding chemically bonded sands.

3.2 Description

The Test Pieces Blower, Model 42109, blows any type of specimen for tensile, transverse, hot distortion and cracking tests, for the control of chemically bonded sands. As standard equipment, it is supplied with heating plates for curing of shell sands and hot box sands.

Specimens are broken cold, except when the cracking test or the hot distortion tests are performed. For these tests the specimens are heated.

Test Pieces Blower, Model 42109, has been designed so the control of sands and binders is performed under conditions similar to those of plant operation, considering that blowing is the most widely used compacting method for chemically bonded sands.

The operation of the instrument is done via a single lever that controls the movement of the tooling and the sand blow. Provided that the necessary core box tooling and accessories are available, test specimens can be prepared for:

- Tensile strength – shell sand
- Cold Tensile strength, hot and warm box
- Transverse strength/hot distortion – shell sand
- Disc transverse strength hot and warm box (special tooling is required for sample preparation – requires *Disc Transverse Tooling, Model 42109C*).

To help maintain repeatability, specimen dimensions are kept within narrow margins and blowing and curing conditions are constant on the Simpson Test Pieces Blower.

3.3 Equipment Features

1. Two column blower with pneumatic valve (Item 8, Figure 3) controlling and sequencing all the operational steps. The blowing pressure is regulated by means of a built-in air regulator with gauge (Items 2, and 1, Figure 3).
2. Cabinet for temperature and time control. Both operating temperature and dwell times are chosen by the operator. The cabinet consists of:

- Timer (Item 6, Figure 3) variable from 0.05 up to 180 hours.
- Temperature regulator (Item 5, Figure 3) ranging from 0 up to 1,000 degrees centigrade (with actual and set temperature reading), protected against damage to the thermocouple. Precision 2% of full scale.

For the maximum operating temperature that the equipment can be set, see table in section 3.4.

3. The timer activates a buzzer (Item 9, Figure 4) when the curing time is complete. After the desired dwell time, the core box is manually extracted.

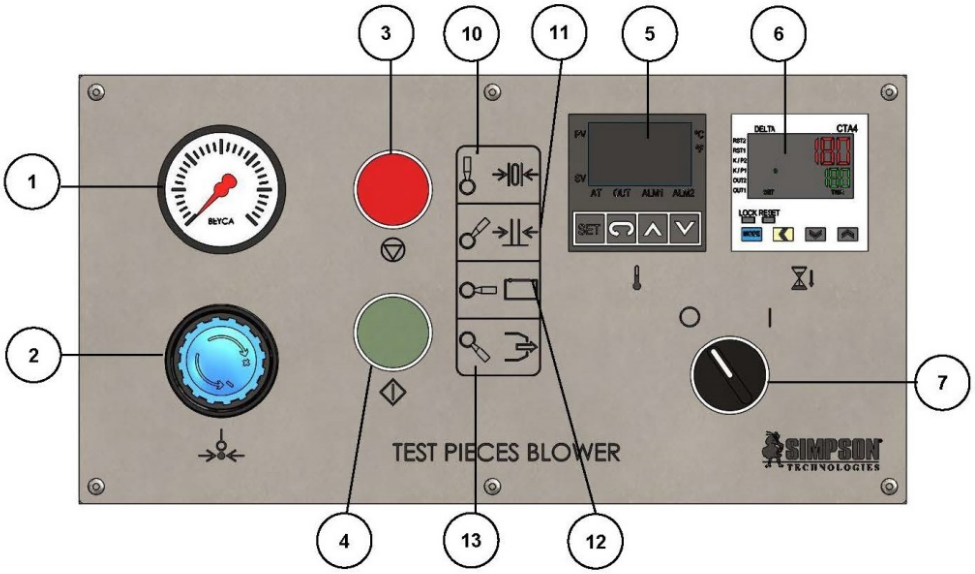

Figure 1: Front View – Test Pieces Blower

Item	Symbol	Description
1	-	Air Pressure Gauge
2		Blowing Pressure Regulator
3		Stop Button
4		Start Button
5		Temperature Control
6		Timer
7		Main Power Switch
10		OPEN Position Heating Plates
11		CLOSED Position Heating Plates
12		Clamp Cartridge Position
13		Blowing Position

Figure 2: Rear View - Test Pieces Blower

Item	Symbol	Description
14		Lubricated Air Inlet
15		Dry Filtered, Regulated Air Inlet

3.4 Specifications, Dimensions and Weights (Approximate)

Specifications	Standard Test Pieces Blower
Length	432 mm (17 in.)
Width	406 mm (16 in.)
Height	584 mm (23 in.)
Weight	47 kg (104 lbs.)
Power	120-230 VAC 50/60 Hz
Compressed Air	6.5 bar (95 psi)
Maximum Operating Temperature	350° C

3.5 Additional Accessories Available

- AFS Core Tensile Strength Tooling

  Part Number: 0026-132
- AFS Shell Tensile Strength Tooling

  Part Number: 206602
- AFS Shell Transverse Strength Tooling

  Part Number: 206604
- AFS Disc Transverse Tooling

  Part Number: 0042109C
- AFS 1.125 x 2” Cylindrical Specimen Tooling

  Part Number: 0042109D
- Metric Core Tensile Strength Tooling

  Part Number: 0026-132-M
- Metric Shell Tensile Strength Tooling

  Part Number: 206603
- Metric Shell Transverse Strength Tooling

  Part Number: 206605

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 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 Test Pieces Blower, Model 42109, is shipped in one piece and is intended to be used as received; no further assembly/disassembly is required. No lifting equipment is required for handling. The machine weighs approximately 47 kg (104 lbs.). Due to its bulky dimensions and tight fitting shipping crate, it is recommended that two people should be utilized. The approximate instrument dimensions are 432 mm x 406 mm x 584 mm (17 in. x 16 in. x 23 in.).

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 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 Test Pieces Blower from the packing crate and place on a stable bench.
3. Once removed from the crate, proceed by taking off any protective wrap and unpack 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.

4.2 Components

Your new Test Pieces Blower is shipped with the following accessories and installation components. Please take a moment to identify that the following items were included:

- 217642 – Blowing Cartridge (for shell Sand)
- 217643 – Dry Mixture Screen (perforated)
- 6.1 mm O.D. x 4.0 mm I.D. Plastic Tubing

Tools included with 0042109-ASM

- 206602 – Tooling AFS Cold Shell Tensile.
- 206604 – Tooling AFS Shell Transverse.

Tools included with 0042109-220-ASM

- 206603 – Tooling Metric Cold Shell Tensile.
- 206605 – Tooling Metric Shell Transverse.

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, claim under guarantee will no longer be considered.

4.3 Installation

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

In order to guarantee effective performance, the Test Pieces Blower should be suited close to the other sand testing equipment and compressed air source.

The pneumatic supply should be dry and clean from contaminants. While a regulator/lubricator/filter are supplied, damage to the machine will result and void any warranty if high levels of moisture and contaminants are allowed to infiltrate the machine.

The Test Pieces Blower would likely be occupied by one operator at a time. It is used in a foundry sand laboratory, with its operation display and control buttons placed at about eye level for the operator. It should be placed in an ergonomically correct position to allow the operator to comfortably handle the sand sample as well as the control buttons.

Although it is not required that the machine is perfectly level in order to operate, it should be in a level condition. Place a bubble level on top of the machine housing and check level from side to side and front to back.

4.4 Electrical and Pneumatic Power Connection

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

Connect the equipment to a grounded electrical outlet.

Pneumatic Requirements: Compressed air that is filtered and regulated to 6.5 bar (94 psi).

Before connecting the equipment, an approved pneumatic safety Lockout air valve must be installed in the supply air line. This item is not supplied with the Test Pieces Blower and is the responsibility of the customer to provide and install.

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.

A pressure regulator/filter/lubricator and length of pneumatic hose, required to connect the Test Pieces Blower to the regulator/filter/lubricator, has been included with the Test Pieces Blower.

NOTICE

The compressed air should be free of dirt, debris and moisture. Debris and moisture will cause damage to the Test Pieces Blower.

NOTICE

Do not operate the Test Pieces Blower without first filling the pneumatic lubricator with standard pneumatic tool oil/lubricant and setting the proper oil addition rate on the pneumatic lubricator. Failure to properly set up the pneumatic lubricator will result in erratic operation and will prematurely destroy the cylinder seal kit and potentially damage the cylinder.

4.5 Connecting Power and Set-up

1. Verify the voltage on the specification plate located on the back of the Test Pieces Blower. Connect the power cable supplied with the blower into the power plug receptacle located on the back of the Test Pieces Blower (Item 16, Figure 4).

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

2. 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 Test Pieces Blower. This device will help to ensure the proper performance of the Test Pieces Blower.

3. Assemble the provided pneumatic regulator/filter/lubricator according to the original equipment manufacturer's instructions supplied with the regulator/filter/lubricator.
4. Connect the Test Pieces Blower to the pneumatic regulator/filter/lubricator using the pneumatic air hose and fittings included with the unit.
5. Connect the air hose from the outlet of the regulator/filter/lubricator to the air inlet. There are two air inlets on the right side of the back of the cabinet:
    - The upper right (Item 15, Figure 4) inlet is for the blowing air, which must be filtered and free of lubricant oil.
    - The lower right (Item 14, Figure 4) inlet is for the actuating air, which must be filtered and lubricated.
6. Secure the air hose to the air inlet with the provided connector that is attached to the air inlet. Refer to the manufacturer's manual for detailed instructions.
7. Turn on the air supply. Using the supplied air regulator/filter/lubricator adjust the air pressure to 6-7 bar (90-105 PSI). Refer to the manufacturer's manual for the regulator/filter/lubricator for instructions on regulating air pressure.

4.6 Airborne Noise Emission

Regarding airborne noise emission by the Test Pieces Blower, Model 42109, there is no motor or other noise emitted by this machinery other than the sound of air released through the sand cartridge as it blows the sand to the specimen tooling. As such, the equivalent continuous A-weighted sound pressure level at the workstation does not exceed 70 db(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 Operation for Heat Cured Resins

1. Switch the power on using the power switch (Item 7, Figure 3).
2. Open the airline valve to allow air to flow to the air regulator and Blower. Determine the blowing pressure and set the blowing pressure air regulator valve (item 2, figure 3) by turning the knob left or right while observing the air pressure gauge (item 1, figure 3). The air regulator has a locking knob. Pull the knob out to unlock or push in to lock
3. Set the desired temperature on the temperature regulator (Item 5, Figure 3) Temperature setting instructions can be found in section 10.2, ½ hour to 1 hour is necessary for the temperature to reach and stabilize at the set temperature set on the temperature controller.

NOTICE

When machine heaters are first used, some smoking may occur from the heater blocks. This is normal. This is the oils in the metal burning off and will subside after several hours of operation.

The maximum operating temperature that the equipment can be set is 350°C.

Wear Protective Gloves. The heating plates, the sand specimen and the specimen tooling are very hot and may produce serious burns on unprotected hands.

1. Place the selected tooling accessory that has been treated with a releasing agent between the heating plates. Placement against the right plate with the bottom of the tooling resting on the position bolts is best. Then close the left plate onto the tooling accessory by setting the pneumatic operation selector lever (Item 21, Figure 3) from the plate open position(Item 10, Figure 3) to the Plate closed position (Item 11, Figure3).
2. Set the desired dwell time (heat time) with the timer (Item 6, Figure3). Refer to timer operation section 10 for adjustment procedure.
3. Rotate the cartridge arm (Item 18, Figure 3) so access to remove the sand cartridge can be made. The heat deflector plate will be just above the heating plates when moved. Remove the sand cartridge (Item 19, figure 3) from the cartridge arm (Item 18, Figure 3).
    - For shell sand testing the six hole deflector plate must be in place at the bottom of the sand cartridge, without this deflector sand will flow through the bottom hole freely.
    - For hot box, silicate and cold box applications this plate must be removed due to the reduced flow of these types of binder sand samples.

To remove this plate the cartridge can be turned over and a gentle tap on a hard surface will help the plate to fall out of the cartridge. When replacing this deflector plate make certain that it is seated securely on the bottom of the cartridge.

NOTICE *Do not leave sand cartridge (Item 19, Figure 3) over heating plates when not blowing specimens. The heat from plates will cure the sand in the cartridge blowing hole, plugging it up.*

1. Fill the cartridge with the sand being used to create the sample wanted for testing.
2. Replace the cartridge into the cartridge arm (Item 18, Figure 3).

3. Rotate the cartridge arm into position so the cartridge aligns over the top of the tooling accessory and stops (Item 20, Figure 3).
4. Move the pneumatic operation lever (item 21, Figure 3) to the position that will lower the blower piston (item 12, Figure 3) onto the blowing cartridge.

5. Move the pneumatic operation lever (item 21, Figure 3) to the blowing position (Item 13, Figure 3) and wait 3-5 seconds until the tooling is filled with sand. Then return the pneumatic operation lever (item 21, Figure 3) to the blower piston clamping position (item 12, Figure 3) and then to the Heating Plate close position (Item 4, Figure 3).
6. Push the start button (Item 4, figure 3), observe that the timer has started, and then move the cartridge arm (Item 18, figure 3) out and away from the tooling to the loading position.
7. Once the timer has counted down the set time the alarm will sound (Item 9, figure 4). Press the stop button (Item 3, Figure 3).

NOTICE *Do not leave the cartridge arm (Item 19, Figure 3) in the position that will lower the blower piston (Item 12, Figure 3) onto the blower cartridge. This will cause the sand residue in the cartridge to harden and obstructing the orifice.*

1. While holding the handle of the tooling with the left hand, rotate the pneumatic operation lever (item 21, Figure 3) to the plate release position, or start position, (Item 10, Figure3). Failure to hold the tooling handle may result in the tooling dropping out of position and damaging the sample and tooling.
2. The left heating plate will move and the tooling accessory can then be removed and the sample can be extracted.
3. Repeat the cycle for the additional sample making.

It is recommended to keep the specimen tooling clamped between the heating plates in order to assure temperature evenness on all surfaces contacting the specimen.

Wear Protective Gloves. The heating plates, the sand specimen and the specimen tooling are very hot and may produce serious burns on unprotected hands.

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.

Despite its robust construction, the Test Pieces Blower, Model 42109, is a precise mechanical/electronic measurement device and needs appropriate care.

Before performing any maintenance, turn-off the Lockout air supply valve and remove the electrical power cord from the wall receptacle. The Test Pieces Blower 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 electric shock or burn, and will result in serious injury.

- Make certain the air entering the equipment is condensate free and that the lubricator in the air line is connected to the correct air inlet of the equipment.
- Lubricate the bushing of the support arm on the right column weekly, using light machine oil (3 in 1).
- Keep the heating plates and core boxes clean of spent sand and binder. Clean heating plate surfaces and core boxes with fine steel wool to remove build up binder residue.
- Keep the area around the left heating plate piston clean to facilitate heating plate movement.

7 Apparatus Layout

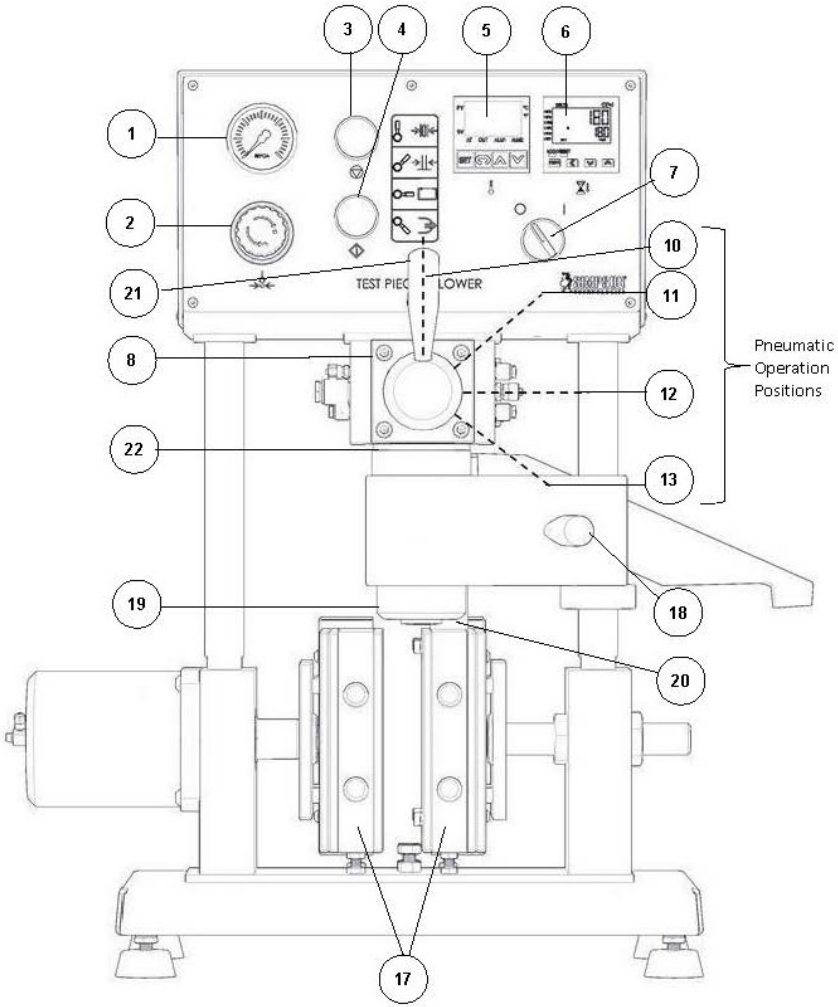

Figure 3: Front View – Test Pieces Blower

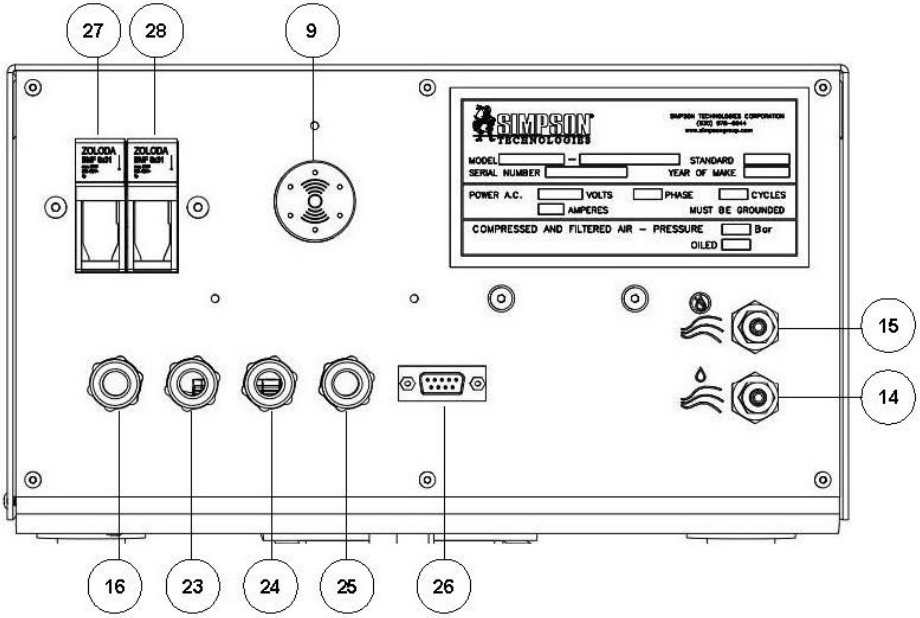

Figure 4: Rear View - Test Pieces Blower

7.1 Legend – Figure 3 and Figure 4

Item	Description	
1	Air Pressure Gauge	
2	Blowing Pressure Regulator Valve	
3	Stop Alarm Button	
4	Start Button	
5	Temperature Control	
6	Timer	
7	Main Power Switch	
8	Manual Central Valve Body	
9	Alarm	
10	OPEN Position Heating Plates	Pneumatic Operation Positions
11	CLOSED Position Heating Plates	
12	CLAMP Cartridge Position	
13	Blowing Position	
14	Lubricated Air Inlet	
15	Dry Filtered, Regulated Air Inlet	
16	Power Cord	
17	Heating Plates	
18	Cartridge Support Arm	
19	Blowing Sand Cartridge	
20	Cartridge Stop	
21	Pneumatic Operation Selection Lever	
22	Cartridge Clamp	
23	Thermocouple Connection	
24	Heating Plate Connection	
25	Heating Plate Connection	
26	9-pin port (used only for connection of multi-wire cable for use with 42109A or 42109SO_2 units)	
27	Fuse - 10 amp	
28	Fuse - 10 amp	

7.2 Blowing Sand Cartridge Assembly

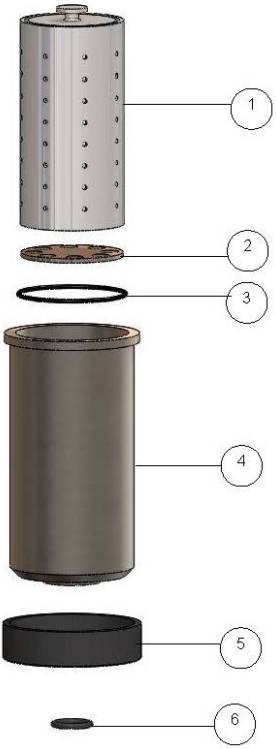

Figure 5

Item	Part Number	Description
1	206612	Auxiliar Wet Mixture Canister
2	217643	Dry Mixture Screen
3	217675	O-Ring for Cartridge
4	217642	Blowing Cartridge
5	217626	Rubber Cushion
6	217657	O-Ring for Cartridge

7.3 Air Regulator / Filter / Lubricator

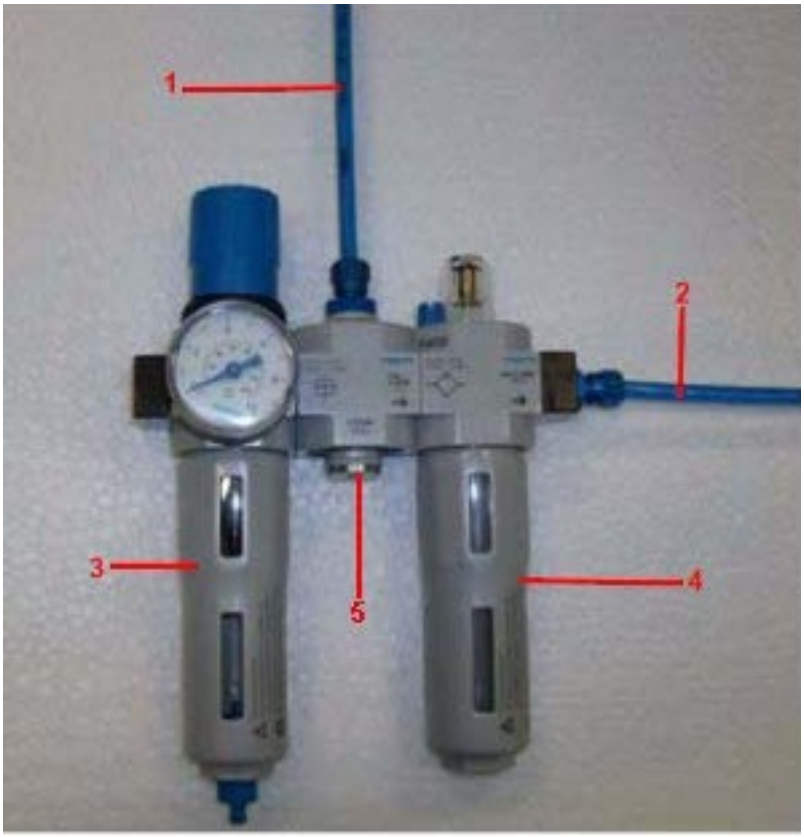

Figure 6

Item	Part Number	Description
1	-	Dry Air
2	-	Lubricated Air
3	42150B	Pneumatic Filter Regulator
4	42150C	Pneumatic Lubricator
5	42150H	Branching Module

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 Number	Description
0026.132	AFS Core Tensile Strength Tooling
206602	AFS Shell Tensile Strength Tooling
206604	AFS Shell Transverse Strength Tooling
0042109C	AFS Disc Transverse Tooling
206612	Auxiliar Wet Mixture
217642	Blowing Cartridge
217643	Dry Mixture Screen (Perforated Baffle Plate)
0026-132-M	Metric Core Tensile Strength Tooling
206603	Metric Shell Tensile Strength Tooling
206605	Metric Shell Transverse Strength Tooling
217657	O-Ring – Sand Cartridge to Heating Block
217675	O-Ring in Sand Cartridge
217630	Seal – Clamping Piston to Sand Cartridge
217626	Sand Cartridge Rubber Collar

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/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 Test Pieces Blower and peripheral equipment.

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

Air Supply: Shut-off all plant airlines supplying air to the pneumatic components and bleed the downstream air lines before dismantling.

WASTE DISPOSAL

The Machinery and Controls Consists of:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic Components and Circuit Boards

Dispose of the parts in accordance with the applicable 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.
3. Press the yellow, left arrow button (Item 2, Figure 7) to enter the set mode. The first digit to the right column on the Set Value Display (Item 5, Figure 7) will begin to flash.
4. Press the UP or DOWN arrow buttons (Item 3, Figure 7) 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 7) to set the time.
8. The unit is now ready to start.

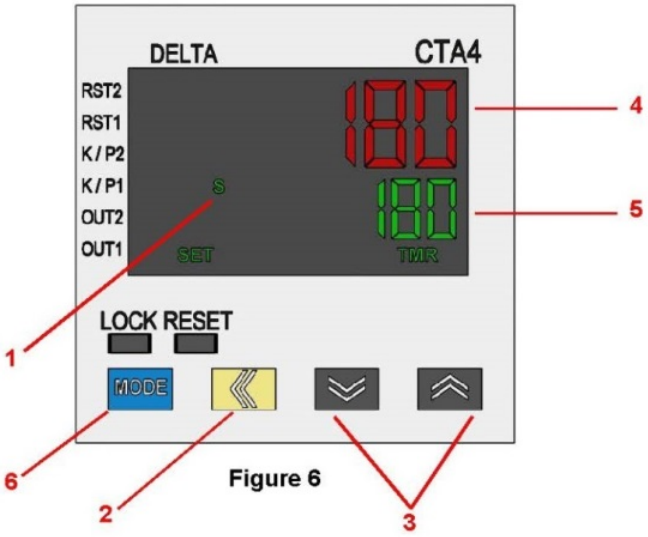

Figure7: Front View – CTA4 Timer Control

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

10.2 Instructions Delta Temperature Controller

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, Figure 8).
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, Figure 8) 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, Figure 8) to save the changes and the numbers will return to normal NON-FLASHING numbers.

For the maximum operating temperature that the equipment can be set, see table in section 3.4.

7. The unit is now ready to start.

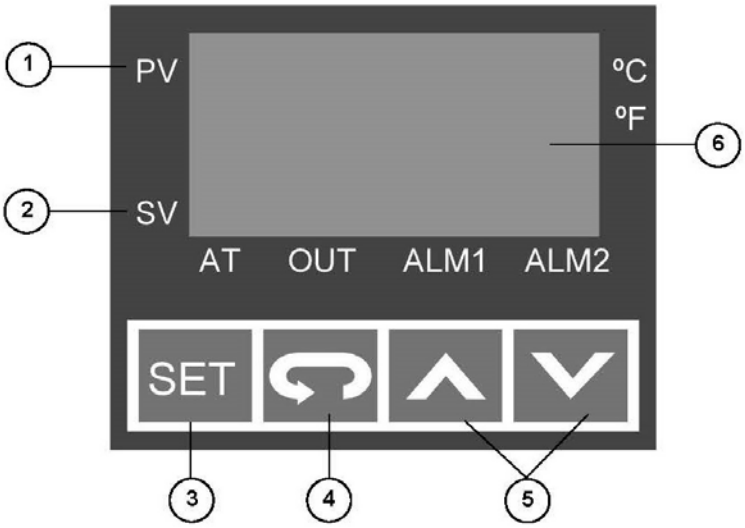

Figure 8: Front View – Temperature Controller

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)

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