

Atlas™ Series Heated Platens

User Manual



List of Safety Symbols

This manual should be consulted when any of the Safety Symbols below appear, in order to understand the nature of the Hazards and any actions to be taken in order to avoid them.

Safety Symbol	Meaning
	Caution. (Reference ISO 7000-0434B, 2004-01)
	Caution – Hot Surface. Reference IEC 60417-5041, 2002-10)
	Caution – Possibility of Electric Shock
	Indoor Use Only

Electrical Safety



Warning: The temperature controller supplied with the accessory is of Class 1 (earthed) construction and must be connected to an earthed mains socket outlet.



Warning: The mains plug from the temperature controller must be removed from the outlet socket before cleaning. Clean only with a soft cloth, lightly moistened with water.



Warning: Do not position the equipment so that it is difficult to access the disconnecting device (Mains plug and/or appliance coupler) when in use. Only use a main outlet socket that is accessible during operation.



Warning: Only use a suitably rated and approved mains cord set (power cable) acceptable for the local national regulations and standards.



Warning: Do not operate the appliance with a broken cord or plug, or if the appliance malfunctions, or is dropped or damaged in anyway.

General Safety



Warning: This product is intended for Indoor use only – do not use outdoors or in damp areas.



Warning: If the heating of materials could lead to the liberation of hazardous substances, explosion or implosion, then an extraction system and/or a temperature limiting device, relating to the materials and safe temperatures for the materials used, should be installed.



Caution: Always follow local laboratory safety protocols and procedures when using potential toxic or flammable substances within this equipment.



Caution: The equipment is intended for use by suitably trained personnel only.



Caution: Always wear adequate PPE gloves when handling the platens and when cleaning.



Caution: No user serviceable parts within, contact the manufacturer or approved service agent for advice if the product is not functioning correctly or is visibly damaged.



Caution: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired



Warning: Risk of burns when operated at high temperatures on accessible parts surrounding the assembly.



DO NOT exceed a load of 15 tons with the Atlas™ Series Heated Platens. It is very important that any applied load is spread over the whole surface area of the platen faces. Localised “point loading” could cause damage to the heated platens.



DO NOT attempt to press potentially explosive materials.



DO NOT attempt to press potentially combustible materials, or materials with a low flash point temperature.



DO NOT use the heated platens without continuous flow cooling water. Water flow must be always on to avoid overheating the heated platens and risk of damage.



Warning: If the cooling water flow is interrupted, the in-line flow safety cut out switch will switch off power to the platens. **DO NOT** re-establish a water flow until the heated platens actual temperature falls below 80°C.



DO NOT touch the heated platen heated surfaces with bare hands. They may be VERY HOT! Samples may take longer to cool than the heated platens themselves. Use a sample handling tool or wear suitable gloves to avoid the risk of burns to hands.



DO NOT attempt to remove the thermocouple connection from the lower heated platen assembly. Removal will cause permanent damage to the heating elements in the heated platens.



DO NOT obscure or block the ventilation openings on the sides or rear of the temperature controller during operation.

End of Lifetime Equipment Use



If any parts have reached their limit of lifetime and need to be replaced, use appropriate WEEE and other local regulations for the safe disposal of electrical equipment and toxic chemicals.



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2I-15515 Issue 24

Atlas™ Series Heated Platens P/N GS15515

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1. Introduction

Thank you for buying a Specac product.

The Atlas™ Series Heated Platens (P/N GS15515) are designed to provide heated pressing surfaces at up to 300°C temperature, with a load bearing capacity up to 15 tons. They are compatible with the following models of Specac press:

Atlas™ Manual Hydraulic Press (15T or 25T)

Atlas™ Power Press (8T, 15T, or 25T)

Atlas™ Autotouch Press (8T, 15T, or 25T) *Not the 40T version

The heated platens are easily installed into the press by replacing the upper pressing face bolster fixing in the leadscrew with the top heated platen assembly and placing the lower heated platen assembly over the lower pressing piston bolster face of the press.

Note: *An Atlas™ Manual 15T Hydraulic Press (P/N GS15011) has been used as an example press for installation of the Atlas™ Heated Platens, but these instructions can be applied for installation into the Atlas™ Power and Autotouch Presses if required to use for any heated pressing applications.*

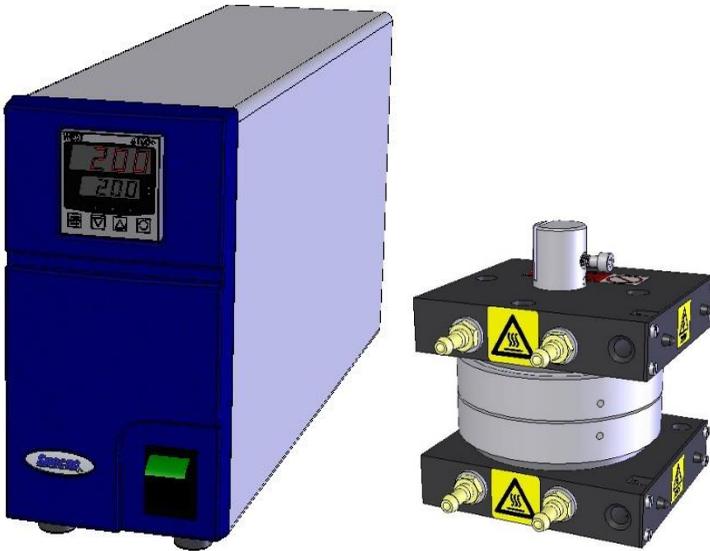
The Atlas™ Heated Platens are controlled for temperature by their own dedicated automatic temperature controller with a stability of $\pm 1^\circ\text{C}$. The heated platens and the controller are matched as a system for operation from a 220-240 volts or 100-110 volts mains supply. Only the lower heated platen assembly is fitted with a permanent K-type thermocouple that monitors the temperature close to the pressing surface of the top and lower heated platens. The support cooling blocks of the heated platen surfaces that connect to the press, are water cooled to isolate the press from any direct heating effect of the platens and to allow for efficient heating and cooling cycles of operation. An in-line safety cut out switch is incorporated into the cooling water flow tubing to turn off power to the heated platens if the water supply is cut or interrupted.

User Manual

The Atlas™ Heated Platens within an Atlas™ Press are also designed to be used with Specac's Constant Thickness Film Maker Accessory P/N GS15640 for the preparation of films of polymers and plastic materials for thicknesses up to 0.5mm and at a diameter of 29mm as standard. However, the Atlas™ Heated Platens can be used alone in a press, without the need for the P/N GS15640 Film Maker Accessory, if thicker or larger diameter films of such material types are required for pressing.

This instruction manual is divided into two main sections for use. **Section 4** is for instruction, installation and operation of the Atlas™ Heated Platens themselves and **Section 5** is for instruction and operation of the dedicated Atlas™ Heated Platens Temperature Controller that powers the heated platens.

It is important that **both sections** of this instruction manual are read carefully first to understand the equipment before using the accessory.



Atlas™ Heated Platens and Temperature Controller

2. Unpacking and Checklist

On receipt of your Atlas™ Heated Platens and Temperature Controller please check the following have been supplied.

- One pair of Atlas™ Heated Platens consisting of a top platen assembly with bolster fixing and lower platen assembly with underside circular recess for location.



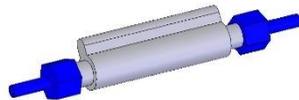
- One dedicated Atlas™ Heated Platens Temperature Controller.
- One mains power cable for the Atlas™ Heated Platens Temperature Controller (for your mains voltage supply).



- Three 2-metre lengths of black flexible silicone rubber tubing.
- Two matched pairs (insert and body) of Quick Connect couplings for cooling water tubing.



- One in-line cooling water flow, safety cut-out switch.



- Four plastic cable ties.
- One 4mm size Allen key.
- One instruction manual for operation.

Carefully remove the heated platen assemblies, temperature controller and parts from the transport packaging. Remove the protective covering from the heated platens aluminium surfaces prior to use.

3. Specifications

This instruction manual contains information and warnings, which must be followed by the user to ensure safe operation and retain the apparatus in a safe condition. The apparatus has been designed for indoor use only.

Platens Specification

Heated platen material:	Anodised aluminium alloy (HE30 TF)
Brinell hardness:	100 (approx.)
Surface diameter:	100mm
Maximum applied load:	15 tonnes
Temperature range:	Ambient to 300°C
Thermocouple type:	K – type NiCr/NiAl (fitted in lower platen)
Heater power:	600 Watts (each platen)
Water cooling:	Continuous, less than 8 bar with a flow rate not less than 0.2 liters/min, recommended 1 liter/min)

Temperature Controller

Temperature range:	0 to 300°C
Temperature setting:	0 to 300°C in 1°C steps
Temperature display:	Digital
Setting accuracy:	1 digit
Control type:	PID (Proportional, Integral and Derivative)

System Specification

Control stability:	Better than +/-1°C
Heating rate:	30°C per/min
Cooling rate:	Typically, 35 minutes from 300°C to 60°C
Rated Voltage:	100, 110, 220 or 230VAC
Maximum working voltage tolerances:	+/-10%
Rated Frequency:	50/60 Hz (100V Japan Model) 50Hz (220V China Model) 50Hz (230V EU & UK Model) 60Hz (110V US Model) 60Hz (220V Korean Model)
Rated Power:	1200 Watts maximum
Fuse rating type:	'F' fast blow
Fuse rating:	F6.3AH 250V (220V/230V models),

Atlas™ Series Heated Platens

	F12.5AH 250V (110V and 100V models)
Temperature range:	5 -40°C (Ambient conditions)
Humidity range:	20 - 90% RH non-condensing
Altitude:	up to 2000m
Pollution degree:	2
Over-voltage category:	II

4. Instruction, Installation and Operation of the Atlas™ Series Heated Platens

Water Cooling of the Atlas™ Series Heated Platens

A cold-water supply for the water-cooling system circuit is required for operation of the Atlas™ Heated Platens. After passage through the cooling system, the water can flow to a drain or be re-circulated if a suitable thermo-circulating system has been employed for use in the water-cooling circuit. (See water cooling thermo-circulator systems, Specac P/N's GS11127 and GS11128.)

Installation of the Atlas™ Series Heated Platens

Before installation into a press, it is best to initially secure the black silicone rubber tubing for water cooling to the top (1) and lower (2) heated platen assemblies (as shown in **Fig 1.**). The silicone rubber tubing must be firmly secured to the heated platen water connections (3) using the plastic cable ties supplied.

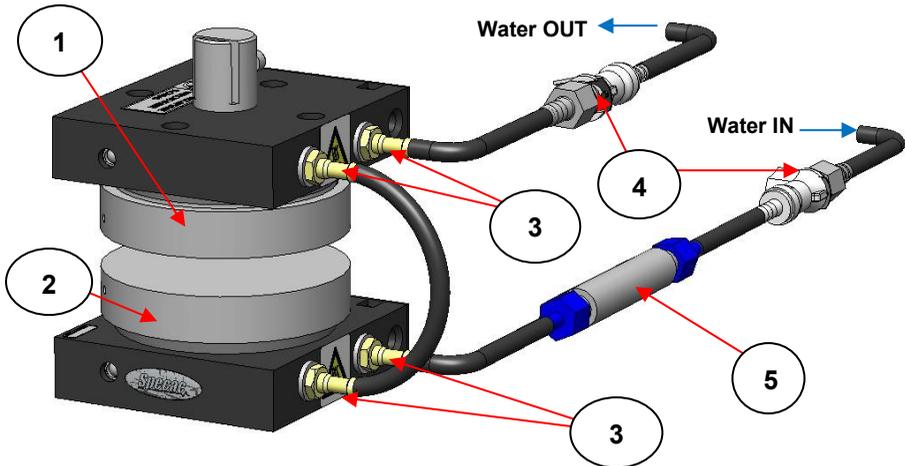


Fig 1. Connection of Parts for Water Cooling of the Top and Lower Heated Platen Assemblies

Warning! *If there is any possibility that the cooling water supply is likely to be interrupted then suitable high-pressure tubing should be used and firmly secured with tie clips. The outlet tube should be secured to a sink or drain pointing downwards to avoid the possible risk of scalding to hands and face, if the water flow is re-established whilst the platens are hot and high-pressure steam is generated.*

The silicone rubber tubing supplied can be cut to specific lengths for the purposes of connection as shown in **Fig 1**. There are two pairs of quick connectors (**4**) as an insert and a body supplied (see **Fig 2.**) and they should be used on both the **water in** and **water out** lengths of tubing in the direction of flow as shown in **Fig 1**.

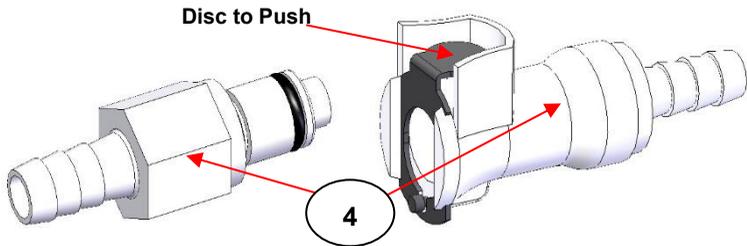


Fig 2. Insert and Body Quick Connectors

The quick connectors (**4**) are a simple push fit (insert into body), which will click when fully engaged. To disconnect, the silver disc on the body connector is pushed down whilst the connectors are being pulled apart. When these quick connections are disconnected, water is prevented from leaking out of the tubing, thus avoiding accidental spillage.

Water In-line Flow Safety Cut Out Switch

The water in-line flow safety cut out switch (**5**) (see **Fig 1**, **Fig 3.** and **Fig 4.**) **must** be included as part of the water-cooling system. It is a flow tube with an internal flow switch that cuts power to the Atlas™

Heated Platens if there is an interruption or stoppage of the cooling water. Power to the Atlas™ Series Heated Platens will be allowed once a minimal flow of cooling water (greater than 0.2 Litres/min) has been established.

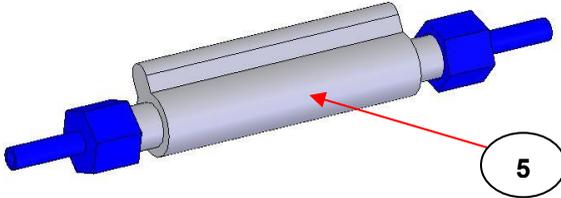


Fig 3. Water In-line Flow Safety Cut Out Switch

The cut-out switch (5) flow tube part has push on hose type fittings at both ends for in-line connection with the black silicone flow tubing. There is a particular direction of water flow indicated on the tube that must be observed for correct connection and operation. When the safety cut out switch (5) has been included within the cooling water flow system, the electrical cable attached to the cut-out switch is connected to the rear panel of the Atlas™ Series Heated Platens temperature controller via its appropriate plug and connection socket (18). (See Fig 10.). Ensure that the plug and its connection socket (18) are correctly aligned when pushing to fit.

For best operation, the safety cut out switch (5) should be placed between the water supply tap and the initial input water connection (3) of the lower heated platen assembly (2). Try to make the length of silicone tubing connection between the input water connection (3) on the lower heated platen (2) and the outlet side of the safety cut out switch (5) as short as practically possible. There is approximately 2 meters of electrical cable with connection plug attached to the safety cut out switch (5) to fit into the socket connection (18) at the rear of the temperature controller, providing a sufficient distance from the temperature controller connection for best positioning of the cut-out switch (5) flow tube in the water-cooling system.

In addition, Specac also recommends the use of an in-line water filter (not supplied by Specac) of 50 microns porosity or better between the

tap supply and the safety cut-out switch (5), particularly if the water supply is not too clean. The filter will help trap any particulates and prolong the life of operation of both the safety cut out switch (5) and the water cooling blocks (6) of the Atlas™ Series Heated Platens themselves.

If the Atlas™ Series Heated Platens are not going to be used for a long period of time, the cooling block parts (6) of both the top (1) and lower (2) heated platen assemblies should be stored **without any water inside them**. After disconnection of the silicone tubing, any water left inside can be expelled carefully by connection of either one of the water connection ports (3) to an airline to blow the water out and away to a drain. (See Fig 1. and Fig 4.)

Note: To ensure that the Water Flow Switch continues to operate correctly it is recommended to test its function periodically, this should be done when the platens are cool, simply stop the flow of water to the flow switch, this will cut the power the platens and prevent them from heating. If the switch fails to operate it should be replaced, contact techsupport@specac for further details.

Using with the Constant Thickness Film Maker Accessory

If the Constant Thickness Film Maker Accessory P/N GS15640 is to be used with the Atlas™ Series Heated Platens, the cooling chamber assembly (7) provided as part of this Film Maker Accessory should be included in the water-cooling system as shown in Fig 4.

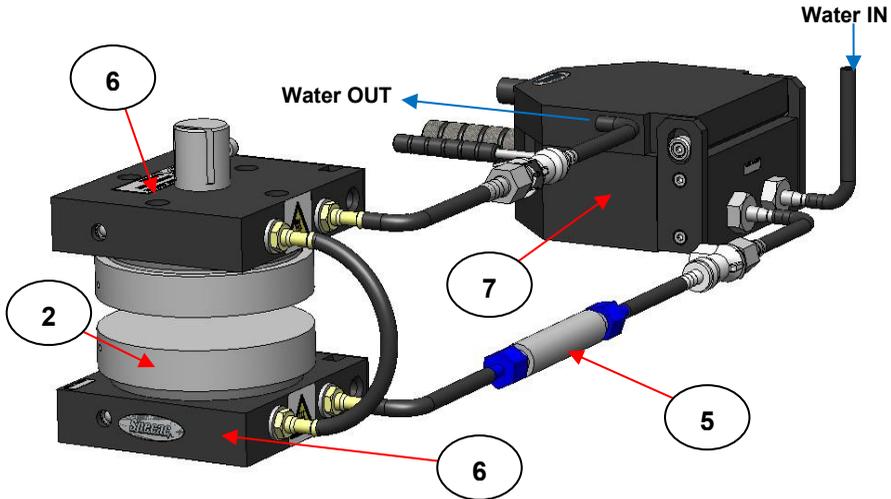


Fig 4. Flow Connections for Cooling Block Assembly of Constant Thickness Film Maker Accessory P/N GS15640

This is a very similar connection set up as shown in Fig 1., but the cooling water should pass through the cooling chamber assembly (7) prior to passage through the heated platen cooling blocks (6). This ensures that the **coolest water** will always flow through the cooling chamber assembly (7) first before passing through the heated platen cooling blocks (6). In this situation of use for inclusion of the cooling chamber assembly (7) in the water-cooling circuit, the safety cut out switch (5) can be situated before or after the cooling chamber assembly (7), but it is important that the safety cut out switch (5) is placed **before any water flows through the lower heated platens assembly (2)**.

Installation into the Press – Example Manual 15T

Remove the top bolster pressing face (8) with its O-ring (9) from the lead screw (10) of the press. The bolster (8) is a push fit held in place in the hollow end of the lead screw (10) by the O-ring (9) and is removed by simply pulling down and away from the lead screw (10).

(See Fig 5.).

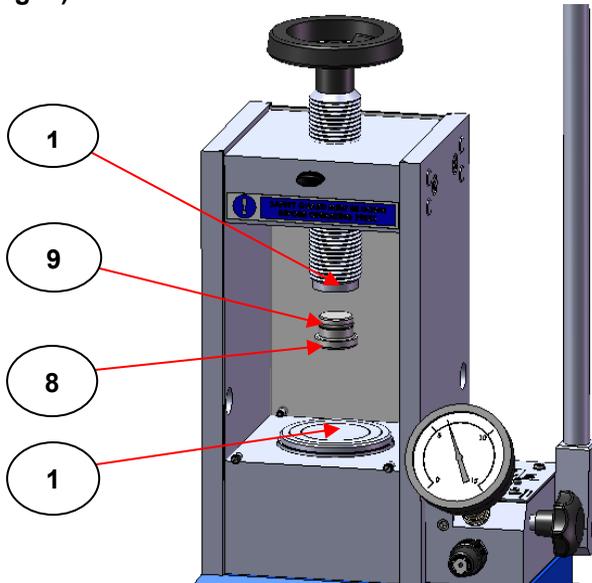


Fig 5. Front View of Press Showing Removal of Top Bolster

Create a sufficient gap in the press between the lead screw (10) and the lower bolster pressing piston surface (11) to accommodate both the top (1) and lower (2) heated platen assemblies for installation by raising or lowering the lead screw (10) as appropriate.

Installation of the Top Heated Platen Assembly

Take the top heated platen assembly (1) and pass it with its water tubing and power cable connections through the rear of the press, ensuring that the water connection ports (3) are projecting outwards and pointing towards the rear of the pressing area. (See Fig 6.)

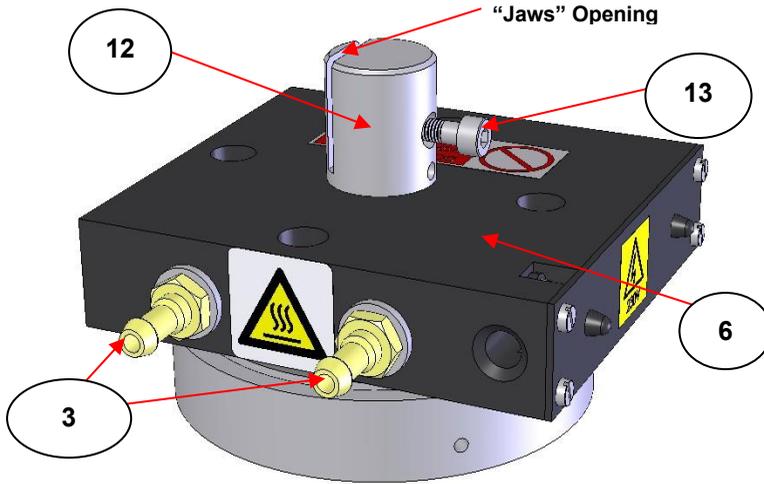


Fig 6. Top Heated Platen Assembly of Atlas™ Heated Platens

Note: *The rear Perspex safety guard on the 15T Manual press should be raised or can be removed to allow for easier installation. If the guard is removed **it must be re-attached** after installation.*

Insert the circular bolster connection (12) of the top heated platen assembly (1) into the hollow at the base of the press lead screw (10) as far as possible and tighten up the locking screw (13) by turning it clockwise using the 4mm Allen key supplied. This applies pressure to the “jaws” of the top bolster connection (12) to push them apart and holds the top heated platen assembly (1) tight in the lead screw (10) for raising and lowering the top heated platen pressing surface (20) with rotation of the lead screw (10). (See Fig 7. – Note front and rear safety guards of the press have been removed from image for clarity.)

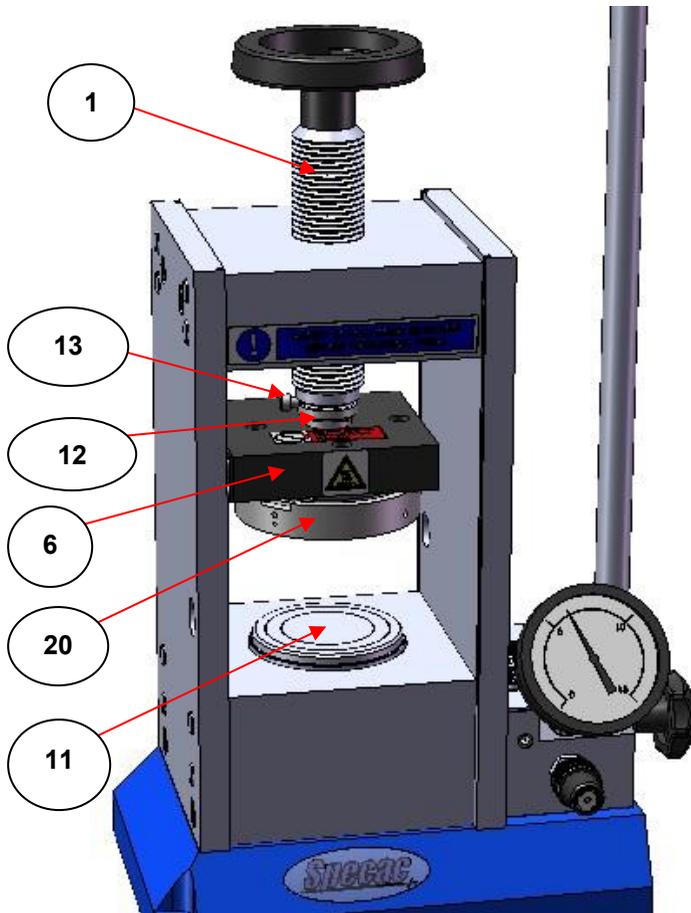


Fig 7. Installation of Top Heated Platen Assembly into the Atlas™ Manual Hydraulic Press

The bolster connection (12) is permanently fixed to the top heated platen cooling block (6) but allows the press lead screw (10) to rotate during normal raising and lowering operations of the press lead screw without rotation of the entire top heated platen assembly (1) itself.

Installation of the Lower Heated Platen Assembly

Similar to the top heated platen assembly (1), take the lower heated platen assembly (2) and pass it with its water tubing, power cable and thermocouple connections through the rear of the press, ensuring that the water connection ports (3) are projecting outwards and pointing towards the rear of the pressing area.

Note: *The rear Perspex safety guard on the 15T Manual press should be raised or can be removed to allow for easier installation. If the guard is removed **it must be re-attached** after installation.*

Locate the underside recess diameter of the lower heated platen assembly (2) over the lower bolster pressing surface (11) of the press. The recess diameter is nominally 83mm (see Fig 8.).

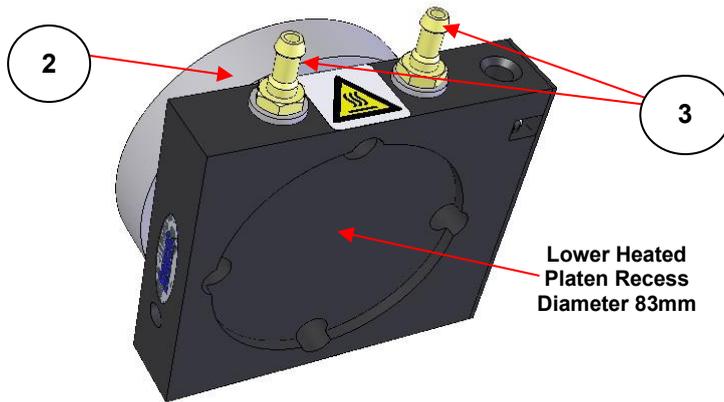


Fig 8. Lower Heated Platen Assembly Location Recess

Note: *The lower bolster pressing surface (11) **must not** be removed from the press to allow for a correct fit of the lower heated platen assembly (2).*

When both the top (1) and lower (2) heated platen assemblies have been installed correctly into the press you are ready to make the electrical connections to the temperature controller. (See Fig 9.)

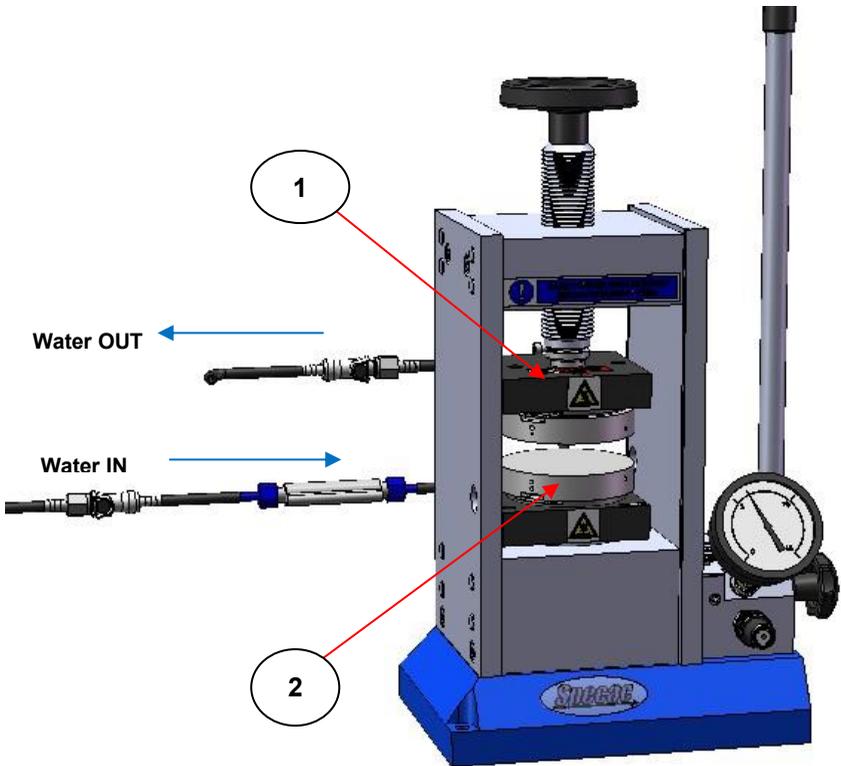


Fig 9. Front View Showing Installation of Atlas™ Heated Platens into the Atlas™ Manual Hydraulic Press

Note: *If the rear Perspex safety guard of the Atlas™ Manual Hydraulic Press has not been removed for installation of the top (1) and lower (2) heated platen assemblies, it will have dropped down to rest on the water tubing and power cable connections to the top heated platen assembly (1). Although the rear guard cannot be fully closed, it is safe to operate the press with the rear guard in position in this way.*

Installation into Atlas™ Power and Auto Presses

For installation of the Atlas™ Heated Platens into an Atlas™ Power or Auto Press, it is similar procedure to that described for the Atlas™

Manual hydraulic Press, but both the top (1) and lower (2) heated platens assemblies with the water cooling tubing fitted and electrical cable connections are passed through the **front** of the press (front safety guard is raised) and the tubing and electrical cable connections are carefully routed through the recess gap at the rear and to the base of the **permanently fixed rear** safety guard on these presses.

Note: *For Atlas™ Power and Auto Presses the **front safety guard** is a crucial safety feature for operation. The front safety guard **must** be used in a down/closed position to allow power to be supplied for automatic operation of the piston mechanism. When the front safety guard is raised, power is cut for any pressing operations.*

Atlas™ Heated Platens for Perkin Elmer Presses Only

If you have use of a Perkin Elmer manual hydraulic press that has a larger diameter pressing piston face (11) (circa 90mm) than that offered from the standard diameter pressing piston face (11) (circa 82mm) of the Specac hydraulic presses, then the Atlas™ Heated Platens that can be supplied for installation are also different from standard.

For installation of the Perkin Elmer press compatible heated platen assemblies, the Perkin Elmer press top bolster pressing surface (8) should be removed as usual, but the Perkin Elmer top heated platen assembly is attached by a screw threaded bolster fixing to the **external screw thread** of the press lead screw (10), rather than by fitting via the hollow recess of the lead screw. The lower heated platen assembly for a Perkin Elmer press has a larger diameter underside recess (circa 91mm) to fit over the larger diameter lower bolster pressing face of the Perkin Elmer Press.

If you have any difficulties in the installation of the Atlas™ Heated Platens into a Perkin Elmer manual hydraulic press, please contact Specac for advice.

Connection of the Atlas™ Heated Platens to Their Dedicated Temperature Controller

Both the top (1) and lower (2) heated platen assemblies are independently connected to their sockets on the rear panel of the dedicated temperature controller via their own power cables. (See Fig 10.) Socket (14) is for the top heated platen (1) assembly and socket (15) is for the lower heated platen (2) assembly.



Warning: The Platen outlet sockets (14 & 15) supply mains voltage, maximum rated output 1200 watts. Only the Specac Heated Platens should be connected to these sockets.

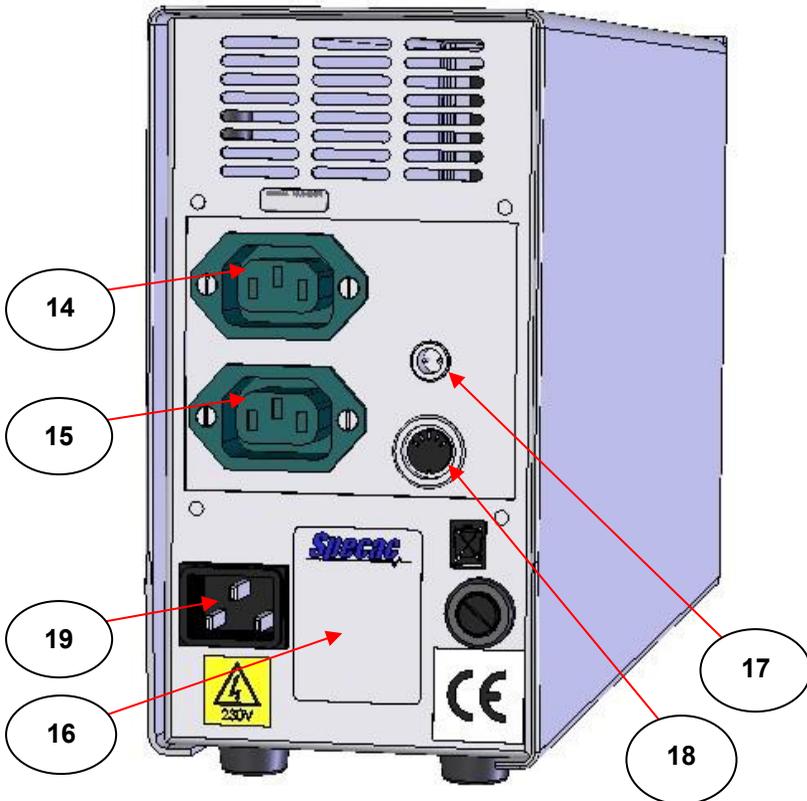


Fig 10. Rear Panel of Atlas™ Heated Platens Temperature Controller for Electrical Connections

Note: *It is very important that the appropriate voltage of operation for the top (1) and lower (2) heated platen assemblies (either 240 volts or 110 volts) are connected to a controller of the same mains voltage output for operation. Ensure that the serial number found on the appliance label (16) at the rear of the controller matches the serial number stickers found on the top and lower heated platen assemblies to be connected. There is an indication of the voltage of operation on the heated platen assemblies too.*

The K-type thermocouple lead fitted into the lower heated platen (2) assembly only is also connected to the rear of the controller via a 2 pin plug connection socket (17). Ensure that the thermocouple connection plug engages properly with the socket.

The plug connection of the in-line water cut-out switch (5) is fitted into the socket (18) on the rear panel of the controller. Ensure that the in-line water cut-out switch plug engages properly with the socket.

When the electrical connections for the top (1) and lower (2) heated platen assemblies have been made to the temperature controller ((1) into (14) and (2) into (15)), then the electrical mains power cable supplied for your controller can be attached. The electrical mains power cable for the temperature controller plugs into the socket (19) on the rear panel of the controller. Ensure that both the mains switch at the supply and the power switch (25) on the front of the temperature controller are off when you plug the mains power cable into the socket (19). (See Fig 12. – front view of temperature controller)

Operation of the Atlas™ Series Heated Platens

With installation of the Atlas™ Heated Platens into a Specac hydraulic press, the press becomes converted for a capability to provide heated pressing surfaces for compression and compaction of particular sample types.

The temperature of the heated platens is applied and maintained by power from the temperature controller. The **actual** temperature that can be obtained (up to a maximum of 300°C) is selected by input of a **set** temperature to reach. Both the **set** and **actual** temperature values are constantly displayed on the WEST 6100+ control unit of the temperature controller. The **actual** temperature at the heated platen surfaces (**20**) and (**21**) is automatically controlled and monitored by the thermocouple connected to the lower platen assembly.

(Please refer to Section 5 of this instruction manual for more detail regarding operation of the temperature controller itself and how to set and apply a temperature to the heated surfaces (**20**) and (**21**) for pressing).

Before applying any power from the temperature controller to the heated platen assembly top (**20**) and lower (**21**) **heated surfaces**, cooling water **MUST** be flowing through the water cooling circuit of parts as shown in **Fig 1**. when the heated platens are installed for use only or **Fig 4**. when the heated platens and cooling block assembly (**7**) of the Constant Thickness Film Maker accessory P/N GS15640 is to be used. Start the flow of cooling water, typically at a flow rate of 0.5 to 1.0 Liters/min. (The minimum flow rate is 0.2 Liters/min in order to keep the in-line flow cut out switch (**5**) open to provide power to the temperature controller).

Procedure for Pressing

When the heated platens have been installed in the press, the top heated platen assembly (**1**) is lowered by clockwise rotation of the lead screw (**10**) for the top heating surface (**20**) to make contact with the lower heated platen assembly heating surface (**21**), or a sample that has been placed on the lower heated platen surface (**21**).

For a sample pressing and heating procedure, it will depend on the sample work to be pressed and the application itself as to how a temperature and load is to be applied. In general though, the order for pressing and heating a sample is as follows.

- 1) Create a sufficient gap between the top heated surface (**20**) and lower heated surface (**21**) by appropriate adjustment of

the lead screw (**10**) of the press to accommodate the sample work to be pressed.

Note: *When installed in the Atlas™ Manual Hydraulic Press, a maximum gap of 55mm can be created between the heated pressing surfaces (**20**) and (**21**).*

- 2) Place the sample to press carefully and centrally on the lower heated platen surface (**21**). It is important to have a sample placed centrally as this helps to minimise any “tilting effect” that may be introduced against the top heated surface (**20**) when brought into contact from an off centre placement of the sample on the lower heated surface (**21**), which in turn could lead to formation of an uneven and inconsistent thickness for a pressed sample area after a tonnage load has been applied.
- 3) Lower the top heated surface (**20**) by clockwise rotation of the lead screw (**10**), such that the sample work is loosely and lightly held for compression between the two heated surfaces (**20**) and (**21**).

It is now at this stage, usually, that a temperature can be set for both heated platen surfaces (**20**) and (**21**) to start the heating of the sample whilst still under a light compressive load, having been applied by hand from the lead screw (**10**).

- 4) Input a **set** temperature value on the temperature controller and allow the heated platen surfaces (**20**) and (**21**) to reach their **actual** temperature value for stability against the **set** value.
- 5) When the **actual** temperature has reached stability a tonnage load (up to 15 tons maximum) can then be applied from the press being used.

Caution: *In general, do not press the sample with an applied tonnage load before the actual temperature stabilises at the set value as resultant damage could occur to heated platens.*

- 6) Hold the tonnage load and maintain the temperature for pressing for as long as required.

Depending upon the procedure and application there may be a requirement to remove **the tonnage load** whilst the sample is still held between the heated platen surfaces **(20)** and **(21)** at an elevated **actual** temperature. If this is the case, the tonnage load is released appropriately from the pressing system being used.

However, in general, for most applications it is a necessary and safer way to work to **reduce the temperature** before any tonnage load is reduced or removed prior to access of the sample after the pressing. To reduce the temperature at the heated platen surfaces **(20)** and **(21)**, input a lower **set** temperature value on the temperature controller than the temperature value being displayed as the **actual** temperature.

When a pressed sample is cool to touch (as indicated from the **actual** temperature displayed) and when no tonnage load is being applied, the sample may be accessed after separation of the top heated pressing surface **(20)** away from the lower heated surface **(21)** by anticlockwise rotation of the lead screw **(10)**.

Operation Notes and Tips

In general, the efficiency of heating operation and temperature measurement for the heated platen surfaces **(20)** and **(21)** is optimal when a good thermally conducting sample is placed between the heated platens and the pressing surfaces are at a minimum distance to each other.

Note: *When the heated platens are in use at an elevated temperature and if there is no sample or work in position to press, it is recommended the heated surfaces **(20)** and **(21)** faces are brought into close proximity to avoid temperature variations between the surfaces.*

Plastic type samples are best pressed between PTFE sheets. (Ten PTFE sheets of dimensions 100mm x 100mm x 2.5mm thick are available from Specac as P/N GS15601 to use for such applications).

Use of the PTFE sheets prevents the sample from sticking to the aluminium heated pressing surfaces (20) and (21) and allows the plastic sample to flow freely at elevated temperatures under compression for reforming.

It is important to ensure that the plastic sample has reached the temperature of the heated surfaces (20) and (21) before applying any pressure (a tonnage load) to the sample. Ideally the heated platens **set** temperature value on the temperature controller should be such that any plastic samples being pressed will be in a soft, malleable state when the **actual** temperature indicated is the same as the **set** value. Therefore, it is always useful to know, if possible, the melting point of the plastic sample to apply an appropriate **set** temperature to reach for the **actual** temperature for the most favourable pressing condition. **Do not** press small, hard pellet samples before they have reached a suitable plastic state, as there is a very real risk of localized “point loading” that will cause indentation to the heated platen surfaces (20) and (21).

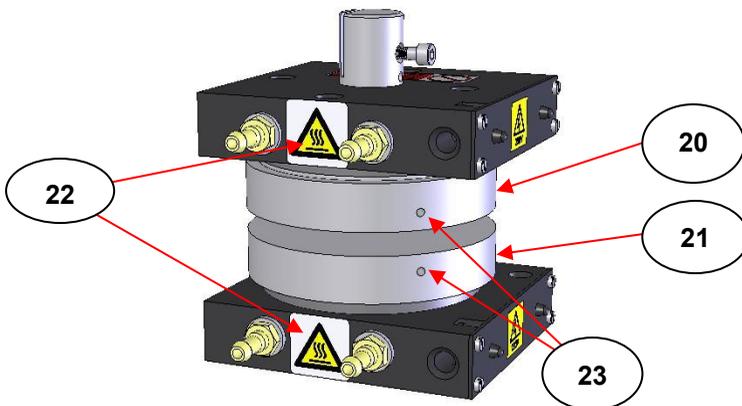


Fig 11. Hot Warning Labels and Additional Thermocouple Holes

There are label “HOT WARNING” labels (22) on the Atlas™ Heated Platens. (See Fig 11.) The circular aluminium heated surfaces (20) and (21) of the heated platens are the hottest parts, so take care during operation not to touch these surfaces. They may be at a temperature capable of causing severe burns.

For critical temperature measurements, there are additional thermocouple location holes (23) on the sides of the heated surfaces (20) and (21). (See Fig 11.) An additional K-type thermocouple with an independent temperature monitoring system may be used by insertion of the thermocouple tip into the relevant location hole (23).

Evacuatable pellet dies should **NOT** be pressed between the Atlas™ Heated Platens. Not only will this method for compaction of a sample within a pellet die damage the heated platen assemblies (1) and (2), it is a very poor method for heating a pellet die.

Care and Cleaning of the Atlas™ Series Heated Platens



Warning: Should potentially hazardous or hazardous materials be used or spilled onto or into the equipment the RESPONSIBLE BODY shall ensure that the appropriate decontamination is carried out and that no decontamination or cleaning agents are used which could cause a HAZARD as a result of a reaction with parts of the equipment or with material contained in it, if in any doubt about the compatibility of decontamination or cleaning agents contact Specac Technical Support for further information.

The Atlas™ Heated Platens can be removed from the Press and stored carefully if they are not going to be used for a long period of time. If the Press itself has a capability to apply loads in excess of the 15 ton maximum limit of the Atlas Heated Platens when they are being used for pressing, removal of the heated platen assemblies allows for this increased tonnage capability of the Press alone to be attained.

As mentioned previously, if the Atlas™ Series Heated Platens are not going to be used for a long period of time, the cooling block parts (6) of both the top (1) and lower (2) heated platen assemblies should be stored **without any water inside them**. After disconnection of the silicone tubing, any water left inside can be expelled carefully by connection of either one of the water connection ports (3) to an airline to blow the water out and away to a drain. (See Fig 1. and Fig 4.)

If the aluminium heated platen surfaces become marked, they may be cleaned with a suitable solvent and cloth. Do not gouge or scrape at any stubborn marks that may have been deposited on the surface after a heating and cooling process, which may risk damage to the surface itself. Water, methanol or acetone may be suitable to remove most stains, but if the surface itself is physically damaged or becomes dented from a “point load” effect, then it may be a requirement to replace the aluminium heated platen surfaces. A smooth and unblemished pressing surface will provide the most consistent and reproducible heated pressing results.

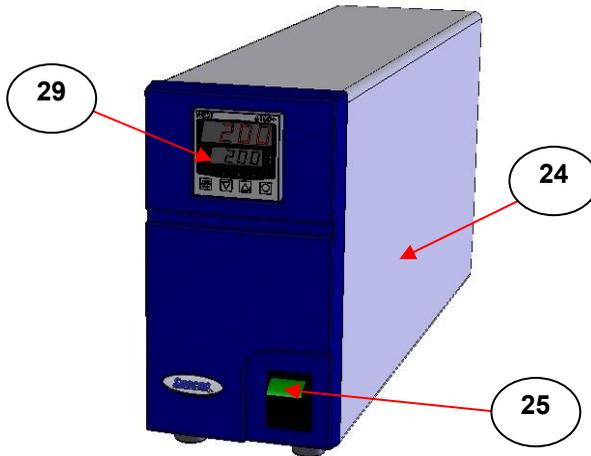
5. Instruction and Operation of the Atlas™ Series Heated Platens Temperature Controller



Important Voltage Warning

Unpack the Atlas™ Series Heated Platens temperature controller (24) supplied with the heated platen assemblies (1) and (2) and check that the input voltage (230V or 110V) indicated on the appliance label (16) at the rear of the controller is compatible with your mains voltage. Check that the voltage requirement of the heated platens assemblies (1) and (2) supplied also match the voltage requirement of the temperature controller (24).

Note: *For operation of the Atlas™ Series Heated Platens temperature controller it is essential that a thermocouple is available. The thermocouple used for control of the heated platen assemblies (1) and (2) is permanently fixed to the lower heated platen assembly (2) and connects to the rear of the temperature controller by a 2 pin fixing plug into the socket (17)(See Fig 10.)*



**Fig 12. Atlas™ Series Heated Platens Temperature Controller
Safety in Use of the Atlas™ Heated Platens System**

Make sure that only fuses with the required rated current and of the specified type are used for replacement. The use of makeshift fuses and the short-circuiting of fuse holders is prohibited. Whenever it is likely that the protection has been impaired, the apparatus shall be made inoperative and secured against unintended operation.

The protection is likely to be impaired if for example the apparatus:

- Shows visible damage.
- Fails to perform the intended measurements.
- Has been subjected to prolonged storage under unfavourable conditions.
- Has been subjected to severe transportation stresses.

Warning!



Any interruption of the protective conductor inside or outside the apparatus or disconnection of the protective earth terminal is likely to make the apparatus dangerous. Intentional interruption is prohibited. When the apparatus is connected to its supply, terminals may be live, and the opening of covers or removal

of parts (except those to which access can be gained by hand) is likely to expose live parts. The apparatus shall be disconnected from all voltage sources before it is opened for any adjustment, replacement, maintenance or repair. Any adjustment, maintenance and repair of the opened apparatus under voltage shall be avoided as far as possible and, if inevitable, shall be carried out only by a skilled person who is aware of the hazard involved. Capacitors inside the apparatus may still be charged even if the apparatus has been disconnected from all voltage sources.

Power Supply to the Temperature Controller

Connect the Atlas™ Heated Platens temperature controller (24) to a power supply line which is protected by a fuse (or by fuses) from 7.5 Amps up to and including 13 Amps. (See **Section 8** for fuse rating on the appliance label (16)). Make sure that the power switch (25) on the front of the controller is off when making the connection (the green-coloured tab part of the switch is not showing when off). Also, when installing and positioning the temperature controller (24) make sure in operation that the power switch (25) is easily accessible and that none of the air vents on the controller casing are blocked. (See **Fig 12.**)

Important Earth Connection

The mains plug must be inserted in a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of an extension cord without a protective conductor. If this apparatus is to be energised via an external auto transformer for voltage reduction, make sure its common terminal is connected to the neutral (earthed pole) of the power supply.

Functions and Operation of the Temperature Controller for the Atlas™ Heated Platens

The top (1) and lower (2) heated platen assembly power cable leads are connected to the rear of the temperature controller into the sockets (14) and (15) respectively. (See **Fig 10.**)

The thermocouple lead (fitted with a 2-pin plug) from the lower heated platen assembly (2) is connected to the rear of the temperature controller into socket (17). (See Fig 10.) Take care that the 'C' shaped inner sleeves of plug and socket are aligned before pressing the plug in. (Failure to do so can damage the plug and socket).

Note: *The thermocouple has been well secured into position in the lower heated platen assembly (2) to ensure constant feedback of the temperature to the controller (24) during operation. If the thermocouple becomes loose or does not make sufficient contact for registering a correct temperature, then the safety feature via a **loop alarm function (26)** automatically cuts power to the heated platens. Without the **loop alarm** it is possible that continuous power being fed from the controller to the platens would cause permanent damage due to overheating.*

Loop Alarm Function

The Loop Alarm is a safety feature to cut power and hence heating of the Atlas™ Series Heated Platens if there are any problems with the heater elements, the thermocouple, or if the equipment has not been connected properly. For example, if the thermocouple was to break or become detached and loose in some way from the heat sensing area, the controller will sense that although power is being supplied there is no response from the thermocouple connection. If this condition has occurred the system will automatically shut down and the Atlas™ Series Heated Platens system needs to be investigated for the fault.

Illumination of the Loop Alarm Light

The Loop Alarm light (26) will be illuminated if either of the following conditions occur during operation.

1) The Safety Loop Alarm Function is Activated

When the Loop Alarm light (26) (see Fig 12.) is illuminated it **may be** indicating a fault with the system, and as such is a failsafe device. When the Loop Alarm light is illuminated, power is cut to the heated platen assemblies (1) and (2). In operation if a fault has been detected,

the system would automatically try to reset itself after a 1 minute time period. The system will be attempting to check that the **actual** platen temperature is the same as the **set** displayed temperature. If the fault does not correct itself after this time, the system will wait another minute before attempting to reset itself again. It is possible that with larger amounts (mass) of sample to heat, there could be some thermal lag and it may take a certain time for the thermocouple sensor to respond to the rate of heat change.

2) Over-Temperature Reading of a Set Temperature Value

The Loop Alarm light (26) will illuminate as a normal function of operation when the **actual** temperature value (28) indicated is at least 10°C or greater than that indicated for the **set** temperature value display (27). For example after raising the heated platens temperature to 100°C and then wishing to cool again, the set temperature (27) could be set to 20°C. Power to the heated platen surfaces (20) and (21) will be cut and after a 1 minute time period the system would recognize the difference in **actual** and **set** temperatures being greater than 10°C and so the Loop Alarm light (26) will illuminate. When the **actual** temperature (28) from the natural cooling process reaches a value of within 10°C of the **set** value (27) then the Loop Alarm light (26) will go out and the system is set to re-supply power to the heated platen surfaces (20) and (21).

If, however, the Loop Alarm light (26) remains illuminated when the **set** (27) and **actual** (28) temperature values are within 10°C of each other, then this would indicate that **there is a fault** with system and power will not be available to supply to the heated platens until the fault is corrected.

When the Atlas™ heated platens and temperature controller system are first supplied, from initial start up the **set** temperature value (27) will be at 0°C. Having installed the heated platen assemblies (1) and (2) and connected up the water cooling system, when switching on for any power the Loop Alarm light (26) will be illuminated if the ambient temperature and hence the **actual** temperature (28) of the heated platens as indicated by the thermocouple is greater than 10°C above the indicated **set** temperature (27) of 0°C. Raising the **set** temperature

(27) to a value similar to or greater than the actual temperature (28), then if there is no fault with installation and connectivity, the Loop Alarm light (26) will go out and power will be supplied to the heated platen surfaces (20) and (21).

Cooling Water Flow Interruption

If there is any interruption to the cooling water flow for the heated platen assemblies (1) and (2), the in-line flow safety cut-out switch (5) (see page 10) will activate and a relay inside the controller (24) will be switched off. (It can be heard to click). Power will be cut to the heated platen assemblies (1) and (2) and they will begin to cool from any elevated temperature above ambient. After a minute or so, if the cooling water flow has not been re-established, the Loop Alarm light (26) will illuminate and flash to signify there is or has been an error in the system.

When the Loop Alarm light (26) has been activated, due to a break in the cooling water flow, even if the cooling water flow is re-established the heated platen assemblies (1) and (2) will not be re-powered automatically. To switch off the Loop Alarm light (26), the **set** temperature display (27) value must be adjusted to read the same temperature as the **actual** display (28). When the Loop Alarm light (26) goes out and if the cooling water flow has been re-established, the relay inside the controller will be heard to click on again and power will be allowed to heat up the platen surfaces.

Caution! DO NOT re-establish a cooling water flow until the heated platens actual temperature display (28) falls below 80°C.
(See Safety point E in **Section 4** – page 8.)

Powering Up

Important: *Before powering up the temperature controller (24) all electrical connections for the heated platen assemblies (1) and (2) MUST be made to the controller and sufficient flow of cooling water (greater than 0.2 Litres/min) MUST be established first to allow for deactivation of the in-line water flow cut out switch (5). (See page 21.)*

Switch on the power supply to the Atlas™ Series Heated Platens temperature controller via the mains power switch (25) on the front panel.

The temperature controller (24) is fitted with a WEST 6100+ temperature controlling unit (29). (See Fig 13.). When power is supplied to the controlling unit (29), four zeroes each will be registered in the upper (27) (in red colour) and lower (28) (in green colour) display panels. The lower display panel (27) records the **set** temperature, and the upper display panel (28) registers the heated platens (thermocouple sensing) **actual** temperature.

Warning! *If the thermocouple connection to the heated platens is broken, OPEN will be shown in the upper display panel (28).*

The four zeroes in the lower display (27) will quickly be replaced by the last **set** temperature value (registered in the memory) and the upper display panel (28) will respond accordingly. (i.e. power will be fed to the heated platens to raise the temperature if the **set** temperature is higher than the **actual** temperature).

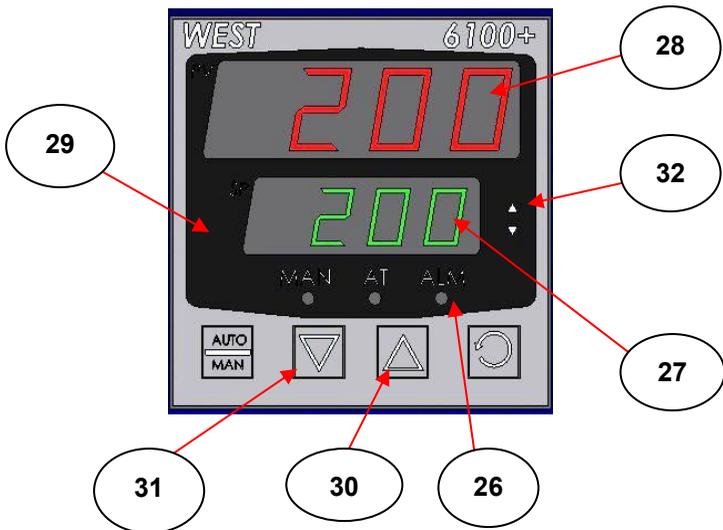


Fig 13. WEST 6100+ Controller Unit on Temperature Controller

Note: *It is good practice when powering down to change the **set** temperature point (27) to zero before switching off. Because a new **set** temperature will have to be input on the controller when it is next switched on, this will ensure that the heated platens would not start to heat up unintentionally if a high (above ambient) **set** temperature had been retained in the memory.*

Changing the Temperature

To alter the set temperature value (27) for the heated platens top (20) and lower (21) heated surfaces (their temperature will be indicated by the **actual** temperature display (28)), use the up button (30) to raise the temperature setting and down button (31) to lower the temperature setting as appropriate. Successive individual depressions and release of the buttons (30) and (31) will raise or lower the **set** temperature accordingly in 1°C steps, but if either button is pushed and kept depressed the step change can be accelerated to reach a target **set** temperature value (27) more quickly. If there has been an overshoot or undershoot for the target **set** temperature value to reach when the up or down button has been released after use of the accelerated step procedure, subsequent individual presses of the appropriate up (30) or down (31) button will allow a slower approach for the correct value to be set.

Note: *The maximum temperature that can be set is 300°C.*

When a new **set** temperature in the lower display (27) has been entered, power will be fed to the heated platens whilst the **actual** temperature is registered in the upper display (28). During the period that power is being fed to the heated platen surfaces (24) and (25), the red light in the upward arrow display (32) will be lit. The rate at which power is fed to the top (24) and lower (25) heated platen surfaces and the duration that the upward arrow display (32) remains lit will depend on the temperature difference between the **set** value and the **actual** heated platen temperatures.

When the **actual** heated platens temperature (**28**) and the **set** temperature (**27**) values have equalized, it is important to wait a few minutes to ensure that the heated platens have reached a stable temperature overall before commencing any pressing operations. The Atlas™ Heated Platens temperature controller (**24**) has a stability of better than $\pm 1^{\circ}\text{C}$ (rms) over a wide temperature range. The proportional, integral and derivative (PID) time constant parameters on the controlling unit (**29**) have been factory set to ensure optimised operation over the complete temperature range from room temperature to 300°C maximum.

Note: *The parameter settings on the temperature controller cannot be altered. They have been factory set to enable for the correct functionality of the safety loop alarm (26) feature.*

6. Legend – Bubble Number Identification

- (1) Top heated platen assembly.
- (2) Lower heated platen assembly.
- (3) Water connection ports on heated platen assemblies.
- (4) Quick connect stop/flow water connectors.
- (5) In-line water flow safety cut-out switch.
- (6) Cooling block (waterway) part of heated platen assemblies.
- (7) Cooling chamber assembly of Constant Thickness Film Maker Accessory P/N GS15640.
- (8) Top bolster pressing face.
- (9) O-ring of top bolster pressing face.
- (10) Lead screw of press.
- (11) Lower bolster pressing piston face of press.
- (12) Circular bolster connection of top heated platen assembly.
- (13) Locking screw on bolster connection of top heated platen assembly.
- (14) Electrical connection socket for top heated platen assembly.
- (15) Electrical connection socket for lower heated platen assembly.
- (16) Appliance label on temperature controller.
- (17) Electrical 2 pin connection socket for the thermocouple.

- (18) Electrical connection socket for the in-line water flow cut-out switch.
- (19) Electrical connection socket for mains power cable.
- (20) Heated surface of top heated platen assembly.
- (21) Heated surface of lower heated platen assembly.
- (22) Hot warning labels.
- (23) Additional thermocouple location holes on heated surfaces.
- (24) Heated platens temperature controller.
- (25) On/off mains power switch on temperature controller.
- (26) Loop alarm warning light.
- (27) Set temperature display.
- (28) Actual temperature display.
- (29) WEST 6100+ temperature controlling unit.
- (30) Up arrow button to raise the set temperature.
- (31) Down arrow button to lower the set temperature.
- (32) Up arrow heating light.

7. Spare Parts for the Atlas™ Series Heated Platens

P/N GS15601 PTFE sheets 0.25mm thick for Atlas™ Series Heated Platens.

P/N GS15512 Replacement heater set for Atlas™ Series Heated Platens (220 Volts).

P/N GS15522 Replacement heater set for Atlas™ Series Heated Platens (110 Volts).

8. Identification of your Atlas™ Series Heated Platens Temperature Controller

At the rear of the Atlas™ Series Heated Platens temperature controller (24) there is an appliance label (16). (See Fig 10.) This label includes the serial number of your specific Atlas™ Series Heated Platens temperature controller. Please make a note of the numbers on the appliance label in the template below. This information will be useful should you need to contact Specac about your controller.

Important: *On no account should the Atlas™ Series Heated Platens temperature controller (24) be used with an accessory having a different part number to that shown on the rear panel of the controller.*

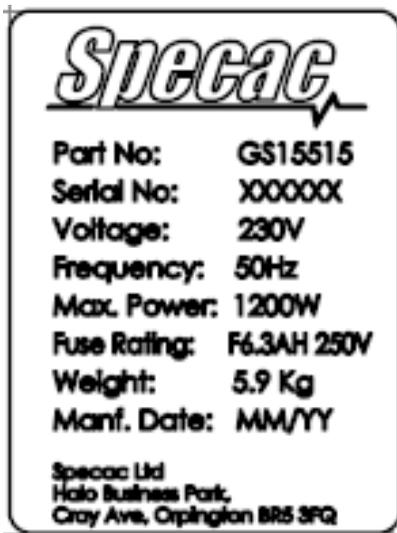


Fig 14. Appliance Label Template of Temperature Controller

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