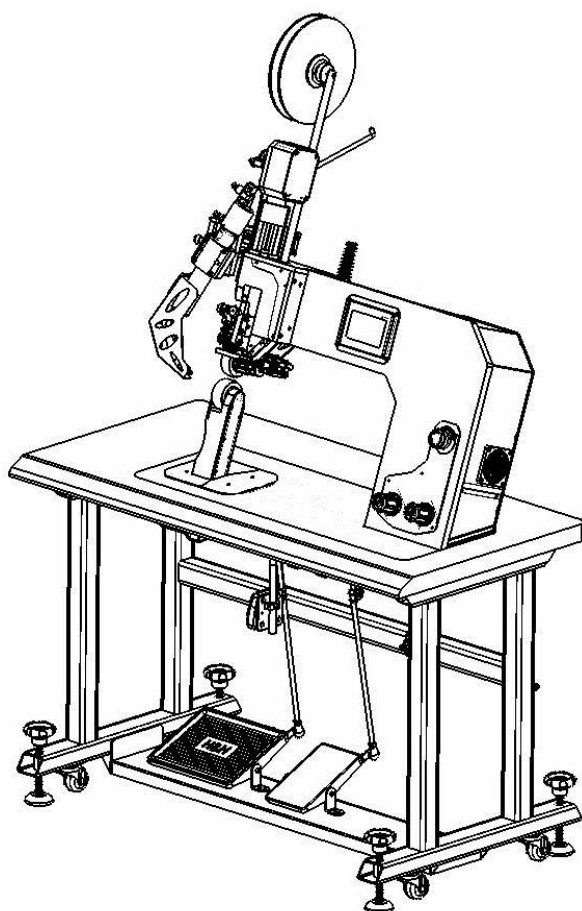


**AI-008 Hot Air Sealing Machine****Operation Manual**

is powered by

**H&H Asia Group Limited**

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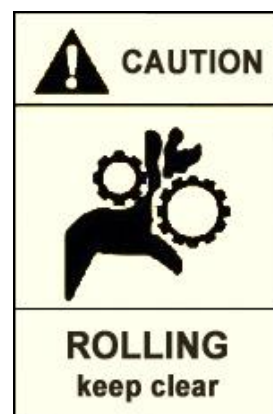
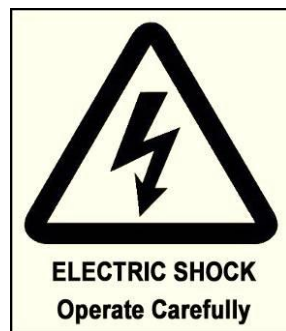
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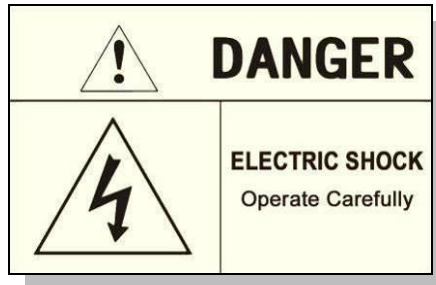
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### > Precautions Regarding to Safety

Please observe these safety tips for a safe, efficient, and injury free operation of your equipment. By strictly following all instructions contained in this manual you will certainly obtain an excellent performance from the use of this equipment for years.



> Precautions Regarding to Safety (cont.)



> Name Plate

<b>Model : AI-008</b>				
<b>Hot Air Sealing Machine</b>				
spec H				
Voltage	Frequency	Power	Compressed Air	Weight
220 V	50/60 Hz	3600 W	0.4-0.6 Mpa	130 Kg
Date :			S/N :	
<b>H&amp;H Asia Group Ltd.</b>				
Room 1117, 11/F, Asia Trade Centre, 79 Lei Muk Road, Kwai Chung, N.T., Hong Kong				
Tel : (852) 2481-3068 Fax : (852) 2481-3727				
<a href="http://www.hh.com.hk">www.hh.com.hk</a>				
MADE IN CHINA				
				

## > Introduction

Thank you for choosing AI-008 hot air sealing machine by H&H.

The hot air sealing machine described in this manual is one of the most sophisticated machines in the market today. Built on pure digital platform and designed for the professional users, AI-007 incorporated many new features that makes seam sealing much easier than before. Operators are recommended to have basic knowledge and skill in seam sealing operation before using this machine.

In order to fully understand how to use this machine properly, and avoid damage to both the machine and operating personnel, please read this manual carefully and keep it safe for future reference.

> **Specifications**

Model	:	AI-008
Voltage	:	AC 220 V
Frequency	:	50/ 60 Hz
Power Consumption	:	3600 W max, 1500 W typical
Compressed Air	:	0.4 - 0.6Mpa
Air Consumption	:	100 L/min max
Sealing Speed	:	1 - 60 ft/min
Nozzle Temperature	:	50 - 800°C
Nozzle Unit	:	22.0 mm standard, other optional
Upper Roller Width	:	25.4 mm
Lower Roller Width	:	31.0 mm
Overall Dimensions	:	1200 mm (L) x 750 mm (W) x 1700 mm (H)
Overall Weight	:	130 kg

Note : due to continuous improvement, specifications are subjected to change without prior notification

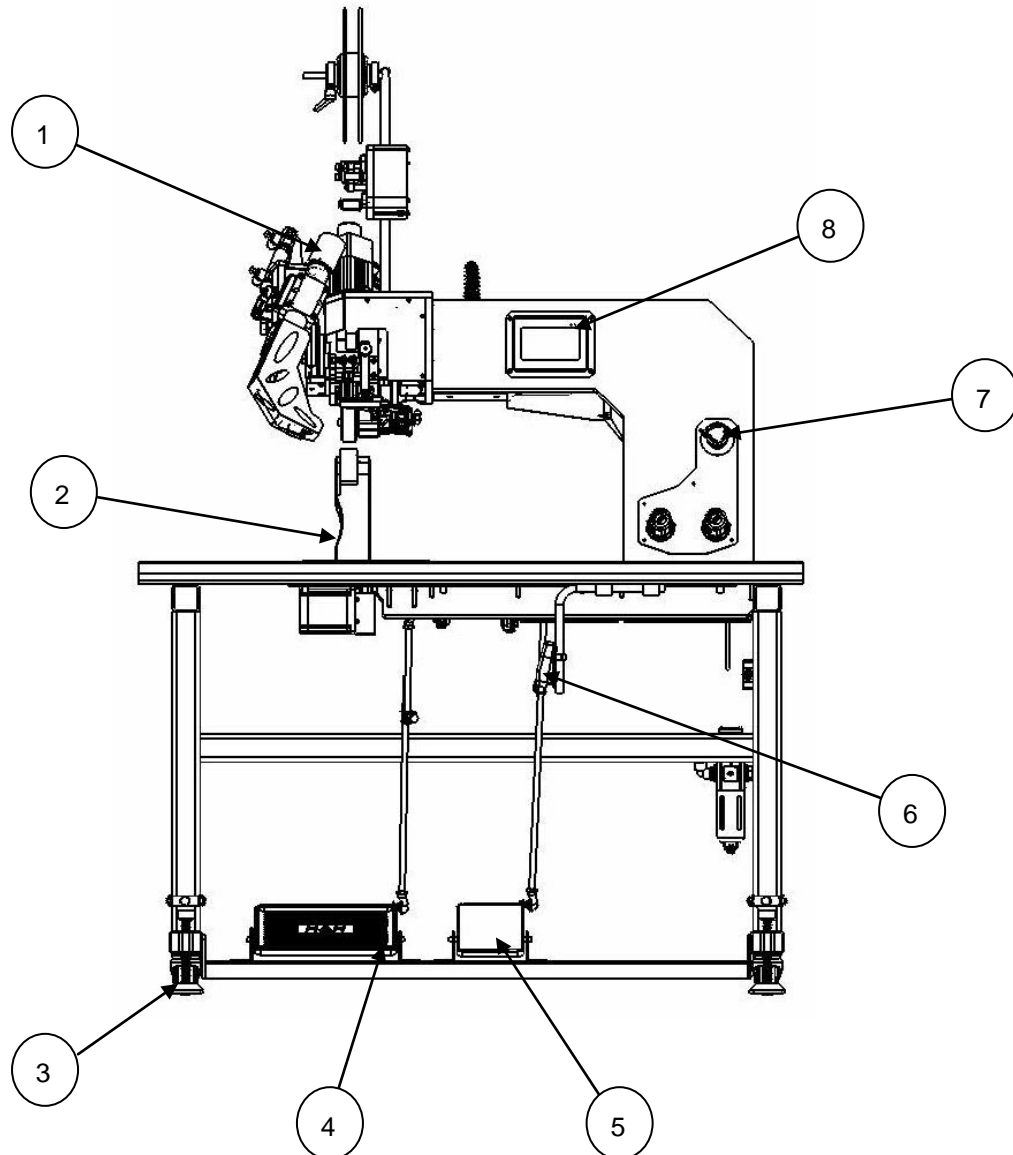


**> Features**

- Differential speed for top and bottom rollers, ideal for reducing stretch fabric puckering.
- Digital tape releaser for stable operation.
- Large size color operator interface.
- Twin foot pedals plus knee control combination for easy foot comprehensive control operation.
- Multi-lingual support for touch screen display interface

## > Identification of Components

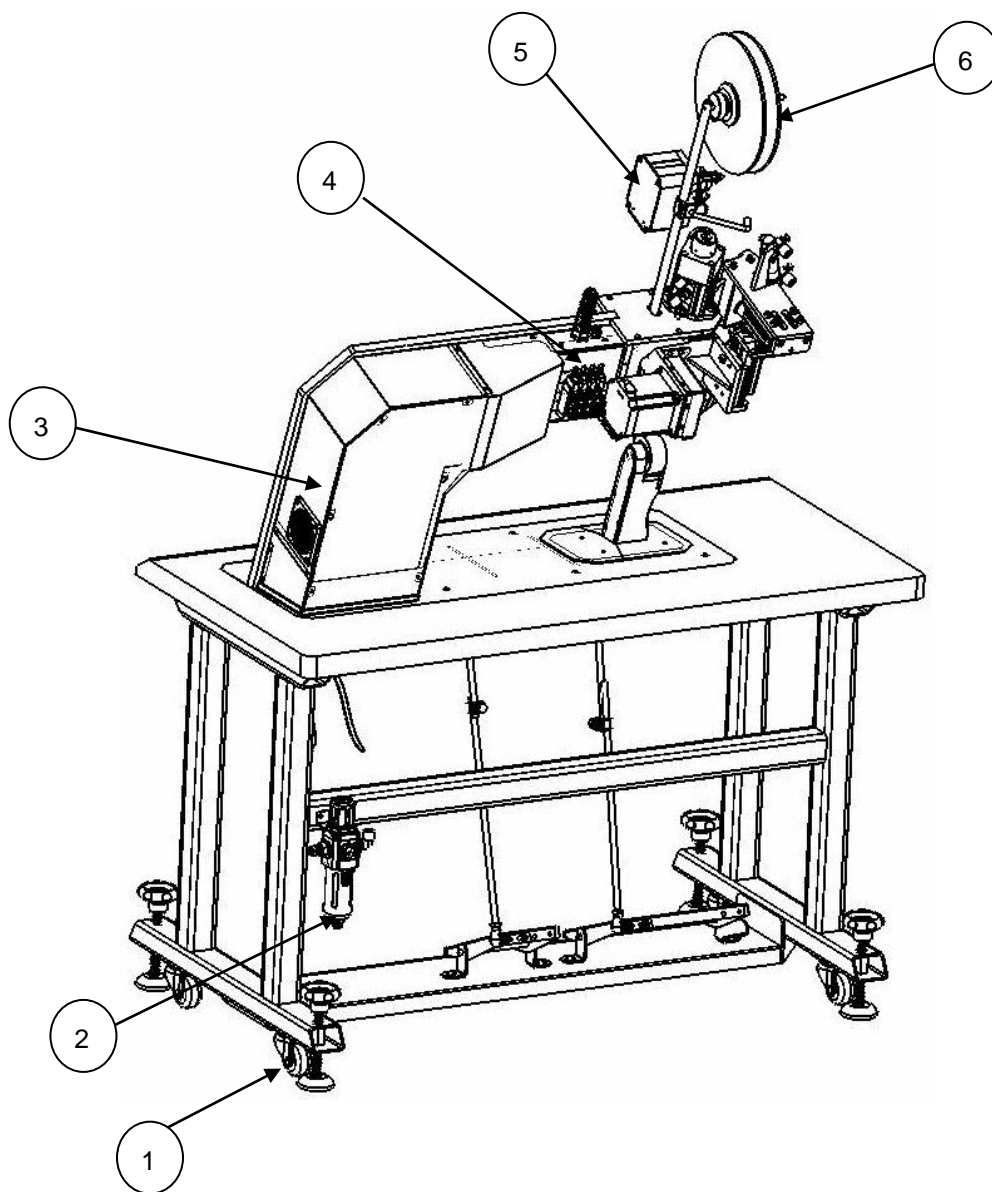
### >> Front View



1. heater body
2. lower pedestal
3. adjustable floor stand
4. left foot pedal
5. right foot pedal
6. main control box
7. combined power ON/OFF switch & emergency push button
8. touch screen control panel

> Identification of Components (cont.)

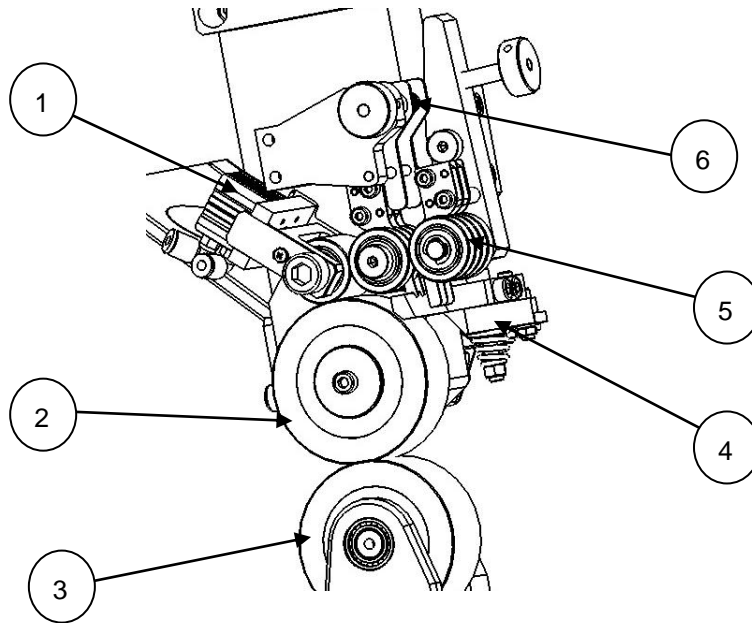
>> **Rear View**



1. transport caster
2. compress air filter assembly
3. distribution box
4. pneumatic solenoid cluster
5. tape tensioner
6. tape spool

> Identification of Components (cont.)

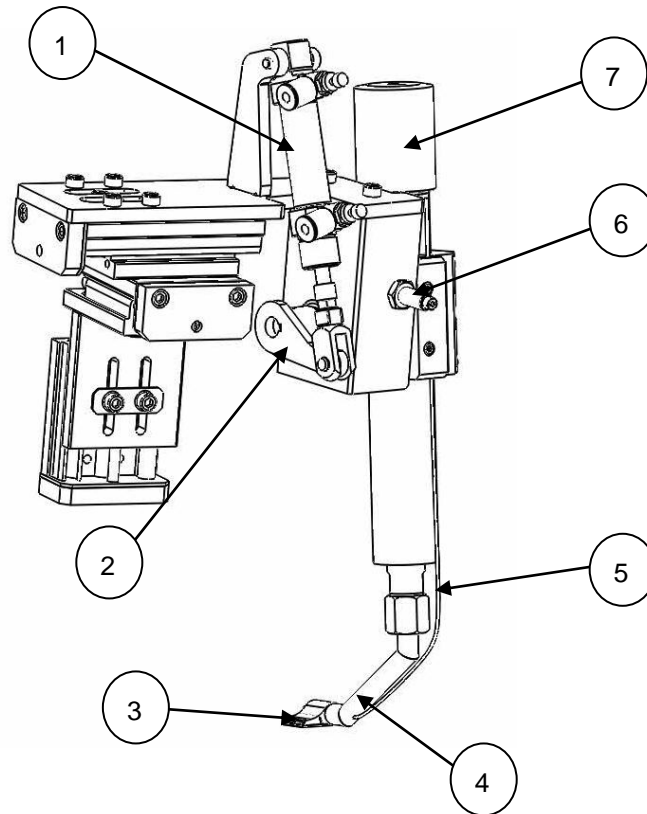
>> Cutter Assembly



1. small tape clamping cylinder
2. upper nip roller
3. lower nip roller
4. cutter blade
5. presser roller
6. tape stabilizer

> Identification of Components (cont.)

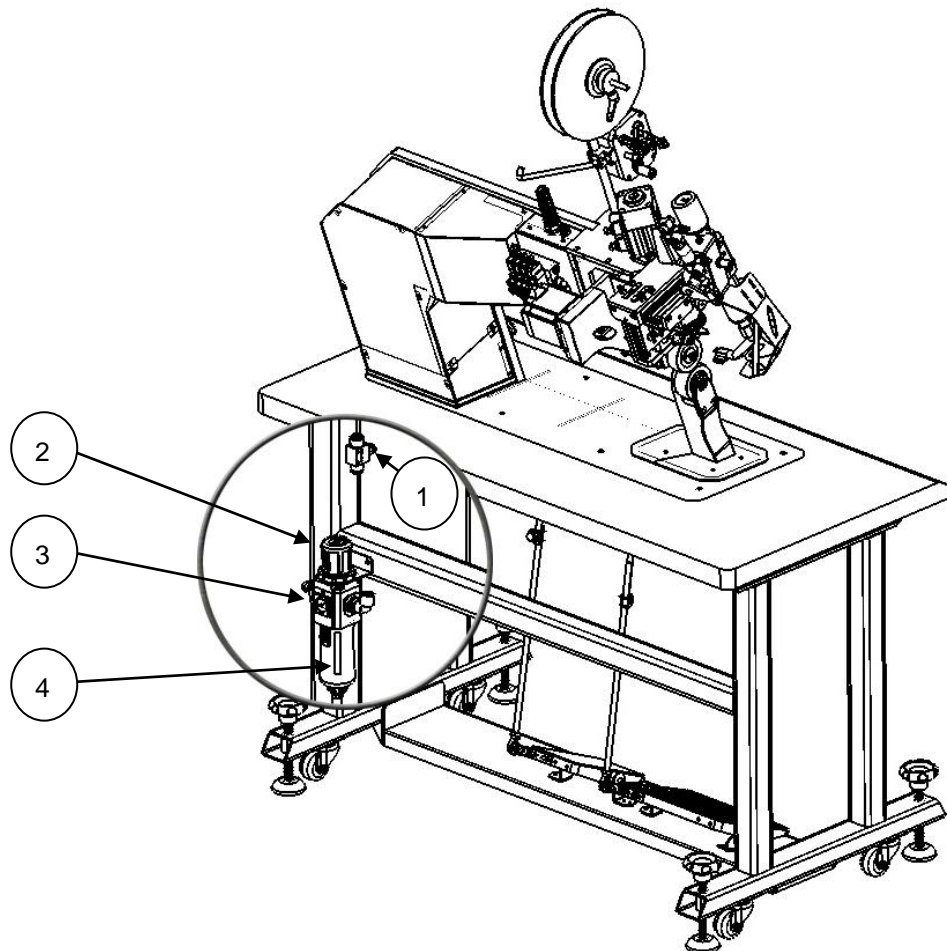
>> Heater Positioning Assembly



- 1 heater swing cylinder
- 2 heater swing arm
- 3 nozzle bit
- 4 nozzle pipe
- 5 temperature senso
- 6 hydraulic absorber
- 7 heater body

> Identification of Components (cont.)

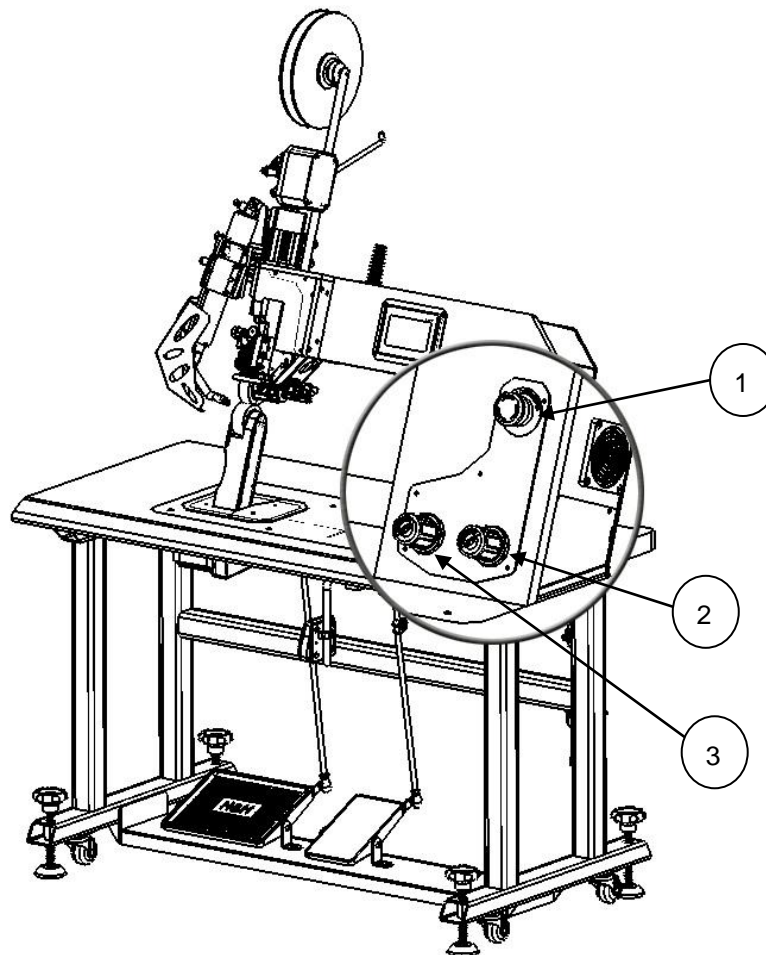
>> Main Air Filter Assembly & Compressed Air ON/OFF Switch



- 1 compressed air ON/OFF switch
- 2 main compressed air pressure regulator
- 3 main compressed air pressure gauge
- 4 compress air water filter

> Identification of Components (cont.)

>> Pressure Adjustment Panel & Power ON/OFF Switch



- 1 combined power ON/OFF switch & emergency push button
- 2 nip roller pressure regulator
- 3 nozzle air pressure regulator

### > Principle of Seam Sealing

When seam tape is heated up, the adhesive on the tape is activated. This activated tape is applied on the water proof coating or lamination of the fabric seam under pressure. When cooled, a strong bond is formed between the tape and the seam. This bond is so strong that it will prevent pressurized water from penetrating the sewn seam. As a result, a water proof seam is produced.

A hot air machine, like AI-008, produces hot air with precisely controlled temperature to directly heat up the adhesive of seam tape. The heated tape and the fabric are feeding into two oppositely rotating rollers under pressure called nip rollers. The linear speed of the nip rollers is called sealing speed.

During sealing, hot air is being blown out from the nozzle. The hot air that actually reaches the surface of the tape is a mixture of hot air from the nozzle and surrounding air, hence the actual temperature that appeared on the tape is somewhat lower than the nozzle temperature. The farther the distance between the nozzle and the tape, the higher the percentage of surrounding air becomes. On the other hand, a higher hot air flow rate will reduce the percentage of surrounding air causing the hot air temperature appeared on the tape to be higher. So both the nozzle position and hot air flow rate are very important factors.

So, the major factors that can affect the seam sealing are as follows:

- Hot air temperature
- Sealing speed
- Nozzle air pressure
- Air flow rate
- Nozzle position

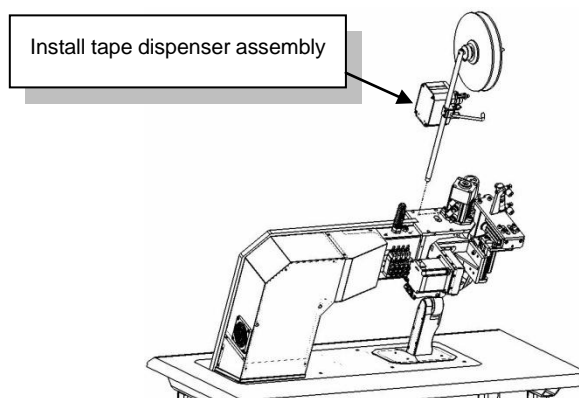
When a consistent product is required, the combination of the above factors have to be set precisely since their effects towards a proper sealing are all interconnecting.



## > Preparation for Installation

Installation must be carried out by authorized personnel. Follow the steps below:

1. Position the machine on a flat surface and allow at least 50cm clearance on both sides as well as the back side, this is essential for the hot air deflector to work properly and also to allow enough room for carrying out necessary service and maintenance
2. Adjust the foot stand so that the machine is level and stable.
3. Cut loose all packing cable ties and materials in order to free up all machine movements.
4. Connect the power plug to a suitable outlet with at least 15A capacity.
5. Locate the air hose supplied with the machine. Connect one end to the inlet of the water filter at the back side of the machine; connect the other end to a compressed air supply such as air compressor or central air supply. Make sure the compressed air supply has at least 0.6 Mpa (6 bar) of pressure and a flow rate of no less than 100L/min.
6. Install the tape dispenser assembly at the top of the machine and align the tape spool at right angle to the width of the machine. (see diagram below)



7. Install a roll of seam tape with the adhesive side facing the operator (refer to the section on tape loading).
8. The machine is now ready for operation.

## > Control Method

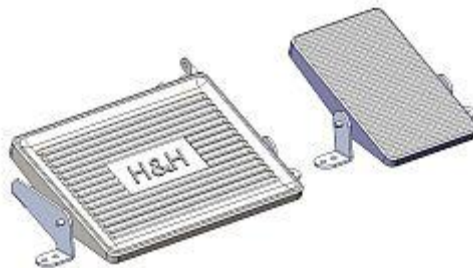
### >> Touch Screen Control Panel

Almost all settings and timing control of the machines can be input from the touch screen control panel. Use your finger tip to touch the parameter to be modified. Switch to different pages to modify other parameters (refer to section on control menu navigation). The screen has a protective cover to prevent the surface from damage and scratch, however, avoid using excessive force when touching the panel.

### >> Foot Pedal Switch & Knee Switch

There are 2 foot pedals for the machine. The design of these pedals is such that they can be operated either individually or in combination to achieve a number of preset tasks by the operator's feet alone. As a result, the operator's hands are free to manipulate the processing fabric.

#### Left & right foot pedal



#### Left foot pedal

The left pedal is used for moving the heater towards the sealing point and starts sealing with the upper and lower rollers in motion simultaneously.

#### Right foot pedal

The right pedal performs different functions according to the timing of activation

During idle (with left foot pedal without steps in)

- step in the right foot pedal will perform jog function that makes the rollers rotate forward without the nozzle coming in.

During sealing (with left foot pedal with steps in)

- step in the right foot pedal will perform cut function that cuts the tape.

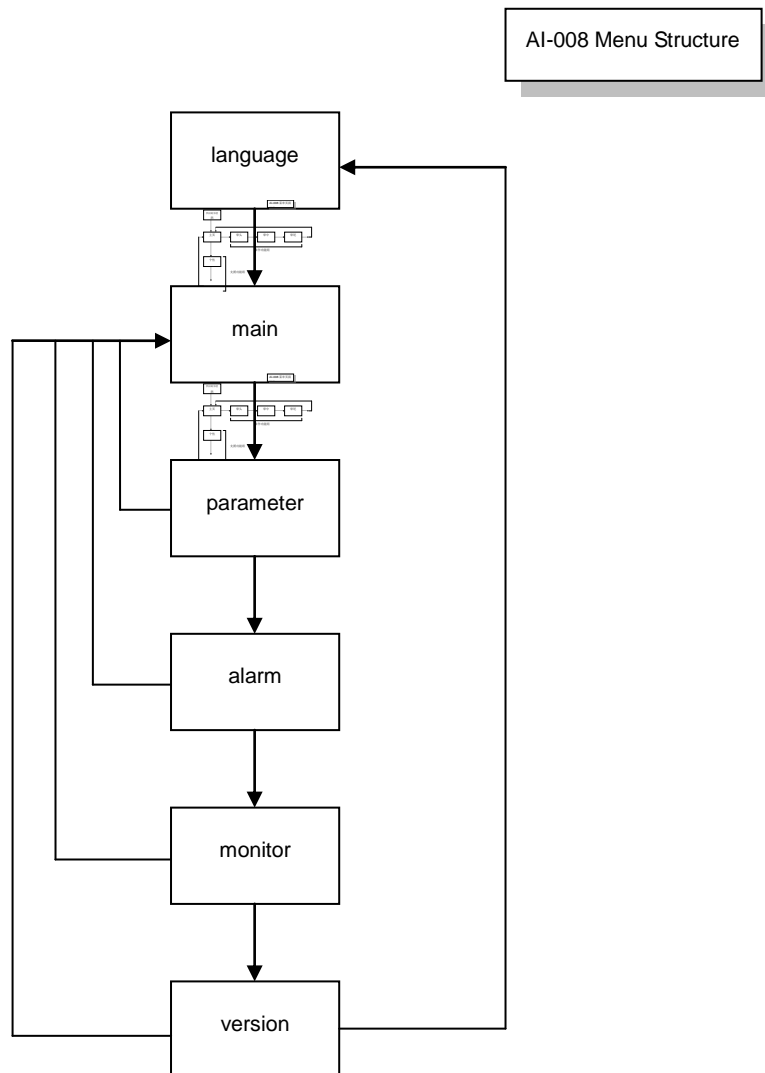
#### Knee Switch

The knee switch can make the upper roller move up when there is a need to check the workpiece condition during the sealing process interval.

## > Control Method (cont.)

### >> Control Menu Navigation

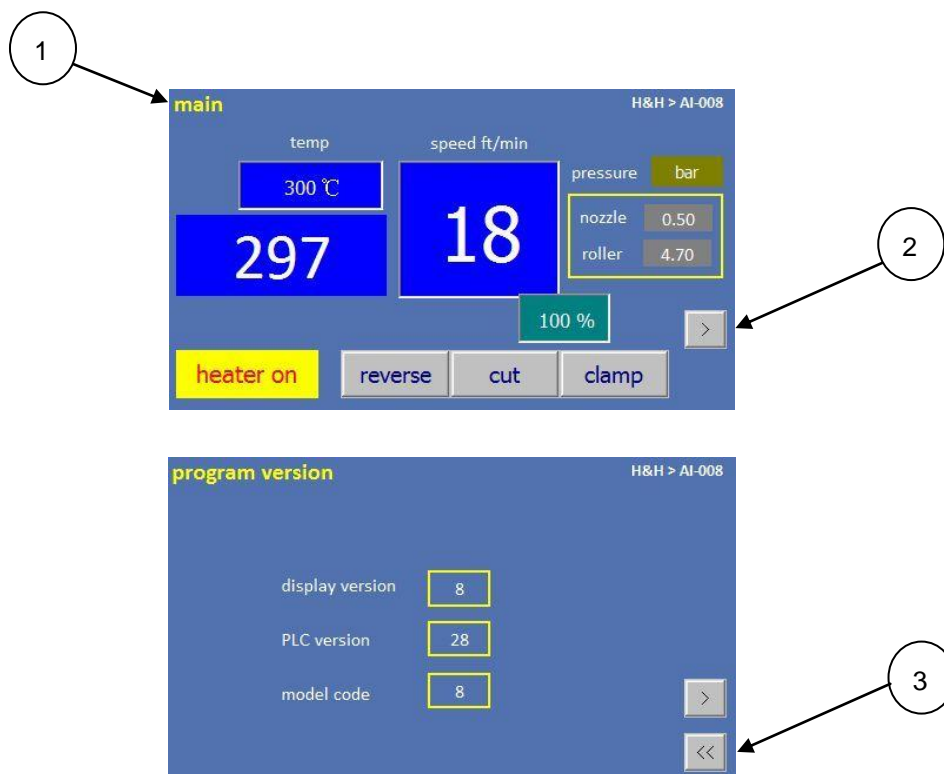
The AI-007 has many parameters that can be adjusted according to the operational situations. These parameters are arranged in different menu pages on the touch screen control panel according to their functionality. The structure of the menu page arrangement is represented in the following diagram.



## > Control Method (cont.)

### >> Control Menu Navigation (cont.)

The followings are typical menu pages, all of them have names at the top left corner for easy identification. Right arrow buttons are for navigating in the operation menu group. Down arrow buttons are for navigating in the support menu group. Please note that page 'main' is the hub of the menu network so only this page has navigation buttons for both operation and support menu groups.

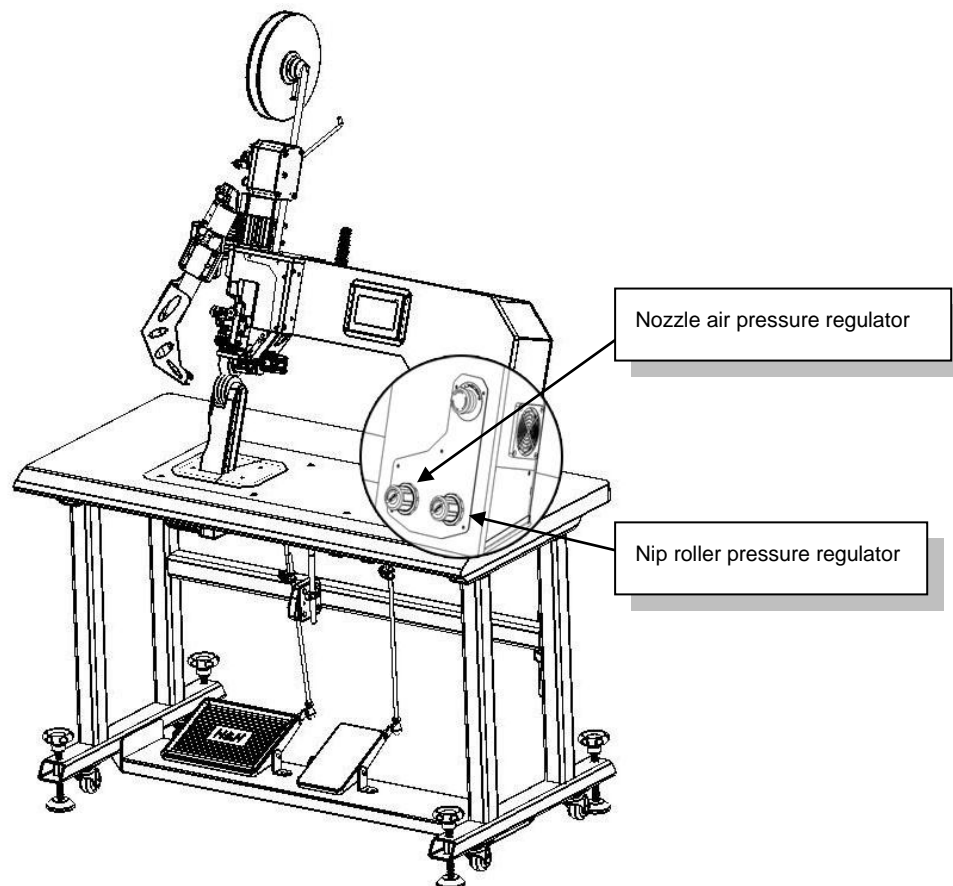


- 1 page name
- 2 next page in the operation menu group
- 3 hot key to return to page 'main'

> Control Method (cont.)

>> Pressure Adjustment

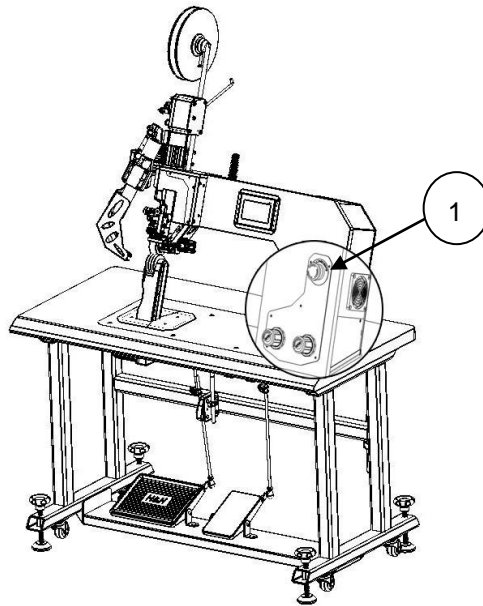
To adjust corresponding pressure, pull out the adjusting knob by one notch, turn the knob clockwise or anti-clockwise to increase or decrease the needed pressure accordingly. When finished, lock the air regulator pressure by pushing the adjusting knob toward the regulator.



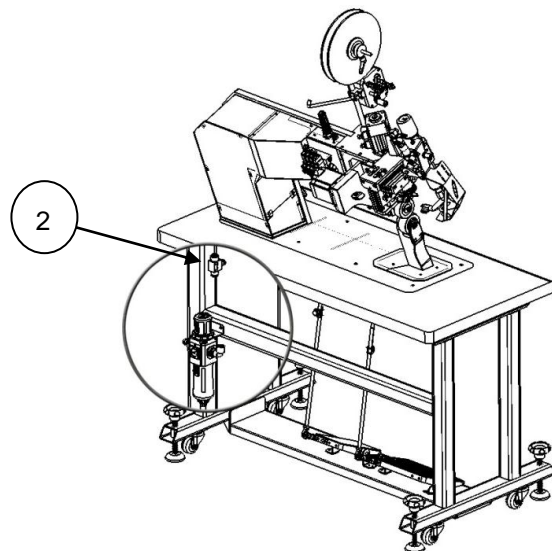
## > Start Up and Shut Down Procedures

Both start up and shut down procedures are extremely important to the well being of AI-007, please take steps to follow the procedures described.

### Location of power ON/OFF switch



### Location of main air supply ON/OFF switch



- 1 power On/OFF button
- 2 main air ON/OFF switch

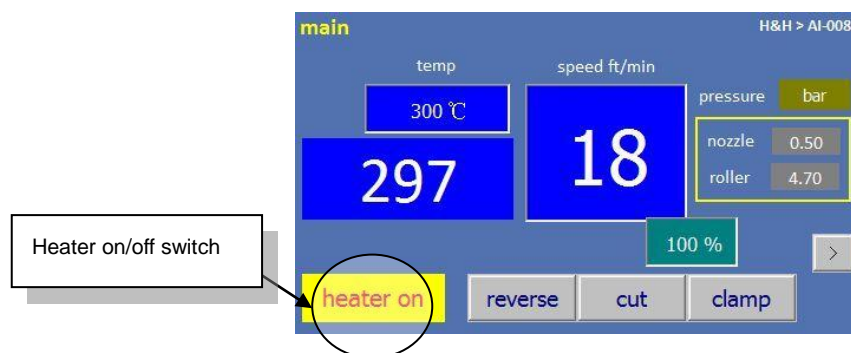
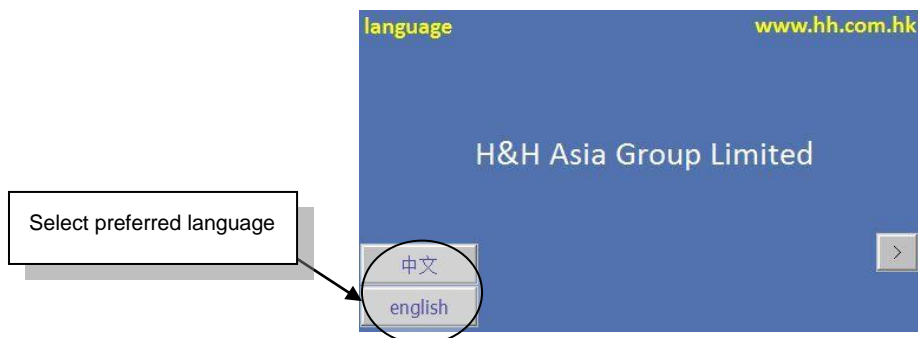
## > Start Up and Shut Down Procedures (cont.)

### >> Start up Procedures

- 1 Turn on the machine by releasing the red power ON button.
- 2 Switch on the compressed air by turning the main air ON/OFF switch knob.
- 3 Select the language after the language is shown up.
- 4 Enable the heating by pressing the **HEAT** button.

After the start, the machine monitor will display with welcome & loading pages. After about 20 seconds, the page 'main' is displayed meaning the machine is ready for operation. While the language page is displayed, you can choose the preferred language.

The display will store this selection after the power is off & you just need to press the next page button.



## >> Shut down Procedures

### **WARNING !**

***Please follow the shut down procedures strictly to avoid damage to the heater. Always cool down the heater before shutting off the compressed air supply.***

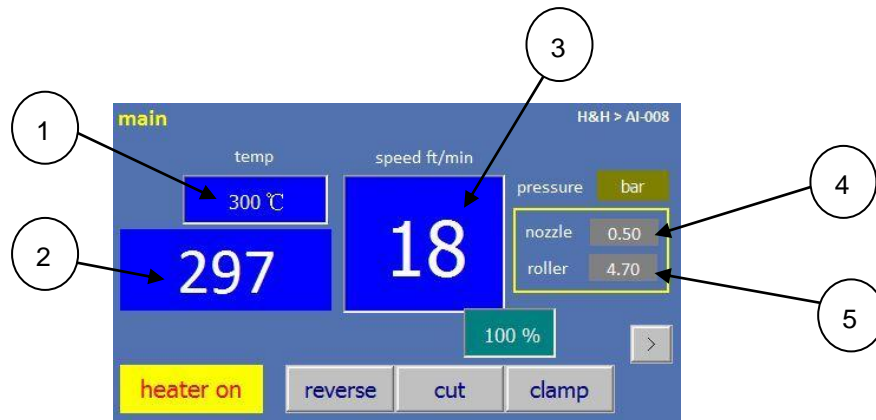
- 1 Disable the heating by pressing the **HEAT** button if the machine is previously in the heating mode.
- 2 Observe the indicated nozzle temperature, it should start to drop.
- 3 Wait until the nozzle temperature is below 60 °C, depending on the previous temperature and surrounding environment, it may take 5-10 minutes.
- 4 Confirm the temperature is below 60 °C, then switch off the machine by pressing the red power OFF button.
- 5 Follow by switching off the compressed air by turning the main air ON/OFF switch knob.



## > Basic Operation

### >> Temperature, Sealing Speed & Pressure Adjustment

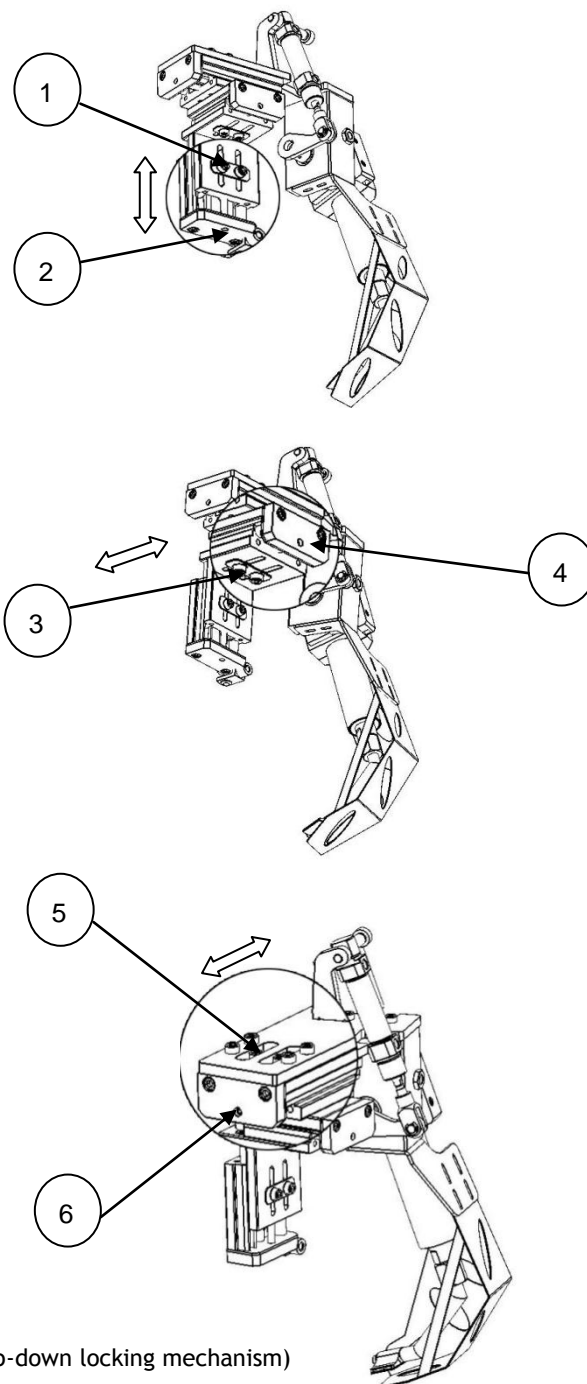
Please note the locations of basic parameters that you need to set before operating the machine. Refer to the corresponding sections for detail explanation.



- 1 preset temperature
- 2 real time temperature
- 3 sealing speed
- 4 nip rollers pressure
- 5 nozzle air pressure

> Basic Operation (cont.)

>> Heater Position Adjustment



- 1 heater position (up-down locking mechanism)
- 2 heater position (up-down adjustment)
- 3 heater position (left-right locking mechanism)
- 4 heater position (left-right adjustment)
- 5 heater position (far-near locking mechanism)
- 6 heater position (far-near adjustment)

**> Basic Operation (cont.)****>> Procedures of Seam Sealing**

Set the heater temperature, nozzle air pressure and fabric speed to the desired values. To begin with, set to 400°C, 0.1Mpa and 12ft/min accordingly. This should be a fair setting to start with. However, other setting can be used depending on the actual situation.

Activate the RUN (left foot) pedal momentarily, check the position of the nozzle and adjust accordingly.

Insert the seam tape through the tape stabilizer and the white tape presser roller, activate the JOG (right foot) pedal to advance the tape towards the nip rollers. The tape must be position in the middle and with the adhesive side facing towards the operator. Adjust the sealing tape to proper tension and running position (refer to section on tape loading)

Raise the upper nip roller by nudges the right leg knee switch , put the tape and the sewn seam in the center and release the left foot pedal so that the upper nip roller presses on the tape and seam tightly.

Collect the seam with both hands until the starting point can be reached by fingers. Position the forearms on the table and smooth out the seam with your fingers.

Activate the RUN (left foot) pedal, the hot air nozzle will engage and the nip rollers will start turning and draw the tape and the seam in between the nip rollers. Release the seam while keeping it in the center of the lower nip roller.

Near the end of tape, step on the right foot pedal while left foot pedal is still down. This will cut the tape, the upper nip roller will rise and new section of tape is fed.

The first seam sealing is completed; resume sealing for the next seam.

**>> Tape Cutting**

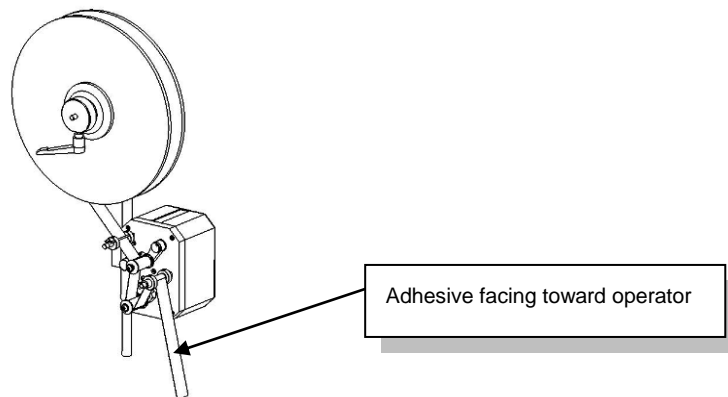
During sealing - while the left foot pedal is in forward sealing position, press on the right foot to cut the tape.

Idling - manually press the CUT button on the touch screen main page to cut the tape

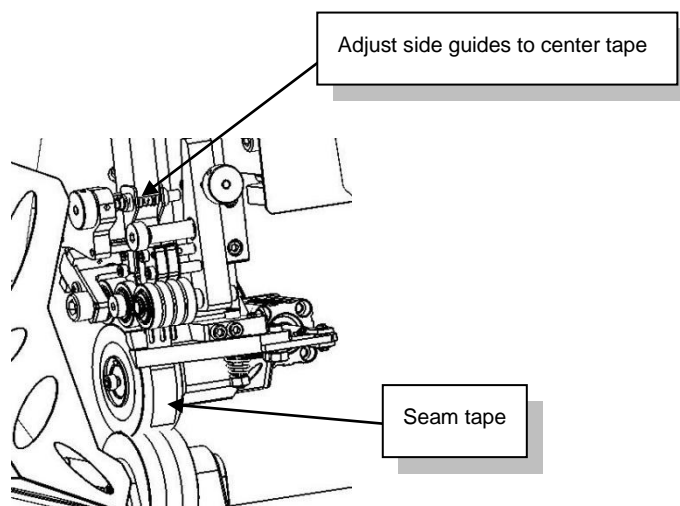
> **Basic Operation (cont.)**

>> **Tape Loading**

Load the tape on the spool and route the tape thru the tape dispenser as shown below. Make sure the adhesive side of the tape is facing the operator when installing the tape.



Next guide the tape thru various path and guide as shown below:



After the tape is loaded, press the right foot pedal to jog the rollers and make sure the tape is running at the center of the rollers and smoothly. Adjust the side guides to shift tape if needed.

> **Advance Operation**

In the past, hot air machines had been built with similar technology. Factory users were forced to compromise between quality and efficiency as fundamental problems in seam sealing still exist in day to day production.

The AI-008 hot air sealing machine is engineered to make seam sealing much easier than before. Unique features allow you to fine tune sealing conditions in the time domain level, eliminating traditional problems.

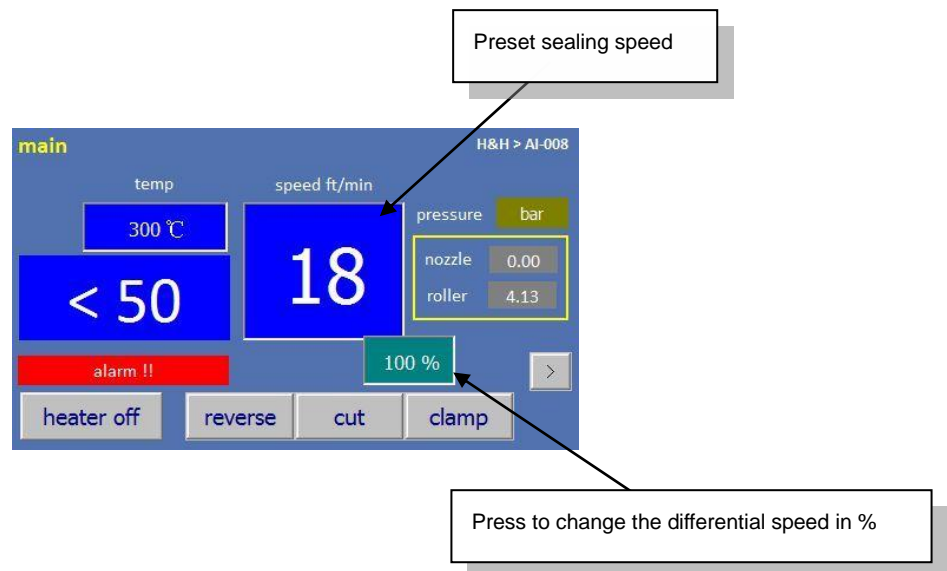
These features including but not limiting to the follows:

- Differential speed
- Duplex nozzle action
- Individual program for start/ middle/ end of tape
- Digital tensioner
- Power save mode
- Parameters lock

> Advance Operation (cont.)

## &gt;&gt; Differential Speed

This feature allows the operator to set the upper and lower rollers to run at a slightly different speed.



While the upper roller is running at the preset sealing speed, the lower roller is running at a speed according to the % (percentage) setting.

Lower roller speed = preset sealing speed x % setting

If differential speed setting = 100%, roller is running at the same speed as the upper roller.

If differential speed setting > 100%, roller is running at a faster speed than the upper roller.

If differential speed setting < 100%, roller is running at a slower speed than the upper roller.

The range of percentage setting is 80-150 %.

**WARNING !**

***When using larger differential speed < 90% or > 110%. Always place a piece of fabric between the nip rollers. Failure to do so may cause excessive stress in the transmission system which may in turn damage the machine parts***

Usage:

To compensate puckering due to stretchiness of fabric

To compensate puckering due to uneven worn out of upper and bottom rollers

To improve a phenomenon called 'bamboo shell' on some kind of fabric

> Advance Operation (cont.)

## &gt;&gt; Parameter Setting

parameter	value	range
motor delay (start)	15	1-200
motor delay (middle)	30	1-200
tape feed length	1700	100-5000
tape feed speed	7000	800-9000
tape feed delay	20	10-200
quill delay	13	5-500
nozzle retract	60	5-500
roller stop	100	5-500
micro reverse	0	0-500
reverse speed	210	200-4000

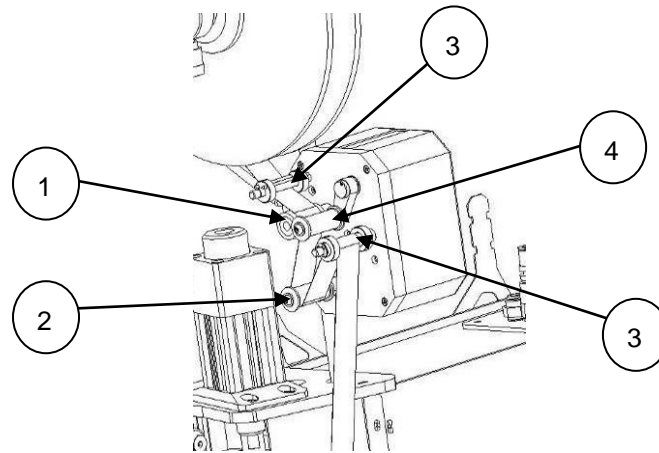
## Explanation:

- motor delay (start) : step in the left foot pedal, the nozzle will move to the working position and the delay is the ensuing time interval for the nip rollers to start again.
- motor delay (middle): when there is a breaking time during the tape sealing (i.e. nip rollers is stopped, heater retract while the nip rollers holding in the position and do not lift up, also the tape is not cut yet), step in the left foot, the nozzle will move to the working position and it is the delay time interval setting which is ensuing for the nip rollers to start moving again.
- tape feed length : the length for the new reloading tape after the tape is cut.
- Tape feed speed : the refresh tape reloading speed after the tape is cut.
- Tape feed delay : the time delay setting for the new tape reloading after the tape is cut.
- Quill delay : the delay time setting between the nozzle goes to the working position and upper nip roller goes down after the left foot pedal is stepped in for sealing.
- Nozzle retract : the delay time setting for the nozzle to retract after the tape is cut.
- roller stop : the delay time setting for the rollers to stop and lift up after the tape is cut.
- micro reverse : fine reverse distance setting for nip rollers to move reverse when there is a stop in the middle of the process.
- reverse speed : reverse speed setting for nip rollers when there is a stop in the middle of the process.

> Advance Operation (cont.)

>> **Digital Tensioner**

During seam sealing, the consistent supply of seam tape to the sealing area is important. Your AI-007 is equipped with a built in digital tensioner to release the seam tape from the tape spool. Route the tape exactly as shown in the below diagram.



- 1 driving roller
- 2 swing sensor
- 3 tape stabilizer
- 4 tensioner press roller



> **Maintenance**>> **Preventative**

In order to keep the machine in top running condition, regular maintenance is important for trouble free operation. This will minimize possible down time and to prolong machine life.

**Daily**

- Check the motion of the machine for smoothness and strange noise.
- Check the air hoses for leakage or damage.
- Check silicone roller for worn or damaged.

**Weekly**

- Check all rollers for excessive play, all play should be less than 5 mm, adjust the corresponding cam belt tension if necessary.
- Lubricate the cutter blade slightly with machine oil. Wipe off any excessive oil if necessary.
- While the machine is off and cooled, test the circuit breaker by pressing the test button. The handle should flip to OFF immediately.
- Check the speed of the nip roller cylinder. Adjust the speed by the air speed regulators located under the touch screen control panel if necessary.
- Visually inspect all the electrical and mechanical parts for abnormal burns and looseness.
- Check the nozzle air pressure interlock: lower the nozzle air pressure gradually to below 0.05 Mpa, an alarm message should appear and the heater power will be cut off followed by a drop in heater temperature.
- Next increase the air pressure to above 0.1 Mpa, the alarm message 'pressure low' in the page 'main' should disappear.

**As Required**

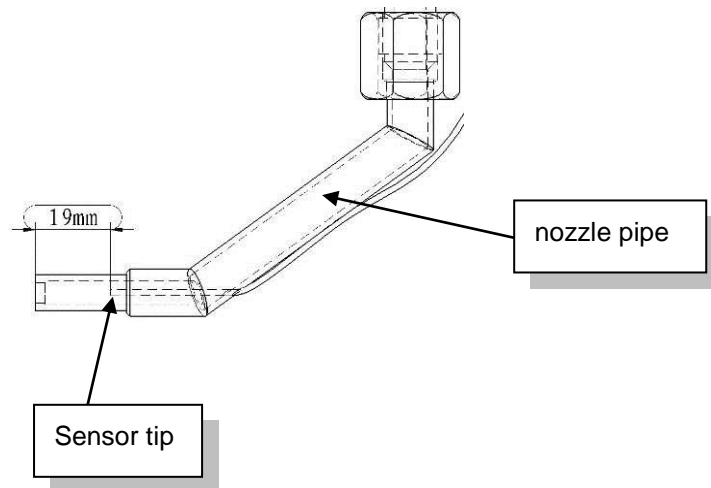
- Clean the rollers to remove any adhesive residue, which may cause fabric wrapping.
- Replace the silicone roller by a new one if necessary.
- Replace heater element if damaged, be careful not to allow material being broken off from the old element causing blockage to the air passages.
- If nozzle is blocked, remove the nozzle from the heater and tap it gently to release foreign material from the inlet side.

> Maintenance (cont.)

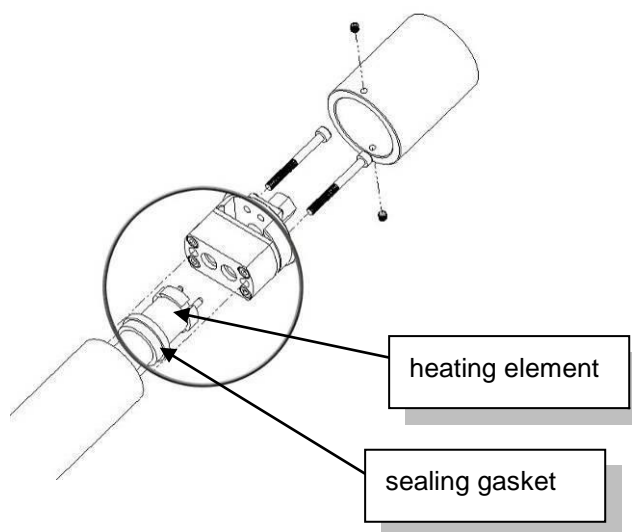
## &gt;&gt; Procedures for Replacing Parts

Temperature sensor

The tip of the replaced thermocouple is very important, the location must be the same as shown in the below diagram. Also inspect and make sure that the tip is in the center of the pipe and not touching the metal part. This is essential for the sensor to measure the air temperature correctly.

Heater Element

Remove the heater top cap and the heater securing mount to locate the heater element. Carefully pull the element off the connecting sockets. Replace the broken element with a new one, make sure that the red colored sealing gasket is installed properly. Installation is just the reversal. After replacing a new heater element, run the machine at 300 °C for at least 10 minutes to break in the heater before operating at higher temperature.

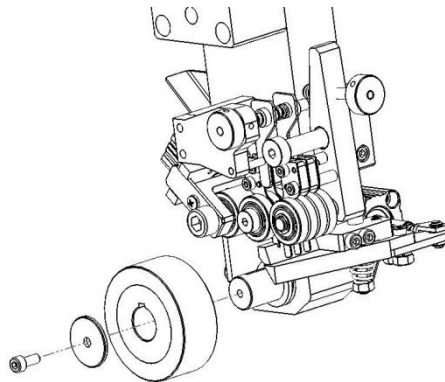


> **Maintenance** (cont.)

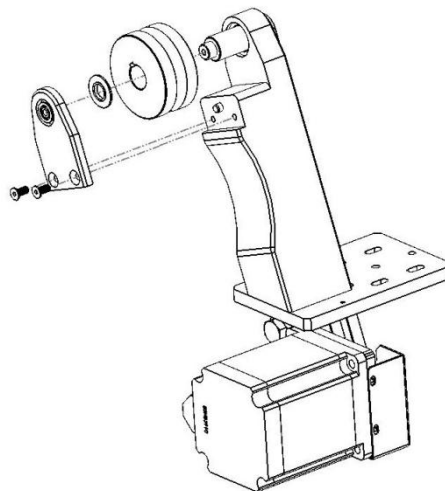
>> **Procedures for Replacing Parts** (cont.)

Rollers

The rollers are needed to be replaced when there are signs of torn or excessive worn in order to maintain the consistence of quality of the finished product. Replace the rollers as shown in the illustration below. Please choose the correct width and softness roller. For best result, always use genuine H&H parts for replacement. Please contact us for optional sizes.



upper roller



lower roller

## > Trouble Shooting



- The green colour blankets which show at the monitor page are the signal feedbacks that are triggered while the red colour blankets are not.

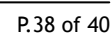
> Trouble Shooting (cont.)

Problem	cause	solution
No power in some places	Power cable or plug faulty	Check the power supply connection
	Circuit breaker tripped	Reset circuit breaker and investigate the cause
	Main power switch not turned on	Press the power ON button (start)
	Bad connection	Check all wires for loose connection
	Faulty transformer	Check the voltage of switching power supply
Motor not turning	Faulty Main controller	Replace a new controller
	Motor short circuit	Check circuit or replace a new motor
Temperature display not stable	Faulty thermocouple	Replace a new temperature sensor
	Loose thermocouple connection	Check and secure the connection
	Faulty temperature controller	Replace PCB in the main electrical box
	Thermocouple extension wire short circuit	Find the location and fix
	Thermocouple not installed in proper position	Check the position of sensor tip and fix
Temperature display read ambient at all time	Heater is not turned on	Press <b>HEAT</b> to enable heater
	Air pressure too low	Inspect if air supply is cut off
Temperature fluctuate abnormally	Broken heater element	Replace heater element
	Faulty thermocouple	Replace thermocouple
	Hose tangled	Check for hose clearance or pinch during heater movement
	Line voltage fluctuation	Install voltage regulator
	Loose object in air passage	Remove nozzle and clean the foreign material
Heater Not heating	Faulty solid state relay (SSR)	Replace solid state relay
	Pressure low interlocked	Increase nozzle air pressure
	Heater broken	Replace heater element

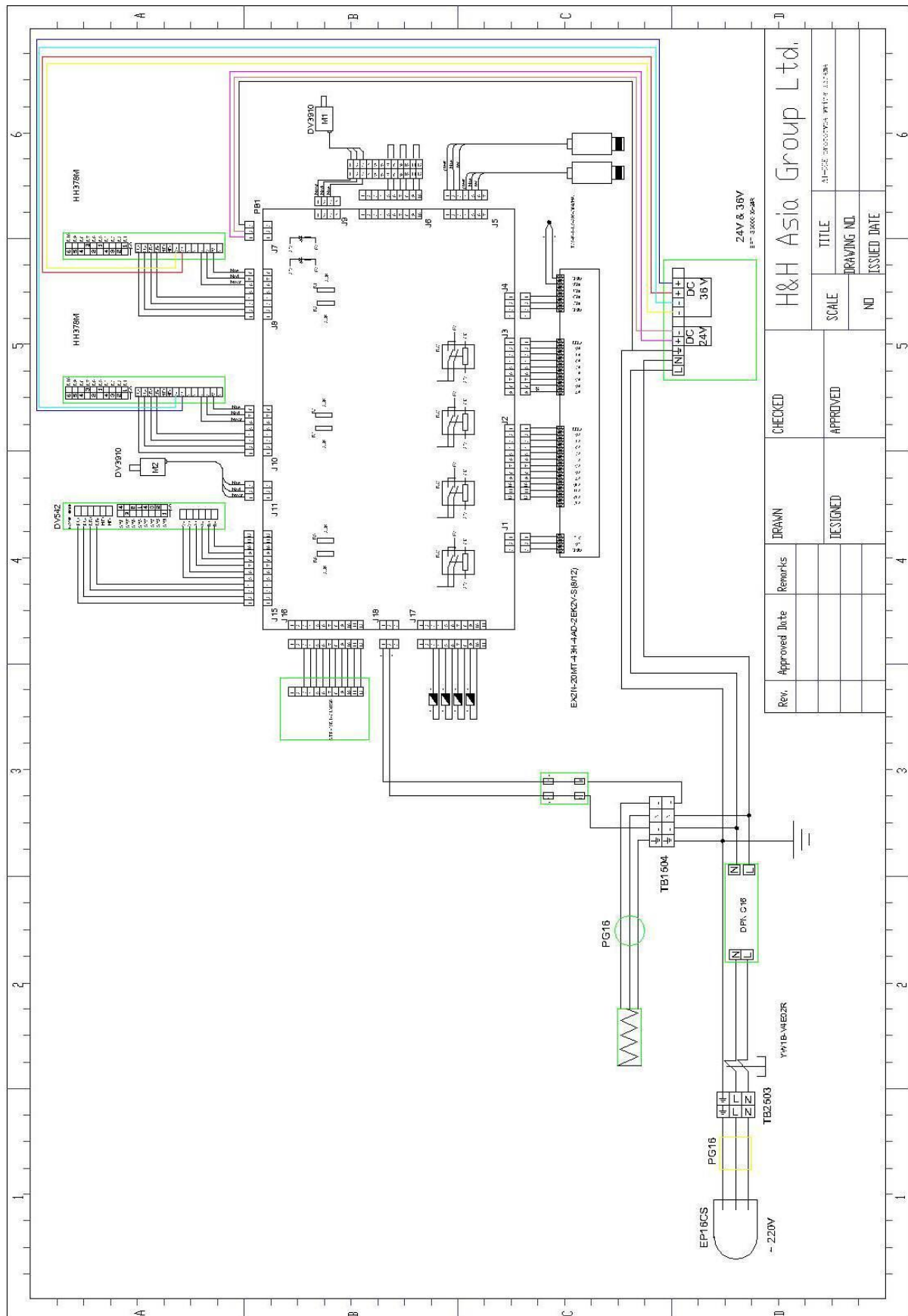
**Appendix A      Nozzle Air Flow Cross Reference Table**

<b>Nozzle air pressure (Mpa)</b>	<b>Air flow (L/min)</b>
0.05	35
0.06	38
0.07	40
0.08	42
0.09	45
0.10	48

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# Appendix C Wiring Scheme





[illegible]