

ADKINS

ADKINS

HEAT PRESS TECHNOLOGY

ALPHA CALENDER ROLL-MASTER 1.6



Operators Handbook

All products within the ADKINS range are labelled with CE marking and are manufactured and tested to comply with EC safety regulations.

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Preface

Dear User

Welcome to the growing group of Alpha Industrial Roll-Master 1.6 users. The product you have purchased has been carefully designed and manufactured to ensure that you, the user, will gain the maximum benefit.

All Charterhouse Holdings PLC products are specifically designed to ensure ease of use with particular attention to safety requirements.

Should you discover any fault or damage upon receipt of this product, you should immediately contact your supplier.

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1. Introduction Alpha Industrial Roll-Master 1.6

The Alpha Industrial Roll-Master 1.6 is a pneumatically operated Calender press for transfer printing and material fusing with an oil heating system dye sublimation onto knitted, synthetic, and non-cloth fabrics such as polyester and nylon. It is capable of printing in piece-to-piece operation and also roll-to-roll for polyester materials and spandex materials.

Features include:

- Automatic felt blanket alignment
- High capacity oil drum that can be filled to 100% capacity
- Hand cranked blanket tensioning system
- Blanket release system
- Auto power off feature
- A duplex Teflon® oil drum
- Air expanding shafts
- Piece-to-piece and roll-to-roll functionality
- Three Feed rollers and two take-up rollers

The auto felt blanket alignment feature avoids lost and spoiled production due to the blanket tracking off alignment during setup and production, and requiring less maintenance during day-to-day operation.

The high capacity oil drum can be filled to 100% capacity, which increases the transfer speed substantially as the heat temperature is more evenly spread across the drum, and more stable during operation.

The auto power off feature makes the machine more energy efficient and economical, and guards against accidental damage due to overheating should the machine be left on accidentally. This feature is fully programmable from the PLC controller and the main power button, saving the operator at least 3 hours a day over using a manual shut down machine, as no user interaction is required when the machine is turned off.

The Control panel is very user friendly and will aid in the rapid training of operators due to its simplicity of useage and easy to read layout.

1.1 Specifications of the Alpha Industrial Roll-Master

1.6

Specifications:

Power consumption	26 kW
Power supply	380 Volts AC 3-Phase (N+E)
Fuse	160 A
Working temperature	70 - 240°C (158 - 464°F)
Heating element (oil filled drum)	Ø-420 mm (Ø-16.5 in)
Display Timer Range	N/A
Machine height	98.5 cm (38.8 in)
Machine width	245 cm (96.5 in)
Machine depth	132 cm (52 in)
Working area required	245 (W)x 98.5 (H)x 132 (D) cm (96.5 (W)x 38.8 (H)x 52 (D) in)
Gross weight	1650 Kg (3,637 lbs.)
Net weight	32 Kg (3,307 lbs.)
Maximum print width	160 cm (63 in)
Maximum transfer speed	2.5 m/min (98.5 in/min)
Feed rollers	3
Take-up rollers	3
Control unit	LED digital microprocessor unit

1.2 Safety tips

- ◆ **Our customer service department** has its own service engineers and, if required, maintenance is available.
 - ◆ **The Alpha Industrial Roll-Master 1.6** meets the European Legislation standard. Under normal conditions accidents are rare. However listed below are some practical points to ensure your safety.
 - **This press will automatically open when the transfer cycle is complete.** Make sure there is sufficient space around the machine for the heat plate to rise from the table, without interference. **Only persons fully trained should operate this machine.**
 - **Always switch off** the current (and pull plug out of the socket) when undertaking maintenance work or when cleaning the machine.
 - **Ensure that there is** sufficient space around the machine. Cables and connections must not get jammed. Although the heat radiation of the press is low, there should be enough space for cooling down.
 - **Avoid contact** with the heating drum.
 - ◆ **DO NOT REMOVE THE INSTRUMENT COVER UNLESS QUALIFIED TO DO SO** - touching internal parts is dangerous and may cause shock hazard. All electrical connections inside covers are live. Never operate Press with any covers and/or guards removed.
 - ◆ **PROTECT THE MAINS CABLE** - damage to the mains cable may cause fire or shock hazard. When unplugging, hold by the plug only and remove carefully. Take care that the mains cable does not come into contact with the heating drum (or moving parts of the m) during operation of the machine.
 - ◆ **OPERATING AMBIENT TEMPERATURE RANGE** - the operating ambient temperature range is 0°C - 35°C, (32°F - 104°F) and humidity of 20 - 80%.
 - ◆ **MACHINE FUSE(S)** – 160 Amps.
 - ◆ **WARNING - THIS APPARATUS MUST BE EARTHED (GROUNDED)**
 - ◆ **CAUTION**
This machine gets hot whilst operating. Take care not to touch any surfaces that are labelled “HOT”.
-

Safety tips (cont.)

♦ MACHINE OPERATION

Only persons trained to do so should operate this machine.

- 1.2.1 **The power source used for the equipment must be in line with the type designated by the nameplate.** The earthing must be accurate and reliable (equipment with three terminal polarized plus plug should not be allowed to change the function of the earth electrode freely).
- 1.2.2 **When the equipment is operating normally the surface temperature of the heating roller is very high,** do not touch with any part of the body, hair or clothing.
- 1.2.3 **When examining or repairing the machine, or when any inspection covers or doors are open,** the machine must be isolated from the power supply to avoid the risk of electric shock and/or mechanical wounding incidents. When the machine is not in use the power should also be switched off.
- 1.2.4 **Care should be taken to ensure that the power cable cannot become a trip hazard** or that it is placed in an area where it can be crushed or otherwise become damaged.
- 1.2.5 **All electrical parts should remain covered by their protective covers, at all times, to prevent dust build-up on electrical parts,** which will become an electrical shock hazard through conduction.
- 1.2.6 **The machine should be situated in a dry,** well ventilated place well away from possible sources of damp or water. No flammable or explosive material should be placed on or near the machine at any time, also equipment sensitive to heat radiation should be situated well away from the machine.
- 1.2.7 **Do not place tools or other sundrie items such as screwdrivers,** screws, nails, nuts, bolts spanners etc. onto any surface of the machine, to avoid them falling into the rollers.
- 1.2.8 **Never clean or wash the machine with water,** to avoid the potential of a short circuit, electric shock or corrosion.

1.3 Safety parts

Heat button and power button:

Both the power button and heat button are on the control panel; Press the heat button to immediately stop the heating of the oil filled drum; Turning off the power button will isolate the oil filled drum from the

supply, and thus stop all heating but does provide power for the motor to revolve.

Felt blanket maintenance:

When the transfer run is completed turning off the heat will allow the motor to continue revolving until the temperature reaches 80°C (176°F), to prevent the blanket from burning.

N.B. The machine can also be set to automatically shut down from the PLC controller.

Oil filled heated roller:

Following heating the surface temperature of the oil filled roller can be in excess of 240°C (464°F). While it is heating do not touch the roller surface with any part of the body, to avoid crushing and/or burning. When the machine is heating and/or operating, operators should always be present to avoid roller damage or accidental fire, due to overheating.

1.4 Warning symbols

Please pay attention to the following warning symbols, to reduce the instance of serious injury and/or death during machine operation and maintenance.



Anti Grinding

This sign is displayed at the junction of the upper and lower drive rollers on both sides, at the front of the machine.

The rubber roller is dangerous in operation, so care must be taken to keep hands, hair, clothing or other parts of the body clear.



High Voltage

This sign is displayed at the inner flank of the power box.

Do not touch to avoid burns and/or electric shock, which can result in serious injury or death.



Chain

This sign is displayed on the inner flank of the left box.

The chain is dangerous in operation, so care must be taken to keep hands, hair, clothing or other parts of the body clear.



Burning Prevention

This sign is displayed at the front of the cabinet near the heated oil drum.

The oil drum coated with black Teflon™ is hot during operation and cool down of the machine so care must be taken to keep hands, hair, clothing or other parts of the body clear until the machine has fully cooled down.

2. Installation

2.1 Transport instructions

The Alpha Industrial Roll-Master 1.6 comes to you in a wooden shipping crate. If you have to transport the machine at any time it is recommended that you use a similar crate and packing method.

2.2 Installing the machine

The machine must be place on a flat stable hard standing, a concrete floor is ideal for this. The ideal are should be twice the length of the machine and twice the width to allow for easy access and maintenance, and the room should be dry and well ventilated with a mechanical extractor where possible.

2.3 Disassembly of the shipping crate

- Unscrew the bolts on all edges and remove all nails on the top cover of the crate.
- Use a hammer and crowbar to remove the upper cover of the crate.
- Remove the four crate walls.
- Move the machine to its desired position, using a forklift truck rated for at least the gross weight of the machine.

2.4 Installation of the machine

Install the working table (referring to the numbered stickers as a guide)

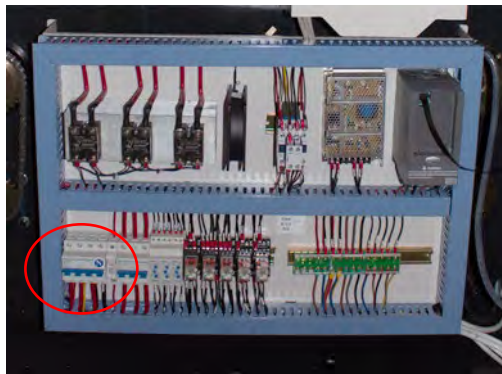


Installation of the machine (cont.)

Use a good quality spirit level of at least 3 m length to aid in leveling of the machine, then connect a compressed air gun to the outlet situated on the lower left rear side of the machine, to provide air for the expanding roller shafts.

2.5 Electrical requirements

2.5.1 Power input point



Release the screw on the main terminal, connect the three live wires to terminals L1, L2 and L3 one-by-one and then connect the neutral wire to the terminal marked N

The ground wire should be connected to the grounding point

N.B. The wiring used should be rated for the power value on the machine dataplate

3. How to operate the Alpha Industrial Roll-Master 1.6

3.1 Starting with the Alpha Industrial Roll-Master 1.6

- 3.1.1 **Before switching on the machine make sure that all electrical wires are connected correctly**, as detailed in **section 2.5**. The body of the machine must also be connected to the grounding point. Press the main circuit breaker and switch on.
- 3.1.2 **Turn the hand wheel** to apply the maximum tension on the felt blanket.
- 3.1.3 **Turn 'Power on/off' to on** and 'Felt Direction BWD – FWD' to FWD, then set the desired transfer speed, on the speed controller (the selectable range is from 6 Hz to 20Hz).
- 3.1.4 **When the felt is revolving press 'Heat on/off' to on**, and the machine will start to heat up (the working temperature range should be between 185°C and 230°C (*365°F and 446°F*)).
- 3.1.5 **When the preset temperature is achieved** check the surface temperature with an infra-red thermometer, then check the transfer result with a small piece of printed transfer paper and substrate. Adjust the temperature with reference to the testing result of the transfer.
- 3.1.6 **Ensure that the Felt Blanket is covered with barrier paper** to prevent strike-through contamination from the ink on the transfer paper. Use the compressed air gun to expand the expandable air rollers to fix the position of the tissue paper.
- 3.1.7 **Place cardboard cores on all** of the rewinding (exhaust) shafts.
- 3.1.8 **Feed then barrier paper through the tension bar**, then through the guide shaft and over the heated oil drum. When the barrier paper reaches the rewinding shaft (exhaust shaft) at the rear of the machine, rotate the crank to control the tension of the tension bar.
- 3.1.9 **Place the printed transfer paper and fabric in the correct working position** on the feed table and through the machine using the correct rollers, and finally over the heated oil drum.

N.B. the tension on both ends must be identical

Once the spent transfer paper reaches its rewind (exhaust) roller, adjust the speed to be slightly faster than the transfer speed that you set earlier. This will have the effect that the printed paper and will be collected automatically and the fabric will automatically be delivered to the front of the machine on the conveyor belt.

Starting with the Alpha Industrial Roll-Master 1.6 (cont.)

If when feeding the barrier paper/transfer paper/fabric it should wrinkle and/or crease this is caused by imbalance of the tension on both sides of the rollers.

- 3.1.10 Adjust the tension of each shaft** to achieve the best results.
- 3.1.11 For thick and/or uneven materials or Spandex™ materials,** switch on 'Transfer Pressure' to give more pressure between the oil drum and the felt blanket.
- 3.1.12 At any time during machine operation** the temperature, transfer speed and felt blanket tension can be adjusted to improve the transfer result.
- 3.1.13 When the transfer run is completed** press the air valve on the rewinding (exhaust) rollers to release the air, and thereby the tension on both the barrier paper and spent transfer rolls. This will allow for their removal.
- 3.1.14 Select the 'auto cool down' and 'auto-off' options** for unattended shut down or monitor the machine until the recorded temperature drops below 80°C for non-auto shutdown.

N.B. If there is a sudden loss of power whilst the machine is operating at high temperature use the hand wheel immediately to move the felt blanket backwards, and then insert soft paper board or papers (around 2 to 4mm in thickness) between the oil drum and the felt blanket, to prevent burning of the felt.

4 Operational notes

4.1 Felt blanket tracking

Felt is pre-shrunk before the machine is dispatched, use the felt tracking device to control the felt.

4.2 Noise

The rollers and bearings may expand and become noisy in operation when they are heated to certain temperatures. This is a normal phenomenon and does not impare operation.

4.3 General maintenance

The following checks should be carried out at regular intervals by a qualified and competent person:-

- Pneumatic system for air leaks
- Pneumatic system for lubrication
- Electrical connections
- Belt tension and condition
- Mechanical moving parts

Any enquiries to: enquiries@aadkins.com

4.4 Cleaning

Keep clean and tidy so that there is no dirt falling into the electric circuit box and transducer. Always keep the electrical coverings in place to avoid electrical shock and/or death.

There is a Teflon™ coating on the oil drum roller that should not be scratched or cleaned with acidic chemicals, this is important as the oil drum is a non-warranty part.

4.5 Lubricating

All bearings should be lubricated with lithium based grease with a temperature flash point of not less than 240°C (464°F).

4.6 Felt blanket

Operators should use good practise with regard to the felt blanket as it is a non-warranty part.

If there is a sudden loss of power whilst the machine is operating at high temperature use the hand wheel immediately to move the felt blanket backwards, and then insert soft paper board or papers (around 2 to 4mm in thickness) between the oil drum and the felt blanket, to prevent burning of the felt.

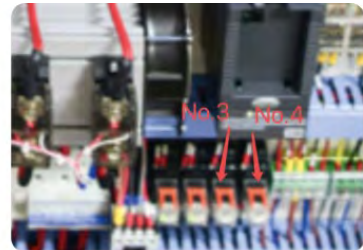
When the machine is next started remove the paper and re-tighten the felt using the hand wheel.

4.7 Pre-Shrinking of replacement felt blanket

If you need to replace your felt blanket then the new part should be pre-stabilized to resist high temperatures.

Please perform the following procedures:

1. **Ensure the actuator is located at the centre position** as shown in image No.1.
2. **Remove No.3 and No.4 relays** to disconnect the felt blanket auto-aligning system.



3. **To keep the blanket under the correct tension status** a pressure reading on the pressure regulator should be 0.2. You should then turn the 'felt tension/release' crank handle to its maximum and then turn back by half a turn.
4. **The procedures for pre-shrinking the felt blanket** should be based on the following table:

Temperature		Working time
120°C	248°F	3 hours
140°C	284°F	3 hours
170°C	338°F	4 hours
200°C	392°F	4 hours (very important)
230°C	446°F	4 hours

N.B. During the pre-shrink period adjust the tracking of the felt blanket manually or reverse the rotation direction of the felt.

After the pre-shrink period is completed the machine should be run for 6 hours at 220°C (428°F), then the No.3 and No.4 relays should be

Pre-Shrinking of replacement felt blanket (cont.)

replaced to activate the auto aligning system. The white sensor rods on either side of the felt blanket should then be closed to touch the edge of the felt blanket.



Caution:

If there is a sudden loss of power whilst the machine is operating at high temperature use the hand wheel immediately to move the felt blanket backwards, and then insert soft paper board or papers (around 2 mm to 4 mm in thickness) between the oil drum and the felt blanket, to prevent burning of the felt.

4.8 Horizontal adjustment

When transfer working is finished please turn the heating off and keep the blanket running until the temperature reduces to 80°C (176°F). Or activate the 'auto-off' function by switching off the 'heating 'on/off' button and the power 'on/off' button, and the machine will auto-off after several hours running, to cool down.

When you restart the machine after a prolonged period of inactivity it is suggested to pre-heat the felt blanket at a temperature of 200°C (392°F) for 3 hours, especially during the colder winter months.

Please use a spirit level of at least 3m to perform initial levelling of the machine at its new location using the adjustable feet to perform the changes.

Precise measurements should be taken both horizontally and vertically to ensure all parts of the machine are perfectly level.



Horizontal adjustment (cont.)

Once all measurements confirm that the machine is level then the adjustable feet should be locked in their positions.

4.9 Heating system

4.9.1 The oil drum was filled with heat transfer oil (mineral base, suggested brand name: Total)

Oil specification:

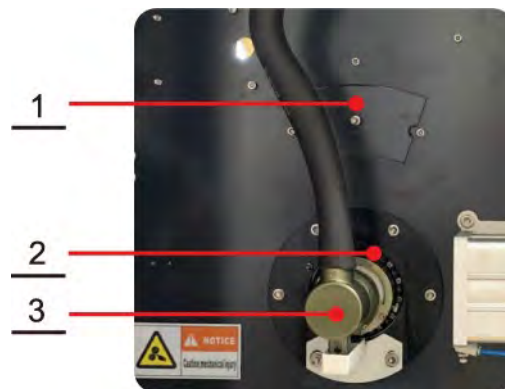
- **Density:** 0.83-0.87 g/cm³ at 20°C (68°F)
- **Viscosity:** 21-31 mm² at 50°C (122°F)
- **Flash point (open to air):** 173°C (343.4°F)
- **Distillation range (2% v/v):** 340°C (644°F)
- **Maximum temperature at use:** 320°C (608°F)

The heating oil can be used for up to 3 years and can be topped up from the top oil tank

4.9.2 The oil observation windows shows the oil level when the machine is cooled down in the centre of the window.

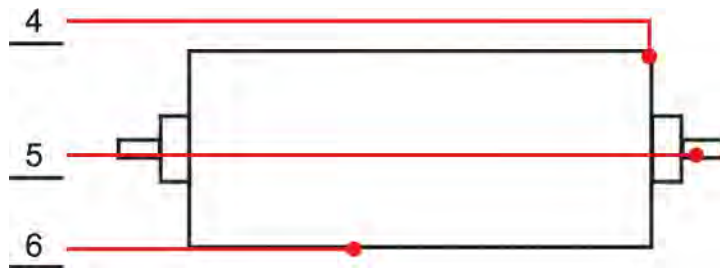


4.9.3 Oil drum



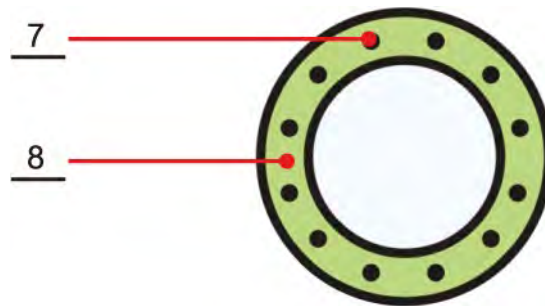
- (1) Inspection window
- (2) Bearing (6019)
- (3) End cap, for sealing

Heating system (cont.)

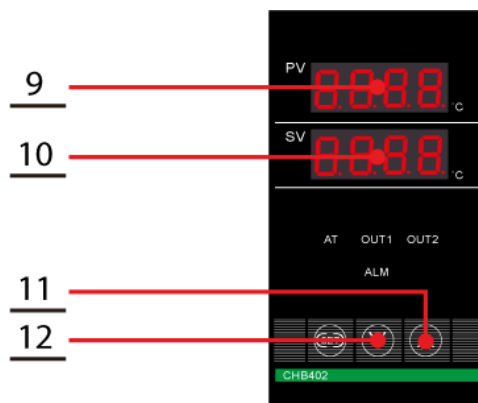


Front view of oil drum

- (4) Release bolt to drain oil
- (5) Release bolt to refill oil
- (6) Thermo sensor to detect surface temperature



- (7) Heating element
- (8) Heating oil (green)



- (9) Present temperature
- (10) Preset temperature (default value: 204°C (400°F))
- (11) Increase setting value
- (12) Reduce setting value

N.B. Collected leaked oil can be recycled back into the oil tank on the top right hand side cabinet

Heating system (cont.)

Do not replace the heating oil or any of the oil roller parts yourself without consulting our engineers. Parts must be provided and approved by Charterhouse Holdings PLC.

4.10 Oil Drum Temperature Measurement

Testing of the oil drum for temperature consistency or fault condition should only be undertaken after consulting Charterhouse Holdings PLC, and then only using a wired Digital Thermometer (*please see note below).



***Please Note:**

The Digital Thermometer with external probe is suitable for surface, air and immersion/penetration measurement, which is required for all Adkins heat presses.

Laser Thermometers only measure air surfaces which can be misleading due to currents of hot air floating on the surface of the oil drum.

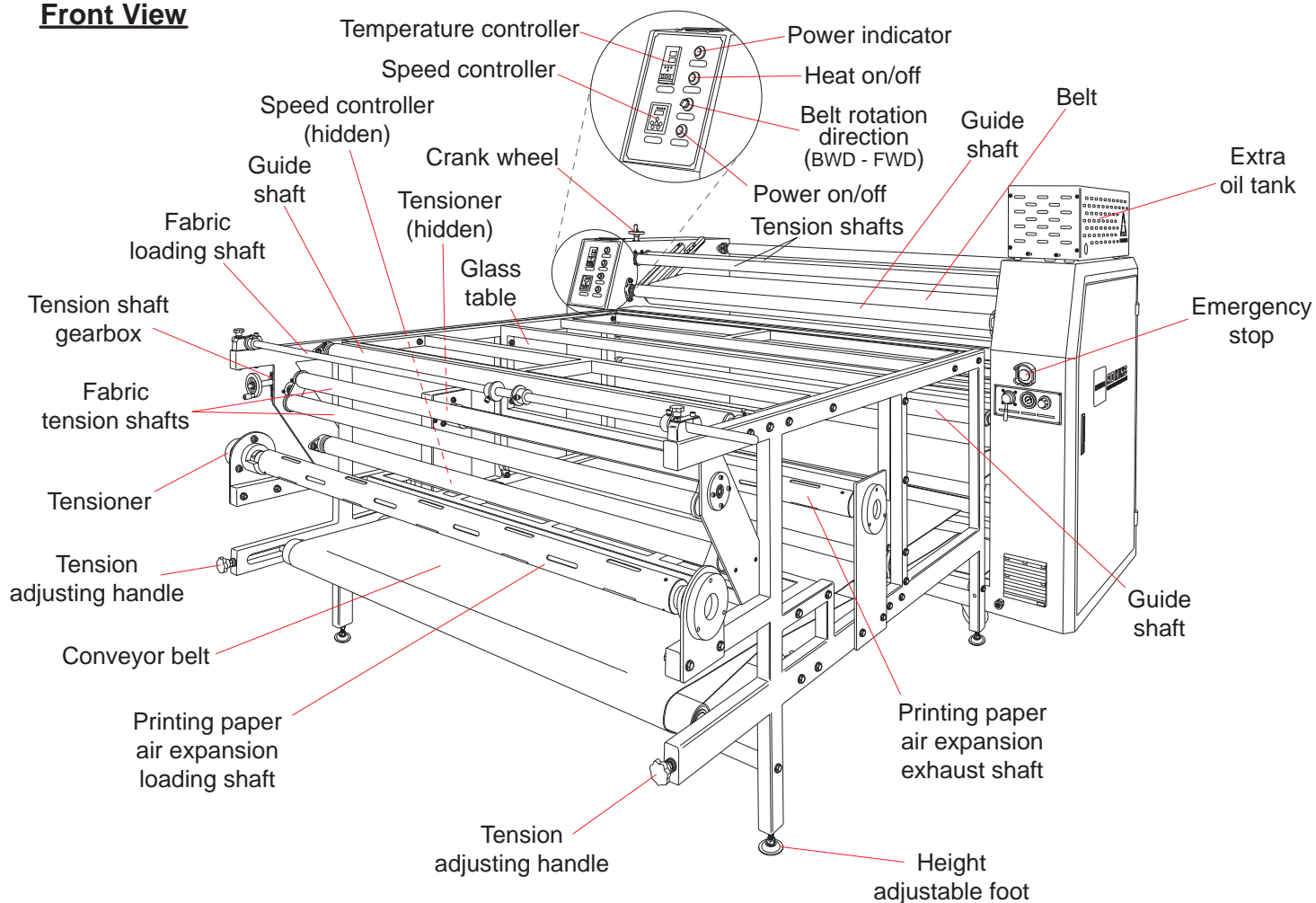
5. Machine drawings and diagrams

On the following pages are the schematic diagrams for the **Alpha Industrial Roll-Master 1.6**.

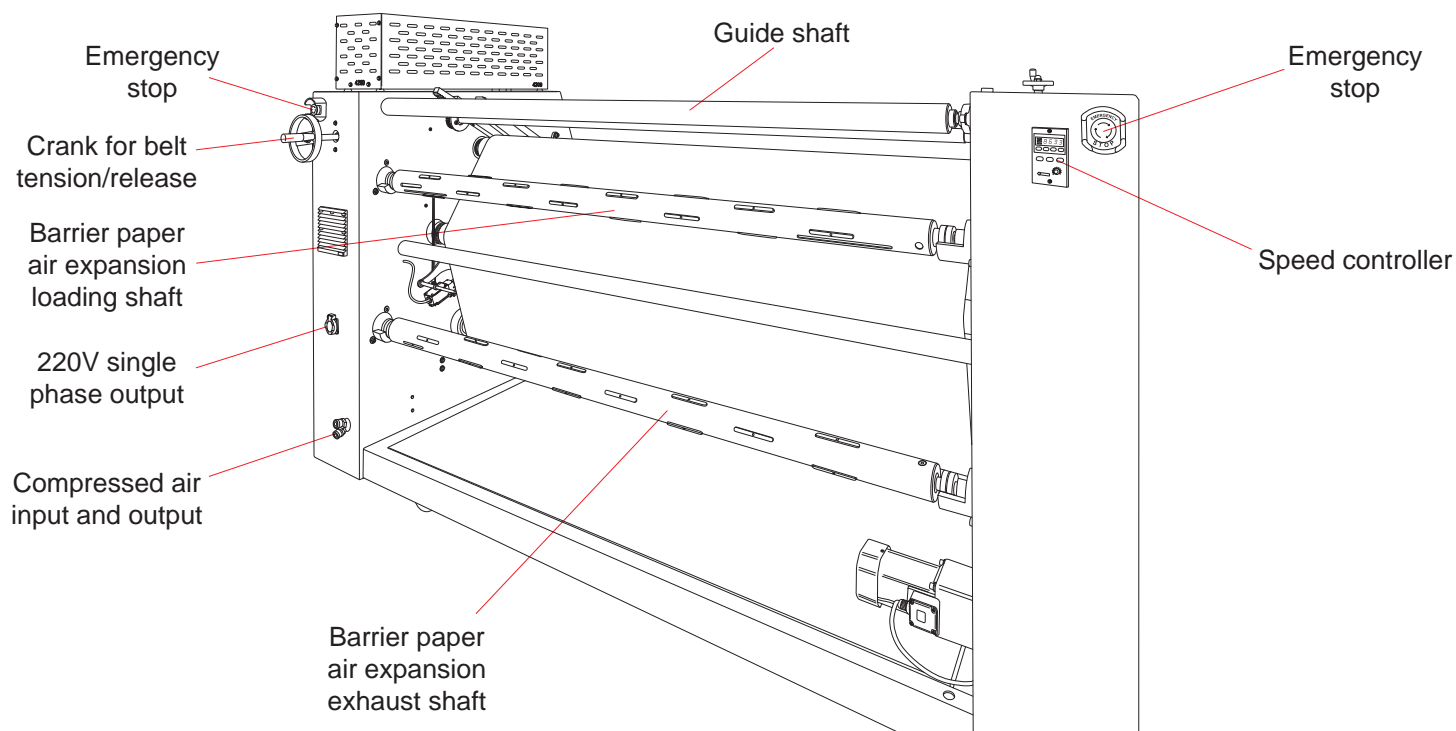
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5.1 General Layout

Front View

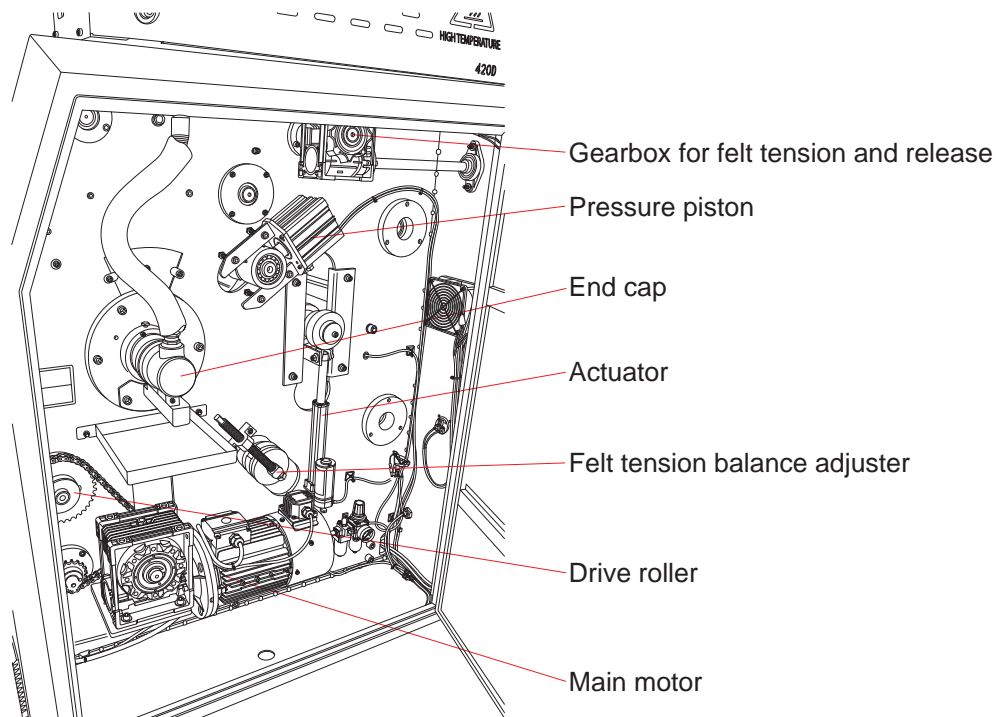


Rear View

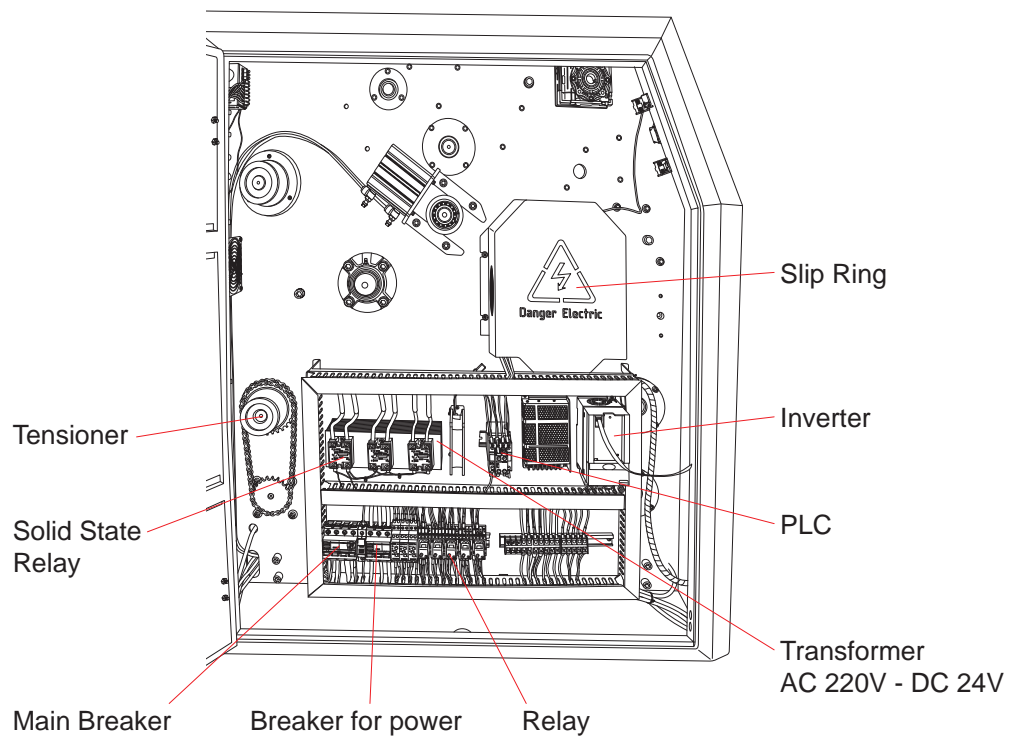


5.1 General Layout (Cont)

Right Cabinet

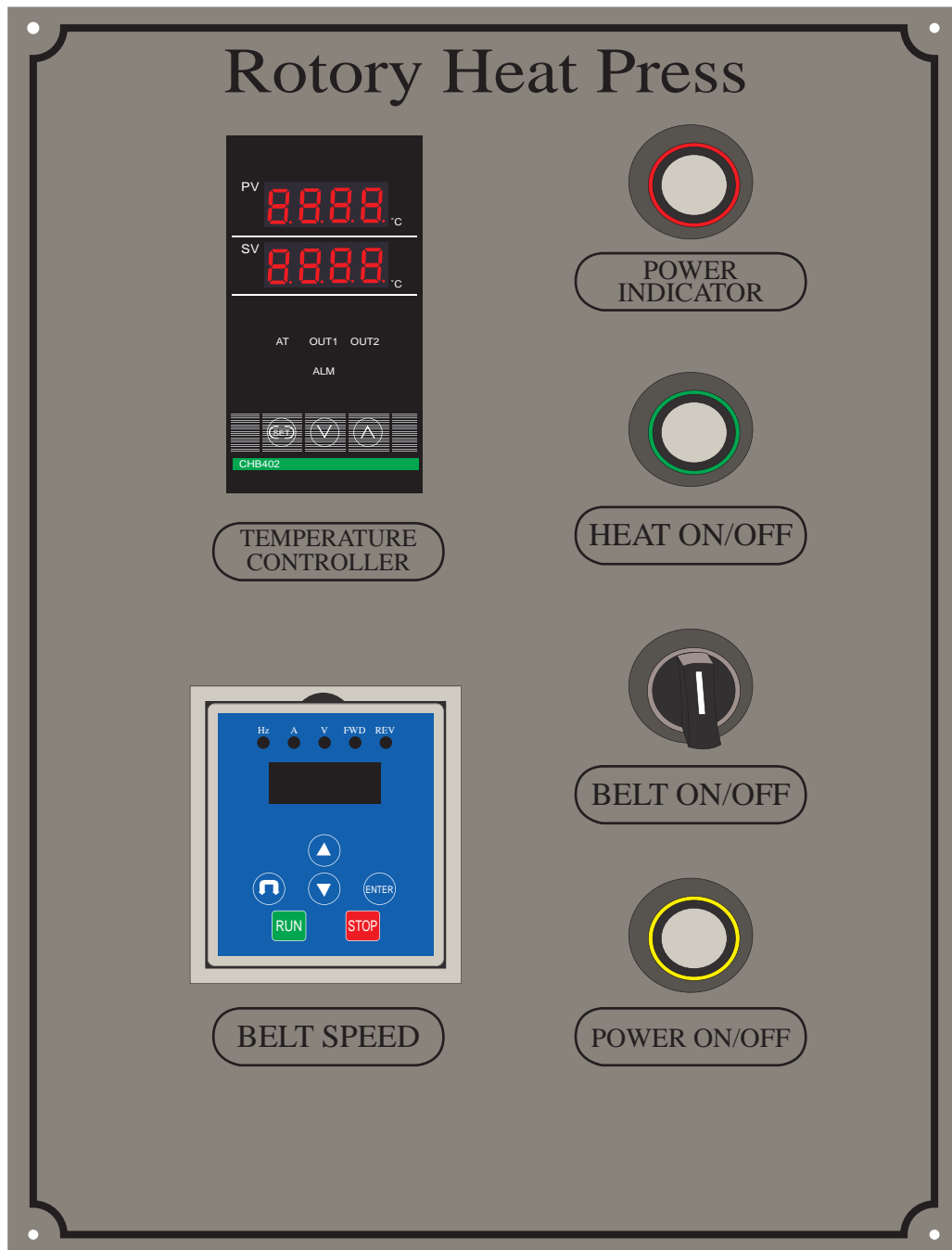


Left Cabinet



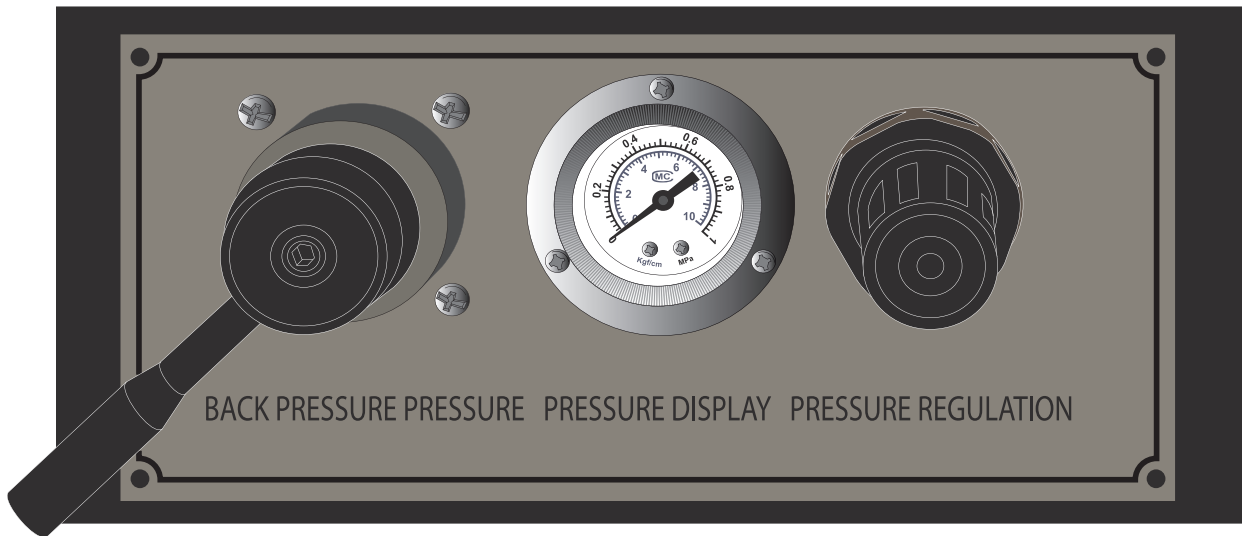
5.2 Control Panel Operations

Main Controller



5.2 Control Panel Operations (Cont.)

Pneumatic Pressure Controller



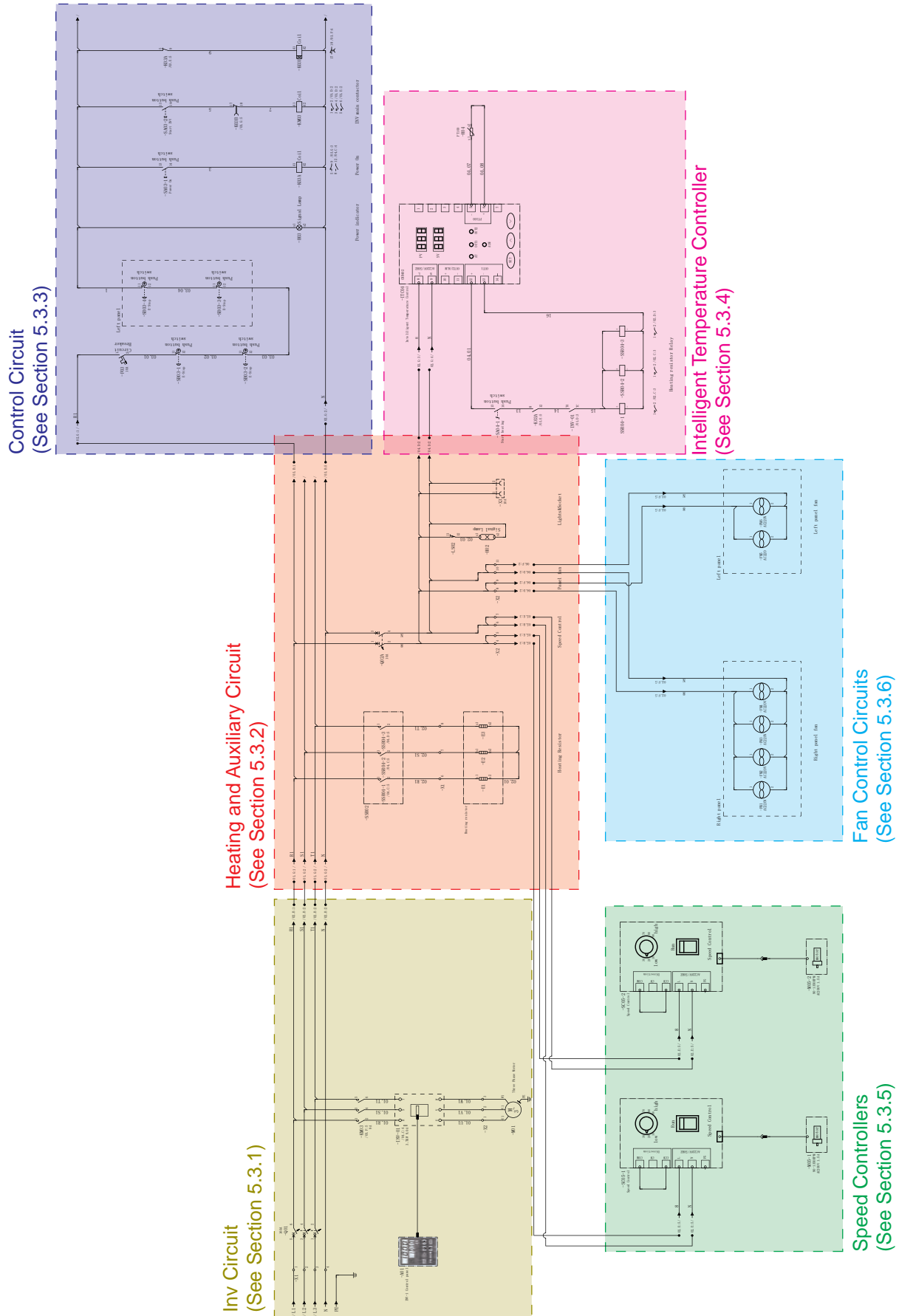
Speed Controller 1



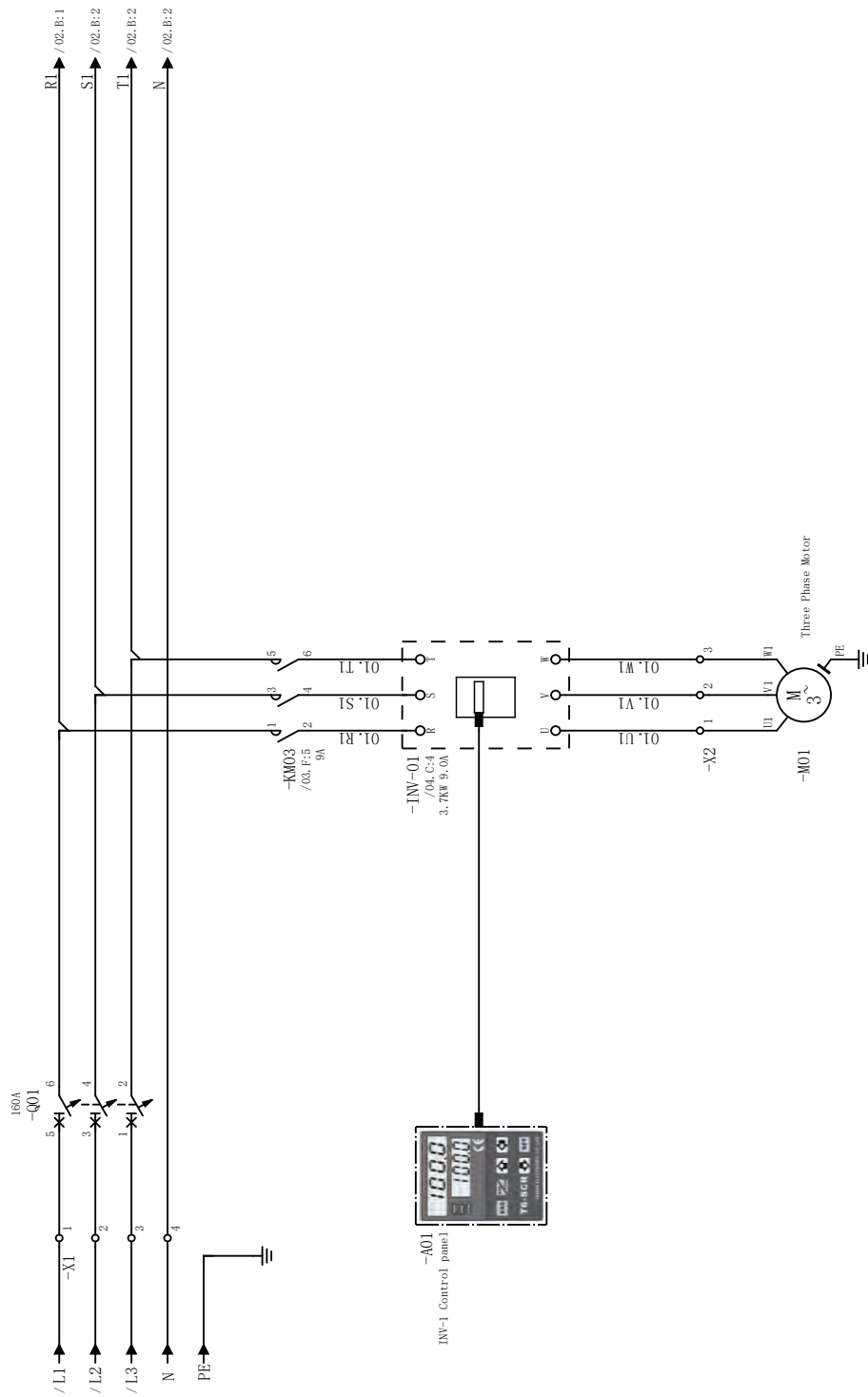
Speed Controller 2



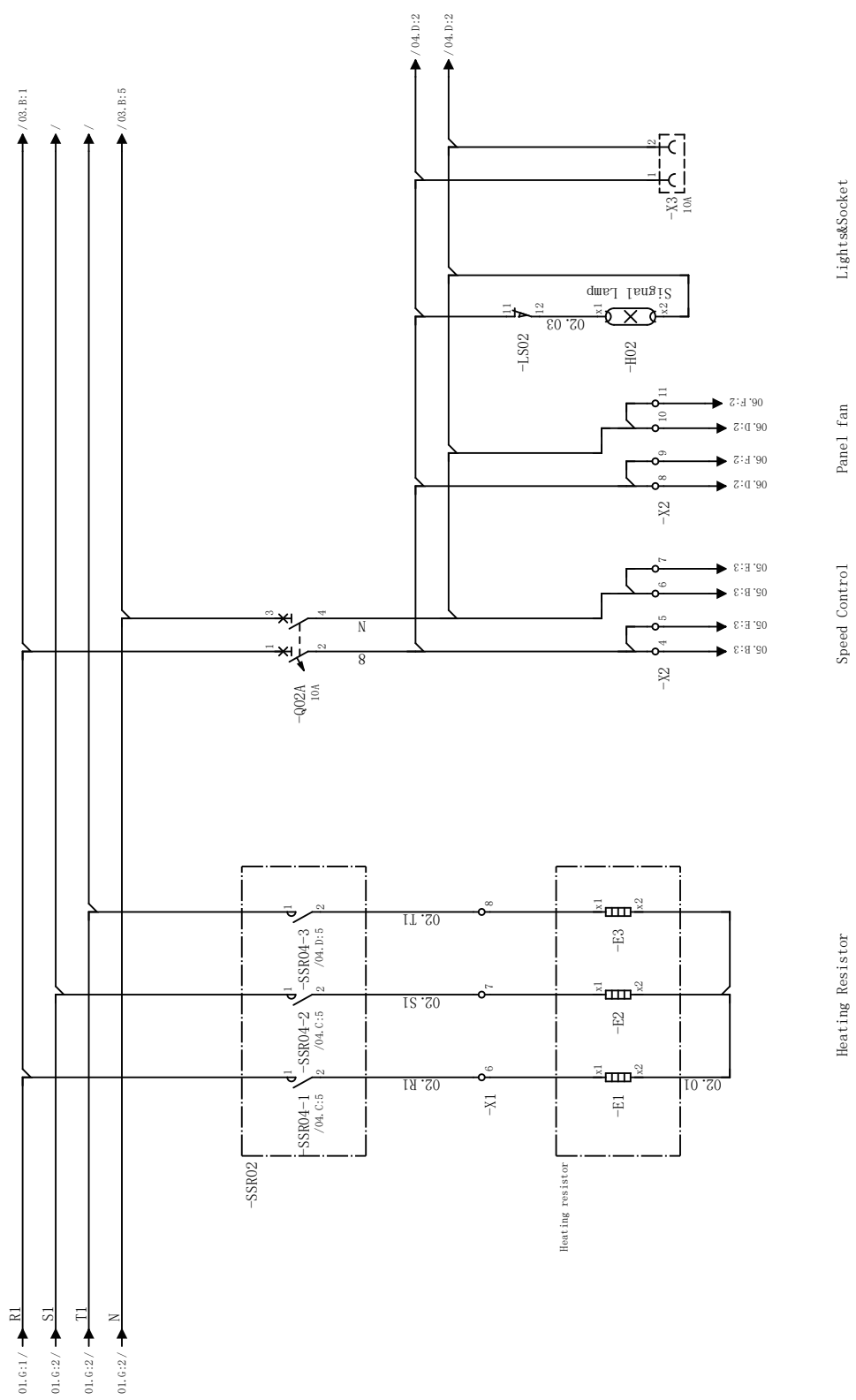
5.3 General Electrical Diagram



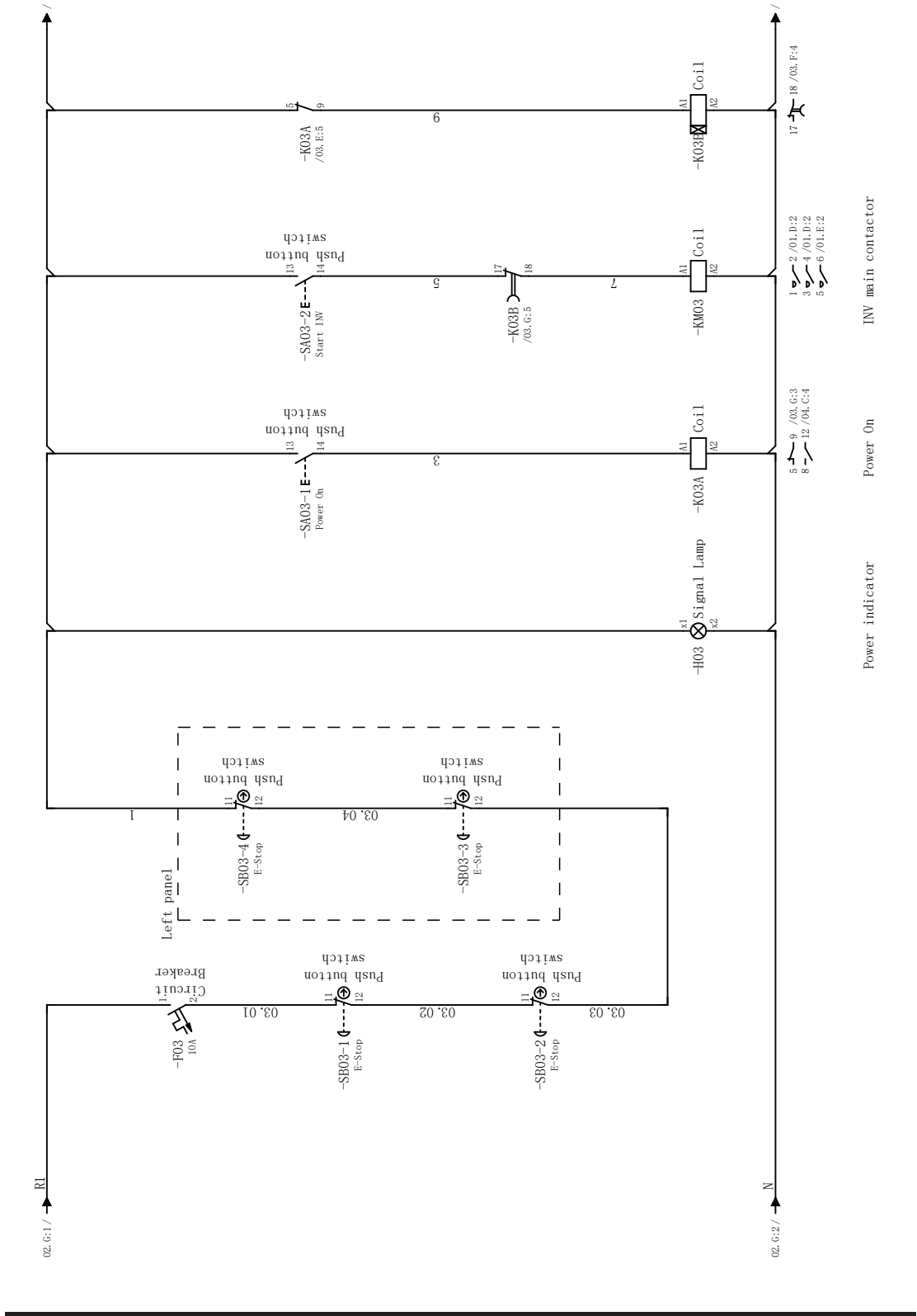
5.3.1 Inv Circuit



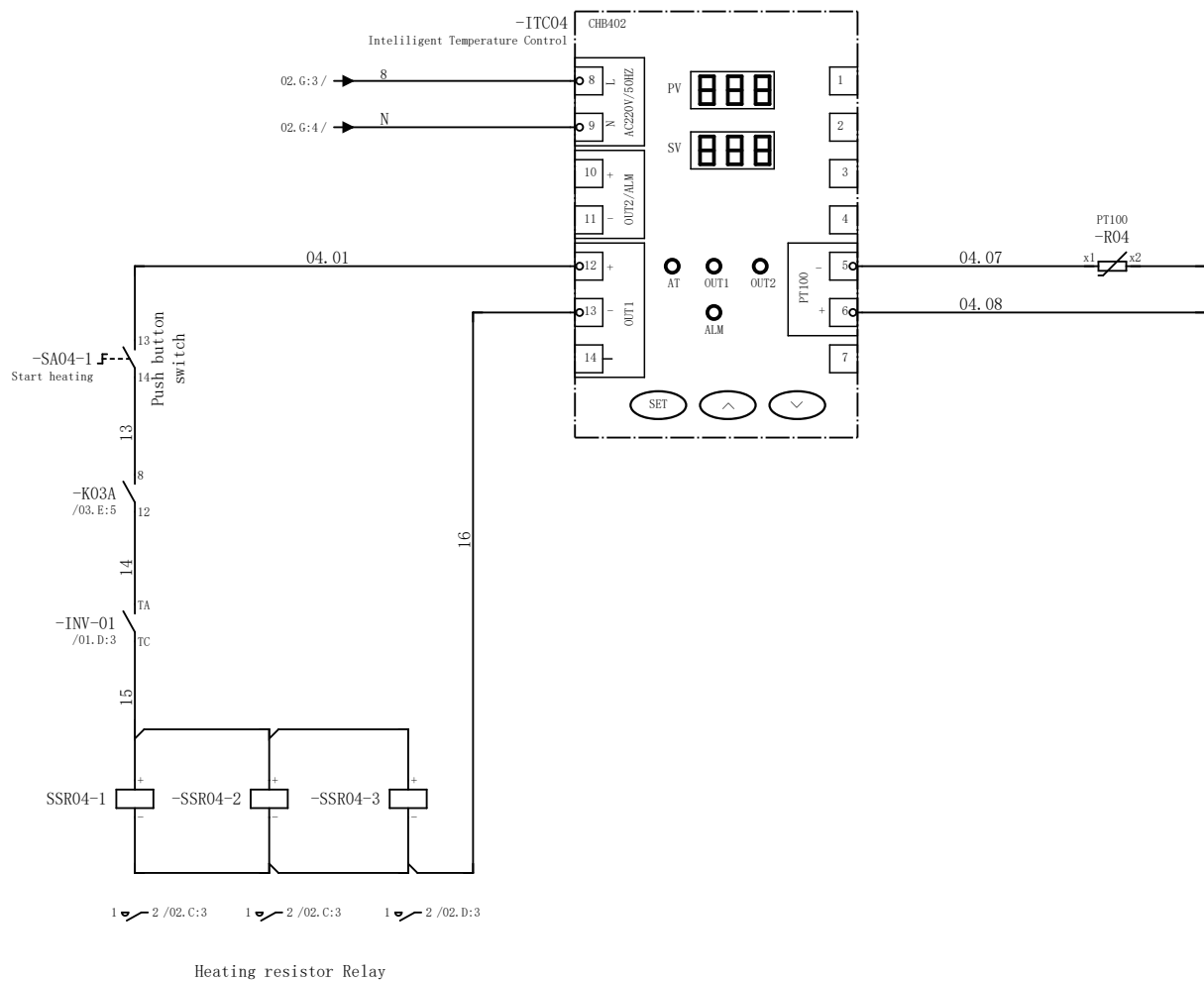
5.3.2 Heating and Auxiliary Circuit



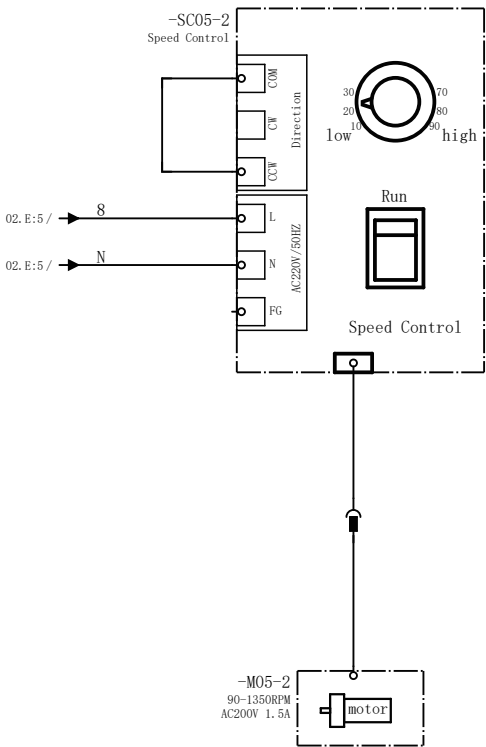
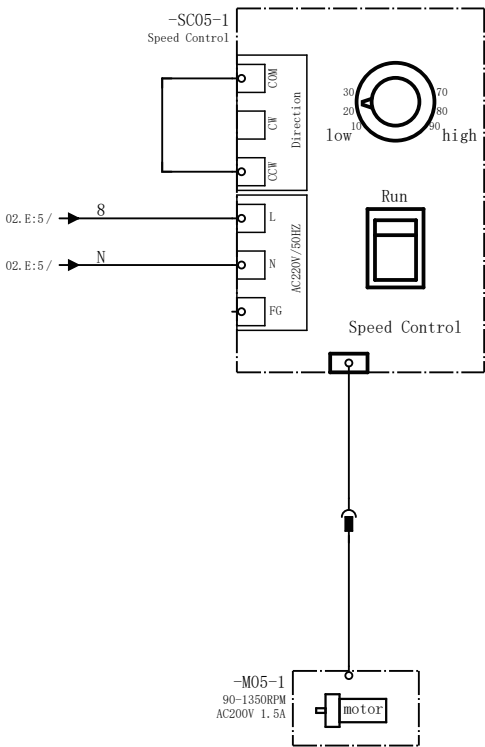
5.3.3 Control Circuit



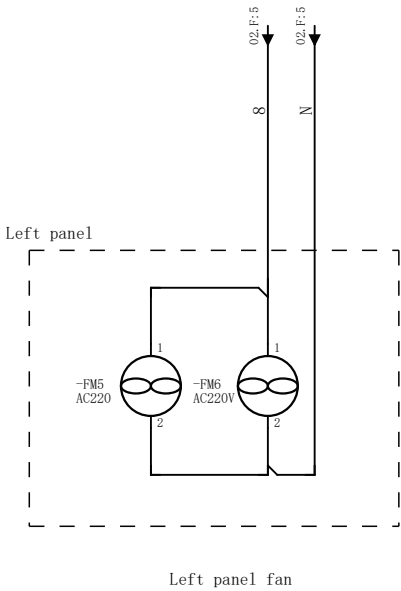
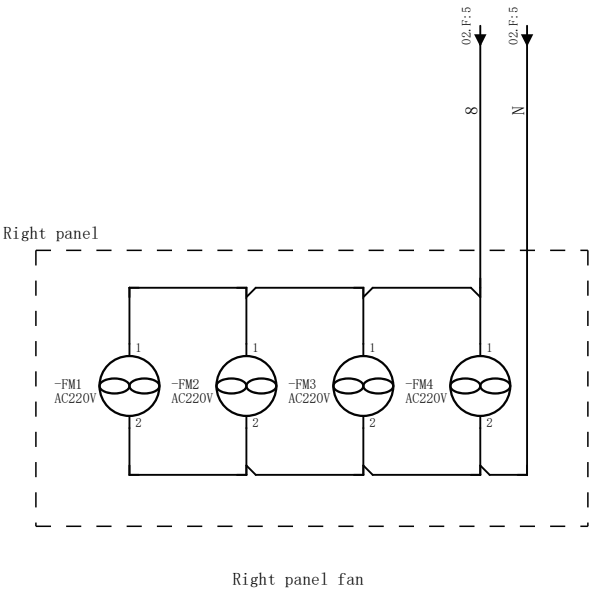
5.3.4 Intelligent Temperature Controller



5.3.5 Speed Controllers



5.3.6 Fan Control Circuits



5.4 Exploded Diagram and Parts List

**Exploded Diagram
and Parts List to follow**

6. Design change

With the policy of constant improvement and/or modification to meet changing conditions, the right is reserved to change the design and/or specifications at any time without prior notification, and therefore specifications may vary and not be in accordance with this manual.

7. Guarantee (limited warranty)

Charterhouse Holdings PLC warrants that the press is free from defects in material and workmanship for a period of 12 months from the date of supply to the customer. The machine comes with a one year warranty on parts and 90 days labour.

This warranty covers all parts to repair the defects, except when damage results from misuse or abuse, accident, alteration or negligence or when a machine has been improperly installed.

If a press covered by warranty should need to be returned to the factory for examination and repair, if on-site component replacement is not possible, Charterhouse Holdings PLC will make every effort to repair the customers press. The warranty will only be effective when Charterhouse Holdings PLC authorises the original purchaser to return the machine to the factory and only when the product upon examination has proven to be defective.



Should in our opinion any part of this press be defective in materials or workmanship, it will be replaced or repaired free of charge, provided that the press has been installed and operated in the correct manner and not subjected to misuse. If Charterhouse Holdings PLC authorise a replacement press, the warranty of the replacement press shall expire on the anniversary date of the original machines invoice to the customer.

In order for this warranty to be effective, no return of machine or parts may be made without prior factory authorisation. (This will exclude any travelling and/or carriage costs which will be charged at our discretion).

This is the sole warranty given by the company; there are no warranties, which extend beyond the description on the face hereof. The seller disclaims any implied warranty of merchantability and/or any implied warranty of fitness for a particular purpose; the buyer agrees that the goods are sold "as is". Charterhouse Holdings PLC does not warrant that the functions of the press will meet the customer's requirements or expectations. The entire risk as to use, quality and performance of the press lies with the customer. (No claim of any kind shall be greater than the sale price of the product or part to which the claim is made).


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A. ADKINS AND SONS LIMITED **DECLARATION OF CONFORMITY**

Application of Council Directives:	European Low Voltage Directive (LVD), European Machinery Directive (MD), Electro Magnetic Conformity (EMC)
Standards to which Conformity is Declared:	(LVD): <u>EN 60204-1:2018</u> (MD): <u>EN ISO 12100:2010 2006/42/EC Annex1</u> (EMC): <u>EN 61000-6-2:2019</u>
Manufacturer's Name:	<u>A. Adkins and Sons Limited</u>
Manufacturer's Address:	High Cross, 18 Lancaster Road, Hinckley, Leicestershire LE10 0AW United Kingdom.
Type of Equipment:	Alpha Calender Roll-Master 1.6
Standards Compliance:	 
Model Number:	.AMP1600.....
Serial Number:
Year of Manufacture:

I, the undersigned, hereby declare that the equipment specified above conforms to the above directives and standards.

Place: Hinckley, United Kingdom

Signature: 

Date:

Full Name: Marie McMahon
Position: General Manager