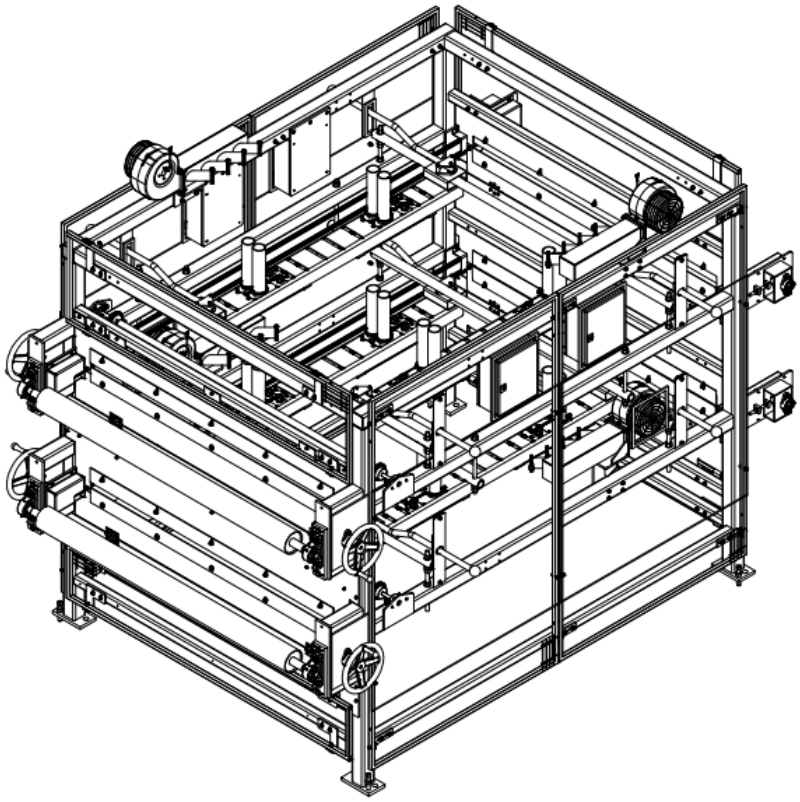
Paper Heater

Maintenance Manual



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Introduction

This manual contains **Original Instructions** written to provide detailed technical information to assist in the maintenance of the **Paper Heater**. For information regarding normal operation please refer to the Area Operator's Manual. Maintenance should only be performed by qualified, trained personnel.

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1 Safety Overview

Never put yourself at risk.

Many pieces of equipment have the potential to cause serious injury or even death. Be sure to understand the safety concerns related to a piece of equipment before undertaking or performing any maintenance or clean out procedure. Work with your supervisors to address any safety concerns prior to undertaking work.

1.1 Infrared Light

The heating bulbs utilize infrared light to heat the paper. Avoid looking directly into any active infrared light source.

1.2 Heating

Surfaces on or around the heating elements could be hot. Use caution when touching these surfaces or utilize the appropriate PPE.

Avoid heating sections of human bodies (hands, face, etc.)

Paper can ignite if too much heat is supplied. When turning on and/or adjusting settings it is important to be present to ensure proper heating of the paper. If paper is turning brown immediately lower the output settings.

1.3 Moving Paper Edge

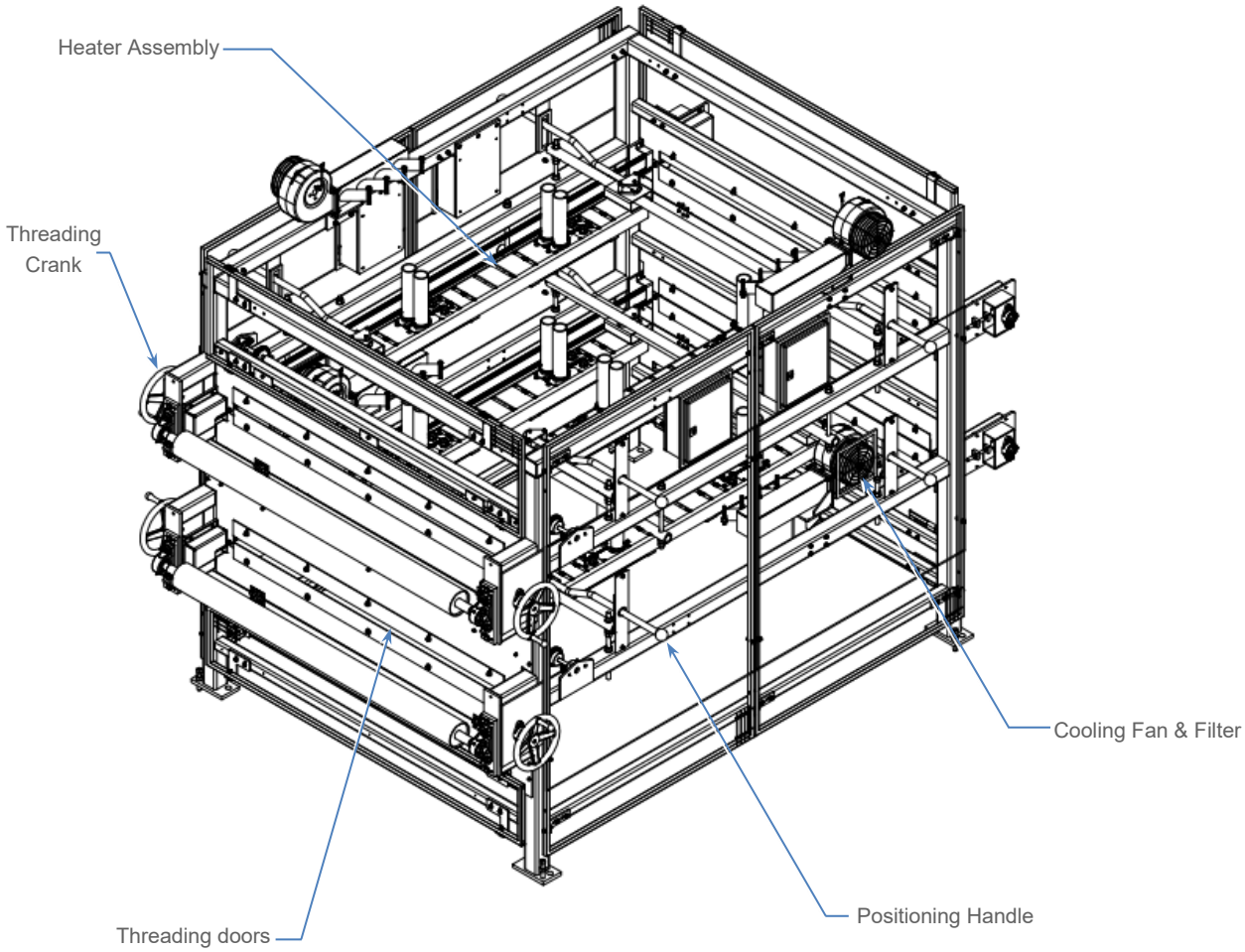
While doing adjustments to the positions of the heating elements take care to avoid coming into contact with the moving edge of the paper with exposed skin. This can lead to skin lacerations.

1.4 General Safety

Refer to section **1.4 General Safety** in the Safety System manual.

2 Equipment Overview

The paper heater is designed to reduce variations in moisture content across the face of the paper in order to reduce ripples in the paper during the forming process. There are two heater assemblies per paper path. Each assembly can be moved in and out to adjust for different paper widths and can also be rotated to cover larger areas if necessary.



2.1 Major Components

2.1.1 Heater Assembly

Each heater assembly consists of a number of individual heating elements. Each heating element is connected to a cooling fan. The edge heater assemblies can be moved in and out to adjust for various paper widths as well as slanted longitudinally to cover a larger area if required.

2.1.2 Cooling Fan and Filter

The cooling fans are connected to the heating elements via a flexible duct. These cooling fans blow cool air through the housings of the heating elements in order to keep the housing temperature low. It is necessary to run the cooling fans the entire time the heating elements are turned on. The cooling fans continue to run after the heating elements have turned off in order to cool off the assembly.

2.1.3 Positioning Linear Rail

The positioning linear rail is utilized to move the heater assemblies in and out to adjust for various paper widths. The positioning handles are used to slide the heating elements along the linear rails without removing the safety guards.

The Positioning Linear Rail also can be adjusted vertically to fine tune the amount of heat applied to the paper. Once the height of the Linear Rail is set it is typically not adjusted again, and any additional change in heat intensity is achieved through the heater controller. It is important not to set the Heater Assembly to close to the paper, as it can light the paper on fire if too much heat is transferred.

2.1.4 Transfer Bar

The Transfer Bar allows the Paper Heater to be threaded without removal of the guards. To use it, open the threading doors on both ends of the Paper Heater (tool required) and turn the Threading Crank until the Threading bar extends out the front end of the heater. Using the spring clips, attach the end of the paper web to the Threading Bar. When the paper is securely clipped into place on the Threading Bar, rotate the Threading Crank until the Transfer Bar extends out the opposite end of the Paper heater. Unclip the paper and continue to pull the paper web along its path. **Important** do not leave the Transfer Bar under a Heating Element. If left under a Heating Element, it will get very hot, potentially starting a fire, or burning an operator if touched. The Transfer Bar should be moved to the exit end of the machine on the outside of the guards while the machine is running.

2.1.5 Threading Doors

The Threading Doors are moveable guards designed to keep hands out of the hazard area inside the Paper Heater. They use 10mm nuts to hold in the closed position. The threading Doors must be kept in the closed and bolted position when the Heating Elements are operating.

3 Maintenance Procedures

3.1 Lockout Procedures

As equipment may start automatically, always lock out any source of motive power (electric, hydraulic, steam, compressed air, etc.) before performing maintenance or cleaning functions. Note that potential energy may also be stored in some equipment such as those held in a raised position by hydraulic or air pressure and that such equipment may move or fall suddenly if pressure is removed.

Depending on the equipment layout, electrical lock out may be performed at the electrical panel or locally with a safety switch or disconnect. Air pressure is removed and locked out at the manual air disconnect switch. As a further safeguard, you must confirm that any equipment in the system being worked on is not operational after being locked out. Test for this by using the normal means of starting, i.e. the operator controls on the HMI station or the manual HOA switch.

Before working on the paper heaters it is important to ensure all work surfaces have cooled sufficiently.

The above procedure is a general recommendation. Operating and maintenance staff must follow lockout procedures and operate in compliance with their company policy and local regulations.

3.2 Paper Heater Maintenance

Inspect and clean paper heater of any buildup of dust or paper fiber.

3.3 Heating Bulb Maintenance

Inspect and replace heating bulbs as required. Refer to vendor manual for step by step instructions.

3.4 Cooling Fan Maintenance

Inspect and replace air filters as required. Inspect and replace cooling duct as required.

4 Maintenance Schedule

The following table summarizes the optimal maintenance intervals.

4.1 Daily Tasks

Task	Notes
Clean heater assemblies of any buildup of paper fiber or dust	A buildup of dust or paper fiber can cause fire

4.2 Weekly Tasks

Task	Notes
Visually inspect that the bulbs light up when in operation	Damaged bulbs will cause uneven heating of the paper
Visually inspect all cables for damage	Damaged cables can be dangerous

4.3 Monthly Tasks

Task	Notes
Visually inspect the interior reflectors of the heating elements	Damaged or dirty reflectors can cause damage to the body of the heating element and cause overheating of the surrounding assembly
Visually inspect the air filter on the cooling fan	If the surface of the filter is dirty then the filter should be changed (cleaned)
Inspect the threader chains and lubricate as required	Damaged or under-lubricated chains can prevent the threaders from functioning and cause start-up delays.

4.4 Annual Tasks

Task	Notes
Visually inspect flexible cooling duct for cracks or holes	Replace any damaged cooling duct

5 Troubleshooting

5.1 General

Problem	Possible Cause(s)	Possible Solutions
Some bulbs do not light up	Defective bulb One supply phase has failed Incorrect connection	Replace bulb Check fuses Check electrical connections
No Bulbs light up or all bulbs go out during operation	Short circuit/damaged cable Incorrect connection Temperature switch in heating element has tripped	Check fuses. Change any defective components Check electrical connections Check fans, filters, ducting and ambient temperature. Reset by pressing on the temp switch button
No cooling air going to heating elements	Cooling fan not operation properly Hose loose or blocked	Check wiring Replace any defective fans Check hose connections

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