



**Corona Supplies Ltd**  
for all your corona needs

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# **BLOWN FILM CORONA TREATER STATION**



**USER MANUAL**

# Requirements

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**IMPORTANT!!!** Please read this information BEFORE installing and operating the equipment.

## **Intended Users**

This manual is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.

The information given is intended to highlight safety issues, EMC considerations, and to enable the user to obtain maximum benefit from the equipment.

## **Applications**

The equipment described is intended for industrial & commercial surface treatment of various poly and non poly substrates.

## **Personnel**

Installation, operation and maintenance of the equipment should be carried out by competent personnel. A competent person is someone who is technically qualified and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

# Safety

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## Product warnings



DANGER  
HIGH VOLTAGE  
RISK OF ELECTRIC SHOCK



CAUTION  
REFER TO  
DOCUMENTATION



DANGER  
PINCH POINT  
RISK OF CRUSHING



DANGER  
MOVING MACHINERY  
RISK OF CRUSHING



DANGER  
ROTATING ROLLERS  
RISK OF ENTANGLEMENT /  
CRUSHING



DANGER  
HOT SURFACE  
RISK OF BURNS

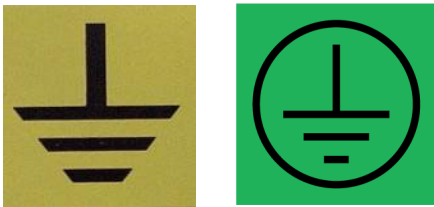


CAUTION  
OZONE CONNECTION PORT

## Hazards

**DANGER!!! Ignoring the following may result in injury or death.**

- This equipment can endanger life by exposure to high voltages, heat and rotating machinery.
- This equipment generates an output at the radio-frequency level. Users who wear a pacemaker, or use other medical electronic devices which might be affected by radio-frequency waves, are advised to consult a physician before using this equipment.
- The equipment must be permanently earthed due to the high earth leakage current, and the treater station must be connected to an appropriate safety earth. Earth connection points are shown with the following label.



- Ensure all incoming supplies are isolated before working on the equipment. Be aware that there may be more than one supply connection to the corona power supply.
- Allow at least 1 minute for the corona power supply's capacitors to discharge to safe voltage levels (less than 50V).
- For measurements use only a meter to IEC 61010 (CAT III or higher). Always begin using the highest range. CAT I and CAT II meters must not be used on this product.
- Guards, covers & doors must NOT be removed unless the corona power supply has been switched off and the incoming supply isolated.
- During the corona treatment process a high level of heat is produced at the electrodes which will be transferred to the base roller. Before attempting any maintenance wait at least 10 minutes after switching the machine off to allow electrodes and associated parts to cool down
- Ozone generated by the corona process must be removed from the treater station by a suitable extraction system manufactured from corrosion resistant materials.
- Access Covers and doors that are regularly required to be opened for correct machine setup & cleaning are protected with a safety device which must be checked for correct operation / damage as shown as detailed in the maintenance part of this manual.

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APP.A: OPTIONS  
APP.B: MACHINE PARTS LIST  
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APP.D: ELECTRICAL DIAGRAMS

## Machinery data

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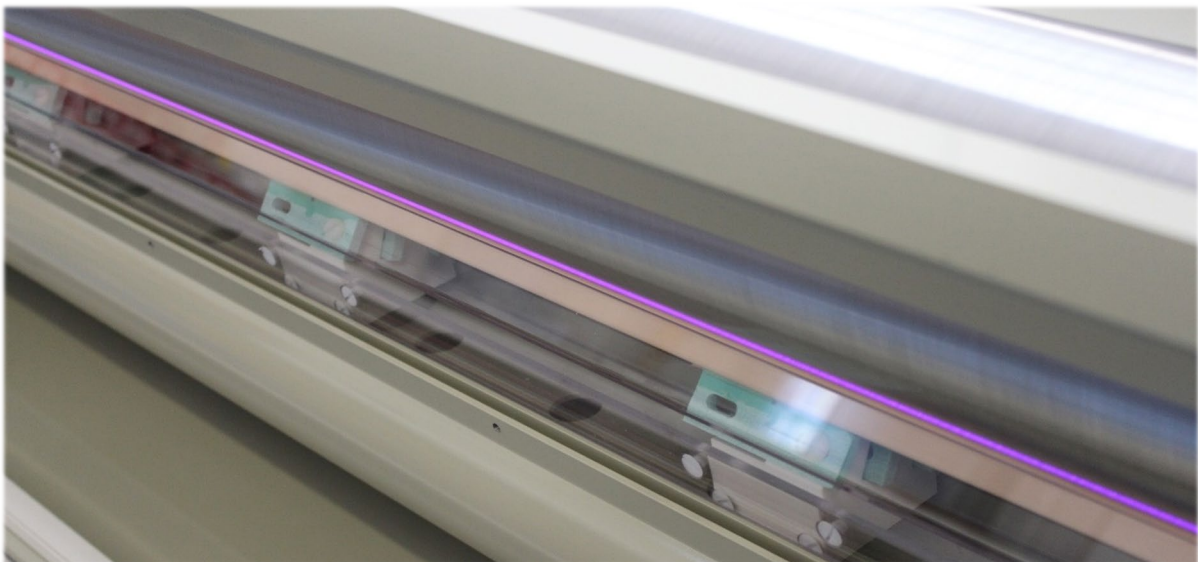
Insert Machinery data here

# Introduction

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## The corona treating process

Gases are normally very good electrical insulators or dielectrics. In the presence of a very strong electrical field a gas can be forced to break down and lose its insulating capability. During this breakdown the gas molecules begin to ionize. This enables them to provide a conductive path from one molecule to another. In a treating system the strong electrical field is generated across an air gap between the electrode assembly and the treater roll. A conductive path between these two electrodes will be completed when a sufficient quantity of gas (usually ambient room air) has become ionized. A sudden discharge across this path will now occur usually resulting in a bright flash or arc. This is very similar to a lightning flash going to earth or the arc between electrodes in a laboratory experiment. In order to prevent this arc from completely developing a solid dielectric barrier is placed in the path between the electrodes. This barrier partially interrupts the conductive path preventing a complete breakdown of the gas. Instead of a hot localized arc, a cooler diffuse glow will occur. This soft violet colored discharge indicates the incomplete breakdown of the gas and is called a corona. The material the dielectric or barrier is composed of is chosen so that enough current will flow between the electrodes and through it to sustain this corona.



During the treatment process, the web is passed through a high voltage discharge field and is exposed to the bombardment of high-energy particles. This corona field has the potential to break polymer bonds, cause micro-pitting, and deposit an induced surface charge with extremely high levels of strong oxidizing agents onto the web. Any one of or possibly all of these processes can alter the surface characteristics of the material in a way, which enhances the surface adhesion and its ability to accept printing inks, adhesives, coatings, etc.

# Installation

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## **CAUTION!!!**

**Do not install this equipment in wet environments subject to high humidity.**

## **Treater Station**

### Location

- The treater station is designed to be located in a production line (fixed installation) with the film substrate being fed autonomously through the treater station. “Webbing up” of the treater station may be carried out manually ensuring the system has been switched off first.
- The position of the treater station on the production line will be governed by the web path and available space however, it should be positioned so that the location does not cause a hazard, including tripping, obstruction, overhead obstruction. Access for maintenance should also be considered when positioning the treater station.
- The treater station must be installed so that the film substrate is entering and exiting the treater in the correct direction (See APP.C – Machine drawing). The direction of travel must be that in the event of an obstruction on the substrate (lump or splice) the electrode assembly will be pushed out of the way by the obstruction.



## Handling

- Lifting the treater station onto the production line should only be carried out using mechanical means due to the weight of the unit.
- The treater should only be lifted using the lifting points located on the treater sideframes. Fig.1.
- Ensure the treater box is closed before lifting commences.

Lifting eyes screwed  
in to sideframes



- Lifting slings / bands must confirm to – EN 1492-1 or equivalent for your country.
- Lifting shackles must confirm to – EN 13889-2003 or equivalent for your country.
- The area around the treater station when being lifted into position should be kept clear of all personnel not involved in the lifting operation.

## Mounting



Fixing  
locations

- The treater station has mounting feet located at each end of the treater to allow it to be mounted to the production line. Fig.2.
- Holes for mounting the treater station should be made in the production line framework in accordance with the treater station drawing in this manual.
- Depending on the size of the treater station M12 or M16 high tensile bolts should be used and secured as shown in. Fig.3.
- The treater rollers must be checked for parallelism with the production line rollers to ensure correct film path alignment. Failure to do this may cause the film to “wrinkle” or move position while travelling through the treater station. Alignment should be carried out with the treater off and the production line stationary.
- Once the treater has been aligned the fixing bolts should be tightened.

1 2 3 4 5 6

TREATER FRAME

MOUNTING FOOT

BOLT

SPRING WASHER

WASHER

MACHINE FRAME

BOLT THROUGH

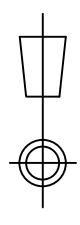
WASHER

NUT

3 FULL THREADS MIN

DEPTH AT LEAST  
1.5 X THREAD SIZE

TAPPED  
HOLE



THIRD ANGLE PROJECTION  
DO NOT SCALE  
IF IN DOUBT ASK

ISS.	DESCRIPTION & DATE
	MODIFICATIONS

<b>Corona Supplies Ltd</b> THAME, OXON, OX9 3GQ, ENGLAND	
DRAWING NUMBER	FIG.3
TITLE	MOUNTING DETAIL
SHT	OF
A4	

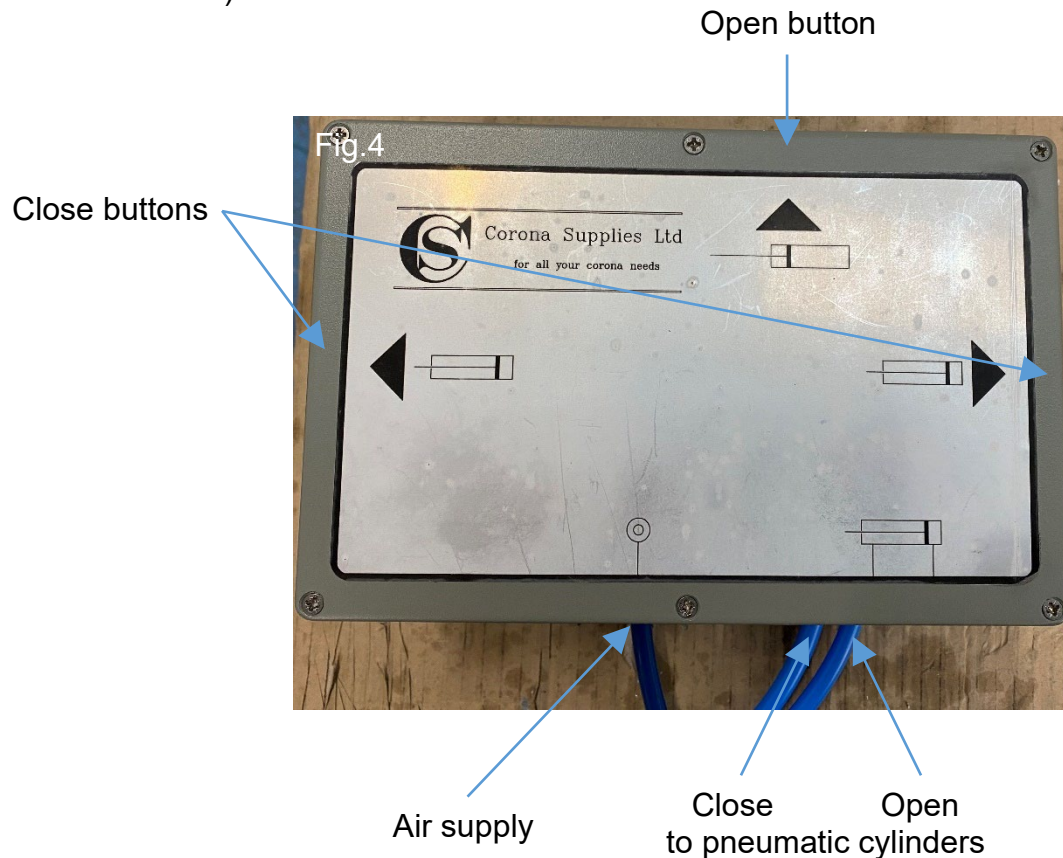
UNLESS OTHERWISE STATED ALL DIMENSIONS ARE IN MILLIMETRES  SURFACE FINISH 1.6um REMOVE ALL BURRS & SHARP EDGES TO 0.25 RADIUS OR CHAMFER	UNLESS OTHERWISE STATED DIMENSIONS ARE IN MILLIMETRES  TO 0 DEC. PLACE 0.4 (.015") TO 1 DEC. PLACE ±0.2 (.008") 2 DEC. PLACES ±0.1 (.004") HOLE DIAS. + 0.15 - 0 (.006" - 0) ANGLES ± 1°  DIMS. APPLY AFTER PLATING SCALE 1 = 1
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TOLERANCES UNLESS OTHERWISE STATED DIMENSIONS	MATERIAL
FINISH	

THE INFORMATION SHOWN ON THIS DRAWING IS CONFIDENTIAL AND MUST NOT BE COPIED REPRODUCED OR COMMUNICATED TO A THIRD PARTY WHOLLY OR IN PART WITHOUT THE WRITTEN CONSENT OF CORONA SUPPLIES LTD

## Pneumatics

The opening & closing of the treater box is pneumatically controlled by a two-handed pneumatic valve which is supplied loose to allow it to be positioned in a suitable location Fig.4. To open the treater box, depress the OPEN button momentarily. To close the treater box, depress both the CLOSE buttons at the same time and hold until the box is fully closed, and the valve has locked (approximately 3-5 seconds after the box has closed).



- The compressed air supply to the valve is made via 8mm plastic pipe and should be at a pressure of between 60 – 100 PSI (4 – 7 Bar).
- The valve should be positioned close to the treater station in a location that is easily accessible approximately 1.5m from the floor. When positioning the valve care should be taken to ensure the valve position cannot be changed accidentally. 2 x M6 holes are located on the rear of the valve enclosure to facilitate mounting.
- The pipework from the valve to the treater station must be secured to the machine framework so that it cannot become a trip or entanglement hazard.
- In the event of any maintenance / cleaning the air supply must be isolated.
- Electrically operated pneumatic control systems will be detailed in the circuit diagram at the end of the manual and in APP A options.

## Electrical

Electrical circuits & connections are detailed in the circuit diagram “Circuit diagram treater installation” found at the back of this manual.

- Control circuits on the treater station where possible are 24vDC. These include the interlock and speed sensor circuits.
- Supply circuits to the generator, treater station and aux electrical equipment i.e. Ozone extraction fan will be either 1 phase or 3 Phase AC and will be identified by one or more of the following labels.



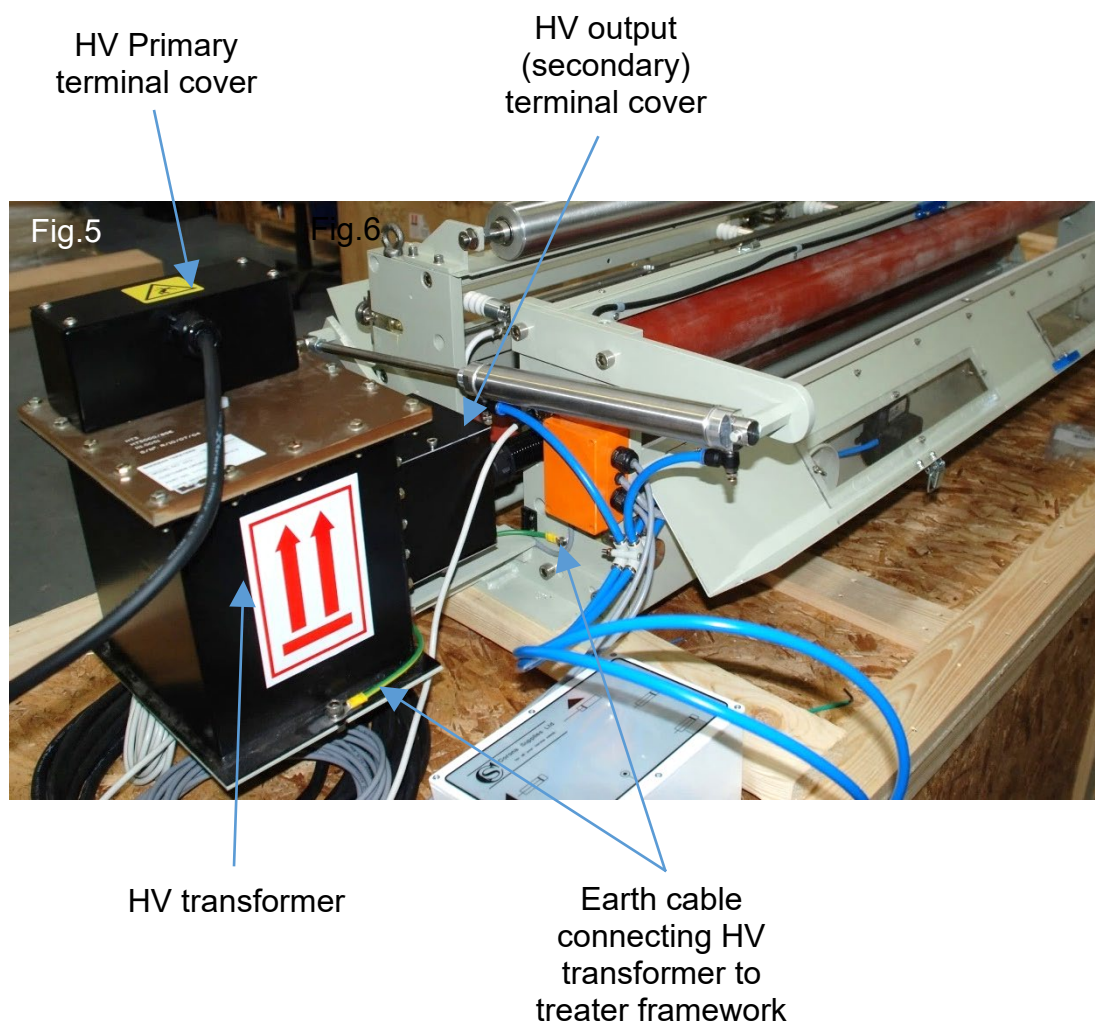
- Cables from the generator to the treater station should be attached to the production line framework or run-in cable trays so that they cannot become a trip or entanglement hazard and are out of operators reach.
- The treater station must be earthed which is made via the high voltage transformer Fig.5.

## High Voltage transformer

A high voltage transformer (HV) is used to boost the voltage from the generator to a level capable of striking an arc across the air gap between the electrodes and the roller. This voltage varies depending on many factors including air gap, dielectric properties of the material and humidity but is in the region of 5,000 to 10,000 volts.

The HV transformer is usually mounted on the treater framework with the high voltage connection to the treater made through screened HV cables Fig.5.

**DANGER!!! Terminal covers must not be removed unless the generator has been switched off and isolated from the main supply.**



## Ozone Extraction

**CAUTION!!!** The ozone produced by the corona treatment process is highly toxic and must be removed from the treater station and exhausted to atmosphere outside the work area. It must not be possible for the ozone to be introduced back into the work area through open windows, vents or air conditioning systems.



- Ensure the ozone port(s) (as indicated by the above label) are connected to the input port of the ozone extraction fan with suitable corrosion and heat resistant (>80 °C) ducting. If the treater has multiple ozone ports a suitable adaptor will be provided to combine these into one port allowing connection to a single piece of ducting or directly to the extraction fan. To simplify installation a short run of flexible ducting can be run from the treater ports to the adaptor or extraction fan.
- Depending on the size of the treater station (treat width & number of electrodes) a suitable fan will be offered with the following port sizes.

Fan flow rate (m <sup>3</sup> /min)	Fan pressure (mm water)	Port diameter (mm)
7	4	100
	6	100
14	4	100
	6	150
28	6	150
	10	200
50	10	250

- The output of the extraction fan should be connected to suitable rigid ducting made from corrosion resistant materials and ducted to atmosphere outside the work area. For a ducting run of up to 5m with 2-3 wide bends ducting of the same diameter of the extraction fan ports can be used. For longer length ducting runs a larger diameter ducting must be used. Fig.6-7.
- The extraction system should be installed in such a way that water is prevented from entering the system and returning to the ozone extraction fan.
- The extraction and exhaust system should be installed in accordance with local legislation

Fig. 6

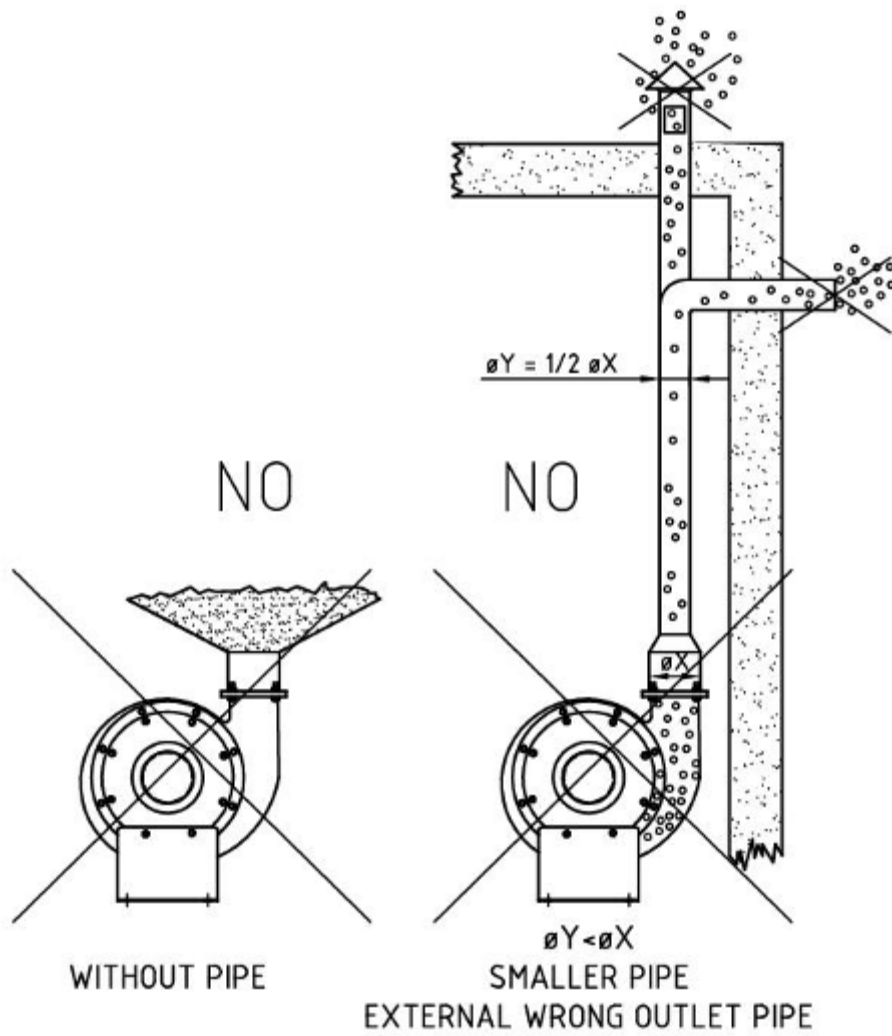
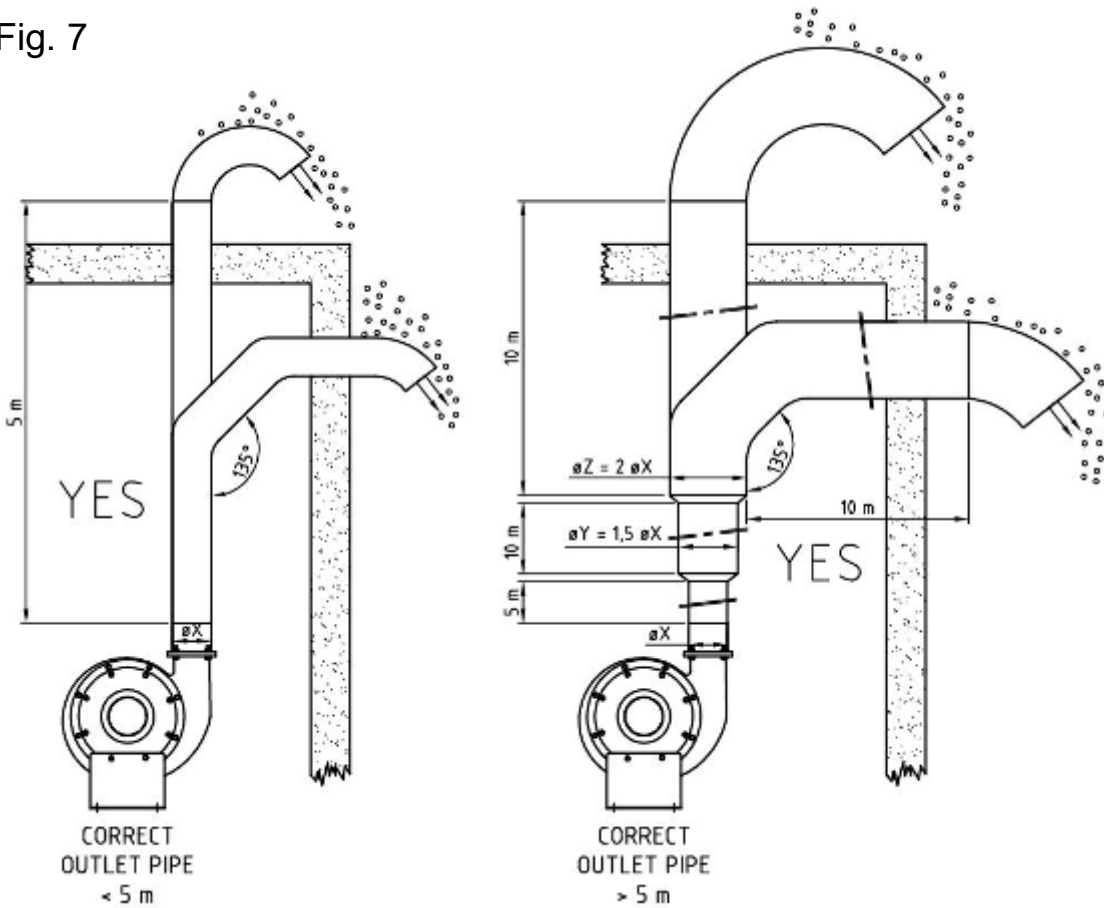


Fig. 7





# Commisioning

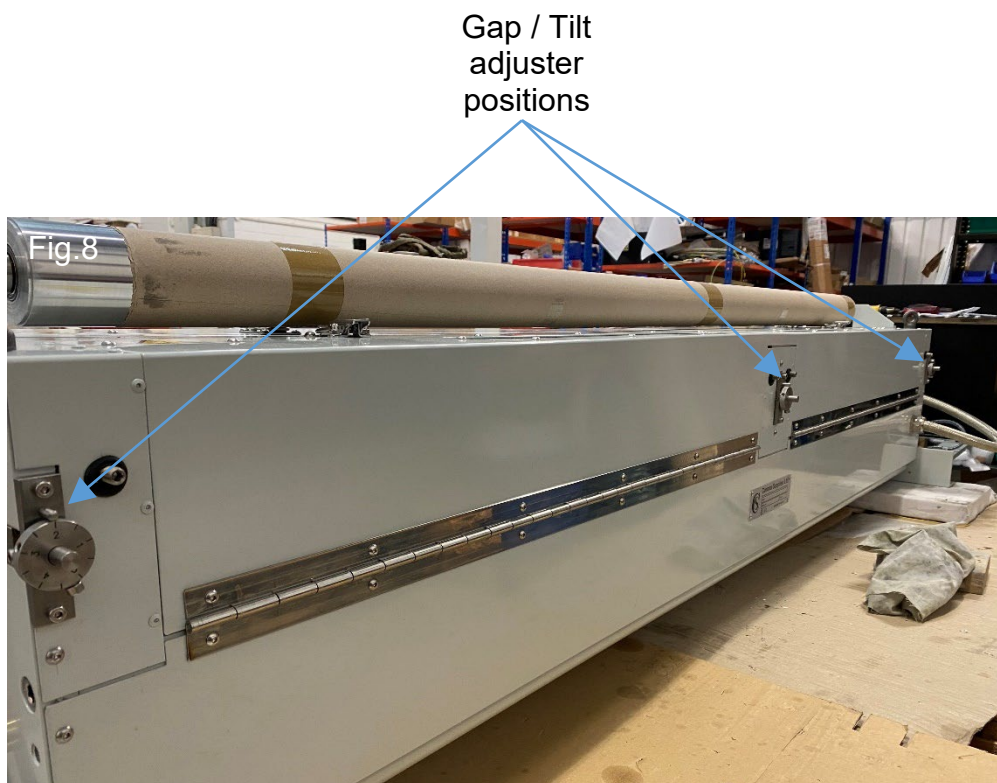
## Air-gap setting

**CAUTION!!!** Before adjusting the distance between the electrodes and the roller, switch off the generator and disconnect from the main supply. Allow the electrodes and rollers to cool for a minimum of 10 minutes.

The gap between the electrodes and the roller is an important part of the corona treating process. The air gap must be large enough for the material to pass through without coming into contact with the electrodes but not so large that the corona discharge becomes uneven. Corona Supplies corona treater stations come with precision air gap adjusters located evenly along the complete length of the electrode allowing for precise and even gap setting Fig.8. NOTE: The amount of gap adjusters will depend on the width of the machine

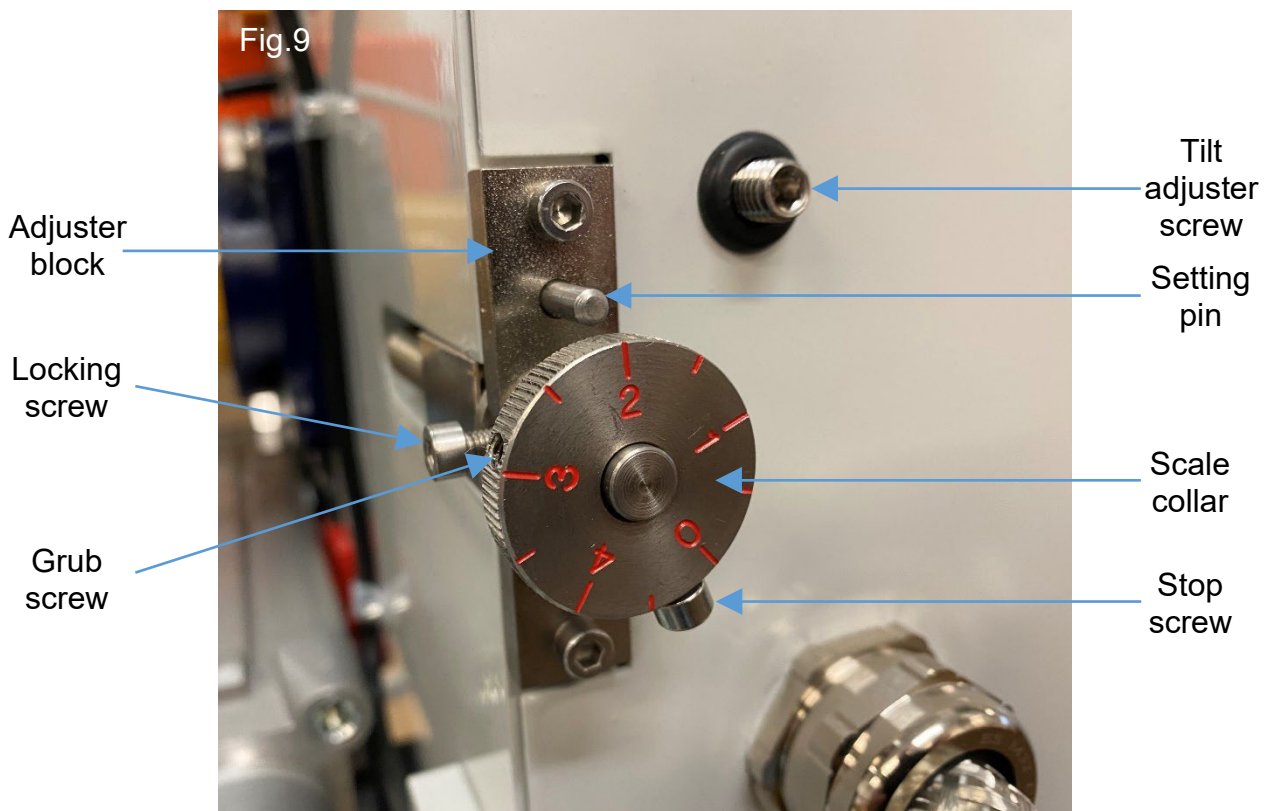
Prior to delivery, the treater system is fully tested and the air gap set to 2.0mm which is the optimal gap for metal electrodes on a covered roller.

However, the distance between the electrodes and the roller (air gap) should be checked before first use once the treater station has been mounted on the customers machine and at regular intervals (see maintenance guide). For optimal performance, the air gap should be approximately 2.0mm.

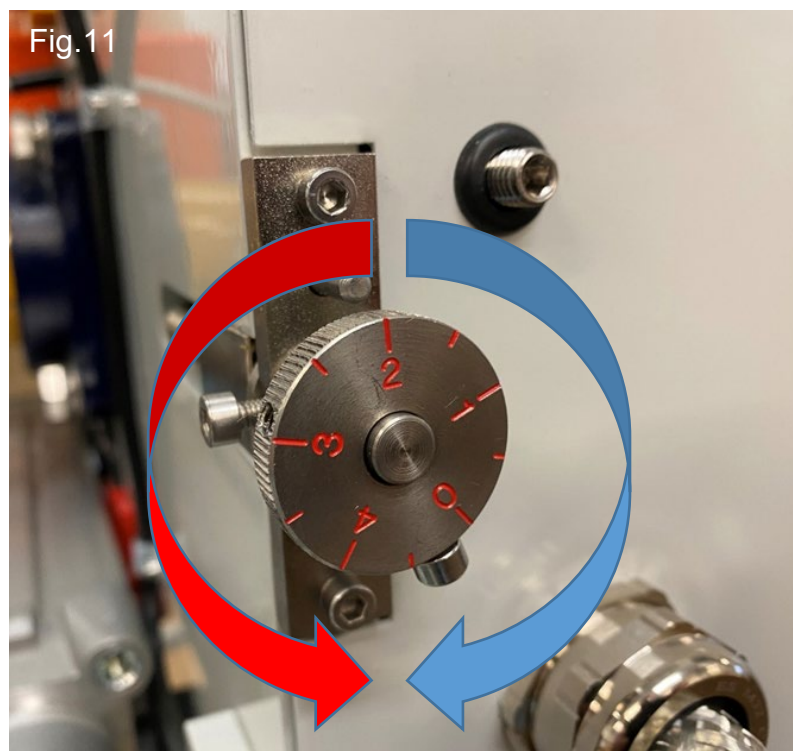
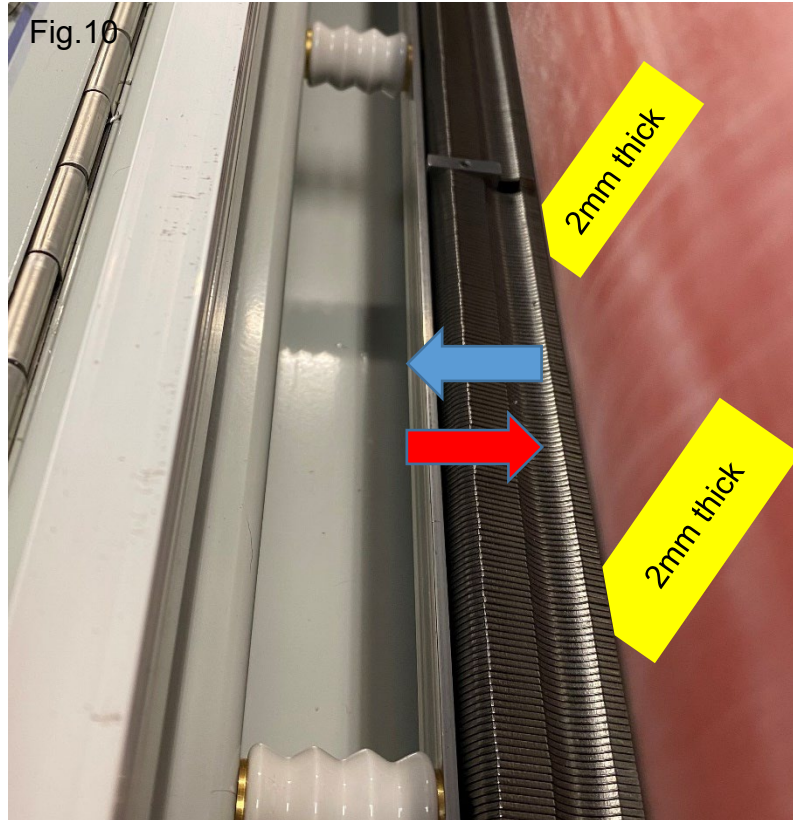


**Air gap adjustment after machine installation (installation of a replacement electrode bridge).**

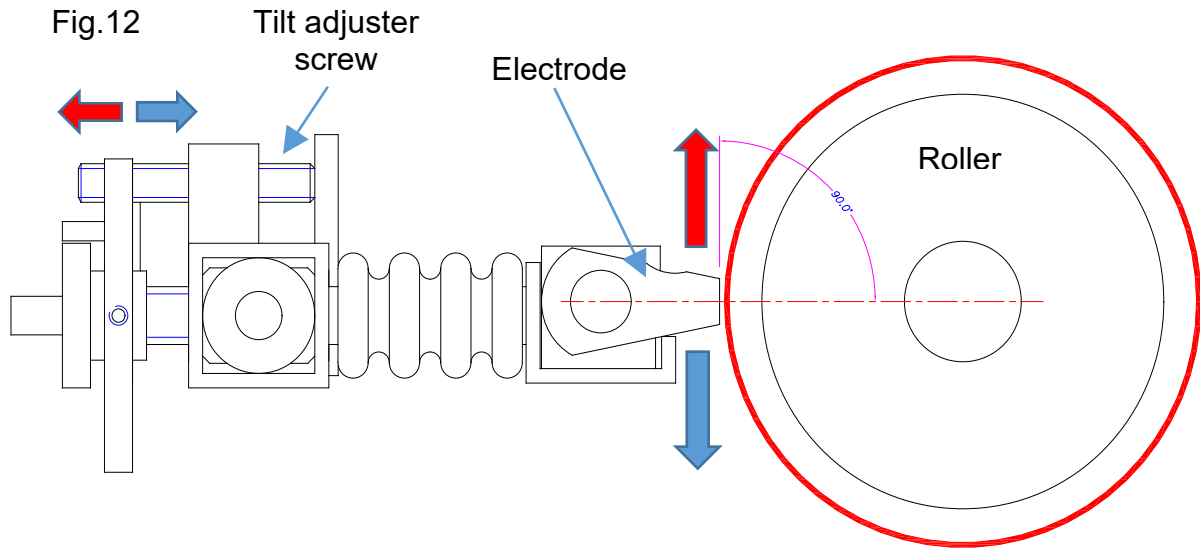
- Ensure the treater box is in the operating position (closed).
- Loosen off the locking screw (1/2 turn) in the adjuster block Fig.9.



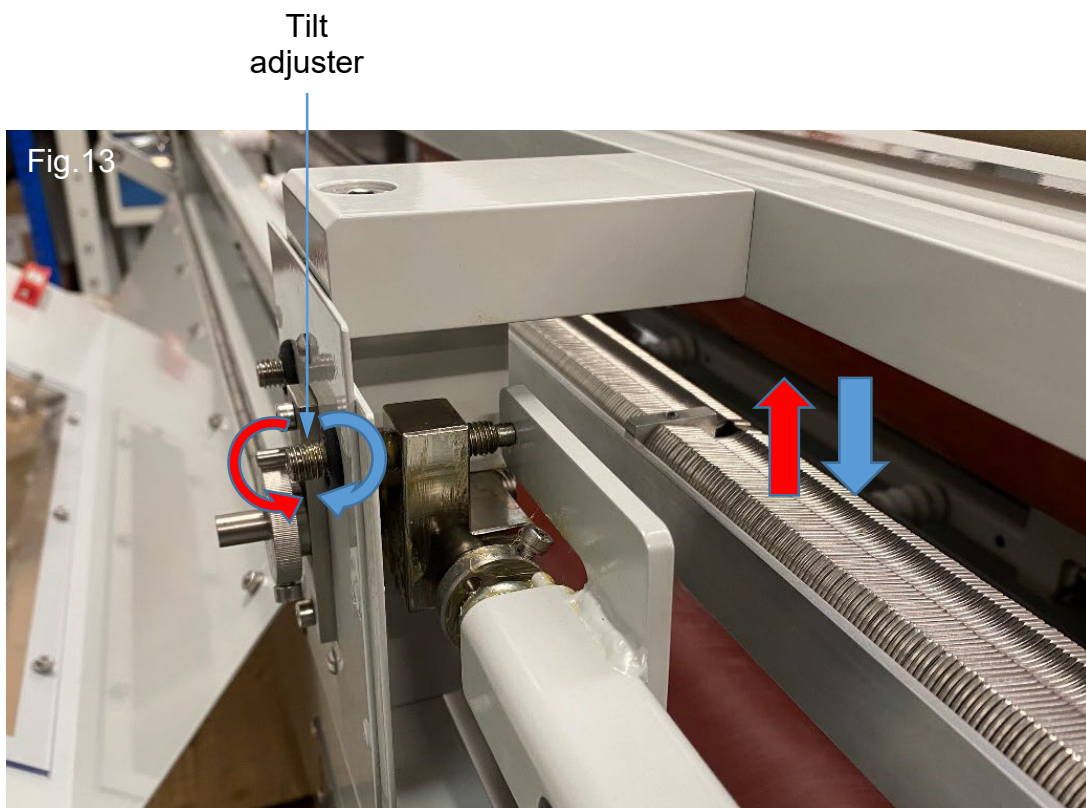
- Insert a piece of material 2.0mm thick between the electrode and the roller at each gap adjuster position Fig.10. Rotate the gap adjuster **Anti-clockwise** to move the electrode closer to or **Clockwise** to move the electrode further away from the roller Fig.11. The material should move between the roll and electrode with a minimal amount of resistance.



- Once the airgap is even the “squareness” (tilt) of the electrodes to the roller should be checked Fig.12.



- The tilt can be adjusted by rotating the screw **Anti-clockwise** to increase or **Clockwise** to decrease the angle to the roller Fig.12 -13.



- Once the tilt is set and the airgap is even along the entire length of the electrode the locking screw in the adjuster blocks can be retightened (finger tight) to lock the adjusters in place Fig.9,14.
- If any of the gap adjusters have been adjusted, the scale collars should be realigned so that the distance of the gap is adjacent to the setting pin. Loosen off the grub screw in the locking collar and rotate the collar until the set gap (2.0mm) is adjacent to the setting pin and retighten the grub screw Fig. 14.



## Electrical Interlocks

During Commissioning the treater station interlocks must be checked for correct operation before the system is put into production. The interlocks can be checked by testing the continuity of the interlock circuit using a multimeter (see circuit diagram) or by connecting the treater station to the generator and monitoring the interlock LED on the front panel. To test the interlock circuit, ensure the following is met.

- Treater box closed (operating position)
- Access covers / doors closed
- Ozone extraction fan running
- E-stop button disengaged

The interlock circuit should now be closed with continuity in the circuit or the interlock LED on the generator lit.

- The treater box position switches should be checked by opening the treater box using the pneumatic valve and checking that the interlock circuit opens. The circuit should open almost immediately the treater box starts to move.
- Access cover / door switches should be checked by opening covers / doors one by one. The interlock circuit should open immediately.
- The Air flow switch should be checked by switching the ozone extraction fan off. The interlock circuit should open within 30 seconds of the fan being switched off.
- The E-stop button should be depressed to ensure the interlock circuit opens immediately.

**DANGER!!!** If any of the above fail to operate correctly the machine should not be put into production and Corona Supplies service dept should be contacted for advice.

## Start-up

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Once commissioning is complete the treater station can be put into production.

### Webbing up

**CAUTION!!! Before webbing up the treater station / adjusting electrode segment ensure the generator is switched OFF. Allow the electrodes and rollers to cool for a minimum of 10 minutes.**

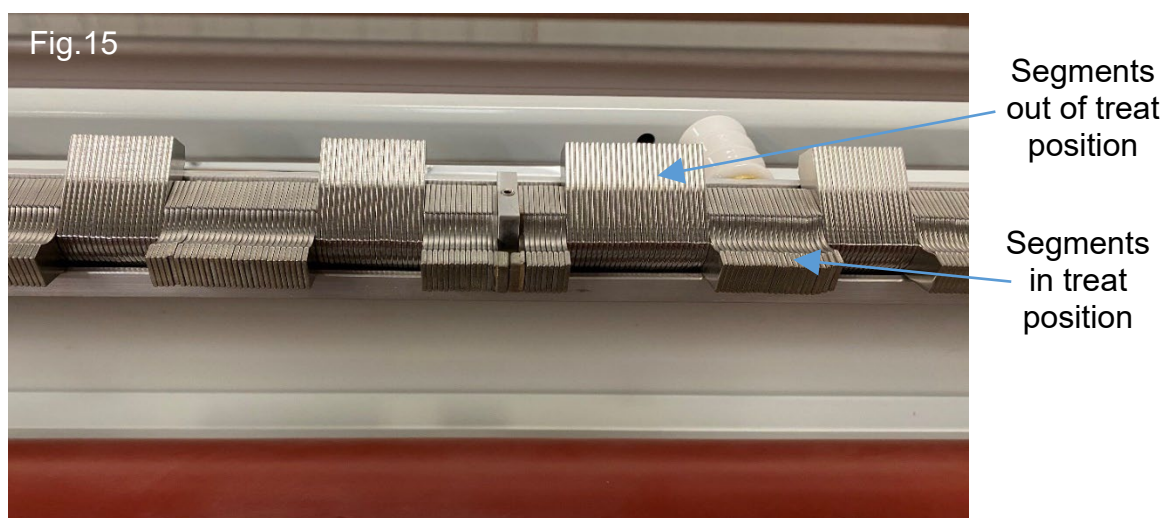
- Open the treater box using the two-handed pneumatic valve.
- Pass the material straight through the treater box, between the rollers, ensuring it is travelling in the correct web path as shown in the treater station drawing.
- Ensure the web is under tension before closing the treater box using the pneumatic valve.
- The treater box should be opened whenever an obstruction / join in the film is passing through (new bubble / splice).

### Setting treatment patterns (segmented electrodes only)

The segmented electrode allows sections (stripes) of the film to pass through the treater untreated which is a requirement for heat sealing bags and some trim systems.

To set the required pattern open the cover adjacent to the electrode to be adjusted and simply rotate the electrode segments out of position where treatment is not required Fig.15.

It is important to keep the electrodes clean to allow the segments to freely move in and out of the treating position (see maintenance section of this manual).



Now refer to the generator manual to continue startup of the corona treater system.

## Maintenance

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To ensure the trouble free operation of your corona treater some regular maintenance is required. This will extend component life and lead to less down time.

### **! Warning !**



The voltages inside the corona treater can exceed 10,000 volts; the generator must therefore be switched off & isolated from the mains supply before any work is carried out on the corona treater or generator.



Ceramic / metal electrodes and rollers reach temperatures in excess of 150 °C during operation. Any work inside the corona treater station should only be carried out after the electrodes / rollers have had time to cool. The corona must be stopped and the extraction fan left running for approximately 10 minutes before the machine is opened and any covers removed.

If in any doubt contact Corona Supplies service department for assistance

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## ELECTRODES

The electrodes should be cleaned regularly to maintain system efficiency and to achieve maximum operational life.

MONTHLY	6 MONTHLY
<p>Using an airline or stiff brush remove any build-up of dust and debris from around the electrodes and ceramic / PTFE insulators Fig.16.</p> <p>Ensure the segments that make up the electrode are free to move. Moving the segments periodically will help to keep them free.</p> <p>Inspect for signs of arcing around the ceramic / PTFE insulators and HT connections. Arcing should be removed using a cloth &amp; light solvent or for heavy deposits emery/sand paper can be used.</p> <p>Inspect for signs of moisture build up around ceramic / PTFE insulators. Moisture should be removed using a cloth &amp; light solvent.</p>	<p>Remove oxidation build &amp; contamination from the electrodes using emery /sand paper or a wire brush.</p> <p>Check air gap between electrodes and base roll and adjust as required to achieve a gap of approximately 2.00mm. Ensure the gap is even along the entire length of the electrode. The tilt screw may need to be adjusted to ensure the electrode is square to the base roll.</p> <p>Ensure the gap / tilt adjusters are free to move and lubricate as required.</p> <p>The electrode bridges are sprung loaded to enable them to move out of position should a obstruction “lump” in the material pass through. Check they are free to move and return to their original position. If not follow the instructions below Fig.17-18.</p>

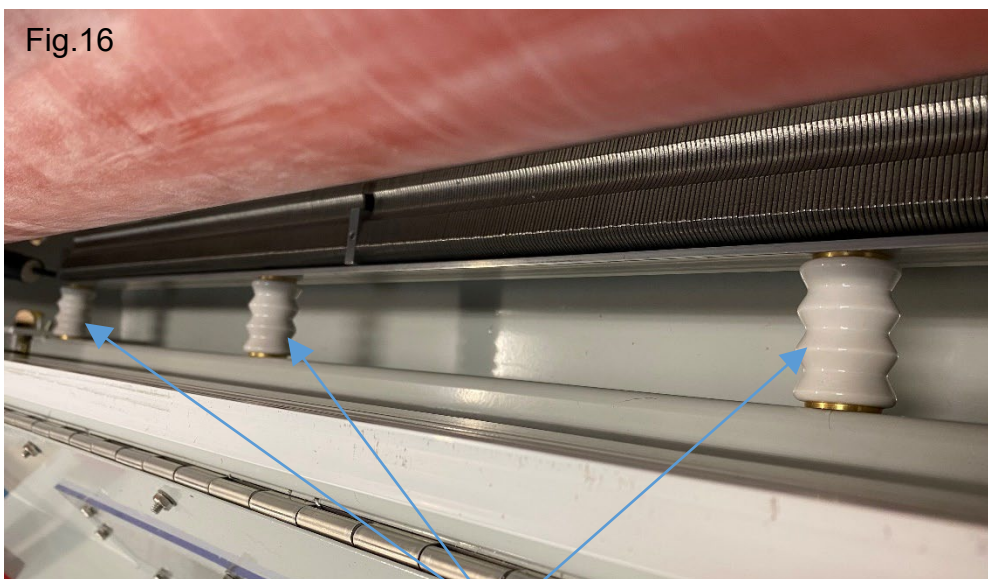
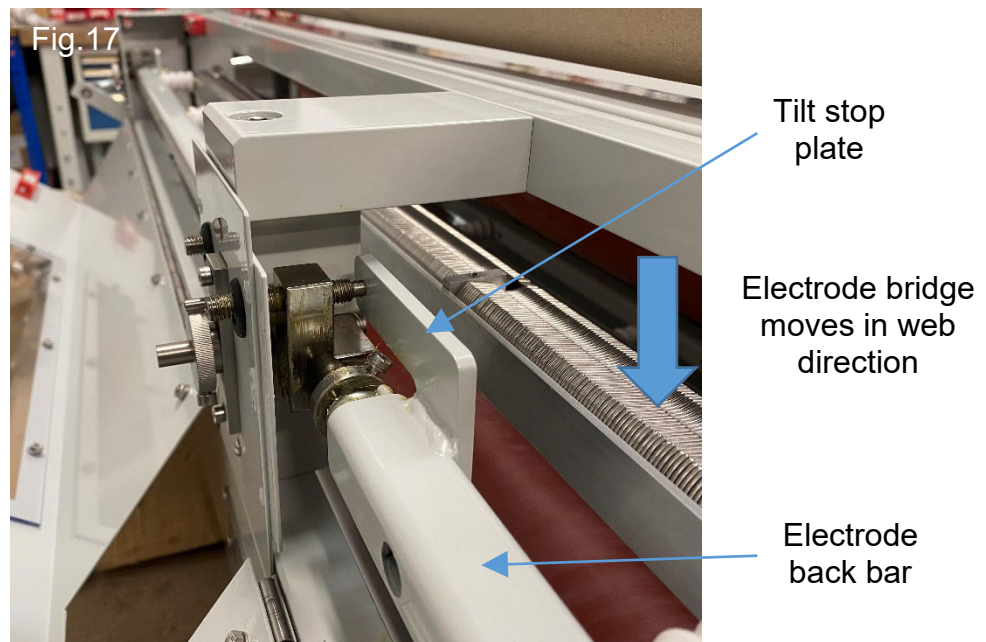


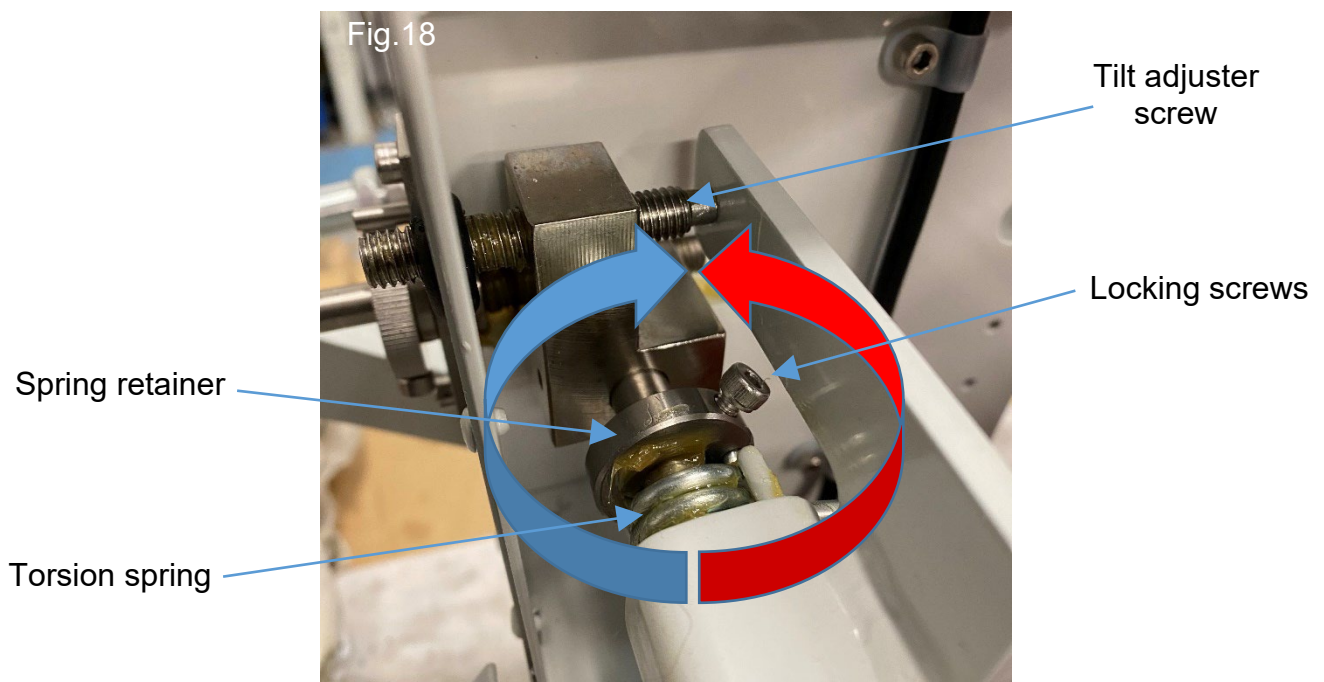
Fig.16

Ceramic insulators

## Adjusting electrode bridge tension



- Loosen the locking screws in the spring retainer. NOTE: Adjust one gap adjuster position at a time Fig.18.
- Rotate the spring retainer **Anticlockwise** to increase tension or **Clockwise** to decrease tension. NOTE: The electrode bridge should be able to move easily out of position if a “lump” passes through the treater but should then return to its original position and still to be under tension against the tilt adjuster screw.
- Retighten the locking screws in the spring retainer.



## ROLLS

Very little maintenance is required of the rollers and bearings. After a period of time the roll surface may become contaminated with dirt & material deposits which should be removed as described below. When handling or cleaning the rolls great care should be taken not to damage the silicone rubber or ceramic coating.

**NEVER USE KNIVES NEAR SILICONE OR RUBBER COATED ROLLERS**

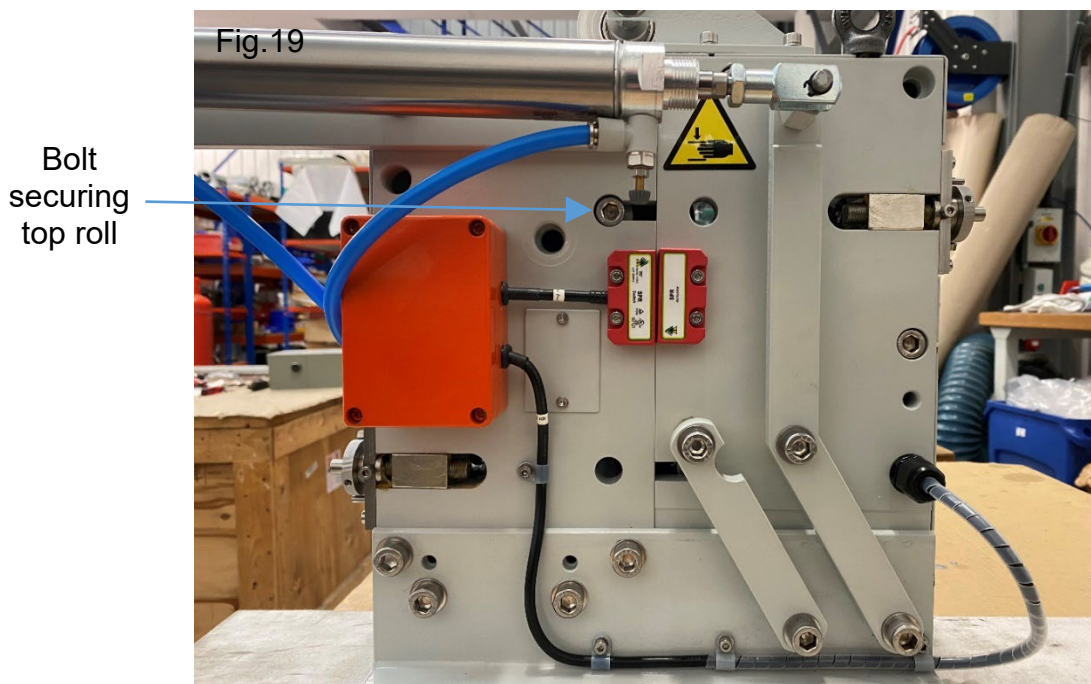
<b>6 MONTHLY</b>	<b>YEARLY</b>
<p>Check roll covering for signs of damage or build-up of contamination. Ceramic coverings can be cleaned with a light solvent. Silicone rubber coverings can be cleaned with a soap &amp; water solution.</p> <p>Check rolls are rotating freely. If the rolls do not rotate freely check the air gap between the electrodes and roller to ensure the electrodes are not inhibiting the rolls rotation.</p> <p>Bearings should be checked and replaced if worn.</p>	<p>Check rolls are rotating concentrically. If the rolls are moving laterally in any axis the bearings may need replacing.</p> <p>Worn or damaged silicone sleeves should be replaced.</p> <p>Check magnets, sensing disc or studs are securely attached to the end of the roller adjacent to the rotation sensor.</p>

## Base roll removal

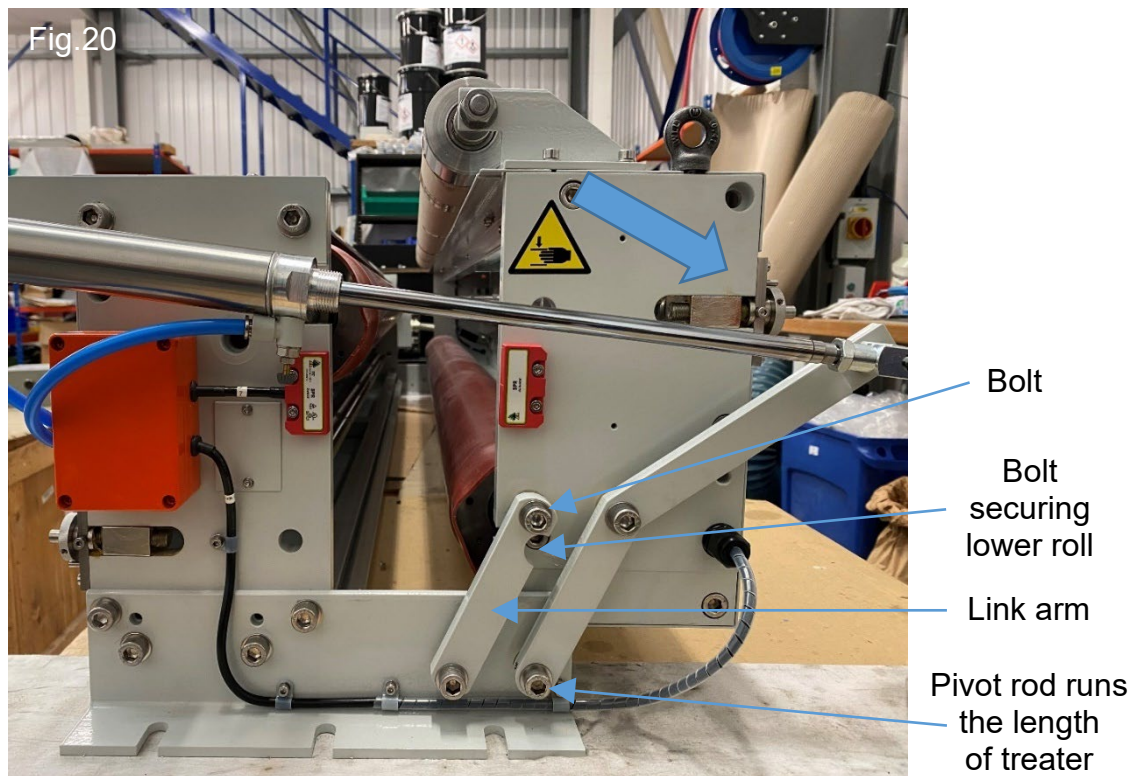
To replace a damaged or worn silicone sleeve the roll will need to be removed from the treater.

**CAUTION!!!** Before removing a base roll ensure the generator is switched off. Allow the electrodes and rolls to cool for a minimum of 10 minutes. Remove the web from the treater.

- Before opening the treater box loosen off the bolts securing the top roll (fixed half). Loosen the bolt until the head is outside the treater side frame Fig.19.



- Open the treater box using the pneumatic valve. Loosen off the bolts securing the lower roll (moving half). Loosen the bolt until the head is outside the treater side frame Fig.20.



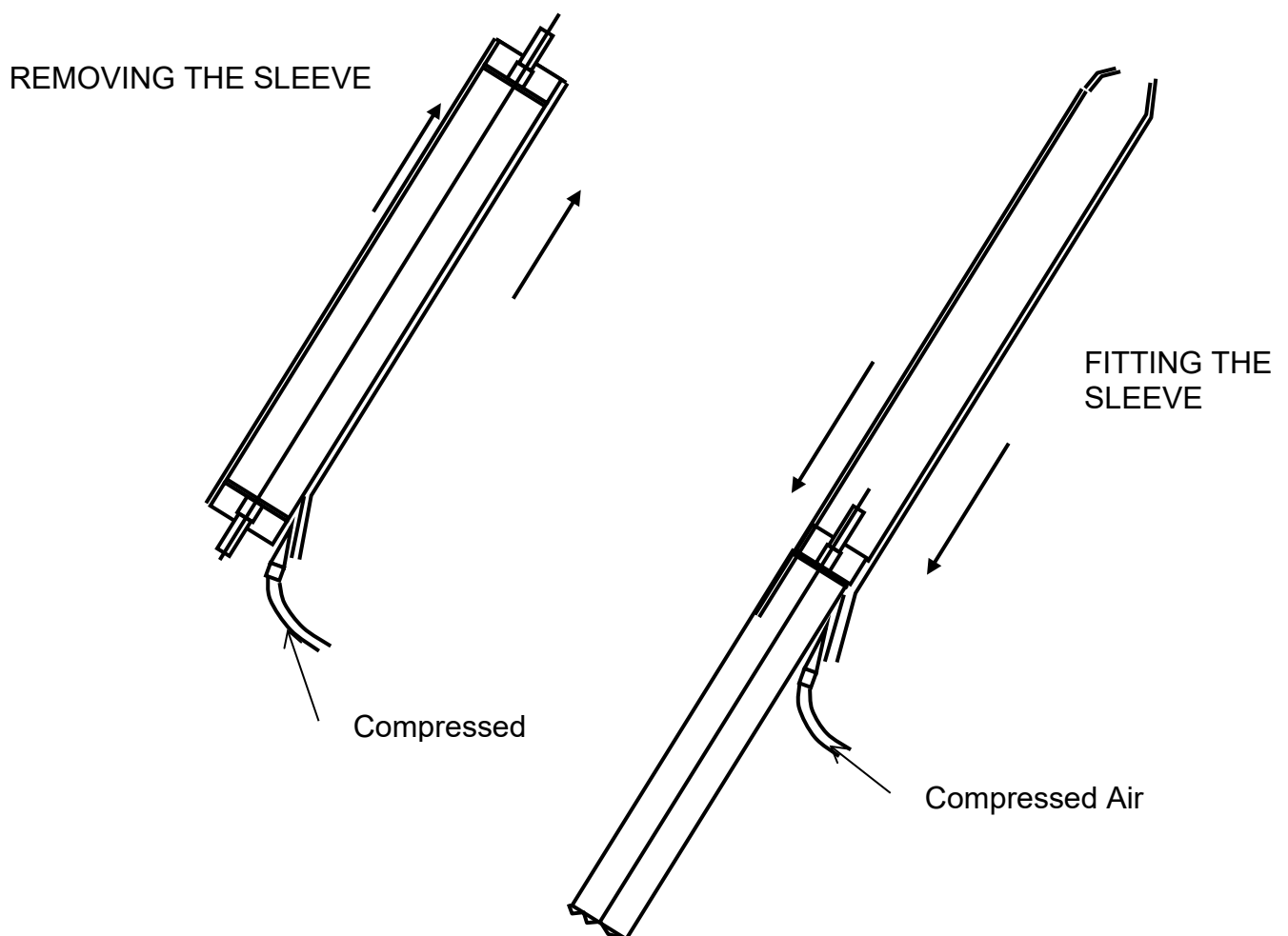
- To allow for easy removal of the rollers the treater box will need to be opened further. Whilst holding the moving half of the treater remove the bolt securing the top of the short link arm. With the bolts removed, slowly swing the moving half downwards until the bottom cover rests on the pivot rod. Fig.20.
- The rolls can now be removed from the treater and the silicone sleeve replaced as shown in the next section of this manual. When removing the top roller (fixed half) ensure the overhanging silicone sleeve does not get caught on the rotation sensor.
- To fit the rollers back into the treater, follow the reverse of the above.

## Mounting Instructions for Dielectric Treater Sleeves

During the following procedures, keep the working area and sleeve surface as clean as possible. Avoid damage of sleeve surface when using tools.

1. Place roll in vertical position on the floor or bench.
2. Slip the open end of the sleeve over the upper end of the roll by approx. 50-75mm.
3. Introduce the nozzle of a high-pressure air line between the sleeve and the roll.
4. Hold sleeve firmly with both hands while an assistant slowly opens air valve.
5. When the sleeve fills with air, it will expand and can be pulled all the way down over the entire length of the roll.
6. Make sure that the sleeve projects over the roll face on both ends by at least 25mm.

**Note:** When sleeves are ordered for replacement, please specify total length at least 100mm longer, to allow for contraction and overlap.



## COVERS & WINDOWS

It is important to make sure all of the machine covers are correctly fitted so that access to the high voltage and rotating rollers is not possible. Build-up of contamination on the inside of the covers may also lead to contamination of the web if it was to come loose.

### MONTHLY

Check covers and windows are correctly fitted and all fixing screws are in place.

Remove any build up debris using a stiff brush. Clean viewing windows.

Check interlock switches operate correctly, are in a good condition and are securely fastened to the frame work.

## PNEUMATICS

### MONTHLY

Ensure the treater box opens and closes freely and evenly. Adjustments to the flow restrictors mounted on the pneumatic cylinders can be made to ensure both ends of the treater box open and close at the same rate.

Check for air leaks in the pneumatic system paying special attention to the flow restrictors mounted on the pneumatic cylinders and any joints in the pneumatic pipework.

Check correct functionality of the two handed pneumatic valve. Both close buttons must be pressed together and held until the treater box has fully closed. The valve should be recalibrated or repalced if either of the following occure.

- 1, If the treater box is not fully closed but continues to close after the close buttons have been released.
- 2, If the valve does not lock after 5 seconds of the treater box being closed.

## **SAFETY INTERLOCKS**

The interlock circuit should be checked regularly to ensure correct and safe operation of the corona system. Failure to carry out these checks may leave the system unsafe.

### **MONTHLY**

Check each interlock switch is working correctly and is securely fastened to the corona treater framework, door or window. When an interlock switch is opened the corona should stop immediately. Switches are fitted to opening doors, windows, opening sideframe(s) and the ozone extraction system), there may also be an emergency stop button mounted close to the corona treater station.

SEE "CIRCUIT DIAGRAM - TREATER INSTALLATION" DRAWING THAT WAS SUPPLIED WITH YOUR CORONA SYSTEM FOR MORE INFORMATION.

## **OZONE EXTRACTION SYSTEM**

The ozone extraction system not only removes the ozone produced during the corona treatment process but also cools the electrodes & rollers during operation. It is important to keep the extraction system running efficiently to avoid over heating of the electrodes & rollers which may lead to premature failure and to eliminate the risk of ozone leaking back into the work area.

### **6 MONTHLY**

Check for blockages in the extraction ducting and fan impellor. Stray material can be easily sucked into the extraction system and fan, reducing the air flow.

Check for leaks and damaged ductwork, especially in the ducting from the fan to atmosphere as this is under positive pressure. Ozone is heavier than air and will fall back to the ground from damaged or leaking duct work above head height.



## Warranty & Aftersales Service

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All our products are warranted for 12 months from invoice date within the underwritten conditions:

Complete replacement of any mechanics or electrics parts not properly functioning.

**This replacement will be accomplished only to the following condition:**

- a)** We are quickly informed by phone or email about a fault on our machinery, specifying equipment plate data and if possible component characteristic and identifier.
- b)** The faulty and/or malfunctioning material to be returned to our office within 30 days from receiving new spare parts. If within this time we don't receive the faulty part we will be obliged to charge the required.
- c)** Will be verified by our technicians that the component is truly faulty. Otherwise if the damage is caused by improper equipment use or there is evidence of tampering with tools and/or unauthorized personnel or the equipment has not been used in accordance with the instruction manual, we will not be liable for damages and parts will be charged.
- d)** The freight will be charged to customer.

**The warranty doesn't cover technician's costs for replacement and/or spare parts installation supplied, so this cost will be charged and invoiced in the usual way.**

**THIS EQUIPMENT WAS SUPPLIED TO YOU BY:**



**Corona Supplies Ltd**

for all your corona needs

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**FOR FURTHER ASSISTANCE, PARTS OR SERVICE  
PLEASE CONTACT US IMMEDIATELY**

**THANK YOU**