FRASER
Anti-Static Techniques

OPERATING INSTRUCTIONS

ROTO-CLEAN

MODELS 4900-112 & 4900-178

CE

LLOYD'S REGISTER QUALITY ASSURANCE ISO9001

UKAS MANAGEMENT SYSTEMS 001

Fraser static control equipment has been designed to give you many years of productive service. However, the science of static control has unique rules, which must be followed to allow the equipment to give a good return on your investment.

Please read the following operating and maintenance instructions carefully.

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1. The Equipment

Models 4900-112 and 4900-178 are high performance static eliminator ring bars fitted with rotating nozzles driven by compressed air for surface cleaning applications. Through rotational movement, they produce an energetic pulsating airflow which, combined with the static eliminator, captures and removes surface contamination.

Both units have a fixed mounting block with an M8 x 15 mm mounting hole and an 8 mm quick release air inlet fitting.

A Power Unit is required to generate and deliver the high-voltage to the ring bar. It converts mains primary input voltage to high voltage which is transmitted to the Bar by the HV cable. The emitter pins in the ring bar use the high voltage to produce a thick cloud of ionised air dense with positive and negative ions to neutralise static charges.

2. Checking the Delivered Equipment

The equipment leaves our factory in suitable protective packaging. Please check that it is undamaged when it arrives. If there is visible damage contact the factory or one of our distributors immediately, before carrying out any installation.

Check that the parts which have been delivered are the same as you ordered.

3. Safety

Proper Use

- Only intended for internal factory applications.
- Must only be used with a suitable Fraser Power Unit.
- Not certified for use in hazardous areas. For these areas see Fraser EX certified Bars.
- Designed exclusively for operation with oil-free, dry and filtered compressed air conforming to DIN ISO 8573 class 3 or better.
- Ambient temperature must not exceed 50 °C.
- The rotating nozzles units must not come into contact with water or corrosive environments.
- Faulty air hoses and connectors can cause serious injury. Only install compressed air hoses when depressurised.
- Noise levels must be checked in final installation and operating air pressure.
- Operators must wear eye protection if working in the vicinity of an operating rotational nozzle.

Identification of Hazards

Fraser designs and manufactures this equipment using the latest technology and safety information. However, all high voltage equipment should be treated with care and only installed and maintained by qualified engineers who have read and understood these instructions.

Please pay particular attention to parts of this manual marked with this symbol which indicate potential safety hazards.

4. Technical Specifications

Power Unit: Use with Fraser 5.5 kV or 6 kV Power Units.

Air Inlet: 8 mm push in, quick fit (Festo).

Air Pressure 1.5 - 3.5 BAR MAXIMUM. DO NOT EXCEED THIS LEVEL.

Air Consumption in Lit/min:

	Size	1 Bar	2 Bar	3.5 Bar
4900-112	112 mm	140	220	340
4900-178	178 mm	160	250	400

Ring Bar: Anodised aluminium, PVC, epoxy resin.

Air Parts: Stainless steel, aluminium and brass (air nozzles).

HV Cable: Special screened HT Cable with PVC outer sheath.
Nominal diameter 6 mm. Bend diameter 70 mm.
Maximum length depends on Power Unit ordered:
HP50 and 9055-2, maximum length is 12 m.
HP50-F maximum length is 30 m.

Ring Bar Resistors: 100 Mohm resistance between emitter and the HV. This makes the emitters shockless to touch. Note: if the emitters are connected in parallel the resistance is reduced and shocklessness cannot be guaranteed.

Ambient Conditions: Maximum temperature 50 °C. Minimum temperature 0 °C.
Maximum humidity 70 % RH, non-condensing.

Nozzle Rotation: The nozzle RPM is regulated by centrifugal control and designed to be independent of air pressure.

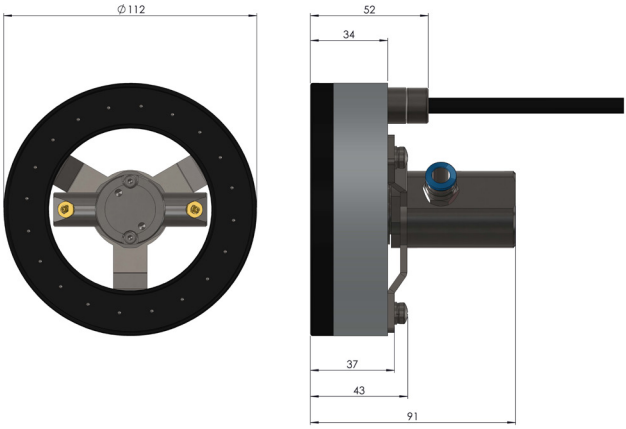
Nozzle Bearings: See maintenance. Factory sealed. Not user serviceable.

Sound Pressure: High sound pressure levels are generated by the release of compressed gas through air nozzles. Typically 80 dBA at 1 m at 3.5 Bar. Higher levels are possible depending on installation configuration. These levels must be checked for operator safety in application, and appropriate safeguards installed as necessary.

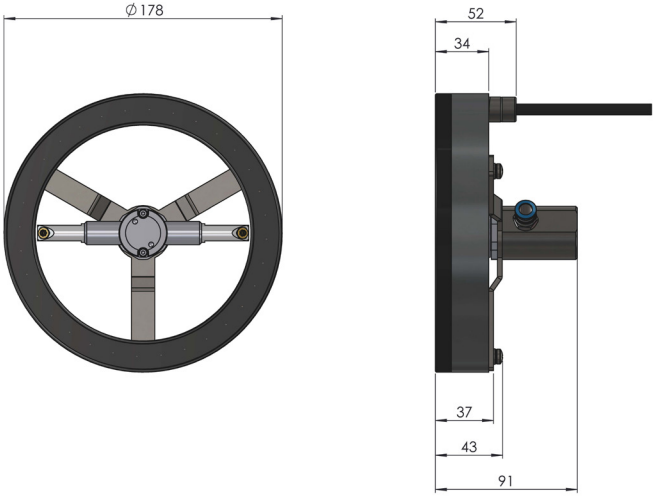
4. Technical Specifications

The 4900-112 has a diameter of 112 mm. The 4900-178 has a diameter of 178 mm.

Model: 4900-112 (dimensions in mm)



Model: 4900-178 (dimensions in mm)



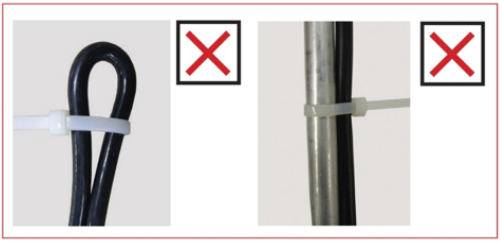
5. Mounting and Installation

Before installation, check the rotation of the nozzle for any damage during transport or handling. Installation and operation must only be performed by qualified persons observing safety warnings and complying with operator health and safety obligations.

Install only when depressurised!

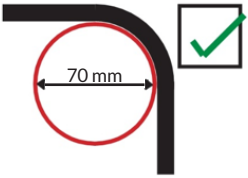
Cable

The high voltage flex cable is made to a high specification and must be treated carefully. Sharp bends will damage the insulation and lead to breakdown. It is very important that cable ties are not used to fix the cable (for example to an airpipe) and that the cable is not bent more than 70 mm diameter. See sketches below:



No tight bends

Cable ties can damage the Cable



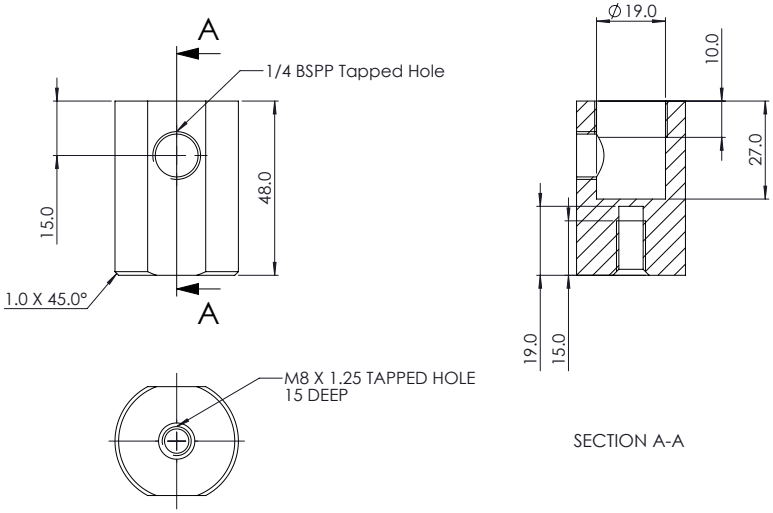
Min. bend diameter 70 mm

5. Mounting and Installation

Mounting

Securely mount the unit to a stable surface using the M8 x 15 mm threaded hole in the base mounting block (34 mm diameter with 30 mm flats).

Mounting Block



Air

- Connect an 8 mm airline to the air inlet mounted on the side of the mounting block. Only use oil-free, dry and filtered compressed air conforming to DIN ISO 8573 class 3 or better.
- Max. oil content: 1mg/m^3
- Max. residual dust content: particle size 5 µm, particle concentration 5 mg/m^3
- Max. residual water content: 0.88 g/m^3, pressure dew-point: -20 °C
- Compressed air hoses should be kept as short as possible. Kinks and bends less than 3x hose diameter should be avoided. Unnecessary quick-lock couplings in the air hose should be avoided to minimise pressure loss.
- If the operating pressure is less than the permitted range, the nozzles may not rotate or will rotate slowly, but will not be damaged.
- Exceeding the maximum pressure of 3.5 Bar will damage the nozzle.

5. Mounting and Installation

Connecting to the Power Unit

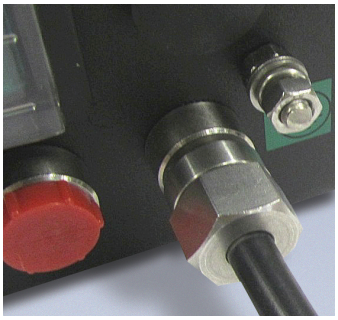
Ensure power is turned off nor not connected to power unit before installation.

Do not touch the white insulators - high voltage will track through any contamination on this insulator and could cause a breakdown.

HP50 Power Units

HP Connector - IMPORTANT Keep white insulator clean.

Dirt or finger grease on the white insulator can cause tracking of the high voltage and failure of the Power unit.



Completely screw into one of the ports

- Turn the hexagon head finger tight.
- The spring contacts the internal HV source.
- Connect the earth terminal to an independent earth for additional protection.

When the installation has been made as the instructions in this booklet, the system is ready to turn on.

The ionised air corona produced by the emission of high voltage from the emitter pins will neutralise static charge that passes through it. This is a powerful and safe process. The emission can produce a soft buzzing sound which is not usually audible in a factory.

Ozone

The emission also produces a small amount of ozone which may be detectable by a sensitive nose. This ozone level is considerably below the international safety limit of 0.1 ppm. If the smell is undesirable then increase the level of ventilation.

Dust and Contamination

The electric field produced by the emission may attract dust from the atmosphere. It can also cause a blackening of the plastic extrusion due to carbonisation. Both the dust attraction and carbonisation are normal. See Maintenance for cleaning of Bar.

Interlock with Process

Although the equipment is designed for continuous operation, we recommend that its operation is linked with the running of the machine or process, so that the system is not running when it is not needed. This will reduce air consumption and reduce cleaning/maintenance.

Shockless

The emitter pins are resistively coupled to the high voltage. The resistance is 100 Mohm which results in a pin energy level of about 50 µA which is shockless. Please note that if more than one emitter is touched at the same time then the resistors may be connected in parallel and so less shockless.

Sharp Emitters

Please note that the emitter pins are designed to be sharp! They could cut fingers if handled without care.

6. Maintenance

We recommend checking installation and operation regularly, at least every 4 weeks.

Important

Turn off the power and the air supply before cleaning or maintenance operations.

Rotating Nozzle

When installed and used as intended, the rotating nozzle is maintenance-free.

The main body and nozzles can become outwardly contaminated and should be cleaned with a soft brush and compressed air.

The rotating nozzle is manufactured using special bearings, with a very long service life. As a moving part, these bearings will wear over time. The nozzle RPM may change slightly as a result. If the RPM changes drastically, or the rotating nozzle stops working, then the unit must be serviced or replace.

Ring Bar

Accumulation of dust and other contaminants is normal, but this will reduce the performance of the Bar. It is important to clean the Bar to keep it working efficiently.

Light dust can be removed with a nylon brush - such as a toothbrush or nailbrush.

Engrained dirt and carbonisation can be removed with Fraser Cleaning Solution, IPA (isopropanol alcohol) or a similar solvent which is compatible with ABS, epoxy resin and aluminium. Soapy water can also be used.

Important

Do not turn on power until the Bar is dry. Take care - the emitter pins are sharp!

7. Troubleshooting

Poor Static Elimination	Clean the Bar. Dirt around the emitters could severely affect performance.
Is the Bar Working?	Check with an electrician`s 'volt stick' (it will illuminate from 200 mm), or a 720 Static Bar Checker.

Try to draw a small spark to earth from the emitters, using an insulated cable with exposed conductors, or similar.

If it is a multi-bar system disconnect one Bar at a time from the Power Unit and see if the system re-starts. The reason for this is that there could be a short in one of the Bars which pulls down the Power Unit by drawing more than 5 mA of current. If this load is removed the rest of the system will restart.

If the Bar is not working it should be returned to the factory for further inspection or replacement if under warranty. There are no user-repairable parts in the Bar or cable.

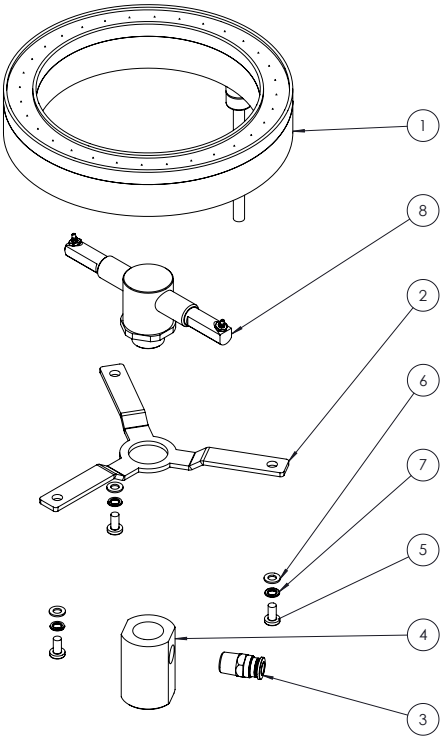
Not rotating?	If air is coming out of the nozzles, but it is not rotating, check air pressure, otherwise contact your distributor or the factory.

8. Warranty

The warranty is for a period of 12 months from date of delivery note. It covers defective workmanship and parts provided:

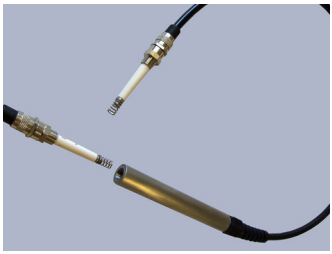
- The equipment has been used within the operating conditions specified in this document.
- There has been no physical damage to the product.
- The product has not been altered or tampered with.
- The rotating jets must not have been opened or manipulated by the customer.
- The complete unit is sent back to the factory by the customer. The customer is responsible for these carriage costs, Fraser is responsible for returning the product repaired or replaced under warranty.

9. Spare Parts



Item	Code	Description
1	12800 12802	4900-112 mm Ring Bar 4900-178 mm Ring Bar HV cable length, specified at order (m)
2	128005 12800	112 mm Bracket 178 mm Bracket
3	153005	Air Fitting QS ¼-8
4	128006	Mounting Block
5	ISO7045	M5 x 10 – Z – 10N
6	80785	M5 Plain Washer
7	80733	M5 Spring Washer
8	49112 49178	112 mm Nozzle 178 mm Nozzle

9. Spare Parts

Item Picture	Description	Part No.
	**HP Connector Set** For assembly by the customer.	90100
	**9055-2 Connector Set**	90101
	**HP-ILC Cable Extension with 2m cable** For HP connectors (not 9055-2).	HVC-2
	**Power Units** Please see range of Power Units on our website.	

For more information about static and to view the full range of our products, please visit **www.fraser-antistatic.com**

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