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**THE NEOS RANGE**  
WITH INTEGRATED REMOTE MONITOR



THE QUEEN'S AWARDS  
FOR ENTERPRISE:  
INTERNATIONAL TRADE  
2015



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## 1. Introduction

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This manual applies to the NEOS Range of Static Eliminator Bars supplied from December 2015.

It is essential that you read and understand the complete manual before installing and using this equipment. This is important for safety and for warranty cover.

### 1.1 Explanation of Symbols

#### Warning!

This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in serious personal injuries.



#### Caution!

This symbol appearing in the operating instructions refers to operations which, if carried out improperly, may result in damage to property.



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## 2. Safety

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### Warnings:

- The Anti-Static Bar is only designed for neutralising surfaces with an electrostatic charge.
- Electrical installation must only be carried out by suitably qualified personnel.
- Adequate installation earth / ground is required to ensure safe and proper operation.
- The 0 V return of the 24 V DC electrical supply must be earthed.
- Disconnect the power supply before cleaning or handling the Bar.
- The emitters are sharp and can cause physical injury.
- There are no user serviceable parts inside the Bar.
- Ensure the Bar and connecting cable are free from damage prior to installation and check periodically once in use.
- Bar must be switched off before adjusting the rotary switch.
- A small amount of ozone will be produced as part of the ionisation process. When installed correctly the level of concentration of ozone is less than 0.1 ppm and is within internationally accepted limits.



Any changes to the equipment without written consent of the manufacturer will nullify the warranty and CE certification.

As with all pulsed DC static eliminators, it is possible for the user to receive a small static shock as a result of their body being charged by the bar, and then discharging to a nearby earthed object. This is not dangerous, but may be uncomfortable and cause surprise. It is for this reason that the rotary switch should only be adjusted when the Bar is not powered.



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### 3. Use

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The NEOS Range are high performance Static Eliminator Bars designed to neutralise electrostatically charged surfaces. Powered by 24V DC, they have an integrated HV supply and feature remote monitoring to check bar function remotely. Connection to 24 V DC is via a standard M12 5-Pin Connector.

Not suitable for outdoor use.

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### 4. Checking on Delivered Equipment

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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 have ordered.

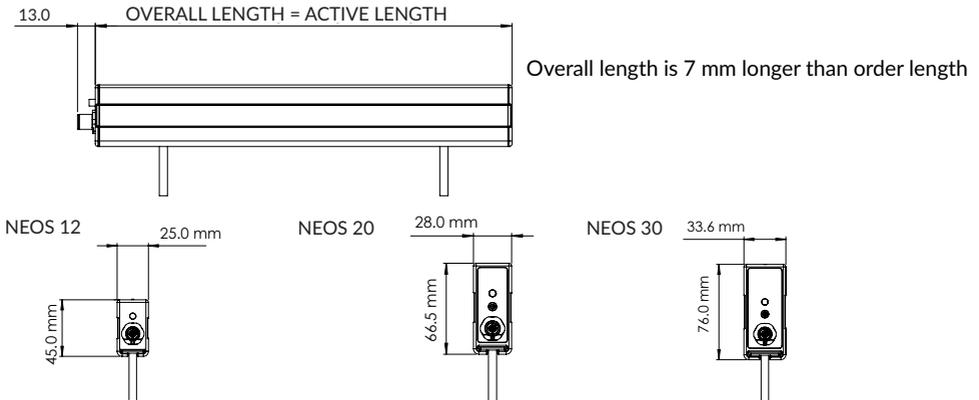
Loose Parts:            Mounting 'T' pieces and fixings - two for the lengths up to 1m plus one extra mounting bracket for every additional 500 mm.

NEOS 20 & 30 only: Emitter Key and two spare emitters.

M12 5-Pin Connector and lead or Power Supply Unit - as per order.

## 5. General Specification and Dimensions

<b>Power Supply:</b>	Voltage: 24 V DC (21-27 V). Current: NEOS 12 1.5 A, NEOS 20 2.0 A, NEOS 30 2.5 A DC Max. Connection: M12 5-Pin. A-coded
<b>High Voltage:</b>	NEOS 12 - 12 kV, NEOS 20 - 20 kV, NEOS 30 - 30 kV integrated into Bar.
<b>Supply cable:</b>	Low voltage, industry standard M12 5-Pin female connector.
<b>Emitters:</b>	Long life, high grade Tungsten.
<b>Status indication:</b>	LED Green/Green Flashing = OK Flashing Red = Standby. Red = Fault. Red/Green Flashing = Attention required.
<b>Signalling:</b>	OK/Attention Open Collector outputs. Remote DISABLE input.
<b>Environmental:</b>	IP67. Internal use. 0-55 °C Max. Dry: max 70% RH, non condensing.
<b>Length:</b>	NEOS 12F available from 300 mm to 4980 mm in 60 mm steps. NEOS 12L available from 450 mm to 4950 mm in 120 mm steps. NEOS 20 available from 450 mm to 4950 mm in 150 mm steps. NEOS 30 available at 600 mm, then 750 mm to 5000 mm in 250 mm steps.
<b>Weight:</b>	NEOS 12 - 1.5 kg/m. NEOS 20 - 2.6 kg/m. NEOS 30 - 3.6 kg/m.
<b>Mounting:</b>	M6 x 40 mm Fixing slides and Flange Nut.
<b>Approvals:</b>	CE. UL and CB.

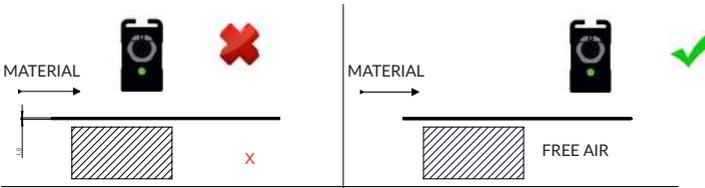


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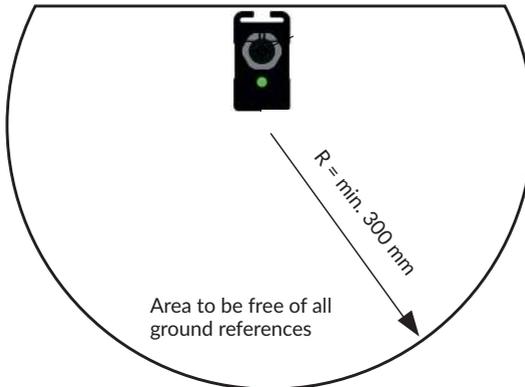
## 6. Positioning

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- i. The best location is at, or immediately before, the area where static is causing the problem. Remember that static can be regenerated if the material passes over rollers or through a process after neutralising. A Static Meter is useful to determine the best position.
- ii. Important: Except on a winding reel of material, the material to be neutralised should be in free air, not touching another surface as it passes the Bar. It is not possible to neutralise static electricity where the material is touching another surface or roller.



- iii. The Bars must be dry and oil-free.
- iv. It is important that the emitter pins are not touching, or close to metal objects, to avoid spark erosion that will damage both the Bar and the metal object.
- iv. The distance from the material should be:
  - NEOS 12F: 30 - 200 mm
  - NEOS 12L: 100 - 600 mm
  - NEOS 20: 150 - 800 mm
  - NEOS 30: 250 - 1000 mm



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## 7. Operation & Control

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### 1. Intelligence and Settings

The NEOS range gives the operator the ability to generate market leading static elimination for better control of processes, quality and safety.

NEOS Bars are pulsed DC static eliminators with five settings: three manual and two automatic (intelligent). The settings are selected using the rotary switch on the endcap of the Bar.



#### Manual Settings

Manual settings allow the Bar to be operated as a conventional pulsed DC static eliminator - slowing the frequency of the ion emission to cope with longer distance neutralisation.

The three manual settings are M1 for longer range - using a low frequency

M2 for medium range - using a medium frequency

M3 for shorter range - using a higher frequency

#### Automatic Settings - NEOS Intelligence

The automatic settings, AN and AL, give the operator the ability to double the neutralisation power of the manual settings by using NEOS Intelligence.

NEOS Intelligence monitors the charge in the object and adjusts the ion emission to achieve faster neutralisation. It adjusts the polarity, duty cycle and frequency of the ion emission to suit the application.

There are practical limits to the sensing capability of NEOS - if the electric field is weak or at a long distance it will be more difficult to monitor.

For this reason there are two automatic settings available: AN and AL

AN (Auto Near) is for shorter distances

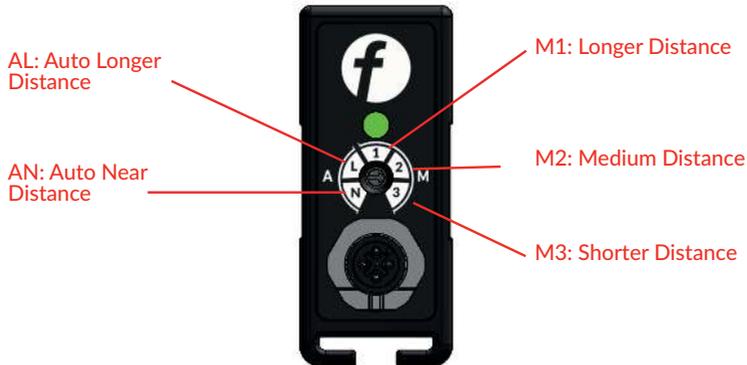
AL (Auto Long) is for longer distances

On the next page the operator is given the information about maximising the performance of the NEOS Bar.

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## 7. Operation & Control continued

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### Selecting the Best Setting

The factory settings are:

AL for NEOS 12L, NEOS 20 and NEOS 30

This gives intelligent operation at medium/long distances.

AN for NEOS 12F

This is a short range setting for fast speeds and high charge levels.

These settings can be changed to meet the actual requirements of the installation.

Typical reasons for this could be:

#### 1) Distance:

The Manual setting M1 is for longest distances to the object to be neutralised.

The sensing intelligence from the automatic settings loses sensitivity with distance, especially if the static charge level is not high. See distance chart on the next page for guidance.

#### 2) Installation:

If there are metal parts in the target area, or close to the NEOS Bar, this could interfere with the sensing - giving it misleading information. See Bar positioning in section 6.

#### 3) Intermittent Static Charge:

For example, if the product is not continuously present there is no charge to sense. In this case it may be better to use a Manual Setting to flood the area with ions.

#### 4) Speed of Process:

Faster material speeds benefit from closer distances and faster frequencies.

A small amount of experimentation may be needed to produce the best performance for the application. The settings can be changed by turning the slot in the end cap. Use a 2mm plastic screwdriver.

Turn off the Bar when changing the setting. See distance chart on next page for the typical range of each setting.



Distance for each Setting.

Pulsed DC static neutralisation is designed for longer range performance. The actual performance is also influenced by the size of the static charge - the higher the static charge, the longer the range of the static eliminator.

This rule applies to NEOS intelligence too - the higher the static charge, the better the sensing operation.

The following chart gives operational distances for the various Bars and settings at a moderate charge level of 20 kV. There is considerable overlap between settings. Operational distances will be longer for higher charges.

Settings	NEOS 12 F	NEOS 12 L	NEOS 20	NEOS 30
<b>AN (Auto Near)</b>	30 - 150 mm	100 - 300 mm	250 - 400 mm	250 - 400 mm
<b>AL (Auto Long)</b>	100 - 250 mm	200 - 500 mm	200 - 750 mm	250 - 800 mm
<b>M1 (Manual Long)</b>	150 - 300 mm	200 - 600 mm	200 - 800 mm	300 - 900 mm
<b>M2 (Manual Medium)</b>	100 - 200 mm	150 - 500 mm	150 - 600 mm	250 - 600 mm
<b>M3 (Manual Short)</b>	30 - 100 mm	100 - 300 mm	150 - 500 mm	250 - 400 mm



NEOS 12



NEOS 20 and 30

## 7. Operation & Control continued

### 2. Electrical

Using an existing 24 V DC supply:

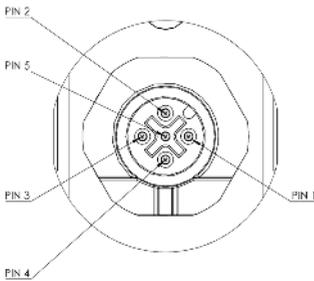
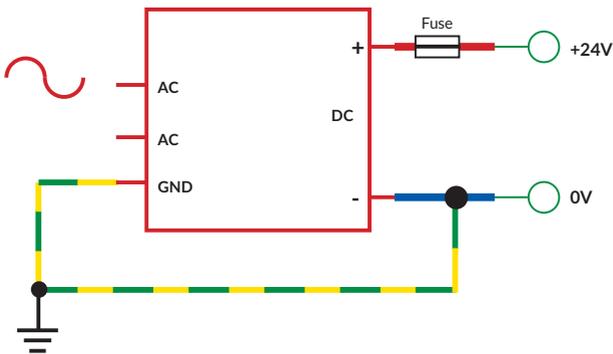
The 24 V return must be fitted with:

NEOS 12F and NEOS 12L: 1.5 Amp fuse e.g. Type: 1.5 AT 250 V

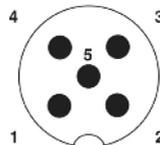
NEOS 20: 2.0 Amp fuse e.g. Type : 2.0 AT 250 V

NEOS 30: 2.5 Amp fuse e.g. Type : 2.5 AT 250 V

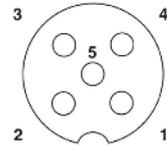
The 0 V output must be connected to earth.



MALE PLUG



FEMALE SOCKET

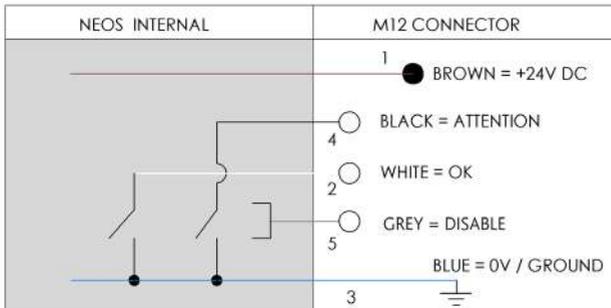
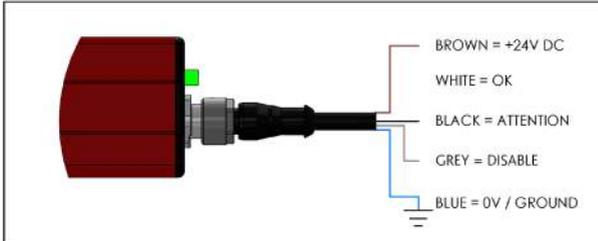


Pin	Colour	Function
1	Brown	24 V
2	White	OK
3	Blue	0 V & Earth
4	Black	Attention
5	Grey or Green/Yellow	Disable

3. Signalling

The NEOS Bars feature two open-collector outputs to enable remote monitoring of Bar status, and a logic-level DISABLE input to allow the HV supplies to be externally disabled when not required (“Standby” mode). For example, the bar can be linked into a machine’s safety interlock system to ensure operator safety during changeover periods.

See wiring diagram and examples below.



Open-collector outputs (OK, ATTENTION)

Both open-collector outputs are capable of sinking a current of up to 200 mA, allowing direct driving of external lamps or relays, or an external LED with a suitable current limiting resistor. An external pull-up resistor may be used to provide a logic-level or 24 V signal voltage to a PLC or other destination. See wiring diagram and examples in the next section.

Both output signals are active low, meaning that a signal is asserted by a connection to 0 V via a low-powered solid-state switch. The two signals are valid 5 seconds after power is applied, according to the following conditions:

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## 7. Operation & Control continued

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Condition	Ionisation	OK (White, Pin 2)	Attention (Black, Pin 4)
Bar powered, all OK	ACTIVE (HV ON)	ACTIVE (connected to 0 V)	ACTIVE (connected to 0 V)
Bar powered, requires attention (e.g. cleaning)	ACTIVE (HV ON)	ACTIVE (connected to 0 V)	INACTIVE (open-circuit)
Bar not powered, overload or hardware fault	INACTIVE (HV OFF)	INACTIVE (open-circuit)	INACTIVE (open-circuit)
Standby mode	INACTIVE (HV OFF)	INACTIVE (open-circuit)	ACTIVE (connected to 0 V)

A working Bar in good operating condition will thus internally connect both open-collector outputs to 0 V, after a delay of up to 5 seconds after power is applied.

If the open-collector outputs are not required, the black wire and the white wire should be connected to 0 V (blue wire).

Voltage applied to open collector outputs must not exceed 28 V DC, and must be of the correct polarity.

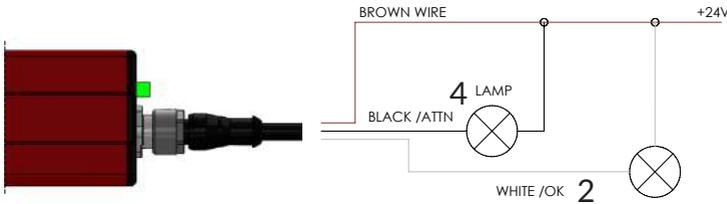
The current through the open collector switch must not exceed 200 mA. Failure to limit the current into the open collector outputs may cause permanent damage to the product. Do not connect the open collector outputs directly to 24 V.



Example applications of open-collector outputs

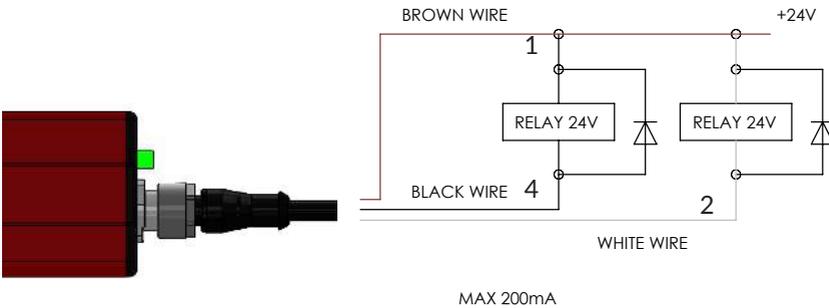
External lamp/indicator

External lamps or indicators can be connected to the OK or ATTENTION outputs to remotely display Bar status. This is useful for bars mounted in inaccessible areas. Lamp rating 24 VDC, maximum 5 W. An LED can also be used with a suitable resistor. Maximum lamp current 200 mA.



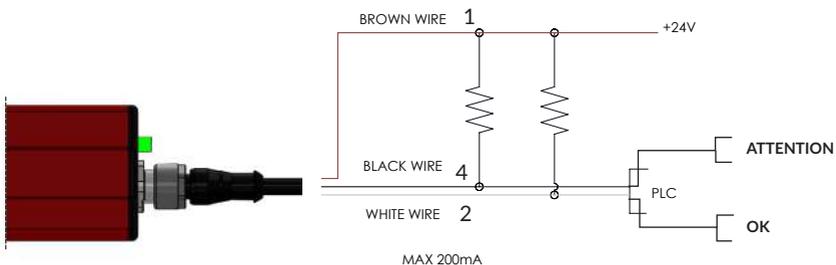
External relay

An external relay can be connected for additional control/feedback applications. Coil rating 24 V 5 W max.



External PLC

A voltage signal suitable for interfacing with a PLC or other control system can be obtained using an external pull-up resistor.



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## 7. Operation & Control continued

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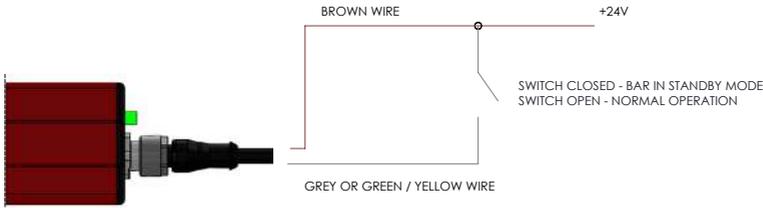
The voltage connected to the external pull-up resistor must correspond to the required high-level PLC input voltage, up to a maximum of 28 V. If the high-input voltage of the PLC is 24 V, then the pull-up must be connected to 24 V (as shown on page 14). If the input is "logic-level" or "TTL-level", then the pull-up should be connected to a lower voltage such as 5 V.



### Remote DISABLE input

The NEOS Bars features a remote DISABLE input signal (Grey or Green/Yellow wire). This may be useful for installations in which the Bar is not used continuously and it is desirable that the Bar should be inactive when not required, or in installations in which the operation of the Bar is to be interlocked with other machinery.

The HV supplies may be externally disabled (Standby mode) by applying any DC voltage between 3 V and 28 V to the DISABLE input, for example by using an external switch or relay contact between the DISABLE input and 24 V, or a logic-level voltage signal. Subsequently reducing the voltage at the DISABLE input to less than 0.5 V restores normal operation of the Bar.



In Standby mode the Bar internal HV supplies are disabled, the status LED flashes red, and the OK output is inactive (open circuit) to indicate that ionisation is disabled. The DISABLE signal has a weak internal pull-down resistor, thus if the DISABLE signal is left disconnected the Bar should operate normally. However, for added noise immunity it is recommended that the DISABLE input is externally connected to 0 V (blue wire) if not required.

Voltage applied to the DISABLE input must not exceed 28 V DC, and must be of the correct positive polarity. The Bar may be permanently damaged by connecting the DISABLE input to any voltage outside the range of 0 V to 28 V DC.



Where the optional SPX - 0724 AC Power Supply has been ordered ensure the Power Unit is connected to 3 wire AC mains supply, Live + Neutral + Ground, and that extra Earth wire from power supply is bonded to Ground. With this optional supply an interface cable is required to access the remote monitor feature.



4. LED



Bar State	LED State	LED State (Intelligence Active)
Auto Near	Pulse Green	Rapid Flash Green
Auto Long	Double Pulse Green	Rapid Flash Green
Manual 1,2,3	Slow, Medium or Fast flashing depending on the mode selected	N/A

IONISATION ACTIVE IN THIS STATE



Bar State	LED State	Cause	Action
Attention	Red/Green Alternate Flash	- Dirty Bar or abnormal conditions	- Clean Bar - Check Installation - Check Process

IONISATION ACTIVE IN THIS STATE



Bar State	LED State	Cause	Action
Fault	Solid Red	- Power supply not within 21 - 27 V - Internal fault - Overload	- Check power supply - Check input voltage - Check HV at pins - Check Bar is correctly wired - Check Bar is correctly positioned.
Standby	Flashing Red	- DISABLE signal active (3-28 V)	

IONISATION NOT ACTIVE IN THIS STATE

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## 8. Mechanical

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Versatile mounting 'T' pieces slide into slot at the bottom of the Bar.

Two mounting slides for Bars up to 1 m, plus extra mounting brackets for each additional 500 mm.



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## 9. Maintenance

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Turn off power supply to the Bar before doing any installation or maintenance work (including adjusting the rotary switch).



Cleaning is the only maintenance required. Dirt around the emitters will reduce efficiency and result in unsatisfactory performance.

Our Fraser cleaning kit (Part Number 81220) is ideal for use, alternatively a toothbrush or nail brush can be used. Do not use a wire brush as this could damage the Bar.

The Bar can be washed with soapy water or IPA, but it must be dry around the emitters before turning the power on.

Please note, when handling and cleaning, that the emitter pins are sharp and care is needed!

The emitter pins are shockless - there is a large resistor below each emitter reducing the current to a shockless level. However please note that D.C. current can transfer charge to a body if it is touching or close to an emitter for a longer period. This could give a shock when discharging.



The emitters on NEOS 20 & 30 should be replaced every two years. Please use the emitter key supplied with the Bar to remove/replace.

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## 10. Certification and Declaration of Conformity

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We declare that this equipment conforms to the Low Voltage Directive, and EMC Directive it is entitled to display the CE and UL marks.

For further instructions and information, please contact the manufacturer.

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## 11. Troubleshooting

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On power-up, the status LED will be RED for up to 3 seconds while internal checks are being carried out inside the bar. After this time, if all operating conditions are normal, the status LED will turn GREEN.

If the status LED does not illuminate GREEN or RED, then check the electrical supply. If the electrical supply is OK, then check the connecting cables for damage.

If the status LED is in SOLID RED, then this indicates overload or other fault:

- Turn the power off and clean the bar.
- Check the electrical supply.
- Check the installation location is as described in this manual.

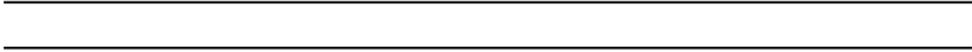
LED/Signal	Problem	Cause	Action
No LED	No 24 V power	- No supply or voltage too low - Faulty wiring	- Check supply voltage - Check wiring
Solid Red	No high voltage at emitter	- Power supply out of voltage range - Bar overloaded - High voltage supply fault	- Check power supply voltage - Clean Bar
Flashing Red and Green	Poor ionisation	- Dirty Bar - Bar overloaded - Bar incorrectly positioned	- Clean Bar - Check positioning of Bar - Check emitters for damage

## 12. Spare Parts & Accessories

Item Picture	Description	Part No.
	3 m cable M12 female, bare ends. Straight socket.	81193
	5 m cable M12 female, bare ends. Straight socket.	81194
	7.5 m cable M12 female, bare ends. Straight socket.	81195
	10m cable M12 female, bare ends. Straight socket.	81196
	3 m cable M12 female, bare ends. 90° socket.	81199
	5 m cable M12 female, bare ends. 90° socket.	81200

## 12. Spare Parts & Accessories

Item Picture	Description	Part No.
	<p>7.5 m cable M12 female, bare ends. 90° socket.</p>	<p>81201</p>
	<p>10 m cable M12 female, bare ends. 90° socket.</p>	<p>81202</p>
	<p>Universal AC/DC power supply: 100-250 V AC, 24 V DC output Fitted with 1.5 m of cable.</p>	<p>NEOS-PSU</p>
	<p>Mounting 'T' Bracket, including flanged nut (40 mm)</p>	<p>34208</p>
	<p>Emitters for NEOS20 &amp; 30</p>	<p>34201</p>
	<p>Spare NEOS20 &amp; 30 Emitter and Key kits</p>	<p>342022</p>
	<p>Fraser Cleaning Kit</p>	<p>81220</p>







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For more information about static and to view the full range  
of our products, please visit [www.fraser-antistatic.com](http://www.fraser-antistatic.com)



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