

Operating Manual



HYPERION⁺TM
A Meech Innovation

Hyperion 650QAC
Ionising Bar

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Section 1: Safety Instructions

Before using equipment, read the following safety and operating instructions to ensure your own personal safety and help to protect your equipment. Failure to do so could result in injury. Connected equipment may require additional safety instructions. Observe all safety instructions for additional equipment connected before operating.

1.1 General Safety

Before setting up the equipment:

- Read the operating instructions carefully and ensure you understand how to correctly use the equipment.
- Installation and testing must only be completed by those suitably qualified.
- Inspect the working environment and ensure it is clean and clear of hazards before removing equipment from packaging and positioning the system.
- Visually check all equipment for damage. If damaged, contact your local Meech representative before continuing.
- Ensure a full understanding of the symbols attached to the equipment before operating.
- Keep all cables secured until ready for use.
- Keep a copy of the Operating Manual close to the system at all times.

1.2 Electrical Safety

Before installing, performing repairs or maintenance on equipment, ensure the system is electrically isolated. Failure of this could result in injury.

Before working on the equipment:

- Check the equipment is electrically isolated correctly.
- Check equipment and cables for damage. If damaged, contact your local Meech representative before continuing.
- Ensure all wiring is completed by competent persons.
- Check all connections in relation to the wiring diagram

Section 2: Introduction

The Meech 650QAC is a high accuracy ionising bar for ESD sensitive applications where static charges need to be controlled to very low levels. The titanium emitter pins are driven by a Quasi AC (QAC) high voltage waveform that generates positive and negative ions from each pin. This bipolar ionisation is vital for the delivery of rapid charge decay with near-zero residual voltage on the object being neutralised.




Intended for use at operating distances between 50mm and 400mm. Pre-set distance configurations can be selected using the built-in keypad. These pre-set configurations modify the frequency and amplitude offset of the output waveform to give near-zero residual voltage, without the need for expensive additional test equipment. For installations that require extra accuracy, the keypad allows fine adjustment of the balance to be made.

All ionising bars suffer from the build-up of contamination on the emitter pins and also gradual changes in performance over time, as the emitter pins slowly wear. To counteract these influences, the 650QAC incorporates Total Ion Current Control (TICC). Using precision components TICC monitors the ion current leaving the emitters and makes fine adjustments to the output waveform to maintain the ion balance to within +/- 35 volts for prolonged periods. Should the bar become too heavily contaminated, and no further adjustment is possible, the TICC system will flash the status LED red and activate the output signal.






Being part of the Meech Hyperion range means that the 650QAC is 24V DC powered and is compatible with the BarMaster remote programmer. This provides access to additional set-up parameters and the ability to configure the output waveform manually.

Titanium has been shown to be the best metal for emitter pins with long service-life and exceptionally good cleanroom compatibility. However, ultimately they will wear down. On the 650QAC the emitter assemblies are replaceable, to allow the bar to be returned to an as-new condition.

Section 3: Package Contents

Item	Code
<p>650QAC Bar</p> 	<p>A650QAC-0240-01 (actual length 336mm) A650QAC-0320-01 (actual length 336mm) A650QAC-0480-01 (actual length 496mm) A650QAC-0640-01 (actual length 656mm)</p>
<p>T-Slide mounts (x2 per bar)</p> 	<p>N/A</p>
<p>Manual</p> 	<p>N/A</p>

3.1 Optional Extras

Item		Code
<p><i>BarMaster (field unit)</i> <i>Remote programmer.</i> <i>Connects to 650QAC</i> <i>for further adjustment</i> <i>of bar output settings,</i> <i>adjustment of clean pin</i> <i>alert and also diagnostic</i> <i>output. Refer to BarMaster</i> <i>Operating Manual for</i> <i>more details.</i></p>		<p>A900-BARMASTER-F</p>
<p><i>4 Pole M8 connection</i> <i>cable</i></p>		<p>M8 cable - M8 connector with bare end A900IPS-PCS2 (2m) A900IPS-PCS3 (3m) A900IPS-PCS5 (5m) A900IPS-PCS10 (10m)</p>
		<p>M8 extension cable (Male/ Female connectors) A900IPS-ECS1 (1m) A900IPS-ECS3 (3m) A900IPS-ECS8 (8m) A900IPS-ECS10 (10m) A900IPS-ECS20 (20m) A900IPS-ECS50 (50m)</p>
<p><i>24V Switch mode Power</i> <i>Supply</i></p>		<p>A900IPS-SM2MS</p>
<p><i>Emitter Kit (Each kit</i> <i>includes x8 emitters plus</i> <i>nozzle key)</i></p>	 <p style="text-align: center;">Nozzle Key</p>	<p>A650QAC-PINSET-01</p>

Section 4: Unpacking the 650QAC Bar

Observe correct manual handling procedures when removing the 650QAC bar from its packaging.

Your Hyperion 650QAC bar was carefully packed at the factory in a container designed to protect it from accidental damage. Nevertheless, we recommend careful examination of the carton and contents for any damage.

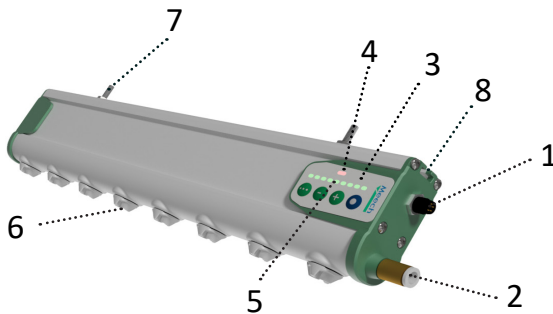
If damage is evident, do not destroy the carton or packing material and immediately notify the carrier of a possible damage claim. Shipping claims must be made by the consignee to the delivering carrier.

Section 5: Component Overview

The 650QAC Bar comprises of of the following components:

1. M8 4-pole power and signal connection
2. 6mm Air Push-Fit Connection
3. Keypad
4. Status LED
5. Indicator LEDs
6. Ionising Emitter
7. Mounting T-slide
8. Mounting Channel

In the below figure each major component is highlighted.

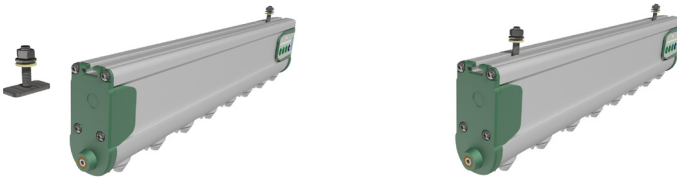


650QAC Bar Overview

Section 6: Mechanical Installation

The 650QAC bar is optimised, but not limited to, target surface distances of between 50mm and 400mm.

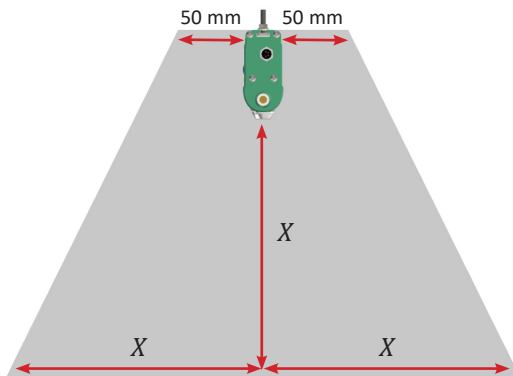
The bar should be mounted securely, using all the M4 T-Slides provided with the bar. These should be positioned along the bar as evenly as possible, where this is not possible a maximum of 300mm should be between each bracket and a minimum of two brackets used.



M4 T-Slide Mounting

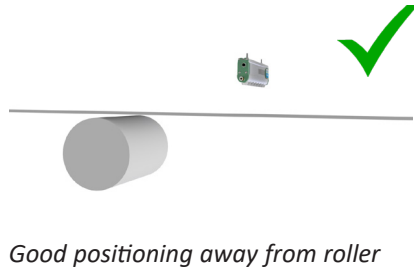
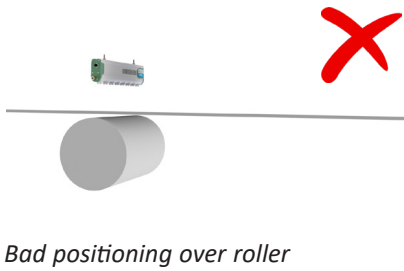
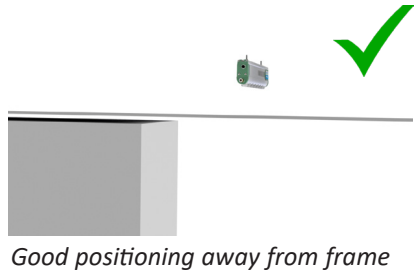
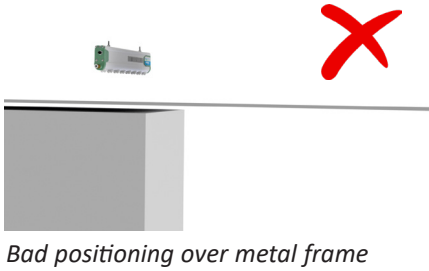
6.1 Positioning

Correct positioning of the bar is vital for effective static control. There must be no metallic objects or obstruction between the bar and the target material. The diagram shows the area that should be kept clear.



Where X lengths are equal

When installed at short range over a web or sheet, the 650QAC bar must be positioned away from surfaces and rollers, as shown in the following diagrams.



Note: Your Meech distributor will be able to assist with questions regarding positioning of your equipment.

6.2 650QAC Air Assist

CAUTION

The 650QAC Bar should only be connected to compressed air supplies by qualified personnel.

Allowing more than stated pressure to bar could cause catastrophic failure of the 650QAC Bar and injury to operators.

Compressed air supply should be limited to a maximum of 2 bar (29 PSI)

The 650QAC Bar has optional air assist for longer range applications, this needs to be connected via the 6mm push-fit airline fitting on the end of the bar (circled in red). This supply should be limited to a maximum of 2 bar (29 PSI).



6mm push-fit airline fitting

6.3: Pressure Settings For Distances

When the bar is >150mm away from the target the air assist can be used to maintain low decay times and consistently low offset voltages.

Distance from target (mm)	Pressure required (bar /PSI)
50-150	Not required
>150	0.5 / 7.25

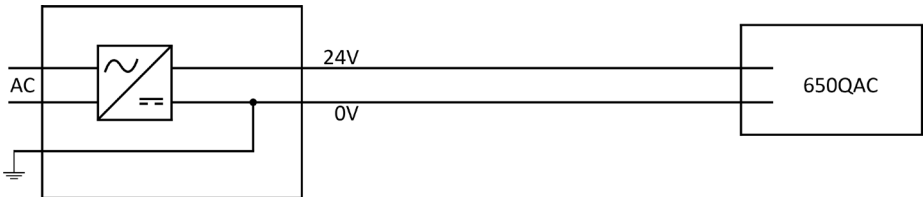
Section 7: Electrical Installation

WARNING

THE 650QAC BAR REQUIRES A GROUNDED 24V DC SUPPLY. THE 0V LINE MUST BE CONNECTED TO GROUND. FAILURE TO DO SO, WILL RESULT IN DAMAGE TO THE BAR OR THE 24V SUPPLY AND WILL VOID THE WARRANTY.

Connection using a grounded 24V DC power supply.
E.g. Meech part number A900IPS-SM2MS.

- Meech 24V DC supplies are grounded internally. They are supplied with a three wire IEC C5 cable.
- The ground connection must be correctly connected at the mains connection.



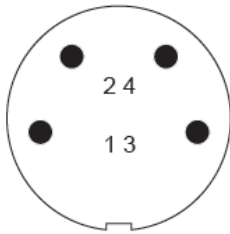
Grounded 24V supply
e.g. Meech A900IPS-SM2MS

Connection using customer's own power supply

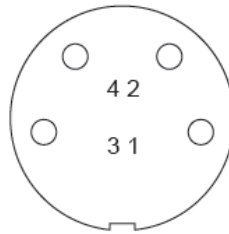
It is the customer's responsibility to check that the 24V power supply they will be using is grounded.

The 24V supply must be protected with a 1 Amp fuse.

Connection to the 650QAC bar is through the M8 4-pole connection. The figure below shows the pin numbers of the connector, the 24V should be through Pin 1 and the ground on Pin 3.



Male connector on Bar



Female connector on Cable

24V Connection on bar and female connection cable

Pin	Colour	Function/Specification
1	Brown	24V (21-27V)
2	White	Clean Pin and Fault Alert Output (0V/24V)
3	Blue	0V / Ground
4	Black	Fault alert output 0V

The 24V DC supply powering the 650QAC Bar **MUST BE** grounded. Failure to ground the 24V connection will cause damage to the 650QAC Bar and provide poor performance.

7.1 Dual Alarm - Remote Monitoring

Remote monitoring of the clean pin signal is provided by the output signal on pin 2 (white) and fault alert is provided on pin 4 (black). The signal is 0V/24V suitable for direct connection to a PLC input.

The output impedance of the signal is **10kΩ**. The output can also be configured to power an external relay to provide volt-free contacts for other monitoring systems.

Using a BarMaster remote programmer (Refer to BarMaster operating manual) the output can be set to Alarm True = Lo (Normally Open) which is factory default or Alarm True = Hi (Normally Closed).

NOTE: Make sure that BarMaster is not connected when using the dual alarm remote monitoring feature.

Alarm Pins

Pin-2 (White)

This pin is used to report when the HV output of the equipment needs cleaning. This is considered as a warning signal. The LED pattern on the bar is **flashing red**.

Pin-4 (Black)

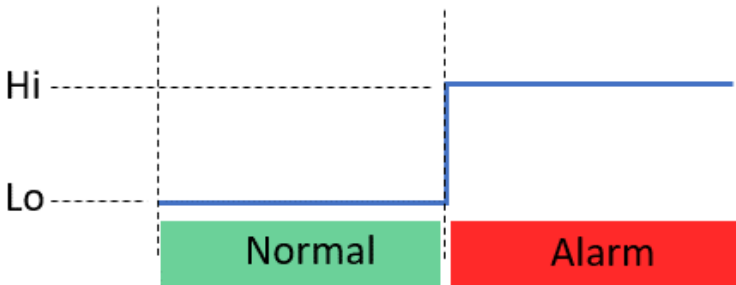
This pin is used to report when the bar has a fault. The LED pattern on the unit is **solid red**.

7.1.1 Alarm Logic Level

This is given by the configuration of the “Alarm True” setting using the BarMaster.

Alarm True = hi

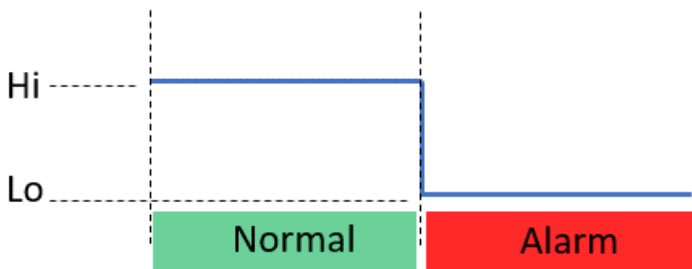
This means the logic on both the alarm pins is active high.



Alarm True, Hi Logic

Alarm True = lo

This means the logic on both the alarm pins is active low.



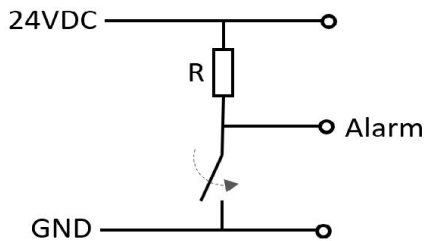
Alarm True, Lo Logic

7.1.2 Dual Alarm - Output drive options

There are 3 different output drive options which are designed to fulfil the vast majority of user requirements and to allow easy integration to PLC equipment.

Option 1 - NPN

Transistor-driven switch which presents a pull-up resistor to 24VDC on the alarm pin. This configuration is the same for both alarm pins (pin-2 and pin-4).



Simplified diagram of NPN Output (internally in bar)

Logic Table

Alarm True = Hi

	Start State	Solid Green	Flashing Red	Solid Red
White	Hi	Lo	Hi	Hi
Black	Hi	Lo	Lo	Hi

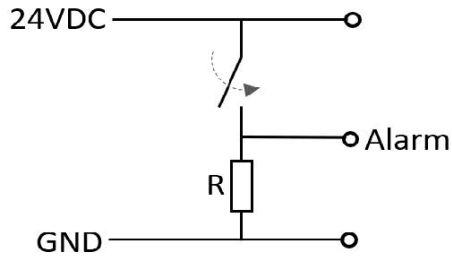
Alarm True = Lo

	Start State	Solid Green	Flashing Red	Solid Red
White	Hi	Hi	Lo	Lo
Black	Hi	Hi	Hi	Lo

Note: On unit power-up, both alarm pins remain in Hi state for up to 60 seconds before these are used as alarm pins.

Option 2 - NPN

Transistor-driven switch which presents a pull-up resistor to 24VDC on the alarm pin. This configuration is the same for both alarm pins (pin-2 and pin-4).



Simplified diagram of PNP Output (internally in bar)

Logic Table

Alarm True = Hi

	Start State	Solid Green	Flashing Red	Solid Red
White	Hi	Lo	Hi	Hi
Black	Hi	Lo	Lo	Hi

Alarm True = Lo

	Start State	Solid Green	Flashing Red	Solid Red
White	Hi	Hi	Lo	Lo
Black	Hi	Hi	Hi	Lo

Note: On unit power-up, both alarm pins remain in Hi state for up to 60 seconds before these are used as alarm pins.




Section 8: Keypad Overview



The 650QAC Keypad offers the following functionality:

- **Output Balance Display (Default)**

The LEDs display the Output balance. When the central LED is lit, the Balance is being held at the set-point. LED's to the left indicate a Negative balance. LEDs to the right indicate a Positive balance.

	The Balance is at its current set point (Default: 0)
	The Balance is Negative relative to the set point
	The Balance is Positive relative to the set point

- **Balance Adjustment**

Provides Balance adjustment of the output. Once stored, TICC monitors and holds this value.



Default: Near zero balance at all pre-set distance settings.

- **Operating Distance Selection**





Allows selection of pre-set configurations for Operating Distances between 50mm and 400mm.

Default: 50mm Operating Distance.



8.1 Indicators

Indicator	Balance Adjustment	Operating Distance Selection
	Indicates Output Balance	Indicates Operating Distance Pre-Set Selection
	Green Constant: OK	
	Green Flashing: BarMaster or other device connected	
	Red Flashing: Cleaning Required	
	Red Constant: Fault	

8.2 Button Functions




Button	Balance Adjustment	Operating Distance Selection
	Stores Output Balance set-point	Stores Operating Distance selection
	Positive Balance adjustment	Selects Distance Pre-Set
	Negative Balance adjustment	Selects Distance Pre-Set
	Unlock the Keypad: Press and hold for 2 seconds. Keypad will auto-lock after 2 minutes of inactivity	
	When unlocked: Toggles between Balance Adjustment and Operating Distance Selection	

8.3 Special Functions


	Bootloader Mode: Press and hold positive button for 3 seconds during power-up.
	Factory Reset the Bar: Press and hold negative button for 3 seconds during power-up. The LEDs will scroll to confirm successful factory reset.

Section 9: Operation

9.1 Balance Adjustment





1. Press and hold  for 2 seconds to unlock the keypad. The LEDs will scroll to confirm a successful unlock.
2. Use   to increase/decrease the Balance Set-Point to the desired level.










*Note: Each button press will adjust the Balance Set-Point.
The LEDs will indicate progress after multiple presses (x10 presses = 1 LED).*

3. Press  to store the new Balance Set-Point. The keypad will now automatically lock, and the LEDs will return to displaying the Output Balance.

Note: Timeout. If the new Balance Set-Point is not stored within 120 seconds of the last adjustment, the changes will be discarded, and the keypad will lock.


9.2 Operating Distance Selection

1. Press and hold  for 2s to unlock the Keypad. The LEDs will scroll to confirm a successful unlock
2. Press  again to enter Operating Distance Pre-Set Mode. The LEDs will illuminate from the left.
3. Use   to select the desired Operating Distance pre-set:

LED Display	Operating Distance	Air-Assist (0.5 bar)
	50mm	Not Required
	100mm	Not Required
	150mm (Factory Default)	Not Required
	200mm	Recommended
	250mm	Recommended
	300mm	Recommended
	350mm	Recommended
	400mm	Recommended
	User Defined*	**

***Settings Configurable via optional BarMaster (Default 400mm settings).**

****Dependant on configuration.**

4. Press  to store the desired pre-set. The keypad will now automatically lock, and the LEDs will return to displaying the Output Balance.

Note: Timeout. If the new pre-set is not stored within 120 seconds, the changes will be discarded, and the keypad will lock.

Section 10: Technical and Construction Data

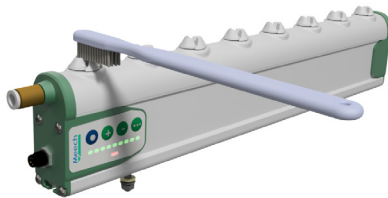
Dimensions (W x H)	31.4 mm x 69 mm Maximum length 656mm (effective 640mm)
Mounting	T-Slide brackets
Materials	Body: ABS Plastic FR Emitters: Titanium (removable)
Ionisation method	Quasi AC output
Output voltage	± 7.5kV Adjustable
Output Frequency	Auto-Adjusted based on Operating Distance Pre-set. Adjustable with BarMaster (Recommended Range 5 - 20Hz)
Output Balance	Adjustable
Electrical Connection	4-Pole M8
Offset voltage	Exceeds the ionisation standard ANSI/ESD STM3.1 of ±35V
Operating Range	Pre-set range 50 - 400mm
Input Voltage	24V DC (21-27VDC)
Input Current	Maximum 500mA
Alarm output	Dual alarm output for clean pin alert and fault alert (0V/24V)
Alarm output drives	PNP, NPN, N+P
Clean Pin Alert	0V/24V
Fault Signal Alert	0V/24V
Local Indication	Green/Red LED
Air-boost connection	6mm push-fit
Air boost supply pressure	Maximum 2 bar/29PSI
Maximum Ambient Temperature	60°C

Section 11: Maintenance

11.1 Cleaning

Ionising bars become contaminated with usage. Dirt build-up on the body of the 650QAC and, particularly on the pins, will cause a drop in performance. To get the best from your bar, the emitter pins should be cleaned regularly.

The emitter pins can be effectively cleaned with a brush, a dry tooth brush is ideal.



Cleaning 650QAC bars

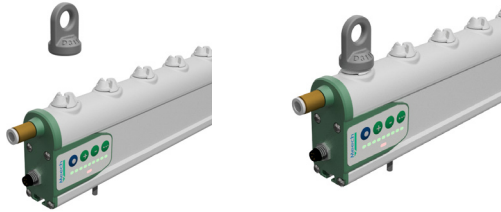
Along with the cleaning of the pins the bar exterior should be wiped clean as dirt will build up on the sides. This can be done with a cloth and an IPA solution.

If periodic cleaning of the ionising pins is not carried out, the performance of the bar will decrease. When performance reaches a pre-set limit, it will trigger the Clean Pin alert. The LED will flash red and the output signal will be activated. In this case, clean the pins as shown on page 29.

11.2 How to Replace Emitters

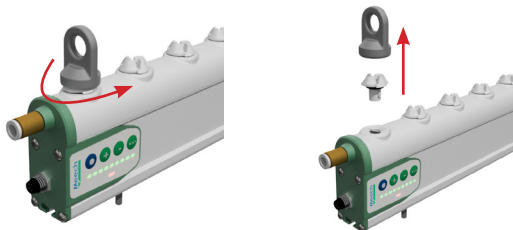
For Emitter removal and replacement, a Meech Emitter Key will be required, all Meech replacement Emitter kits will be sent with an Emitter key.

1. Align and locate Key onto Emitter to be replaced.



Emitter Key alignment

2. Rotate the Emitter key anti-clockwise, quarter turn / 90 deg to disengage the emitter. The emitter can now be lifted out of the bar.



Rotation direction to remove nozzle






3. Installation is the reverse of the removal process, whilst ensuring the O-Ring is seated onto the Emitter housing properly prior to fitment.



Emitter O-ring Seated Correctly

Section 12: Troubleshooting & LED Status

Status LED and corrective actions

Status LED Colour	Meaning	Corrective Action
Solid Green LED 	In normal operation the LED will illuminate Green. This indicates that the bar is operating correctly with good ionisation performance.	N/A.
No LED 	No power to bar.	Check 24V Power Supply over pins 1 and 3. (Brown and Blue wires).
Flashing Green LED 	BarMaster remote programmer is connected.	After programming, reconnect directly to the power supply to resume normal operation.
Flashing Red LED 	Contamination causing a drop in performance.	Switch off power supply and clean as described in Maintenance (section 10). Turn the power on and check for solid green LED.
Solid Red LED 	Abnormal output current detected.	Check installation for metallic objects on the emitter pins.
	Bar has internal electrical fault.	Contact Meech for Return of product.

Section 14: CE Approval

An EC Declaration of Conformity for this product exists and can be provided on request.

Section 15: Health and Safety

Emission of Ozone

Considerably below international standard of 0.1ppm.

Shockless Emitters

The Titanium emitter pins on the 650QAC Bar are resistively coupled to the high voltage supply. This avoids sparking and operator shocks.

Section 16: Repairs and Warranty

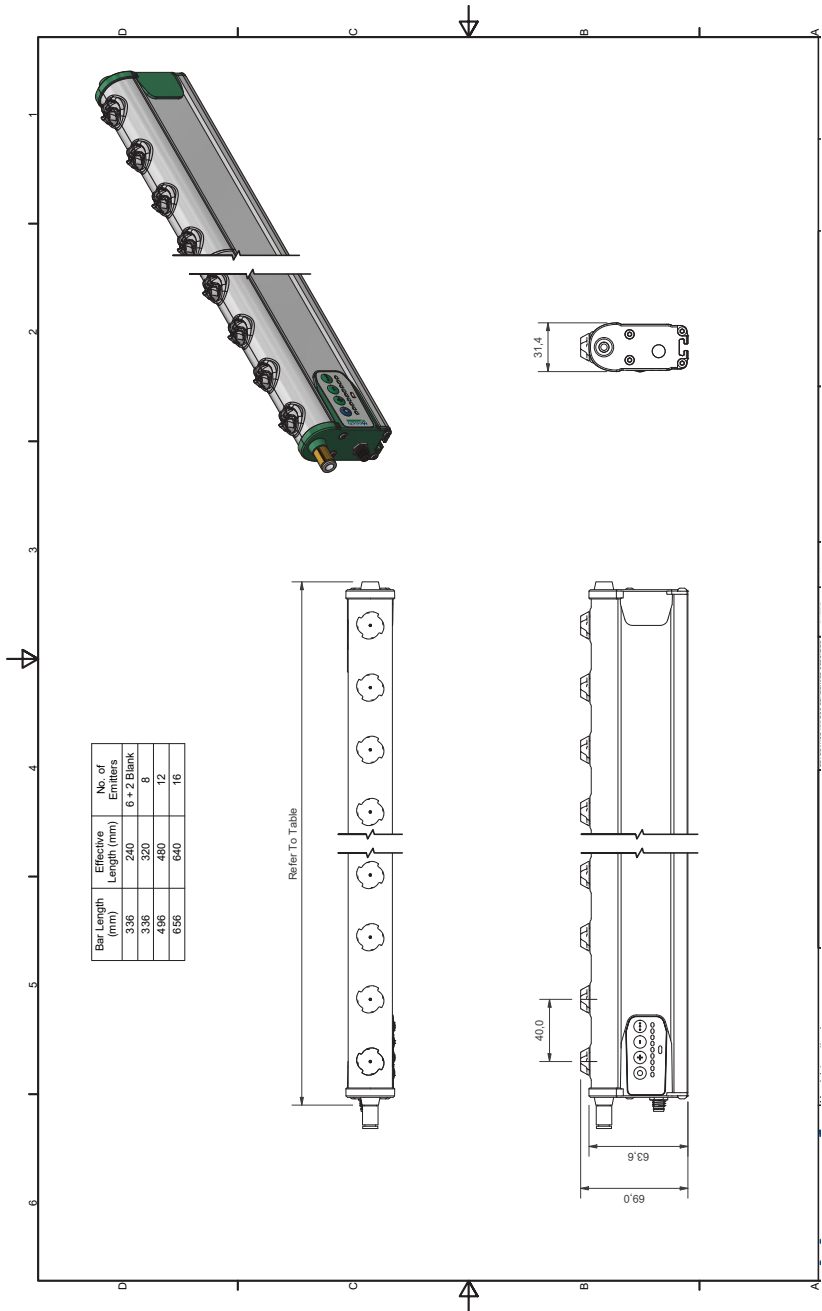
The Meech 650QAC bar is warranted by Meech Static Eliminators Ltd. to the original purchaser against defects in material and workmanship for two years after shipment.

The 650QAC requires a grounded 24V DC supply. The 0V line **must** be connected to ground. Failure to do so, will result in damage to the bar or the 24V supply and will void the warranty.

Should any malfunction occur, please return the bar directly to Meech Static Eliminators Ltd. or your local Meech Distributor. All products returned to the factory **MUST** be accompanied by a return authorisation number and must be shipped prepaid. For prompt service, ship the unit to the factory with the return authorisation number shown clearly on the label. Be sure that it is well packed in a sturdy carton with shock absorbing material.

Include a note stating the nature of the problem as specifically as possible, and also include instructions for returning the bar to you. We will pay one-way return shipping

Section 17: Technical Drawing





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