

Operating Manual



HYPERION™
A Meech Innovation

Hyperion 233v4
Pulsed DC Controller

Contents

Introduction.....	3
Package Contents	4
Features and Benefits of the 233v4 Pulsed DC Controller.....	5
Installation	8
Dual Alarm Alert	12
Output Drive	14
Operation	17
BarMaster	21
Adjustments	22
Maintenance	24
Fault Finding.....	25
Technical Construction	29
Repairs And Warranty	30
CE Approval	30
Health and Safety	30
Technical Drawing.....	31

Products shown in this document may be covered by one or more patents, patents applied for and/or registered designs and/or trade marks. For further information please refer to our Head Office or visit www.meech.com.

Introduction



The Hyperion 233v4 Pulsed DC Controller is a compact and powerful 15kV controller. It was principally designed to directly power two Meech pulsed DC ionisers. If more ionisers are required, they can be connected via splitters.

The versatility and flexibility of the 233v4 make it suitable to use in a wide range of industries. Installation and set up of the controller are easily achieved.

The 233v4 features all the adjustability and monitoring that you would expect from a Hyperion product. Fully BarMaster and SmartControl Touch compatible, the output voltage, frequency and balance can all be adjusted to suit particularly difficult applications. The adjustable output voltage is particularly useful in very sensitive applications such as those found in cleanroom environments.

The Hyperion BarMaster remote programmer and SmartControl Touch are available for purchase from the Meech network: Visit www.meech.com to find your nearest Meech office or distributor for further product information.

Unpacking and Inspection

The Model 233v4 has been 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.

Package Contents

Standard:



233v4 Controller

Optional:



SmartControl Touch:
Allows optimisation of the output of the 233v4 and monitoring and data logging plus remote access.

Optional:



Power Cable - 4 Pin M8 (straight or 90° elbow) Available in 2,3,5 and 10M lengths.



C5 cable and 24V DC Supply



BarMaster remote programmer:
Allows optimisation of the output of the 233v4

Features and Benefits of the 233v4 Pulsed DC Controller

Overall look



The Hyperion 233v4 is a compact pulsed DC controller. It is constructed of DuraForm PA (Nylon 12) with dimensions of 46 x 93 x 129mm.

High Voltage Output

The 233v4 has an adjustable output voltage from 2kV to 15kV. The 233v4 will be configured to suit the type of installation and the type of ionising equipment connected to it.

Low Voltage Wiring

The 233v4 is powered by 24V DC via a 4-pin M8 Connector, used throughout the Hyperion range. This greatly simplifies installation; avoiding the need to route high voltage cables from a remote high voltage power supply.

Clean Pin Alert LED



The 233v4 has 6 modes. The local LED illuminates either red, green or amber to indicate it's current operation.

Below are the 6 modes for the LED status:

- Green Continuous - HT on
- Green Flashing - HT on, BarMaster connected
- Amber Continuous - Standby mode (remote control)
- Amber Flashing - Standby mode (remote control), BarMaster connected
- Red Continuous - HT failure alarm
- Red Flashing - Clean pin alarm

Clean Pin Alert and Fault Output

An output signal indicates when the ionisers needs cleaning or when a fault has been detected. The signal is 0V/24V output on pin 2.

By default: Bar OK = 24V

Bar needs cleaning (or fault detected) = 0V

If required the signal can be inverted to give OK = 0V, Cleaning Required = 24V using a Barmaster Remote Programmer.

Remote Signal

In the case of the Clean Pin Alert signal, the Cleaning Alert LED will activate. This can be monitored remotely to alert the operator to attend to the controller.

Sealed Construction

IP67 construction allows the controller to be mounted in areas subject to wash-down or spillage.

WARNING

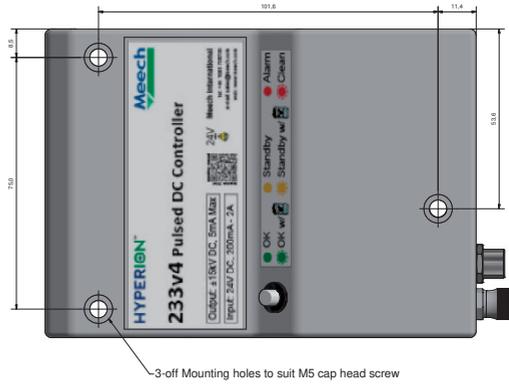
This equipment must be grounded /earthed via the mains cable. Failure to do so can result in damage to the unit.

Installation

Installation and connection should be completed by a qualified electrical engineer.

Install the 233v4 in a dry, well ventilated area. Allow sufficient space for the cables on the right hand side of the unit.

Mount the unit using the holes provided.



- Connect ionising equipment using grey HT connections



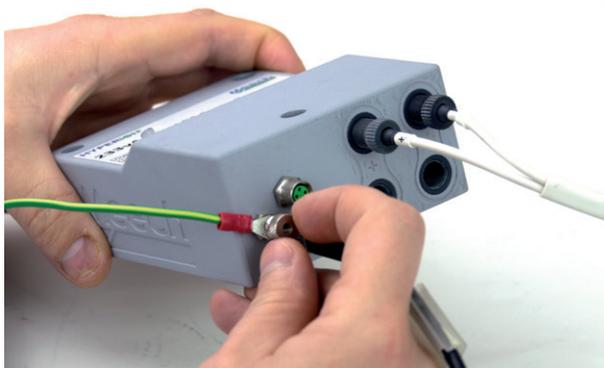
- Connect the 24V DC supply with 4 Pin M8 cable to the controller.



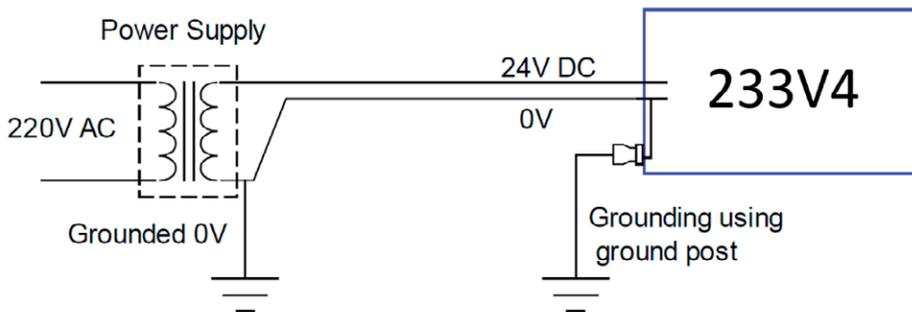
Electrical Installation

WARNING

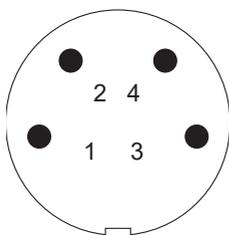
The 233v4 requires a grounded 24V DC supply. The 0V line must be connected to ground. Failure to do so, will result in damage to the ioniser or the 24V supply and will void the warranty.



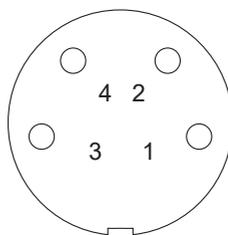
A grounding post on the controller is provided for this purpose. Meech recommend that, for certainty, the controller is grounded using this post, in addition to using a grounded 24V DC supply.



Connection to the 233v4 is via an M8 4 Pin connector. With the following pin-outs:



Male connector on Controller



Female connector on Cable

Pin	Colour	Function	Specification
1	Brown	Input	24V
2	White	Output	Clean pin 0V/24V
3	Blue	Input	0V/ Ground
4	Black	Output	HT Failure 0V/24V

For the first 60 seconds of start-up, the unit is in communications mode and will output 24V on both alarm lines.

After 60 seconds, both alarm lines revert to being used for alarm purposes.

Connection using Meech 24V DC power supply



Meech 24V DC supplies are grounded internally. It is important that the mains connection offers a ground connection. Two-pin outlets without a ground connection must not be used, unless the ground post on the 233v4 controller is connected to ground.

The Meech switchmode power supply has a C5 socket and a 2000mm cable to an M8 Connector. A break-out wire from the power supply provides the Clean Pin Alert output signal.

Note: The 233v4 does not come with a 24V DC power supply and must be ordered separately.

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. If it is NOT grounded they must check that grounding it via the ground post on the 233v4 controller will not affect any other systems running from that power source.

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

Dual Alarm Alert - Remote Monitoring

Remote monitoring of the need to clean the bar 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 or SmartControl 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

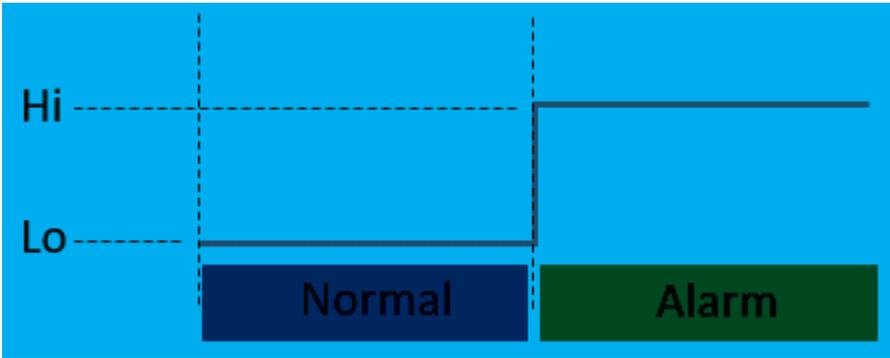
Pin-2 (White)	This pin is used to report when the HV output of the equipment needs cleaning. This is considered as a warning signal. The LED pattern on the unit is flashing red .
Pin-4 (Black)	This pin is used to report when the HV output of the equipment is critically low. This is considered as a serious fault. The LED pattern on the unit is solid red .

Alarm Logic Level

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

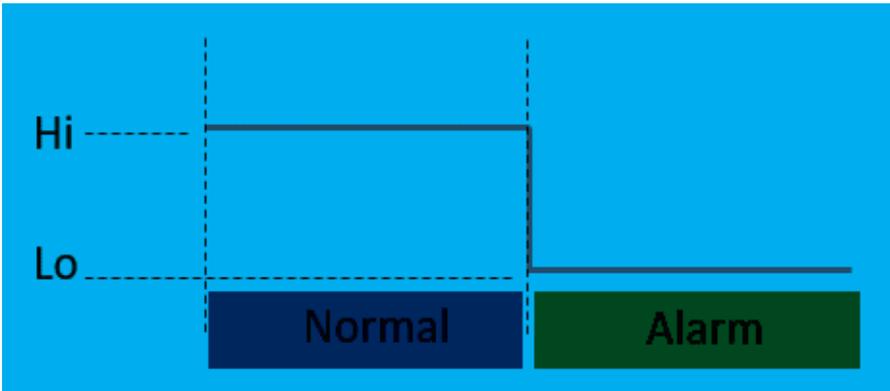
Alarm True = hi

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



Alarm True = lo

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

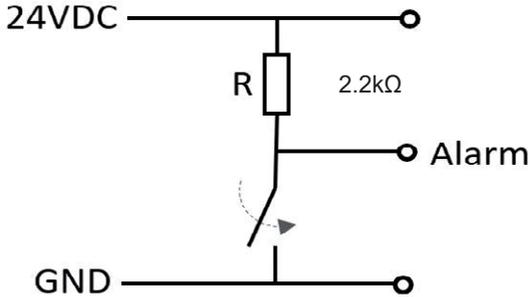


Output Drive

There are 3 different output drive options which are designed to fulfill 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

Logic Table

Alarm True = Hi

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

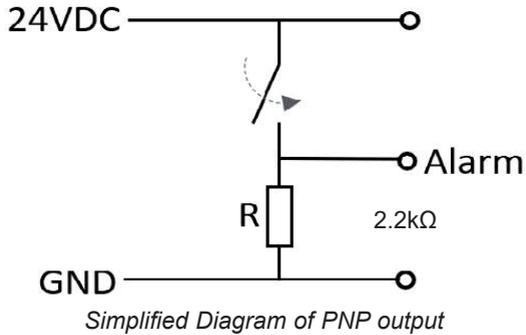
Alarm True = Lo

	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 - PNP

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



Logic Table

Alarm True = Hi

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

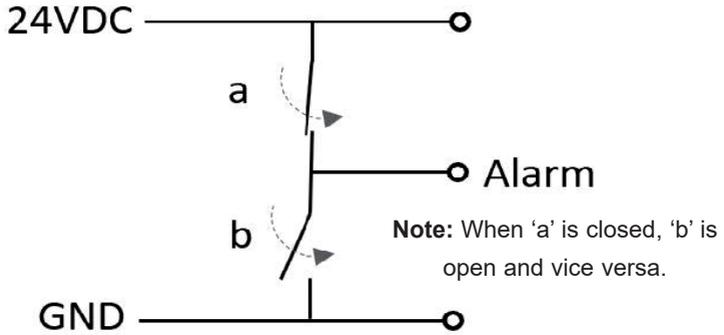
Alarm True = Lo

	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 3 - N+P

This option presents the combination of both of the previous cases, NPN and PNP, however, the alarm lines are hard-driven to either 24VDC or GND. This configuration is the same for both alarm pins (pin-2 and pin-4).



Simplified Diagram of N+P output

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.

Operation

Getting Started

The 233v4 must be configured to suit the installation and the ionising equipment connected to it. Before you receive your 233v4, Meech, if required, will preset the controller to suit your application. This includes applying basic settings of the output power, rate and balance as well as alarm functionality and the lock option.

Note: If you are using it with a 971 ionising bar it will be preset to 15KV.

To change these settings you will need a BarMaster or SmartControl Touch and to follow the instructions below.

Setting the Start Voltage and Ion Output Set Point

During installation and commissioning, two parameters must be set correctly to allow optimum performance:

1. Voltage Output. The correct start voltage must be set, depending on the ioniser connected to the 233v4. The correct output voltages for Meech ionisers are:

971	15 kV
242	10 kV
251	9 kV
261v2	9 kV
271/272/273	9 kV
976 Head	9 kV
976 Mini	9kV

2. Ion Output Set Point: This is the target Ion Output as measured when the system is clean.

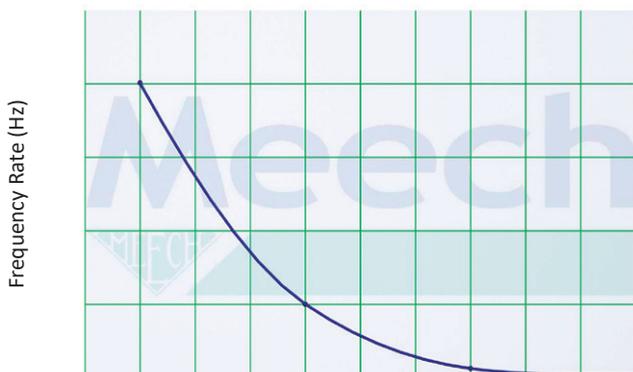
- This value should only be set when the ionisers have been cleaned, otherwise the performance of the system will be reduced.

During use, ionisers become contaminated which reduces their performance.

Setting the Rate

The 233v4 features a variable output frequency. The frequency that the 233v4 should be set to depends on the ionising product and the distance to the target object.

Suggested Frequency Vs Operating Distance for 971/233v4

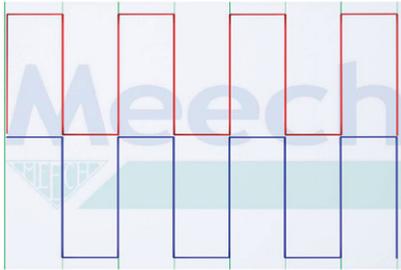


Ionising Nozzles:

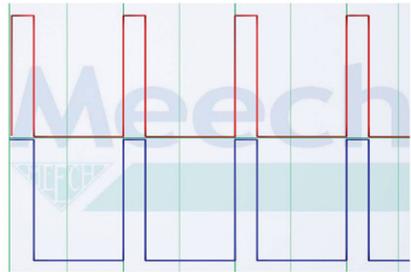
Ionising Nozzles and Air Guns (251,261,271) should be used from 10 to 20 Hz.

Setting the Balance

The output of the 233v4 can be biased to negative or positive. The adjustment changes the percentage of time that each HT output is switched on. The maximum bias is 80% to either positive or negative.



50% positive



80% negative

Changing the balance of the output changes the relative amount of positive and negative ions produced by the ioniser. With the help of a static locator the balance can be adjusted for more accurate neutralisation of the target material.

To set the balance see BarMaster section (page 19).

Setting the Alarm Point

The 233v4 features an adjustable alarm that will alert the operator when the Ion Output of the ionising system falls below a desired level or when a system fault is detected.

To alert the operator to the need for cleaning, the 233v4 will trigger the LED to flash red.

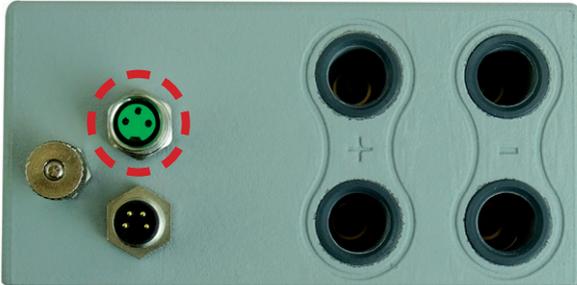
The alarm point is set as a percentage of maximum Ion Output. An initial value of 35% is recommended.

To set the Alarm Point see BarMaster section (page 21) or the SmartControl Touch manual.

Input/Output Connections

Remote On/Off

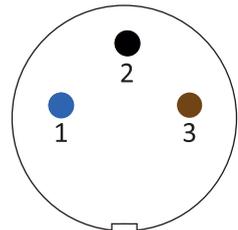
The output of the 233v4 can be turned on and off remotely via the 3 pin female socket located on the connection panel.



A 3 pin M8 connection to volt-free contacts will allow the 233v4 to be switched on when the contacts are made.

233v4 M8 3 Way Female Pin Out

Pin	Colour	Specification
1	Blue	On/Off Remote Control
2	Black	Not Used
3	Brown	O/V ground



ON/OFF Control Logic

	HT ON INPUT = LOW	HT ON INPUT = HIGH
	OFF	ON
	ON	OFF

BarMaster

Connection

The BarMaster is connected in line with the controller's 24V power supply cable. The power cable is connected to the BarMaster and, in turn, its cable is connected to the 233v4 controller.

Note: The Meech BarMaster does not come with the 233v4 and must be purchased separately.

WARNING

It is recommended to turn-off the 24V power supply to the controller and wait a few seconds before disconnecting the power cable from the controller. Failure to do so will not damage the equipment, but may result in a small shock caused by the stored energy in the ionising system.



- Attach the cable on the BarMaster to the M8 connector on the controller, then connect the M8 connector from the power supply to the BarMaster.
- Switch on the power supply. After a few seconds, the BarMaster will establish a connection to the controller and display the controller's settings and status.

The display on the BarMaster will show data including:

Model No and Software version	233v4 / VXXX
Ref	XXXX/XX
Frequency	1-20Hz
Balance	20%-80% Positive
Alarm	20%-90%
Ion Level	0%-99%
Reset Ion Ref	Calibration command.

Adjustments

Frequency

Your Hyperion controller is set to a default frequency that provides good performance across its operating range. Lower frequencies can assist long-range use. Higher frequencies give better results at short-range.

Balance

To get faster decay times, it is possible to adjust the output balance. Negative static charges will be neutralised faster if the controller is biased to a positive balance (>50 Pos).

High accuracy neutralisation can be required in applications involving electronic circuitry, E.g. Cleanroom production. In this case, the balance can be adjusted to give the most accurate neutralisation for the target distance

Alarm

This is the level of performance (Ion Level) at which the Clean Pin Alert will be triggered. Typically set at 66%, it can be set higher for more critical applications.

Ion Level

This is an instantaneous measure of the performance of the ioniser, compared to its performance when new and clean. A low percentage could indicate that the ioniser needs cleaning.

Reset Ion Ref.

This function is used to set reference performance level when the ioniser is clean. It is set by Meech during initial calibration. It should be reset after making changes to either the balance or the frequency of the output.

WARNING

Only reset the Ion Reference with the ioniser connected and clean. Failure to do so will result in an incorrect calibration.

Please see BarMaster operating manual for more information.

Fault Finding

Tests must be completed by a qualified electrical engineer.

If in doubt contact the Meech head office or your local distributor.

CAUTION:

Whilst no danger to personnel exists, it is essential that any high voltage ionising equipment makes no contact with water or water based fluids. Should such an event occur, disconnect immediately and return equipment to the manufacturer for water damage assessment.

The table below identifies the meaning of the LED display on the 233v4. A Meech BarMaster or SmartControl Touch is required to make a full diagnoses and adjustments to the system.

LED

When the equipment powers on, the LED will show green whilst the system monitors the ionisers performance. If it then starts to flash red or go solid red, check the ion level with the BarMaster or SmartControl Touch.

No Light	Meaning	No power to power supply
	Action	Check that the power supply is connected properly. If you have electrically installed the unit, ensure that the installation is correct (see electrical installation page 10)
Solid Green	 Meaning	Power supply OK
	Action	No action required
Flashing Green LED	 Meaning	Power supply OK, BarMaster connected
	Action	Remove BarMaster when settings are correct. Re-attach power supply when BarMaster removed

Solid Amber		Meaning	Standby mode (remote control)
		Action	Switch remote signal on to tell 233v4 to run
Flashing Amber		Meaning	Standby mode (remote control) BarMaster connected
		Action	Remove BarMaster when settings are correct. Reattach power supply when BarMaster removed
Flashing Red		Meaning	Clean pin alarm
		Action	Turn off power supply, clean pins of your ioniser according to the relevant manual. Turn on power supply
Solid Red		Meaning	HT failure alarm
		Action	Turn off power supply, clean pins of your ioniser according to the relevant manual. Turn on power supply. If the power supply is still not working remove bar and test HT connections (see page 23)

To reduce the time it takes to resolve a problem with a Hyperion product, the following process must be completed before requesting assistance from Meech.

Cleaning

If regular cleaning of the ionising equipment is not carried out, the controller will detect a drop in performance from the ioniser and this will trigger the Clean Pin alert. The LED will flash red and the output signal will be activated.

If the LED flashes red and the ioniser drops in performance, follow the cleaning procedure in the Maintenance section for your ioniser connected to the 233v4.

If cleaning does not rectify the problem:

Positioning

Ensure metallic objects have not been positioned close to the emitter pins of the ioniser during installation. This will affect its performance.

Reducing the output voltage for example from 7500V to 4000V and not resetting the ion level would affect the calibration causing the controller to alarm repeatedly after a short period.

BarMaster Diagnostics

Ensure the ioniser is clean, set the output voltage to the correct level for the ioniser. The ion level on the BarMaster or SmartControl Touch display should produce a %.

- a. If Ion level is 0% ioniser is faulty.
- b. If 10-34% with a 35% alarm setting, see the cleaning section

If after cleaning a 80-99% Ion level is reached, you can then adjust the output voltage to suit required ioniser. Only then can you reset the Ion Ref.

If the Ion level is well below the alarm level % of the Ion output, it will shut down and a solid red LED will show.

Should the solid red LED persist, connect your BarMaster and follow the Troubleshooting section or contact your local Meech distributor.

Using a high voltage probe (RS 610 281) and meter (RS 610 590) can be used to measure the voltage output of the ionisers. The voltage output will vary to the ioniser connected to the 233v4. Please see corresponding manual.

WARNING

Only reset the Ion Reference with the ioniser connected and clean. Failure to do so will result in an incorrect calibration.

Support Procedure

If the above procedure does not rectify the problem, by supplying the following information when you first contact Meech will ensure your claim is processed quickly:

1. Connect to a BarMaster and turn on the equipment
2. A readout will appear on screen and we will require the following information:
 - a. Product Code (e.g. A233v4)
 - b. Software information
 - c. Frequency
 - d. Balance
 - e. Output Voltage
 - f. Alarm %
 - g. Ion level %
 - h. Reset Ion Ref
 - i. Alarm True (Hi or Lo)
 - j. Output drive
3. Status of the Warning LED (i.e. flashing red, solid red)
4. Please provide a photo of the equipment as it is installed.
5. A description and a photo or video of the problem you are experiencing.
6. The action you want Meech to take e.g. repair, replace, warranty etc.



Technical Construction

Supply Voltage	24V DC
Input Connection	4 Pin M8 Connector
Output Voltage	2-15kV Pulsed DC, adjustable with BarMaster
Number of Outputs	4 (2 Positive, 2 Negative)
Output Frequency	Adjustable with BarMaster or SmartControl Touch from 1-20Hz
Output Balance	Adjustable with BarMaster or SmartControl Touch from 80:20 to 20:80 Pos:Neg
Output Current	600 μ A Maximum
Output Short Circuit Limit	5mA
Electrical Consumption	Maximum 625 mA
Operating Environment	0-55°C
LED Indication	Red/Green/Amber LED
Protection Class	IP67
Remote HT on/off	3-pin M8 Connector (blue and brown wires used)
Clean Pin and Fault Alert	0/24V
Dimensions (mm)	46 x 93 x 129
Weight	650g
Housing Material	DuraForm PA (Nylon 12)

Repairs And Warranty

The Meech 233v4 Controller is warranted by Meech Static Eliminators Ltd. to the original purchaser against defects in material and workmanship for two years after shipment.

The 233v4 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 controller 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 controller to you. We will pay one-way return shipping costs on any repairs covered under the warranty.

CE Approval

A CE Declaration of Conformity for this product exists in respect of the Electromagnetic Compatibility Directive 2014/30/EU.



Health and Safety

Emission of Ozone: Considerably below international standard of 0.1ppm.



Meech International

2 Network Point
Range Road
Witney, Oxfordshire
OX29 0YN
United Kingdom
Tel: +44 (0)1993 706700
Fax: +44 (0)1993 776977
Email: sales@meech.com

Meech Static Eliminators USA

1298 Centerview Circle
Akron, Ohio 44321
United States
Tel: +1 330 564 2000
Fax: +1 330 564 2005
Email: info@meech.com

Meech Static Eliminators (Shanghai)

7G, 7F, LP Tower
#25 Xianfeng Road
201103 Shanghai
China
Tel: +86 400 820 0102
Fax: +86 21 6405 7736
Email: china@meech.com

Meech Shavotech

29/2, Kharadi
Off Pune-Nagar Road
Old Kharadi Mundhwa Road
Pune: 411014, Maharashtra
India
Tel: +91 (0)703 093 8211 / +91 (0)741 000 4817
Fax: +91 (080) 28395963
Email: india@meech.com

Meech Elektrostatik SA

Kaiserbaracke 166
B-4780 St. Vith
Belgium
Tel: ++49 (0) 651 468637 97
Fax: +32 (0)80 862 821
Email: mesa@meech.com

Meech International (Singapore)

7 Temasek Boulevard
12 - 07 Suntec Tower One
Singapore
038987
Tel: +65 65918859
Email: singapore@meech.com

Meech CE

Gábor László utca 2
Budapest 1041
Hungary
Tel: +36 1 7977039 / +36 30 2803334
Email: ce@meech.com

