Vulcan

User Manual

Vulcan is a device manufactured with the latest technology and all devices is tested individually. The device has the INMETRO seal and registration with the Brazilian Health Surveillance Agency, thus ensuring compliance with national standards. This device also complies with the requirements set by the European Union (MDD 93/42) and can be marketed in the European market.

Vulcan was designed for use by dental and medical professionals. The dentist or physician is responsible for learning the techniques used in this system. Improper use may result in irreversible damage.

⚠ The manufacturer recommends reading the entire manual before using the product.

DEVICE FUNCTION

The device Vulcan has the function of rotating electric engines.

INDICATIONS

Indications are many within the areas of dentistry and medicine. As an example:

- Orthopedic Procedures;
- Wrist and Ankle Arthroscopy;
- Debridement for procedures in ENT;
- Bone cuts;
- Drilling;
- Inserts;
- Bone Thinning in general.

CLASSIFICATION

Standard / Policy	Classification
IEC 60601-1	Device Class I and Type B Applied Part
MDD 93/42 (European Union)	IIa
RDC 185/2001 (ANVISA)	III

SPECIFICATIONS

Micro Electric Motor

Features	Specifications
Handpiece associated	Parts with Power plug
Speed	Min.: 2000 rpm and Max.:45000 rpm
Cycle Time	1 minute on/2 minutes off

Mini Shaver

Features	Specifications
Handpiece associated	Razek Mini Blades
Speed	Min.: 500 rpm and Max.:10000 rpm

General Features

Features	Specifications
Power supply	90-240 V~
Input Power	200 VA
Power Frequency	50/60 Hz
Protection to water penetration	IPX0 (cabinet) and IPX3 (pedal)
Peristaltic Pump	Maximum Flow: 50 mL/min - Minimum Flow: 8 mL/min
Fuse	Nominal Current: 2 A
	Type: T
	Voltage: 250 V~
	Break Capacity: 35 A or L
Size	25 cm (W) x 16 cm (D) x 21.5 cm (H)
Control Box Weight	2,000 kg
Wired Pedal Weight	0,560 kg
Micro Electric Motor Weight	0,390 kg
Part of Mini Shaver	0,420 kg
Current type	Alternating current
Manufactured and tested according to:	IEC 60601-1, IEC 60601-1-2 and IEC 60601-1-4

SAFETY - IMPORTANT PRECAUTIONS

⚠ Avoid working with the overheated engine. If this occurs, stop using, and start using it alternately.

⚠ Do not use any component that has not been mentioned in this manual. The use of different components could damage the device.

⚠ If any component present damage, it must not be used.

⚠ The use of any part, accessory or unspecified material is the user's responsibility.

⚠ Never use worn drills or saws.

⚠ Never lubricate the Micro Electric Motor/Mini Shaver.

⚠ Never connect or remove a drill or micro saw or mini blade with the Micro Electric Motor/Mini Shaver connected.

⚠ Only trained people can operate the device. Improper use may result in irreversible damage.

⚠ Only the components covered in this manual can be used together with the device

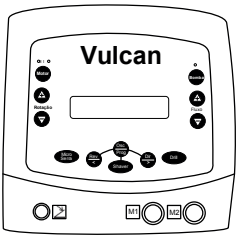
⚠ The device should not be used with cables and accessories that are not supplied by DMC, which could result in emissions increase or decrease the immunity of the device.

⚠ The device should not be used close to or stacked with other device. If necessary, the device is recommended to be observed to verify normal operation in the configuration in which it will be used.

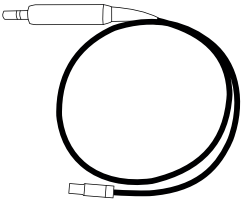
COMPONENTS LIST

Vulcan consists of the following parts and accessories:

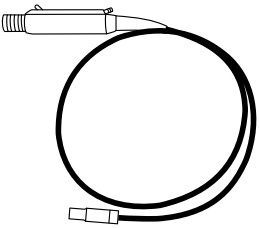
PARTS



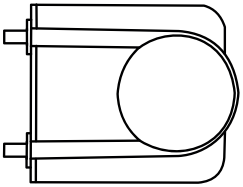
Control Box (Cabinet)



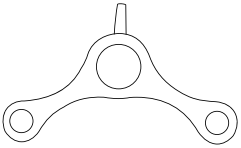
Micro Electric Motor



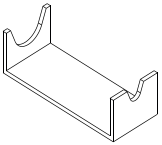
Mini Shaver



Peristaltic Pump (Optional)



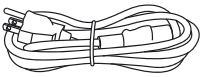
Control Pedal



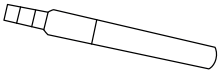
Micro Electric Motor Support

Micro Electric Motor Cover

Serum Rod (Optional)



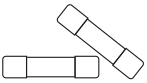
Cable A/C



Serum Connector (Optional)

Larger Hose (Optional)

Smaller Hose (Optional)

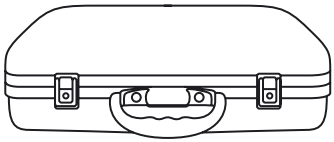


02 Fuses

ACCESSORIES

User Manual

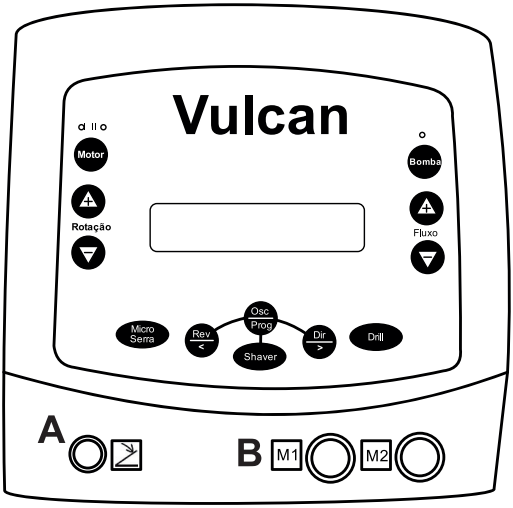
Warranty Term



Case for Transport

⚠ All accessories and parts described above are exclusive use of Vulcan device.

FRONT PANEL FUNCTIONS



(A) Control Pedal: Footswitch connection location.

(B) M1 and M2: The unit has two output connectors for connecting Electric Motor Micro or Mini Shaver.

1 (Motor)**:** By pressing this button, you can select the output connector to the motor: M1 or M2 (section B). The motor selection will be indicated by green LEDs I or II located above this button.

2 Rotation: (▲) **or** (▼)**:** Increases or decreases the engine rotation.

3 (Micro Serra)**:** By pressing this key, you can select the model of micro saw. The key (Dir >) or (Rev <)**:** changes the selection;

4 (Rev <)**:** This button allows to:

- Trigger the Mini Shaver in reverse mode;
- Browse among the options of the language and settings selection menu;
- Choose the drill model;
- Choose the model of micro saw;

5 

: This button allows to:

- Trigger the Mini Shaver in oscillating mode. The speed limit for this mode is 3000 rpm;
- Access to the language and settings selection menu;
- Acts as selection button of on-screen adjusted parameter.

6 

: This button allows to:

- Trigger the Mini Shaver in direct mode;
- Browse through the options of the language and settings selection menu;
- Choose the drill model;
- Choose the model of micro saw.

7 

: Access to Shaver mode.

8 

: Provides access to Drill mode and choosing a model.

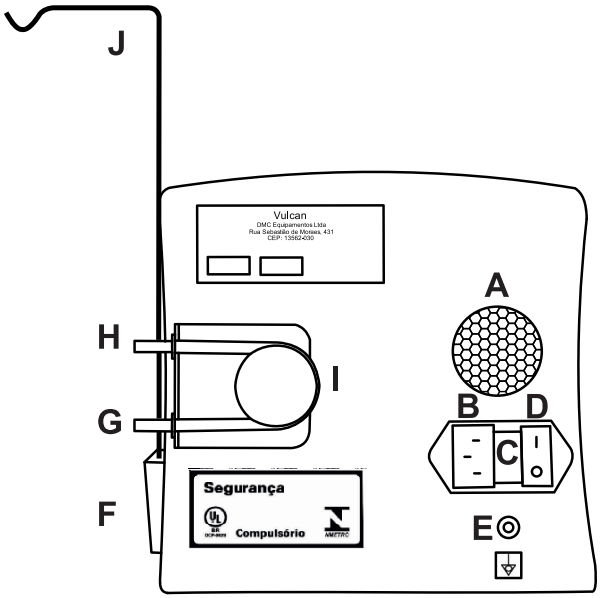
9 Flow  **or**  **:** Allow adjustment of the pump irrigation level, FL1 corresponding to the minimum level and FL8 to the maximum level. The pump will be triggered only when the LED on the key 

is lit and the pedal is pressed.

10 

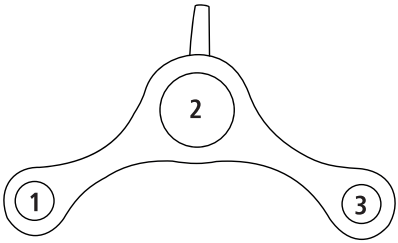
: By pressing this key, the irrigation pump is turned on and the LED on the key will light up. To turn it off press the key again.

BACK PANEL COMPONENTS



(A) Micro-blower: Air output location - It should not be obstructed;
(B) Cable A/C Connector: Location where the power cord should be connected to;
(C) Holder Fuses: Location where the fuses are inserted into the device;
(D) On/Off switch: It turns on and off the control box;
(E) Potential Equalizer: This connector establishes a equipotential connection. It is recommended that the connection to ground is made by qualified personnel;
(F) Support: Serum rod socket location (optional);
(G) Connecting nipple 1: Docking location of the larger hose, irrigation kit (optional);
(H) Connection nipple 2: Docking location of the smaller tube, irrigation kit (optional);
(I) Peristaltic Pump: Serum irrigation system (optional);
(J) Serum rod: Serum support location (optional).

CONTROL PEDAL



(1) REV:

• Micro Electric Motor: Enables/ disables the REV function, with the function enabled the engine will rotate counter-clockwise. This function is possible only when a drill handpiece is connected to the engine;

• Mini Shaver: Drives the engine in reverse, counterclockwise.

(2) CENTRAL BUTTON:

• Micro Electric Motor: Drives the engine, the maximum speed is selected on the control panel and the same varies with the pressure held on the pedal;

• Mini Shaver: Drives the engine in oscillating mode. The speed limit for this mode is 3000 rpm.

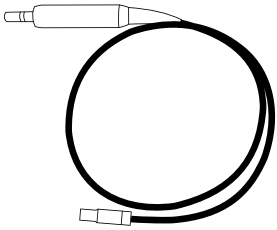
(3) DIR/ PUMP:

• Micro Electric Motor: It allows you to enable/disable the pump - irrigation function. By pressing the button, the LED on the key (Bomba) will light up in the Command box;

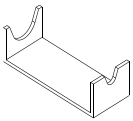
• Mini Shaver: Drives the engine in direct mode, clockwise.

MICRO ELECTRIC MOTOR

The Micro Electric Motor has a Power plug. The handpiece should perfectly fit into Micro Electric Motor, thus preventing shaft wear. Speed limits depend on the attached handpiece: micro saws or drills.



The user must correctly select the handpiece attached to the Micro Electric Motor. If the user selects a handpiece on the control panel and fits a different model to the one selected, the device will not present the expected results and may be damaged.



Micro Electric Motor Support
This support serves as the Micro Electric Motor rest support.

Micro Electric Motor Cover
This cover should be used during calibration and cleaning of the micro electric motor.

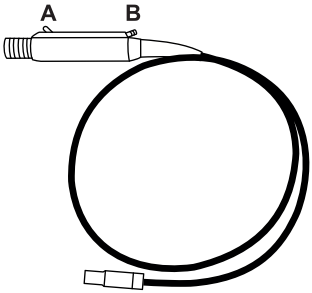
Handpieces
Micro saws and drills are to be used in conjunction with Vulcan. These should have Power plug.

Before using the micro saw or drill, check the cleaning and sterilization recommendations of the manufacturer. Handpieces should not contain oil residues at the time of fitting the micro electric motor, as this will cause damage to the engine.

⚠ Whenever the surgical procedure request a higher torque to the torque limit of the control box or selected by the user, the device will beep, the micro electric motor will stop its operation and a message appears on the display.

⚠ If necessary, the user can acquire the micro electric motor separately at DMC Equipamentos.

MINI SHAVER



(A) Lever: It adjusts the suction flow between high and low. To increase the level turn the lever toward the end of the engine and decrease turn the same towards the body.

(B) Connector for Suction System: Location where will be inserted the suction tube.

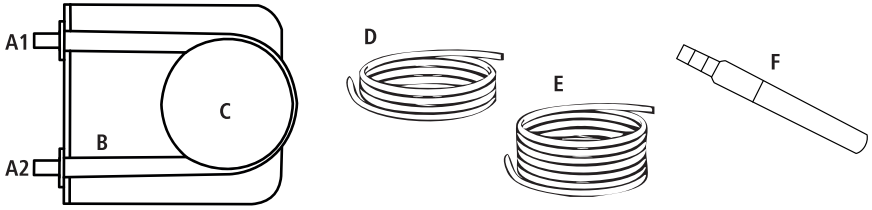
Before using Razek mini blades, check the cleaning and sterilization recommendations of the manufacturer. They shall not contain oil residues at the time of fitting the Mini Shaver, as this will cause damage to the engine.

⚠ Whenever the surgical procedure request a higher torque to the torque limit of the control box or selected by the user, the device will beep, the engine will stop its operation and a message appears on the display.

⚠ If necessary, the user can acquire a new Mini Shaver separately at DMC Equipamentos.

IRRIGATION PUMP

The peristaltic pump is located at the rear of the device. This consists of two nipples, a roller and a pump hose.



(A1 and A2) CONNECTION NIPPLES;
(B) PUMP HOSE;
(C) ROLLER;
(D) SMALLER HOSE: To be connected to the section A2 and the serum connector (F);
(E) LARGER HOSE: To be connected to the section A1 and the handpiece;
(F) SERUM CONNECTOR.

CLEANING OF MICRO ELECTRIC MOTOR, MINI SHAVER, CONTROL BOX AND PEDAL

• The device should be unplugged before cleaning in order to prevent user exposure to electrical shock;
• Do not wash the control box, the pedal, the micro electric motor and the mini shaver, it will result in loss of warranty;
• The cleaning of the same is to pass a soft cloth moistened with disinfectant solution, allowing the liquid to remain on the surface in question for the time recommended by the manufacturer;
• The micro electric motor protective cover must be attached at the time of cleaning it.

⚠ Be sure to not drain liquid in the control box, as this may damage it.

SETUP

- Plug the power cord into the back of the device;
- Connect the control pedal in the front of the device;
- Connect one handpiece in the Micro Electric Motor or a blade in the Mini Shaver;
- Insert the Electric Motor Micro or Mini Shaver connector in front of the control box;
- Then insert the cable A/C in the power grid. The potential equalizer must be connected to a potential equalization bus of the electrical installation.

INSPECTION BEFORE USE

Check that all sections listed in "SETUP" are connected.

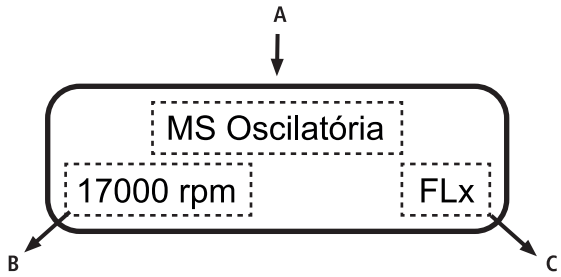
HOW TO USE

When pressing the on/off switch located on the rear panel screens will be presented with information such as product name, version, serial number and usage time.

To select the language press Osc / Prog in the corresponding screen, and then Rev / < or Dir / > to cycle through the available options.

MICRO ELECTRIC MOTOR

The operation screen for the use of Micro Electric Motor is represented below:



(A) Handpiece model selected: micro saws or drills;
(B) Rotation;
(C) Pump Flow.

Micro saw selection

When you select the function Micro Serra, press the buttons Rev / < or Dir / > to cycle through the available options.

For each micro saw model there is a maximum limit of rotation stored in the device's memory. It is important that the user properly select the model of micro saw to be used.

Drill selection

When you select the function (Drill), press the buttons (Rev <) or (Dir >) to cycle through the available options.

For each drill model there is a maximum limit of rotation stored in the device's memory. It is important that the user properly select the drill model to be used.

Changing the rotation and flow

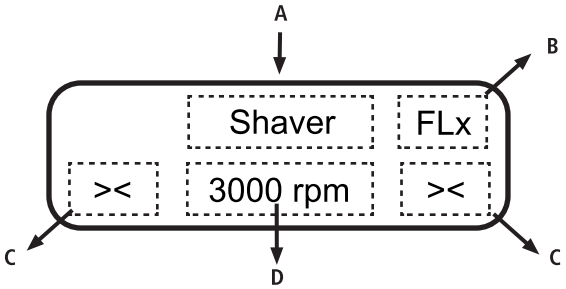
To change the rotation and flow of the device, press (+) or (−), as the panel display.

Starting the Micro Electric Motor

To start the engine, press the center button of the pedal, as section "CONTROL PEDAL".

MINI SHAVER

The operation screen for using the Mini Shaver is shown below:



(A) Indication of Shaver Mode;
(B) Pump Flow;
(C) Engine status: "><" - Stopped, ">>"- Driven in Direct Mode,
"<<" - Driven in Reverse Mode, "<>"- Driven in Swing Mode;
(D) Rotation;

Changing the rotation and flow

To change the rotation and flow of the device, press (+) or (−), as the panel display.

Starting the Mini Shaver

To start the engine, use the pedal as section "CONTROL PEDAL".

In the absence of the pedal, you can trigger the Mini shaver with the keys (Rev <), (Osc Prog) and (Dir >), as section "FRONT PANEL FUNCTIONS".

MENU SETUP

The device has a configuration menu for the user, which is allowed to:

- Load preset factory programs;
- Select the Micro Electric Motor brake;
- Calibrate the Micro Electric Motor/Mini Shaver;
- Calibrate the control pedal.

To access the settings menu, press and hold the key Osc/Prog during startup of the device. Use Rev/< or Dir/> to scroll through the options and the key Osc/Prog to confirm.

Standard Programming

Select "Startup Programs", then press the button Prog to confirm the restart of the preset factory programs.

Brake Setting

Select "Brake Setting", then press the key Osc/Prog to enter the function and select the desired brake for Micro Electric Motor, for example, 10 or 100%. Press Osc/Prog after choosing to confirm the setting. The higher the value selected, the faster the motor will stop.
The brake for Mini Shaver is determined in 100%.

Micro Electric Motor/ Mini Shaver Calibration

⚠ The calibration of the Micro Electric Motor should be performed with the respective cover and it should be positioned on the support.

⚠ The calibration of the Mini Shaver should be performed without any blade is connected to the same.

Select "Calibrate Engine", following the procedures described in display.

Control Pedal Calibration

Select "Calibrate Pedal", press the key Osc/Prog to confirm. Leave the central button of the pedal free and press the key Osc/Prog for calibration of the minimum value. Then fully press the center button of the pedal and the key Osc/Prog for calibration of the maximum value.

Exit the Settings menu

Select "Exit" and press the key Osc/Prog.

Important Notes

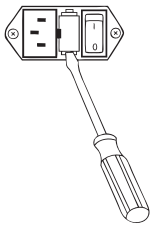
⚠ The unit has a display with a user-friendly menu. Alert messages can be displayed in the same.

⚠ Caution - Use of controls or adjustments or performance of procedures other than those specified herein may be harmful to the patient, the operator or device.

POST-SURGICAL PROCEDURES

- Turn off the on/off switch located on the rear panel;
- Disconnect the cable A/C in the power grid;
- Disconnect the Micro Electric Motor/Mini Shaver and the control pedal of the front of the device via the connector - never pull on the cable;
- The Micro Electric Motor, Mini Shaver, the control box and pedal should be cleaned as section "MICRO ELECTRIC MOTOR, MINI SHAVER, CONTROL BOX AND PEDAL CLEANING".

PROCEDURE OF EXCHANGE AND FUSE CHECK



- Disconnect the cable A/C from the power grid and device;
- With the aid of a small screwdriver, pry both ends of the fuse holder cover (see figure), until you can remove it by hand;
- Remove each fuse and check if they are burned - see if the fuse is dark or with a broken filament;
- If necessary, replace the blown fuse using the spare fuse supplied or another of equal value and characteristics (see section "SPECIFICATIONS");
- Insert the fuse holder into the receptacle until it locks.

PREVENTIVE MAINTENANCE

The device must be calibrated at least every two years by the manufacturer. If this maintenance is not performed, the manufacturer assumes no responsibility for security in the operation thereof.

All support services, such as alterations, repairs, calibration, etc., can only be performed by the manufacturer. The circuit diagrams, lists of components, descriptions, instructions for calibration and testing are not available to persons not qualified by the manufacturer.

If maintenance or other assistance service is carried out by non-authorized personnel, the manufacturer assumes no responsibility for security in the operation of the device.

⚠ Never open the control box. Call the technical assistance of DMC Equipamentos in case of operating problems.

CONDITIONS OF USE, STORAGE AND TRANSPORT

- Following are the conditions of use, storage and transport of the device:
- Protect against dust, exposure to direct sunlight, away from chemicals and cleaning agents;
  - Temperature: +10°C - +40°C;
  - Humidity: 30% to 75%;
  - Atmospheric pressure: 700 hPa to 1060 hPa.

⚠ Avoid dropping the device.

⚠ Keep the device in a safe place, preventing submit it to blows and vibrations.

MAIN PROBLEMS AND POSSIBLE SOLUTIONS

Error Code	Error Type	Possible Solutions
Error01	Micro-blower blocked	- Check obstruction in micro-blower; - Reset the device; - Contact the manufacturer.
Error02	High internal temperature error in the control box	- Clearing the air outlet; - Check the operation of the micro-blower; - Contact the manufacturer.
Error04	Exceeded torque limit	- Do not block the engine; - Contact the manufacturer.
Error06	Error during engine calibration	- Check that the motor cable is properly connected to the control panel; - Conduct engine calibration as section "Calibration of the Micro Electric Motor/Mini Shaver"; - Contact the manufacturer.
Error08	Read error of Pump calibration	- Reset the device; - Contact the manufacturer.
Error09	Non-calibrated engine	- Check that the engine cable is properly connected to the control panel; - Conduct engine calibration as section "Calibration of the Micro Electric Motor/Mini Shaver"; - Contact the manufacturer.
Error10	Engine calibration reading error	- Check that the engine cable is properly connected to the control panel; - Reset the device; - Contact the manufacturer.
Error11	Writing error on the engine memory	- Check that the engine cable is properly connected to the control panel; - Reboot the device and repeat the engine calibration procedure; - Contact the manufacturer.
Error12	Memory read failure	- Reset the device; - Contact the manufacturer.
Error13	Memory written failure	- Reset the device; - Contact the manufacturer.
Error14	Read error of the temperature sensor	- Reset the device; - Contact the manufacturer.

Error Code	Error Type	Possible Solutions
Error15	Engine disconnected error	- Do not disconnect the engine with the same operating; - Connect engine again; - Contact the manufacturer.
Error 16	Operation error of the irrigation pump	- Check the fitting of the hose in the roller; - Contact the manufacturer.
Error18	Engine release speed	- Reset the device; - Conduct engine calibration as section "Calibration of the Micro Electric Motor/Mini Shaver"; - Contact the manufacturer.
Error19	Engine speed below the selected speed	- Reset the device; - Conduct engine calibration as section "Calibration of the Micro Electric Motor/Mini Shaver"; - Contact the manufacturer.
ER-A	Device does not turn on	- Make sure the cable A/C is well connected; - Please check with the cable A/C unplugged, if the fuse is blown, as section "PROCEDURE OF EXCHANGE AND FUSE CHECK"; - Make sure the outlet is working properly.
ER-B	The device turns on, but the engine does not turn	- Check if the engine cable is properly connected to the control panel; - Check if the control pedal is properly connected; - Send the device for the Manufacturer's technical assistance.
ER-C	The Peristaltic Pump is not irrigating	- Make sure that the hose pump is properly fitted; - Check if any of the hoses is broken or clogged; - Check that the roller pump is spinning; - Send the device for the Manufacturer's technical assistance.
ER-D	The set does not perform as expected	- Check the wear of drills, saws and blades; - Replace the blade; - Replace the micro saw; - Replace the drill; - Replace the engine; - Send the device for the Manufacturer's technical assistance.

DISPOSAL

After the end of lifetime of the product and its accessories, it may cause environmental contamination or may be misused. To minimize these risks, the customer must dispose of the device as required by local law.

BIOCOMPATIBILITY

No part of the device touches the patient, so the ISO 10993 standards do not apply.

DEVICE ELECTROMAGNETIC SAFETY STANDARDS

Below are described tables representing the adjustment to emission standards and electromagnetic immunity.

<table>
<tr><th colspan="3">Guideline and manufacturer's declaration - Electromagnetic Emissions - for all Device and System [IEC 60601-1-2/2006 – subcl. 6.8.3.201 a) 3)]</th></tr>
<tr><td colspan="3">Vulcan is intended for use in the electromagnetic environment specified below. The Vulcan user or customer should ensure that it is used in such an environment.</td></tr>
<tr><th>Immunity Test</th><th>Conformity</th><th>Electromagnetic Environment - Guideline</th></tr>
<tr><td>RF emissions
ABNT NBR IEC CISPR 11</td><td>Group 1
Complies
(Meets)</td><td>Vulcan uses RF energy only for its internal functions. Therefore, its RF emissions are very low and not likely to cause any interference in nearby electronic device.</td></tr>
<tr><td>RF emissions
ABNT NBR CISPR 11</td><td>Class "B"</td><td rowspan="3">Vulcan is suitable for use in all establishments, including domestic establishments and those directly connected to public electricity distribution of low voltage that feeds buildings for residential use.</td></tr>
<tr><td>Harmonic emissions
IEC 61000-3-2</td><td>Class "B"</td></tr>
<tr><td>Emissions due to voltage/flicker fluctuation.
IEC 61000-3-3</td><td>Complies</td></tr>
</table>

Table 1: Conformity information to electromagnetic emissions requirements based on the Table 201 – 60601-1-2, 2006

Guideline and manufacturer's declaration - Electromagnetic Emissions - for all Vulcan – [IEC 60601-1-2/2006 – subcl. 6.8.3.201 a) 6)]			
Vulcan is intended for use in the electromagnetic environment specified below. The Vulcan customer or user should ensure that it is used in such an environment.			
Immunity Test	**Test level of ABNT NBR IEC60601**	**Level of conformity**	**Electromagnetic Environment - Guideline**
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV by contact ± 8 kV by air	Complies	Floors should be wood, concrete or ceramic. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Fast electrical transient/pulse train ("Burst") IEC 610004-4	± 2 kV on power supply lines ± 1 kV on the input/ output lines	Complies	Quality of power supply should be that of a typical commercial or hospital environment.
Surges IEC 61000-4-5	± 2 kV line (s) to ground ± 1 kV line (s) to line	Complies	Quality power supply should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% Ut (>95% voltage drop in Ut) for 0.5 cycles. 40% Ut (60% voltage drop in Ut) for 5 cycles. 70% Ut (30% voltage drop in Ut) for 25 cycles. <5% Ut (>95% voltage drop in Ut) for 5 seconds.	Complies	Quality power supply should be that of a typical commercial or hospital environment. If the Vulcan user requires continued operation during power interruption, it is recommended that Vulcan be powered from an uninterruptible power supply or battery.
Magnetic field at supply frequency (50/60 Hz) IEC 61000-4-8	3 A/m	Complies	Magnetic fields in the frequency of the supply should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: Ut is the supply voltage a.c. before application of the test level.			

Table 2: Conformity information to electromagnetic immunity requirements based on the Table 202 – 60601-1-2, 2006

Guideline and manufacturer's declaration - Electromagnetic Immunity - device that is not LIFE- SUPPORT - [IEC 60601-1-2/2006 – subcl. 6.8]			
Vulcan is intended for use in the electromagnetic environment specified below. The Vulcan customer or user should ensure that it is used in such an environment.			
Immunity Test	**Test level of ABNT NBR IEC 60601**	**Level of conformity**	**Electromagnetic Environment – Guideline**
RF Conducted IEC 61000-4-6 RF Radiated IEC 61000-4-3	3 Vrms 150 kHz up to 80 MHz 3 V/m 80 MHz up to 2.5 GHz	3 V 3 V/m	Portable and mobile RF communication device should not be used near any part of Vulcan, including cables, with separation distance less than the recommended, calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance. D = 10.10 m D = 10.10 m (80 MHz up to 800 MHz) D = 20.20 m (800 MHz up to 2.5 GHz) Where P is the maximum output power of the transmitter in watts (W) according to the transmitter manufacturer and D is the recommended separation distance in meters (m). It is recommended that the Field intensity established by the RF transmitter, as determined by an electromagnetic inspection at the sitea is less than the compliance level in each frequencyb range. Interference may occur around the device marked with the following symbol:
NOTE 1 – at 80 MHz and 800 MHz, it applies the higher frequency band. NOTE 2 – These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people. [a]Field strengths established by the fixed transmitters, such as base radio stations, telephone (mobile/wireless) and land mobile radios, amateur radio, AM and FM radio broadcast and TV transmitters cannot be theoretically predicted with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, it is recommended an electromagnetic inspection on site. If the measured field intensity at the location where Vulcan is used exceeds the level of conformity used above, Vulcan should be observed to see whether the operation is normal. If abnormal performance is observed, additional measures may be necessary, such as reorientation or replacement of Vulcan. [b]Over the frequency range from 150 kHz to 80 MHz, the field strength should be less than 3 V/m.			

Table 3: Conformity information to electromagnetic immunity requirements for device not intended to LIFE-SUPPORT based on the Table 204 – 60601-1-2, 2006

Minimum recommended separation distances between portable and mobile RF communications device and Vulcan.			
Vulcan is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or Vulcan user can help prevent electromagnetic interference by maintaining minimum distance between portable or mobile (transmitters) RF communication device and Vulcan as recommended below, according to maximum output power of the communications device.			
Maximum rated output power of the transmitter (W)	Separation distance according to transmitter frequency (m)		
	150 kHz up to 80 MHz	80 MHz up to 800 MHz	800 MHz up to 2.5 GHz
0,01	0,12	0,12	0,23
0,1	0,37	0,37	0,74
1	1,2	1,2	2,3
10	3,7	3,7	7,4
100	12	12	23
For transmitters with a maximum rated power output not listed above, the recommended separation distance (in meters [m]) can be determined by an equation applicable to the transmitter frequency.			
Note 1: At 80 MHz to 800 MHz, it applies to the separation higher frequency band. **Note 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

Table 4: Recommendations for separation distances between the device and RF emission sources based on the Table 206 – 60601-1-2, 2006

SYMBOLS USED

Potential equalization terminal

Caution! Consult Accompanying Documents

Unshielded

On (with electric power supply)

Manufacturing Date

Pedal connection

Serial number

Fragile

It should not be exposed to sunlight

Keep it dry

Applied part Type B

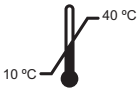
Protected against spraying

Do not tip over

Off (without electric power supply)

Made by

Alternating Current



Temperature limits

Indicates the position of transport

Protect against radiation

Maximum stacking

WARRANTY

A. The device manufactured and/or marketed by DMC are warranted for 24 (twenty four) months from the date of purchase against defects in workmanship.
B. The warranty covers only manufacturing defects or materials used in the manufacture of the products. The warranty does NOT cover shipping expenses.
C. The warranty is automatically canceled if occurs electrical, physical abuse, if the parts are changed, or if there are different applications other than those for which the device was developed.
D. In the case of device repaired outside the warranty period, it will only cover the replaced components.
E. The most common causes of defects come from physical shock applied to the unit, where the warranty is canceled.
F. DMC is not liable for personal injury or property damage resulting from misuse of the device it produced and/or marketed, getting to the user to provide security measures in order to prevent such occurrences.
G. Responsibility for the DMC regarding the use of the device and its consequences, limited to the replacement value of the same.

The device will only be warranted by the manufacturer if:

- Assembly, extensions, adjustments, modifications or repairs operations are carried out by persons authorized by it;
- The electrical installation of the environment in question is in accordance with the appropriate requirements;
- The device is used according to instructions.

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