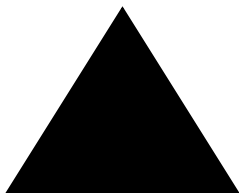


Model VMX720-S / VMX-720-FC

ShockStop®

Models VMX720-S / VMX720-FC



Caution: Read and follow all safety rules and operating instructions for this device.

Note: Not for use on the high frequency setting of the welding machine.

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Introduction

Electrical shock from a welding machine is serious. Every day workers receive shocks when either changing the electrode or through inadvertent contact of the electrode on a stick welding machine. There are documented cases of fatalities as well.

Previous methods of protection included latex gloves, rubber mats, anti-moisture sprays, and other non-conductive barriers. These methods have proven to be less than adequate, time-consuming, and simply not practical for most situations.

ShockStop® is an electronic device that requires no intervention on the part of the user. ShockStop® functions automatically between the user and the welding machine when properly installed and operated. The ShockStop® is the standard for welding shock protection in North America. It is the only CSA approved add on Voltage Reduction Device (VRD)

About the ShockStop®

The ShockStop® is classified as a VRD. Most voltage reducers either switch off part of the primary winding to reduce the output voltage of the welding machine, or shunt part of the output of the welding machine away from the welder and reduce the output voltage. In all these cases, the welder is still in contact with the welding machine output. The ShockStop® utilizes proprietary technology to completely block the welding machine output without affecting the arc striking or welding process.

When properly installed and operated, the ShockStop® blocks the entire welding machine output when the welding function is suspended. As a result the ShockStop® reduces the potential at the electrode to a negligible amount, thereby preventing electrical shock from contact with the electrode.

The new VMX720-S ShockStop® utilizes DDC Technology's proprietary FastStart technology to ensure ease of striking the arc. The ShockStop® is transparent to the user and does not affect the weld or welding process.

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Installation Instructions

ShockStop® installation is very simple. The electronics are enclosed in a CSA/UL approved electrical enclosure fitted with rear mounting lugs. The unit can be mounted directly on a back plate of suitable material with the enclosed mounting bolts. The user may also attach the four enclosed lugs as desired and the ShockStop® can be mounted on a frame or plate.

It is preferable that the ShockStop® be mounted in close proximity to the welding machine that the ShockStop® will be used on. This facilitates hook-up of the small ground wire that is attached to the welding machine from the ShockStop®. This is one of the unique features of the ShockStop®. It can be mounted near the welding machine in a clean dry environment and the worker will still be protected out in the work environment. By mounting the ShockStop® in a more hospitable environment, the life of the ShockStop® will be prolonged.

After the enclosure is mounted, the electrical connections to the ShockStop® must be made. The ShockStop® comes with CSA/MSHA approved cables. The cables are left without ends and the user must attach whatever style of ends they choose, or lugged and bolted direct to the welding machine output. The welding cable on the input (left) side of the ShockStop®, is labelled as "+ From Welder". This cable must be connected to the + output of the welding machine. The output (right) side of the ShockStop®, is labelled as "Output" and is the output of the ShockStop®. This cable is connected to the electrode holder when using reverse polarity or to the work-piece when using straight polarity. There is a small ground lug located on the bottom of the ShockStop®. The attached ground wire must be connected to – output of the welding machine.

As mentioned above the ShockStop® can be used in either reverse polarity or straight polarity. The hook-up for each method is different. The following diagrams illustrate the proper hook-up of the ShockStop® for the various configurations.

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Reverse Polarity Hook-up

Figure 1 shows the proper hook-up of the ShockStop® for the reverse polarity configuration. The small ground wire is attached to the ground lug nut on the bottom of the ShockStop® and the other end is attached to the negative output terminal of the welding machine.

In reverse polarity the work terminal should be positive with respect to the ground terminal. The work terminal (positive) is connected from the welding machine to the cable on the left side of the ShockStop® labelled "+ From Welder". The cable on the right side of the ShockStop® labelled "Output" is connected to the electrode holder. The negative terminal of the welding machine output is connected to the work-piece.

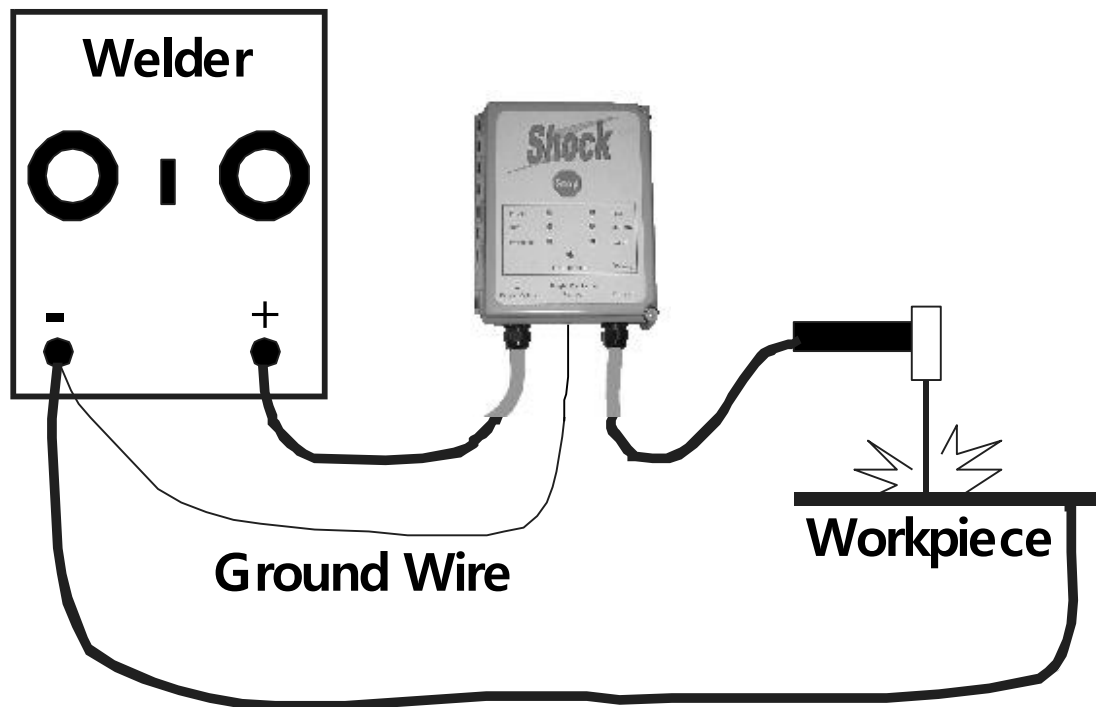


Figure 1

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Straight Polarity Hook-up

Figure 2 shows the proper hook-up of the ShockStop® for straight polarity operation. The small ground wire is attached to the ground lug nut on the bottom of the ShockStop® and the other end is attached to the negative output terminal of the welding machine.

In straight polarity the ground terminal should be positive with respect to the work terminal. The ground terminal (positive) is connected from the welding machine to the cable on the left side of the ShockStop® labelled "+ From Welder". The cable on the right side of the ShockStop®, labelled "Output" is connected to the work-piece. The negative output terminal of the welding machine is connected to the electrode holder.

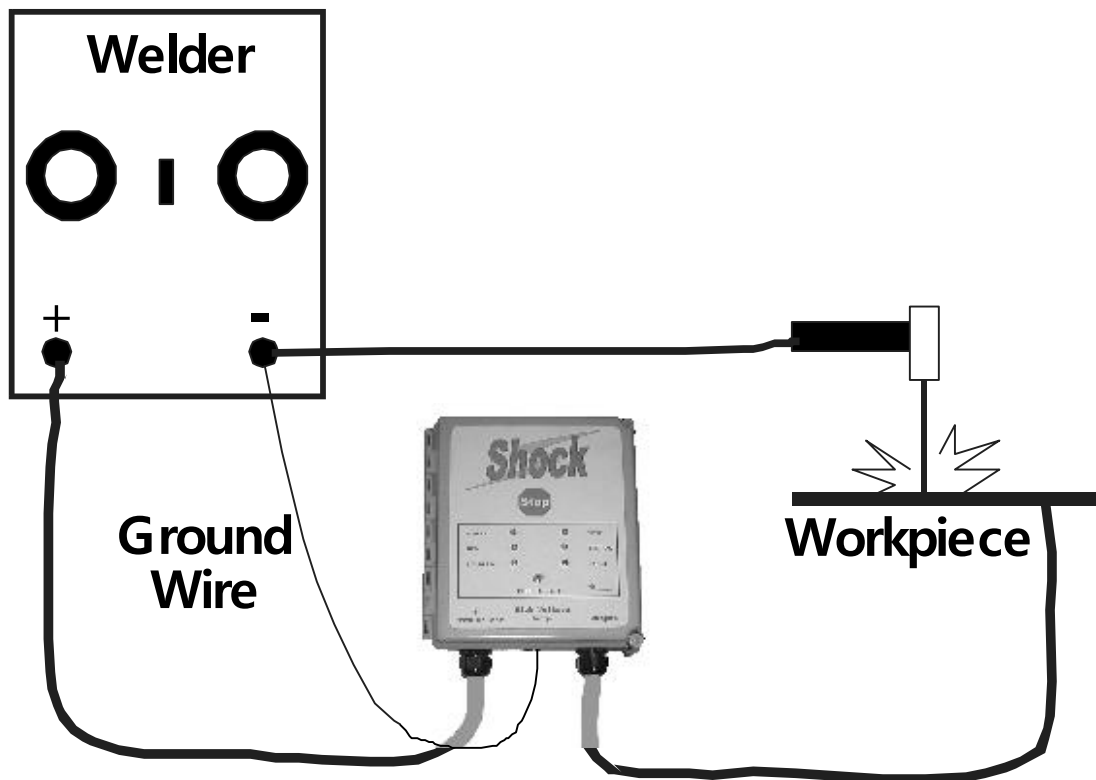


Figure 2

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Operation

Once the ShockStop® is properly connected the unit will power up when the welder is turned on. Upon start up the “POWER” LED should come on first, followed by the “RUN” LED. Once the “RUN” LED is lit the unit is ready to use. The user should then initiate the diagnostics test by pushing the button on the front of the ShockStop® to ensure that unit is functioning properly before using. When the test button is pushed the “TEST” LED will illuminate, indicating that the unit is now in test mode. If the diagnostics find no faults the “TEST OK” LED will illuminate for a few seconds. Once the unit has returned to “RUN” mode the user can now proceed with the normal weld process. When the rod is struck against the work-piece the ShockStop® will immediately detect this action and allow the arc to start and the welding process to proceed. When the welding process ceases the unit will automatically sense and return to the de-energized safe state. This allows the user to safely change electrode. The de-energized state also ensures that the user does not receive a shock by inadvertently contacting the electrode with any part of their body.

If during operation, and dependent upon the ambient temperature of the environment the ShockStop® is being used in, the “HI TEMP” LED illuminates the unit will shut down to protect the internal electronics from damage due to overheating. The ShockStop® unit should be mounted in a well ventilated area to ensure the interruptions are minimized.

If during the test mode a fault is detected by the internal diagnostics the “FAULT” LED will flash a diagnostic code.

Due to the critical nature of the internal electronics and the stringent testing required to ensure proper operation, DDC Technology does not supply schematics or allow third parties to attempt to repair ShockStop® units. In the event of a fault, the user should contact DDC Technology to make arrangements for repair.

The VMX720-S Model is a fully sealed unit and is meant for harsh environments. The VMX720-S has automatic reset, thermal protection built into the unit. If the unit detects that the electronics have been heated to a specific temperature, the thermal protection will shut down the unit and prevent further heating which could damage the unit. This state will be indicated by illumination of the Hi Temp LED on the front panel of the enclosure. Once the unit has cooled sufficiently, it will automatically reset, the Hi Temp LED will turn off and welding can continue.

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The VMX720-FC and VMX1200-FC models are a fan-cooled unit. They have automatic reset, thermal protection built in. If the unit detects that the electronics have been heated to a specific temperature, the fan will automatically start and try to cool the unit. If the unit cools, the fan will automatically shut off. Welding can continue throughout this circumstance. If the fan cannot cool the unit, the thermal protection will shut down the unit and prevent further heating which could damage the unit. This state will be indicated by illumination of the Hi Temp LED on the front panel of the enclosure. The fan will continue to run to cool the unit down. Once the unit has cooled sufficiently, it will automatically reset, the Hi Temp LED will turn off and welding can continue. The fan will continue until the unit has completely cooled and the fan will then automatically shut down.

Note: It is important to ensure that the fan filters are changed on a regular basis to help ensure the life of the fan. It is also important to ensure that the fan intake and the exhaust opening are kept clear to maintain proper airflow to ensure proper cooling.

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Caution

The ShockStop® is intended to reduce the potential for electrical shock. It is not a substitute for poor work practices or current safeguards. It may not protect a person from poor safety practices and equipment such as cables and electrode holders must be kept in good shape.

The ShockStop® should not be subjected to harsh environments without protection. If mounting in poor locations ensure that the ShockStop® is well covered by heavy plastic. Proper installation will ensure that the ShockStop® continues to function well for many years. Fan and exhaust openings must be kept clear and fan filters need to be checked and replaced on a regular basis to ensure proper cooling.

Do not open the ShockStop® enclosure. The unit is sealed for warranty purposes. If the user opens the enclosure prior to the expiration of the warranty period the warranty will be considered void. If the user opens the enclosure after the warranty period has expired caution must be exercised as there are electrically live parts located within the enclosure. There are no user serviceable parts within the ShockStop®.

The user should run the diagnostic tests everyday before using the unit.

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Fault Detection

The ShockStop® is designed to run diagnostics on the most critical components to ensure reliable operation of the unit. If the unit detects a serious fault in any of the critical components, the Fault LED will be lit continuously. If at any time the user is unable to strike the arc and then observes the Fault LED lit on the front panel, the ShockStop® has detected a serious fault and will attempt to render the unit inoperative to prevent possible injury to the user. Whenever the Fault LED is lit continuously the user should perform an internal test of the unit.

The test button on the front of the panel allows the user to initiate an internal electronics test of the critical components. The user must not be welding when performing this test. To perform the test, push the rubber covered pushbutton on the front panel. The unit will automatically test the internal circuitry and if all is well the “TEST OK” LED will light for a brief period and the unit will then automatically return to Run Mode. If the unit flashes the “TEST” LED three times, this indicates that the welding machine output voltage is too low. The unit will not run the tests but will simply return to run mode. If an error does occur the “FAULT” LED will flash out a code to indicate the error and if a critical error persists the unit will return to the “FAULT” LED being constantly lit.

The table on the following page lists the flash codes and the remedies for each. The flash codes are a combination of long flashes and short flashes, and the code will be flashed three times. The critical nature of the components used in this device means that repairs should not be attempted by the customer. As each code confirms a separate problem, it is important to note the code and to advise DDC Technology of the code sequence.

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Fault Detection Table

Code Sequence	Remedy
1 long - 1 short	Unit has a serious fault. Do not use! Return unit to DDC Technology for servicing.
1 short - 1 long	Power unit down, power unit up, and re-run diagnostics. If error persists, return to DDC Technology for servicing.
1 long	Return unit to DDC Technology for servicing.
1 short - 1 long - 1 short	Disconnect output of ShockStop® and re-run diagnostics. If error persists, return to DDC Technology for servicing.
1 short - 2 long	Return unit to DDC Technology for servicing.
2 long	Return unit to DDC Technology for servicing.
2 short - 1 long	Serious fault detected. Do not use! Power will be present at output. Return unit to DDC Technology for servicing.
2 long - 1 short	No power through system. Return unit to DDC Technology for servicing.
1 long – 1 short – 1 long	Return unit to DDC Technology for servicing
3 long	Return unit to DDC Technology for servicing

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Frequently Asked Questions

Q. *Where do I get help with this unit?*

A. Contact DDC Technology. See ShockStop website www.shockstop.ca

Q. *The unit does not power up when I turn on my welder. Why?*

A. If the unit does not power up, you may have the unit hooked up incorrectly. Check connections. If the unit is hooked up correctly and still does not power up, check the voltage output of the welder. If the proper voltage is present, the unit will need to be serviced. Contact DDC Technology.

Q. *I am having problems getting the arc to strike. What's wrong?*

A. If the work-piece material is rusty you will have problems getting the arc to start. The unit cannot distinguish between the high resistance of the human body from the high resistance of the rust layer on the metal. Proper surface preparation is the remedy. Ensure at least one area of the surface is clean to bare metal and start the arc in that location. Ensure that the negative connection to the work-piece is also clean. Once the first weld is made and a good ground established, the unit should start more easily.

Q. *I just took a shock! What should I do?*

A. Immediately run a test on the unit. If the unit tests ok, then check cables and connections.

Q. *The unit powers up, but I can't get any power to the electrode. Why?*

A. Check the welder. If it happens to be set to the AC position the electronics will power up but the unit will not let current pass.

Q. *Does the ShockStop® make striking the arc slow or difficult?*

A. DDC Technology has developed their proprietary FastStart technology to ensure that the arc establishment is extremely fast. In fact, we would be surprised if you could tell that the ShockStop® is even connected

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Q. *Why does my ShockStop® keep shutting down on Hi Temp?*

A. It appears that either the process you are performing is causing overheating or the environment you are using the unit is. This is usually caused from the heat dissipated by the cables inside the enclosure. If you are running extremely high currents for extended periods you should probably be using the larger fan-cooled unit, the VMX-1200FC. If the unit you are using is fan cooled, ensure that all vents and fan openings are clear.

Q. *Can I fix the electronics myself?*

A. The ShockStop® utilizes the latest in technology and is a proprietary system. The unit contains critical parts and improper substitution of parts may render the device useless and potentially dangerous. You should return the unit to DDC Technology so it may be properly taken apart, repaired and tested. If you attempt the repairs, DDC Technology is not responsible for the outcome. It may also increase your costs to repair the unit.

Q. *The cooling fan won't run?*

A. The ShockStop® utilizes the latest in technology and is a proprietary system. The unit contains critical parts and improper substitution of parts may render the device useless and potentially dangerous. You should return the unit to DDC Technology so it may be properly taken apart, repaired and tested. If you attempt the repairs, DDC Technology is not responsible for the outcome. It may also increase your costs to repair the unit.

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Warranty

DDC Technology warrants its products to be free from defects in materials and workmanship for a period of one year from the date of purchase. Its obligation under this warranty is limited to repairing or replacing, at its own sole option, any such defective products. Products must be returned to DDC Technology with transportation charges prepaid and must be accompanied by a brief description of the problem encountered. This warranty excludes liability for labour for removal of this product or reinstallation. This warranty does not apply to equipment which has been damaged by accident, negligence, or misapplication or which has been modified in any way.

This warranty is void if:

- a) the warranty seal is removed prior to expiration of the warranty period;
- b) the product is overloaded, misused, or is installed improperly or in an improper environment;
- c) The equipment is not operated under normal operating conditions or in accordance with the manufacturers specifications; and
- d) The equipment was not maintained in accordance with the manufacturers specifications.

The warranties provided by the DDC Technology are not assignable.

EXCEPT AS PROVIDED HEREIN, OR AS REQUIRED BY STATUTE, DDC TECHNOLOGY MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. If any implied warranty is required by the applicable jurisdiction, the duration of any such implied warranty, including merchantability and fitness for a particular purpose, is limited to one year.

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Liability

EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL DDC TECHNOLOGY BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

DDC Technology is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of equipment use, injury, or loss of life. The owner assumes full responsibility for the installation and proper use of this device. The owner also assumes full responsibility for maintaining proper condition of any equipment to which the unit is connected.

DDC TECHNOLOGY IS NOT LIABLE FOR ANY DAMAGES, COSTS, EXPENSES OR LOSSES OCCASIONED BY OR RELATED TO NEGLIGENT, FAULTY, CARELESS, IMPROPER OR RECKLESS INSTALLATION OR USE.

Model VMX720-S / VMX-720-FC**Specifications**

Model	VMX720-S	VMX720-FC
Welding Machine OCV (Open Circuit Voltage) Range	20VDC – 100VDC	20VDC – 100VDC
Current (Max)	250A	450A
Sensitivity (Arc Trigger)	40 ohms or less	40 ohms or less
ShockStop® Blocked Output Voltage	< 10VDC	< 10VDC
Fan Cooling	No	Yes
Internal Diagnostics	Yes	Yes
Thermal Protection With Automatic Reset	Yes	Yes
Jackson Ends Included	No	No

Model VMX720-S / VMX-720-FC

Contact Information

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