

ZON MULTI-SHOT CONTROLLER ***Electronic Conversion Kit***



Operating Instructions

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Multishot Controller w/Timer Kit



General

This conversion kit fully converts mechanical Zon Mark 4 to a semi-electronic scare cannon.

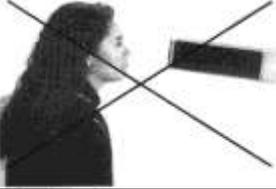
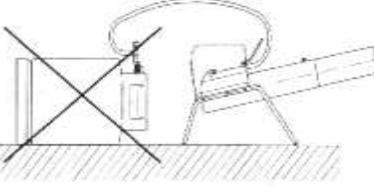
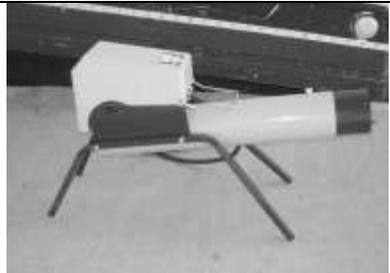
The electronic control-unit makes the propane gas cannon produce 1, 2, 3, or 4 shots series, with approximately 5 seconds between each shot.

The time-interval between consecutive series can be configured electronically between 1 and 60 minutes. The equipment provides three different possibilities to choose random intervals between shots series, in which case the control-unit selects a different time interval after each series.

The control-unit is equipped with a 24-hours clock. No less than 4 periods can be configured, during which the control-unit will operate the propane gas cannon.

Always wear ear-protection near cannons in operation!

WARNING

	<ul style="list-style-type: none">- Wear ear protection while operating the device (sound pressure level is approximately 120dB(A) FAST when measured perpendicular to the end of the megaphone at 1 meter's distance) (Fig. 1)
	<ul style="list-style-type: none">- Never look into its megaphone- Never place subjects in the megaphone
	<ul style="list-style-type: none">- Do Not Smoke- Keep the gas cylinder away from sources of heat
	<ul style="list-style-type: none">- The gas cylinder should be placed upright- Never place the gas cylinder in a pit- Only propane or butane gas may be used, preferably propane. No other types of gas are allowed.
	<ul style="list-style-type: none">- Never use the device indoors.
	<ul style="list-style-type: none">- If there is a fire:<ul style="list-style-type: none">a. close the valve of the gas cylinder;b. extinguish fire with dry-chemical extinguisher
	<ul style="list-style-type: none">- Clear area surrounding gas cylinder and Zon cannon of all debris and inflammable objects

The device has certain components which can only be repaired or set by the DAZON technical service department or by a recognized dealer

Contents of the conversion kit:

1. Electronic control unit 1x
2. Hose fracture protection valve 1x
3. NH14. hose clamp 3x
4. User manual 1x

Installation

1. Close the gas valve of the gas tank. Do not open this until you have finished installation and configuration!
2. Disconnect the pressure regulator from the gas tank.
3. Disconnect the hose from the precise regulator.
4. Unscrew the precise regulator from the pressure regulator (unscrew is clockwise).



Pressure regulator (Shell type) Precise regulator

5. Screw the hose fracture protection valve onto the pressure regulator (on is counterclockwise). Secure a no-leak connection by using Loctite or Teflon tape on the wire of the hose fracture protection valve. The precise regulator only allows a small amount of gas flowing through in a relatively long period. To produce a series of shots, it's necessary to allow a large amount of gas in a short period, that's why the precise regulator has to be disconnected. The hose fracture protection valve provides extra security, by closing the gas flow at the moment the counter-pressure disappears. For instance when the hose detaches on either side of the equipment, or when it is accidentally run over and severely damaged. **After opening the valve of the gas tank always push the red button of the hose fracture protection valve, to make sure an unobstructed gas flow is guaranteed.**



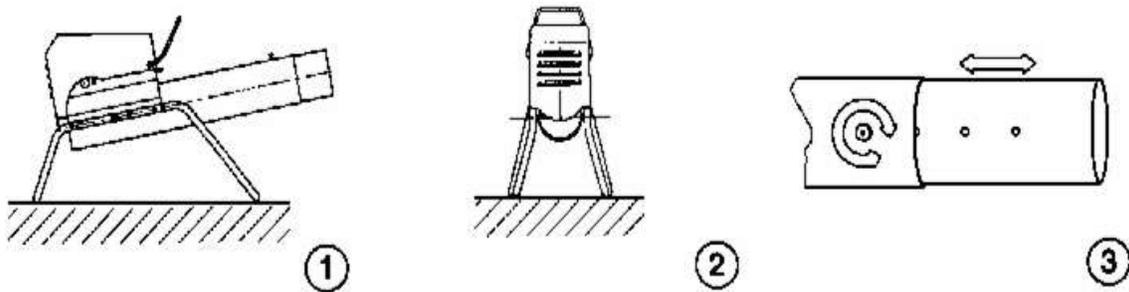
Pressure regulator Hose fracture protection valve

6. Connect the hose to the hose fracture protection valve and secure it with one of the supplied hose clamps NH14.
7. Cut the hose so the control unit can be installed between the gas fracture protection valve and the propane gas cannon.

8. Connect both ends to the electronic control unit and secure these with the remaining 2 clamps NHI4. The arrow on the magnetic valve in the control-unit indicates the direction of the gas flow. Connect the gas cannon on the side to which the arrow points out.

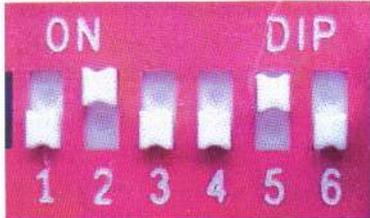


9. Connect the pressure regulator to the gas tank.
10. Connect the battery cable of the control-unit to a 12V battery. The red or brown wire should be attached to the + of the battery. The blue wire should be attached to the -. When attached properly, a red control will light up to show the device is active. Check the connections when this does not happen. The control-unit consumes 0.53 ampere per day. A fully loaded car battery of 30Ah will operate the control-unit for approximately 60 days, a 7.2 Ah battery for approximately 14 days.
11. Put the battery and the control-unit preferably above the ground on an elevated spot and protect them from rain and extreme heat. The control-unit is splash waterproof and heat resistant to at least 190°F/70°C. A careful positioning and protection will increase the lifespan of the equipment significantly.
12. You have finished installation and the control unit is ready to be configured.



Operation

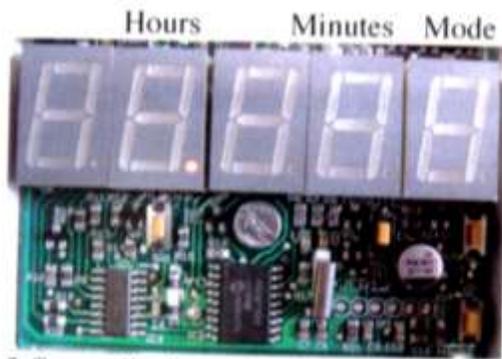
The number of shots in a series and the time interval between consecutive series are configured with DIPSWITCHES. There are 6 white rocker switches located in the red block, numbered 1 to 6, as pictured below. Dipswitches 1 and 2 are used for configuring the number of shots in a series, and dipswitches 3 to 6 are used for configuring the time interval between consecutive series.



Block with 6 dipswitches

A dipswitch is ON when it is pushed fully to the ON-side of the red block. A dipswitch is OFF when it is pushed fully to the side of the red block with the numbers 1 through 6. In above picture, dipswitches 2 and 5 are ON, the others are OFF. This configuration will produce 3 shots in a series and 7 minutes between series. **The cannon is shipped from the factory with these settings.**

The current time and on-off settings can be configured with the 5-digit display and the 4 small yellow pushbuttons. All times are in a 24-hour clock with 00:00 as 12 o'clock midnight. The "Hours" and "Minutes" pushbuttons are used to enter time settings. The "Mode" pushbutton is used to select the on-off periods. The "Reset" pushbutton is used to clear settings.



5-figure display, with 4 push buttons



Pushbutton Hours



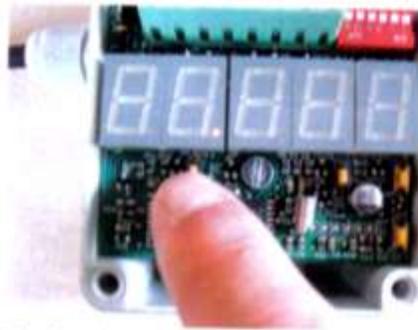
Pushbutton Minutes



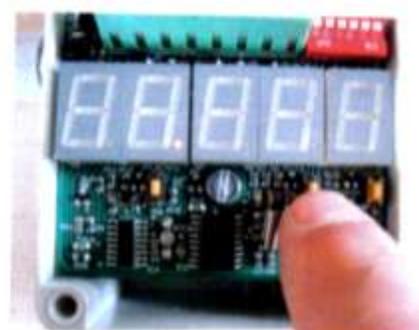
Pushbutton Mode



Pushbutton Reset



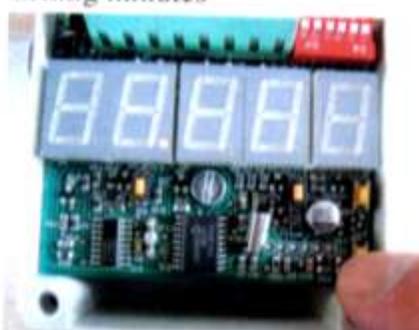
Setting hours



Setting minutes



Selecting Mode



Reset

Configuring the number of shots in a series.

The cannon can be configured to produce 1, 2, 3, or 4 shots in a series with approximately 5 seconds between each shot. The number of shots in a series is controlled with dipswitch 1 and 2.

Series	Dipswitch 1	Dipswitch 2	
1 shot	Off	Off	
2 shots	On	Off	
3 shots	Off	On	
4 shots	On	On	

Setting the interval time.

The time that has to pass between consecutive shot series is controlled with dipswitch 3 through 6. These are the possible settings:

Interval	Dipswitch 3	Dipswitch 4	Dipswitch 5	Dipswitch 6	
1 minute	Off	Off	Off	Off	
2 minutes	On	Off	Off	Off	
3 minutes	Off	On	Off	Off	
5 minutes	On	On	Off	Off	
7 minutes	Off	Off	On	Off	
10 minutes	On	Off	On	Off	
13 minutes	Off	On	On	Off	
16 minutes	On	On	On	Off	
20 minutes	Off	Off	Off	On	
25 minutes	On	Off	Off	On	
30 minutes	Off	On	Off	On	
45 minutes	On	On	Off	On	
60 minutes	Off	Off	On	On	
Random 5	On	Off	On	On	
Random 10	Off	On	On	On	
Random 15	On	On	On	On	

Random 5: The time after a shot series is randomly chosen by the cannon between 1 and 5 minutes.

Random 10: The time after a shot series is randomly chosen by the cannon between 1 and 10 minutes.

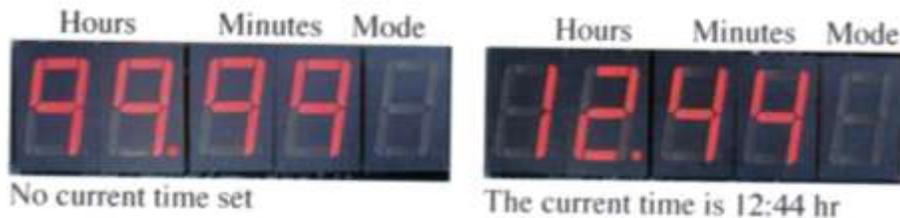
Random 15: The time after a shot series is randomly chosen by the cannon between 1 and 15 minutes.

Setting the current time.

The 5-digit display is normally not lit. Pushing one of the push buttons for the Hours, Minutes, or Mode light will display and show the current time.

When the display is lit, the current time is displayed if the Mode display is empty. When the Mode display shows one of the figures 1 through 8, it does not show the current time but instead, one of the starting or ending-times. To show the current time, push the Mode button several times until the Mode display is empty. Now it shows the current time which can be set or changed.

If no current time is set, the hours and minutes both contain the value 99. The current time is a continuously changing value that can't be stored in memory. After each power interruption, the current time will contain 99:99. When no current time is set, the cannon will operate continuously regardless of the periods of operation being set.



By pushing the Hours button or the Minutes button, the displayed current time can be altered. Keeping the button pushed down will speed-up the changing of hours or minutes.

By pushing the Reset button for one second, the current time will be set to 00:00, which is 12 o'clock midnight.

The current time does not have to be confirmed by pushing the Mode button again, as it is not stored into memory.

Setting starting-times and ending-times.

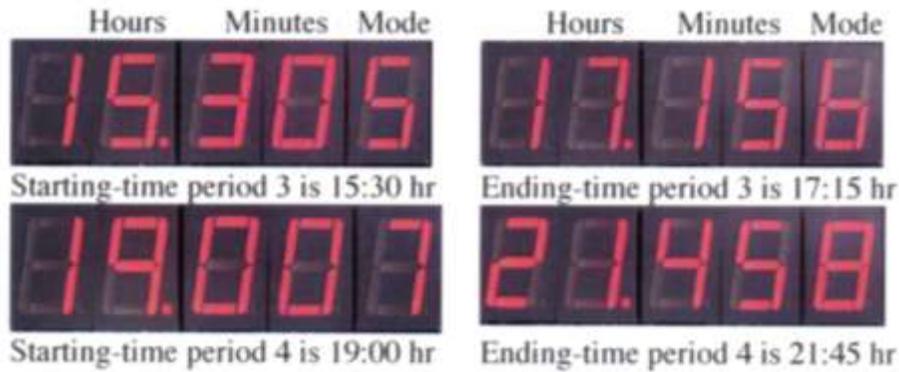
Four periods can be set by means of a starting-time and ending-time, for a 24-hour period. During these periods, the scare cannon will operate according to the chosen configuration. Outside of these periods, it will do nothing.

To set or change a starting or ending-time, the time you want to set or change has to be displayed first. Push the Mode button repeatedly until the value in the Mode display is the time you want to modify.

Mode = 1 Starting-time period 1
Mode = 2 Ending-time period 1
Mode = 3 Starting-time period 2
Mode = 4 Ending-time period 2

Mode = 5 Starting-time period 3
Mode = 6 Ending-time period 3
Mode = 7 Starting-time period 4
Mode = 8 Ending-time period 4





By pushing the Hours or the Minutes button, the displayed starting or ending-time can be altered. Keeping the button pushed down will speed-up the changing of hours or minutes.

By pushing the reset button for 1 second, the display will be set to 00:00, which is 12 o'clock midnight. Once the time is set, it has to be activated and written to memory by pushing the Mode button again. In the event of a power interruption, the cycle interval times will remain in memory.

Not all 4 periods have to be set, you only have to set the ones you want. If no period is set, all starting and ending-times contain the value 00:00, will operate the cannon continuously according to the dipswitch settings.

On-Demand Mode.

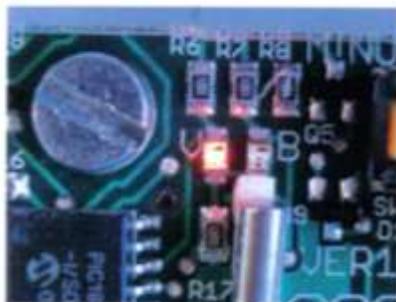
To set the cannon in on-demand mode only (cannon is activated by push button or radio remote). Set Starting-Time Period 2 (Mode 2) earlier than Starting-Time Period 1 (Mode 1). For example set starting time 1 to 3:00 and starting time 2 to 2:00.

In operation.

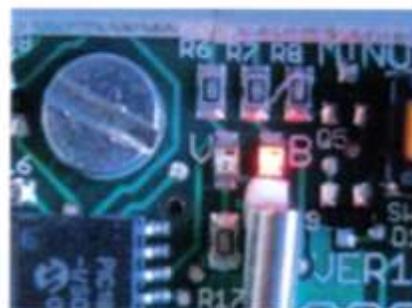
When everything is installed and configured, the cannon will operate according to your chosen settings. Once the cannon is connected to power, you will have to start a shot series. Do not open the gas valve on the gas tank until you have finished configuration.

After opening the gas valve on the gas tank, always push the red button on the hose fracture protection valve to make sure an unobstructed gas flow is guaranteed.

On the circuit board of the cannon, you'll find 2 LED's. The led with the character V beside it will light during the time gas is injected into the cannon. The led with the character B beside it indicates the moment before ignition. **Be careful, this is the moment of the explosion!!**



Led V (open gas valve)



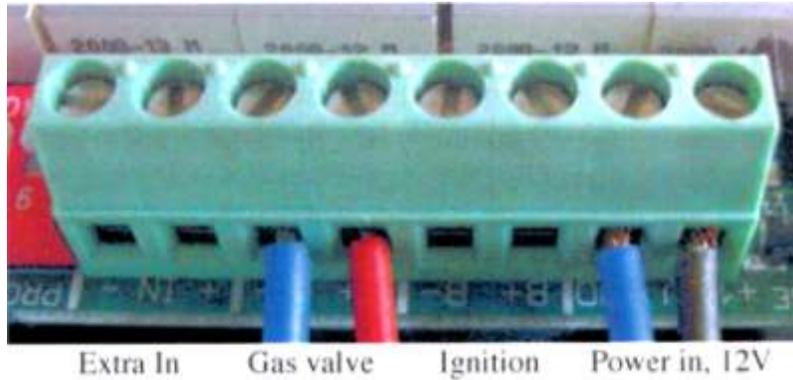
Led B (ignition)

When the cannon is powered on and the display is not lit, pushing the reset button will light the display and show the remaining time until the next shot series. This time is descending and will be shown for 15 seconds.

During the time the display is lit, the cannon will not produce shots. Pay attention, however, if the display should turn to “unlit” a time interval to the next series has passed, as the cannon will start firing the next series of shots immediately.

Connections on the PCB (printed circuit board).

On the PCB 4 inputs are provided. From the factory 3 are used.



“Power in” is used for the connection of a 12V battery. The “Ignition” input is not used. The magnetic valve that controls the flow of gas is connected to the “Gas Valve” input.

The “Extra IN” input, is used for the connection of optional equipment, such as a wired or wireless remote control. When equipment is connected to the + and - of this input and short-circuits these, the cannon will immediately begin firing the configured number of shots regardless of the periods of operation being set.

When “Extra In” is used it will override previous settings.

ZON RECOMMENDATIONS

Read the following information carefully. In it you will find important instructions concerning the safety and maintenance of the device. Always keep these instructions with the device.

1. Place the cannon on a stable and horizontal surface
2. Observe the local requirements and rules that may apply to noise and the production of sound in the vicinity of a residential area or otherwise.
3. Do not place any heavy objects on the scare cannon and do not block the air circulation.
4. It is important to move the device regularly in order to increase the effectiveness.
5. If the device functions inadequately, consult the failure table or your local dealer.
6. Consult your dealer for separate accessories.

ZON ROUTINE MAINTENANCE

- When not in use, store in a dry place.
- All nuts, bolts and screws should be tightened occasionally as the explosion causes a vibration which in turn can cause these connectors to loosen.
- Check the following at least once per year;
 1. Check the gas hose for defects. If defects are found (porous/cracks), replace it with a new one. When in doubt, use a new hose.
 2. Check the gas regulator, fitted with a hose fracture protector, for damage or leaking. If any problems are detected, repair or replace immediately.
 3. If there are any defects in the battery cable, repair or replace it.
 4. Check the electrode (No. 91536) for damage. If any defects are detected replace with new electrode.
 5. **Check electrode and ground wire on back of barrel for corrosion or residue build-up.** Remove and clean with emery cloth. Spray a protective coating over ground wire and back of electrode to prevent corrosion. See appendix A for description.
 6. Use a suitable multi-meter to check whether the DC source (battery) has enough power (minimum 10 v). If the battery requires charging, be sure to follow the manufacturer's instructions carefully.
 7. If other defects are detected consult your local dealer.

ZON TROUBLESHOOTING

FAILURE	CAUSE	REMEDY
The cannon, fully connected, fails to operate at all	<p>The control unit is turned off.</p> <p>The battery cable has not been connected properly</p> <p>Low battery</p>	<p>Turn on switch on control box.</p> <p>Ensure the battery terminals are connected properly. The black terminal is negative and the red terminal is positive.</p> <p>Recharge or connect a new battery</p>
The Zon cannon operates, but there is no explosion or sound	<p>The gas tank valve is not open</p> <p>The gas tank is empty or does not have enough pressure</p> <p>The hose fracture protector button (red) has not been pushed</p> <p>Poor gas mixture</p> <p>Gas valve is blocked or partially blocked.</p> <p>Ignition gives a weak spark or no spark at all.</p> <p>The gas valve will not operate</p>	<p>Open the valve</p> <p>Fill or replace gas tank.</p> <p>Push the red button on the hose fracture protector one or more times.</p> <p>Gas mixture in the gas tank is not good, replace gas tank.</p> <p>Open up blockage using thin wire of approx. 0.6 mm diameter or welding tip cleaner.</p> <p>Check the electrode, No. 91536. It is possible that the porcelain base is broken: if so, replace.</p> <p>Corrosion on the connection points between the electrode and the barrel or the ground wire and the barrel. Remove electrode and ground wire and clean all contact points with emery cloth.</p> <p>Electrode No. 91536 is wet: Dry it well.</p> <p>Check the connection points. If properly connected, call the dealer for repair.</p>
The Zon cannon works, but gives dull explosions	<p>Wind is too strong; gas to air mixture is disturbed.</p> <p>Inner megaphone not out or partially pulled out.</p> <p>Gas valve is partially blocked.</p>	<p>Place the Zon cannon down wind or place it out of wind or behind a screen.</p> <p>Pull out to full extension.</p> <p>Open up blockage using thin wire of approx. 0.6 mm diameter or welding tip cleaner.</p>
Leaks	<p>The coupling nut on the gas regulator is not tight enough.</p> <p>The hose from the regulatory-unit to the Zon cannon has been damaged.</p>	<p>Tighten coupling nut</p> <p>Replace the hose</p>

APPENDIX 1 - CLEANING ELECTRODE AND GROUND WIRE



Figure 1. Corrosion of rear cover and electrode. Remove electrode from rear cover.



Figure 2. Corrosion of rear cover and ground wire. Remove ground wire from rear cover.

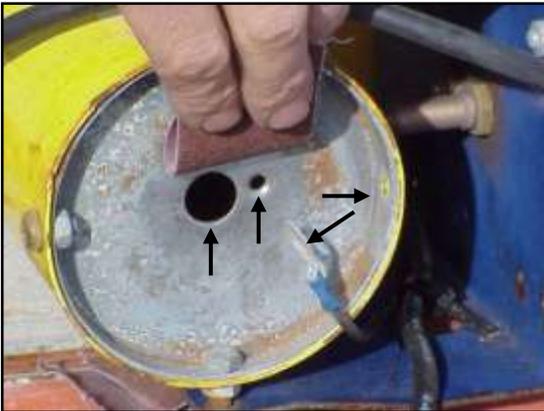


Figure 3. Cleaning points. Use emery cloth or similar material to remove any rust or corrosion from these key points.



Figure 4. Corrosion on electrode. Use a wire brush, emery cloth or similar abrasive material to remove corrosion from point where electrode contacts the rear cover.



Figure 5. Clean contact points.