



8424 / 8425 / 8427 / 8429 / 8434 / 8435 / 8437 / 8439

4/5/7/9 ZONE Electronic Controller



Your Nelson 4, 5, 7, or 9 ZONE Electronic Irrigation Controller is a solid-state controller for underground sprinkler systems.

The unit features an LCD (Liquid Crystal Display) which shows all programmed information when requested as well as the operational status of the controller. True dual programming is provided. Any zone can be assigned to one or both programmed day schedules. The controller can be set to water on specific days, every second day or every third day.

Other features include manual start or stop cycle, manual operation of a single zone, manual actuation of a syringe or test cycle, a rain button which allows cycle shut-off in rainy weather without affecting the resident programs, and a pump/master circuit that can be utilized without eliminating an irrigation zone.*

You will find a condensed version of the programming instructions on the inside of the unit cover. We recommend, however, that you read the complete instructions in this operating manual before attempting to program your controller.

* Pump feature not available on the 8424 or 8434 models.

MODELS

- 8424-4 ZONE (Indoor Case)
- 8425-5 ZONE (Indoor Case)
- 8427-7 ZONE (Indoor Case)
- 8429-9 ZONE (Indoor Case)
- 8434-4 ZONE (Weather Resistant Case)
- 8435-5 ZONE (Weather Resistant Case)
- 8437-7 ZONE (Weather Resistant Case)
- 8439-9 ZONE (Weather Resistant Case)

INSTALLATION INSTRUCTIONS

Cabinet Mounting - 8424, 8425, 8427, 8429 Indoor Case

Find an indoor location to install your Nelson 4, 5, 7, or 9 ZONE Electronic Irrigation Controller near a 110V (220V for "E" versions) outlet. The enclosed mounting template will help you locate mounting points. Situate the unit on the wall at eye level.

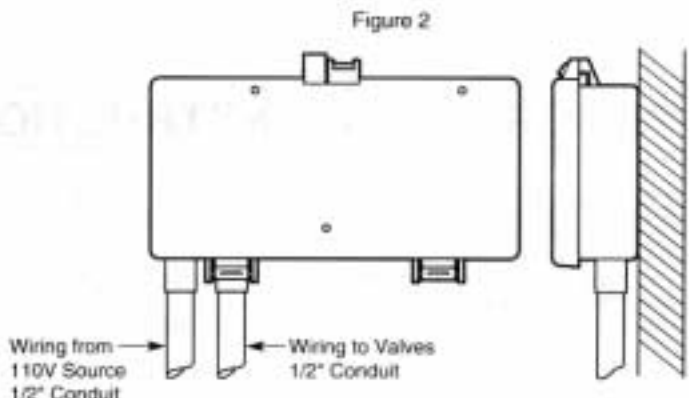
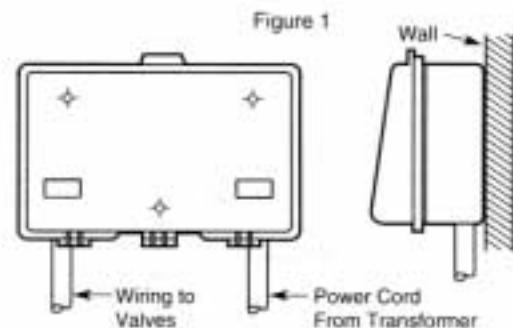
Drill two pilot holes where indicated on the template and drive screws into the wall leaving about 1/8" exposed. Hang the controller on the screws using the two keyhole slots in the back of the unit. If you think the controller needs a more secure mounting, open the face panel and insert a third screw through the hole in the bottom center of the case back. See Figure 1.

To open the face panel, loosen the screw at the top center of the panel until it is almost out. Grip the screw head and pull outward to bring the panel forward and down.

Cabinet Mounting - 8434, 8435, 8437, 8439 Weather Resistant Case

Install your 4, 5, 7, or 9 ZONE Electronic Irrigation Controller in a location indoors or outdoors that is near valve wires and a 110V (220V for "E" versions) wiring source. Locate the unit near eye level if possible. Attach unit to wall using the three screw guides behind the face panel in the back of the case. Use the template in the back of this manual to pre-drill holes in the wall. Punch or drill through plastic before using screws. See Figure 2.

To open the face panel, loosen the screw at the top center of the panel until it is almost out. Grip the screw head and pull outward to bring the panel forward and down.



INSTALLATION INSTRUCTIONS

Valve Wiring - All Models

CAUTION: Complete all wiring and installation before plugging in or wiring the transformer. This will prevent any accidental wiring short from damaging the controller or transformer.

Complete all wire, valve and pipe installation up to the controller unit. To wire the controller, open the controller panel by pulling on the loosened screw and insert valve wiring through the hole in the bottom of the case. On indoor models you may either run the wires through the slots in the back or attach them to the slots using wire ties.

Attach the proper valve control wire to the screw-type terminal strip located on the back of the panel on the printed circuit board. The terminal strip contains a common circuit for all valves, numbered terminals for each valve, and a pump/master valve relay.* See Figure 3.

If you are planning to use a pump or master valve, insert the wire from the pump or master valve in the last position on the terminal strip marked with a "P". The pump circuit can operate a solenoid with .8 amp surge current and .250 amp operating current.

* Pump feature not available on the 8424 or 8434 models.

Transformer Wiring - 8424, 8425, 8427, 8429 Indoor Case

To wire the transformer which supplies the valve control power, bring one end of the wire through the right side of the case, around the strain relief, and attach the two leads to the two tab-type connectors located between the terminal strip and the fuse. It does not matter

which wire is attached to which tab. Fasten the other end of the wire to the two screws on the transformer. Do not plug in the transformer yet. If you need more than the six feet of wire provided use #18x2 lamp cord.

Transformer Wiring - 8434, 8435, 8437, 8439 Weather Resistant Case

CAUTION: Disconnect 110V (220V for "E" versions) power source before wiring transformer.

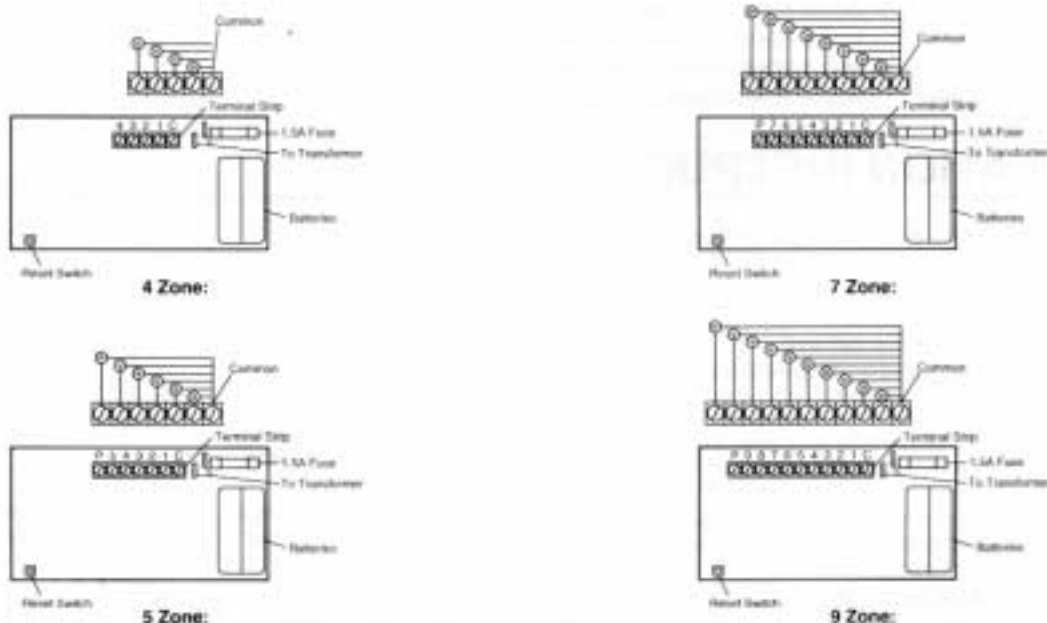
Remove transformer cover using screw at the top of the cover. Bring 110V (220V for "E" versions) wires up through 1/2" conduit into the left hole in the bottom of the case. Attach to transformer wires using wire nuts. Also insure earth ground wire is attached. Replace transformer cover. Do not turn on power yet.

Getting Started - All Models

Insert two AA Alkaline batteries in the battery holder in the back panel. **BATTERIES MUST BE INSTALLED FOR THE CONTROLLER TO OPERATE.** Confirm that the transformer or 110V (220V for "E" versions) power is disconnected. **FAILURE TO DO THIS WILL BLOW THE ZONE LINE FUSE.** With power disconnected, press the reset switch to assure the controller is ready for operation.

Close the panel being sure not to damage wires. If wires are stiff, you may find it helpful to pre-bend them. Tighten the panel screw to hold the panel in place. Plug in the transformer or turn on power source.

Figure 3



PROGRAMMING INSTRUCTIONS

Your Nelson, 4, 5, 7 or 9 ZONE Electronic Irrigation Controller is simple to program. The following instructions will guide you through every step.

Looking at the front panel, you see the LCD readout and 20 color coded keys. Blue keys are for functions, yellow keys are for data - numbers and days, purple keys are for special operations - manual

override or am/pm selection, and the white key enters information. Programming will always be easy to do if you remember: **programming an instruction is a flow from blue to yellow to purple keys and, lastly, using the white key to enter the instruction step.**

PROGRAMMING INSTRUCTIONS

AUTOMATIC OPERATION



Set current day

Press the blue **TODAY** key on the panel, then the yellow key which corresponds to today, and then press the white **ENTER** key. Today's day has now been entered and is shown by a bracket under the appropriate day name on the display.



Set time of day

Press the blue **TIME** key, then press the appropriate yellow number keys to enter the present hour and minutes. The numbers will be displayed. Next set AM or PM by pressing the purple **AM PM** key once or twice. The AM and PM setting will toggle back and forth with each press. Lastly, press the white **ENTER** key to set this time.



Set zone run time

A run time is the duration each zone will run (in zone order) at a given time (see next section). To set a run time, press the blue **ZONE** key. The display will show "ZONE____" with the underline flashing. Press the numbered yellow key corresponding to the zone number. The display will show that zone number and the current programmed run time for the zone. Press the yellow keys to change the run time to any amount between 0 and 999 minutes. Lastly, press the white **ENTER** key to set this run time for the zone.

Repeat for each zone that is desired on the same watering day schedule (i.e., in the same program).

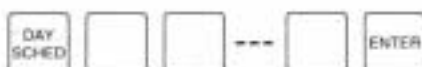


Set start times

A start time is the time of day the controller will begin the run time. Zone one will begin at the start time and each subsequent zone in the program will follow. You do not set a start time for each zone. You can program up to three start times a day. To set the first start time, press the blue **START TIME** key. The display will show "START TIME____" with the underline flashing. This is prompting you to enter the start time number. Press the yellow key numbered 1 for start time one. The display will flash the currently programmed start time number and start time. You may now enter the desired time to start watering by pressing the yellow number keys, followed by pressing the purple **AM PM** key once or twice for AM or PM. Lastly, press the white **ENTER** key to add it into the program.

Repeat the above sequence for start times two and three. Instead of pressing "1" when the display prompts you with the flashing underline, press yellow key 2 or yellow key 3 for start time two or three. You will typically need a 2nd or 3rd run time on newly planted material or on newly planted slopes.

A start time can be omitted if desired. Press the blue **START TIME** key followed by the start time number. The start time will flash on the display. Press the yellow 0 key. The start time will change to ---, indicating no start time. Lastly, press the white **ENTER** key, to record the omitting of the start time.



Set day schedule

Press the blue **DAY SCHED** key. The display will show the programmed day schedule with raindrops flashing under the days of the week and "2nd" and "3rd." Use the yellow keys with day names to switch a particular day on or off.

A visible raindrop symbol on the display indicates a watering day. No raindrop, no watering that day. When you've entered the schedule you want and it shows on the display, press the white **ENTER** key to save the day schedule.

To set an every other day schedule, press the **DAY SCHED** key, then the yellow 2nd key. A raindrop will flash under "2nd" on the display and all other raindrops will disappear. Press the white **ENTER** key to record this every other day schedule. The present day will be the first watering day of the schedule.

Setting an every third day watering schedule is done in the same sequence as described for the second day schedule above. Press the blue **DAY SCHED** key, then the yellow 3rd key, then the white **ENTER** key.



Switch to other program

The run times, start times and day scheduling described in the previous steps were for one program, A. A totally different program can be entered for any or all of the zones. This controller offers dual programming which, in effect, makes it two controllers in one. Zones needing a different day schedule, run time and/or start times can be entered in the B program.

Press the blue **DAY SCHED** key. The day schedule will be flashing on the display, indicated by raindrops, but also an "A" or "B" after "PROG" will be flashing. Press the yellow A/B key to switch between programs. Note the day schedule displayed is for the program indicated by "A" or "B."

To set up the second program, repeat the steps for setting zone run times, start times and the day schedule. Remember, any zone can be in program A or B. A zone can be in both programs with different run times and a zone can be omitted from either or both programs.

NOTE: Ensure that run times do not overlap between programs. If two zones are scheduled with the same start time, or their run times overlap, only program A zone will run.

IMPORTANT: If a zone is not used in a program it is important to "zero" the run time for that zone in the program.

Typically, if two programs are used, (i.e. different plant materials) one schedule is for the lawn and the other for the shrubs and bushes.



Turning the system off temporarily

Pressing the purple **OFF RAIN** key suspends all watering cycles and the display will show "OFF" at the upper right. When you are ready for the controller to resume operating, press the key again, the controller will resume the preselected program and the display will indicate "AUTO." In this way you can temporarily turn the system off in rainy weather or if maintenance is required on a watering day.

PROGRAMMING INSTRUCTIONS

MANUAL OPERATION



Turn zone on

In order to turn on a particular zone manually, press the blue **ZONE** key. Then press the zone number using the yellow keys. If the flashing run time needs to be changed, enter the desired time. Finally press the purple **MAN ON/OFF** key.

While running, the remaining run time minutes will count down. When completed, the controller will return to automatic operation. Stored run times will not be changed by manual procedure.



Turn zone off

To turn off a zone which is operating, press the purple **MAN ON/OFF** key.



Run a test or syringe cycle

To run each programmed zone, whether in program A or B, for three minutes, press the blue **ZONE** key followed by the purple **MAN ON/OFF** key. This lets you check system operation or flush system lines at the start of the season.

SEMI-AUTOMATIC OPERATION



Start a complete cycle

To start a complete automatic cycle, press the purple **START STOP CYCLE** key. The complete irrigation schedule will start for the program indicated on the display, either A or B.

If the alternate irrigation cycle is desired, first change the displayed program by pressing the blue **DAY SCHED** key followed by the yellow A/B key. Then, press the purple **START STOP CYCLE** key.

NOTE: It is not unusual for there to be a 10 second delay between starting a cycle (manually or automatically) and the actuation of the valve.

HELPFUL HINTS

Batteries

Your controller requires two AA alkaline batteries for operation. Some of the electronics are on a different circuit than the 110V (220V for "E" versions) transformer. This separation helps protect the battery-driven components from power surges and voltage spikes. The batteries should last over two years.

When the batteries weaken, the display will automatically flash "BAT" to let you know they should be changed within the next one to two months.

You are allowed about thirty seconds to change the batteries without affecting the program in memory. It's quicker to change one battery at a time. If the display shows wrong information or the keys don't respond, disconnect the transformer, press the reset switch on the printed circuit board near the batteries, and reprogram.

NOTE: The controller does a battery check once a day at midnight so "BAT" will continue to flash until midnight.

Programming points

You can check stored information at any time. Simply press the blue function key and the yellow keys needed to review the requested information. The display will flash the data for fifteen seconds before returning to the current status display. Information can't be changed without using the white ENTER key.

Zone display: Whenever a zone is running, the zone number and the remaining run time will be displayed. However, this won't interfere with any programming you wish to do.

Six start times: If you're not using dual programming, you can

program up to six start times. Simply enter the same day schedule and zone run times that you have in program A into program B. By using three start times in each program you'll have a total of six.

Complete the cycle: A watering cycle will always run to completion before an automatic start will occur. Any zone operating on manual will also prevent a start. All zones must be off for an automatic start to take place, thereby making certain a watering cycle will run to completion.

One zone at a time: Only one zone will operate at any one time to avoid depleting your water supply which would, in turn, hinder system operation. If program A and B have overlapping cycles, only Program A will run.

Special features:

Reset switch: You can reset the programming at any time by disconnecting the transformer or 110V (220V for "E" versions) source and then pressing the reset switch on the back panel near the batteries. This will erase all previous programming.

Removable panel: The panel can be removed from the case if repairs are needed. Detach wiring and drop the panel 90 degrees relative to the closed position and pull outward. The panel will snap off the hinge pin.

TECHNICAL DATA

1. Transformer

North America:

117 VAC, 60 Hz, U.L. Listed, CSA Approved, 20VA, Class 2 transformer with 24 VAC secondary.

Europe and Australia:

230 VAC, 50 Hz, 20VA, Class 2 transformer with 24 VAC secondary.

2. Fuse:

1.5 amp fuse for zone lines.

3. Terminal Strip:

All zones, common, and pump/manual circuit hookup to the printed circuit board.

4. Pump/Master Circuit:

The pump/master circuit is rated to accept a solenoid with .8 amp surge current, and .250 amp operating current. The circuit is located on the terminal strip in the last (left) position that is marked with a "P" (not available on models 8424 and 8434).

5. Zone Lines:

Each zone is capable of operating two (2) solenoids sized for 0.24 amps at 24V/AC holding and 0.48 amps inrush. With a pump/master circuit installed, the recommended load per zone is 1 valve of a 7900 series or equivalent. This will insure proper operation of the pump and zones even at low voltage conditions.

There is a six second delay between a zone turning off and the next zone turning on.

Recommended wire size is 14-20 AWG solid.

6. Temperature Range:

All components to operate at -20°C (-4°F) to +70°C (+160°F).

7. Display:

A large, 4.4" x 0.4" Liquid Crystal Display with time, start time, run time, zone number, today's day, day schedule and mode indication.

8. Batteries:

The unit requires two (2) AA Alkaline batteries. The program will be retained for about thirty (30) seconds when changing batteries.

9. Programming:

- Dual programming.
- Each zone can be programmed for 1 to 999 minutes run time in one minute increments.
- Different day schedule with each program, A or B.
- The same zone can have different run times on each of the two programs.
- Three start times per program.
- Day schedules can be set on a weekly basis with selected days on and off or every second or third day watering.
- Four zones (8424 or 8434)
- Five zones with one pump/master valve control. (8425 or 8435)
- Seven zones with one pump/master valve control. (8427 or 8437)
- Nine zones with one pump/master valve control. (8429 or 8439)

10. Default Program (resident after reset):

- The time of day is 12:00 AM, Monday.
- Program A, zones one through four, five, seven or nine each with ten minutes, start time one is 6:00 AM, start times two and three are omitted, day schedule is every second day.
- Program B, zones one through four, five, seven or nine with zero minutes, start times one, two and three are omitted, day schedule is every second day.

TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
Automatic cycle does not begin at set start time	<ul style="list-style-type: none"> • AM/PM set wrong • In rain mode • Today is non-watering day • Another cycle overlaps so start cannot occur • Was running manually at time of start 	<ul style="list-style-type: none"> • Enter correct time • Press ON/OFF RAIN • Correct day schedule or today's day • Change start times • Do not run manually at start time
Zone display on but valve off	<ul style="list-style-type: none"> • Fuse blown • No voltage to transformer • Broken wire to valve • Bad transformer (no 24V common to valve) • Bad valve 	<ul style="list-style-type: none"> • Replace fuse • Fix power to transformer • Fix wiring to valve • Replace transformer • Replace valve
Zone(s) run when not expected	<ul style="list-style-type: none"> • Zone(s) in other program • AM/PM set wrong 	<ul style="list-style-type: none"> • Omit zone(s) from other program • Enter correct time
Display is off or has scrambled segments and/or reset won't work	<ul style="list-style-type: none"> • No batteries • Weak batteries • Corroded battery contacts 	<ul style="list-style-type: none"> • Install batteries and reset • Replace batteries and reset • Clean battery contacts and reset
Keyboard dead or reacts strangely	<ul style="list-style-type: none"> • A key is stuck in pressed position 	<ul style="list-style-type: none"> • Release key
Display is black	<ul style="list-style-type: none"> • Display is hot 	<ul style="list-style-type: none"> • Let display cool off

FCC RULES

This electronic irrigation controller generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this controller does cause interference to radio or television reception, which can be determined by turning the controller off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna

Relocate the controller with respect to the receiver

Move the controller away from the receiver

Plug the controller into a different outlet so that controller and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Stock No. 004-000-00345-4.

CANADIAN RADIO INTERFERENCE REGULATIONS

NOTE: This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian Department of Communications.

WARRANTY

Limited Warranty

L.R. Nelson Corporation ("Nelson") warrants all Nelson products (except electronic products), to be free of defects in material and workmanship for a period of five (5) years from the original date of purchase. Electronic products are warranted for two (2) years. In the event of such defects, Nelson will repair or replace, at its option, the product or the defective part.

This warranty does not extend to damage to a Nelson product or part resulting from accident, misuse, alteration, neglect, abuse, improper installation or normal wear and tear, or to exterior appearance and color. This warranty extends only to the original user of the Nelson product.

If defect arises in a Nelson product or part within the warranty period, you should contact your Nelson retailer, distributor, or L.R. Nelson Corporation at one of the following locations:

One Sprinkler Lane
Peoria, IL 61615
(888) NELSON-8
Fax (309) 692-5847

1961 Miraloma Ave.
Suite B
Placentia, CA 92670
(800) 800-0993
Fax (714) 993-0496

3462 Maggie Blvd.
Orlando, FL 32811
(800) 743-1020
Fax (407) 648-0924

Nelson may, at its option, require that product or part be returned to a Nelson service point or your retailer or distributor. Nelson will determine whether the claimed defect is covered by the warranty. If coverage is found, the product will be repaired or replaced. Please allow 4 to 6 weeks for completion of repairs or replacement and return of the product or part. If a product or part is replaced, the replacement is warranted only for the remainder of the original product or part warranty period.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. L.R. Nelson Corporation does not authorize any person to create for it any other obligation or liability in connection with Nelson Products.

TO THE EXTENT ALLOWED BY LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE APPLICABLE TO THE NELSON PRODUCTS IS LIMITED IN DURATION TO THE DURATION OF THESE WRITTEN WARRANTIES. NEITHER L.R. NELSON CORPORATION NOR ITS DISTRIBUTORS OR DEALERS SHALL BE LIABLE FOR LOSS OF TIME, INCONVENIENCE, ECONOMIC LOSS, OR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE SALE OR DISTRIBUTION OF NELSON PRODUCTS WHETHER FOR BREACH OF WARRANTY HEREUNDER OR FOR NEGLIGENCE OR IN TORT. Some states do not allow limitations on how long an implied warranty will last or the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

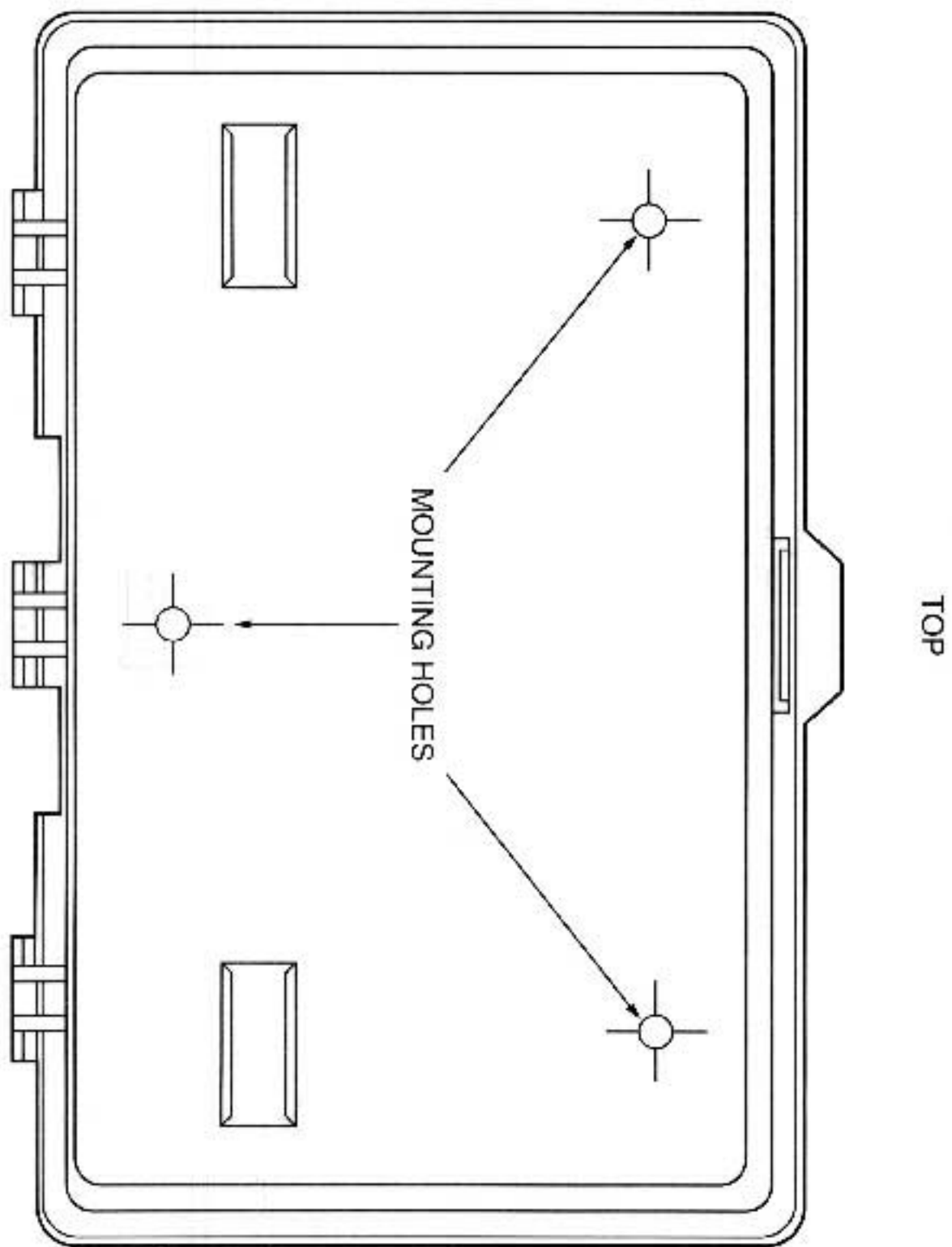
If you have any questions concerning the warranty or its application, please write to L.R. Nelson Corporation, One Sprinkler Lane, Peoria, Illinois 61615, U.S.A. Attention: Customer Service.

CLAIMED DEFECTIVE MERCHANDISE POLICY

Products returned to the retailer or distributor and claimed defective must be inspected by the Nelson sales representative to determine warranty compliance. If approval is granted, products will be repaired or replaced or a credit memorandum covering the net purchase price will be issued.

MOUNTING TEMPLATE – 8424, 8425, 8427, 8429 – Indoor Case

Mount unit at eye level



MOUNTING TEMPLATE – 8434, 8435, 8437, 8439 – Weather-Resistant Case

