EL/GL Series - Mach 3

ML200 User Guide

Note regarding EL and GL systems: Mach 3 EL and GL systems function identically, but conform to different International requirements. This user guide will refer to EL systems for the sake of simplicity, but the information given applies to both EL and GL products.

Balboa Instruments, Inc.
ISO 9001
A6159

Balboa Instruments Incorporated

EL/GL SERIES (Mach 3) CONTROL WITH ML200 PANEL

The ML200 panel can be used as a main panel with the EL2000 and EL1000 systems, but only as a remote/additional panel for the EL8000 and EL5000 systems. This reference card lists all features that are available. Your spa may not respond as described in this document as specific operation varies by system and equipment used. If your spa is not fully equipped, the panel buttons on your spa control may not be laid out as shown. Functions not accessible by this panel may be accessible by a larger panel such as the ML700 or the ML900. One such example: This panel can be used with EL2000 systems equipped with two pumps plus a blower, but the blower cannot be controlled with this panel unless the system does not have a pump 2. In this case, the blower can be controlled with an optional auxiliary panel.

The pump responsible for heating and filtration (pump 1 low on non-circ systems, or the circ pump on circ systems) will be referred to simply as the pump.

Timeouts refer to a preset length of time that a function is programmed to operate before shutting off automatically. Certain conditions (filters or freeze) can cause a function to operate longer, while faults can cause a function to operate for a shorter length of time. The system keeps track of timeouts regardless of other conditions occurring.

In multi-button sequences, if buttons are pressed too quickly in sequence, they may not register.

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Initial Start-up

When your spa is first actuated, it will go into Priming mode (after displaying some configuration information). **Please see the M-7 Installation Instruction Manual for complete instructions on Power-up and Pump Priming.**

The Priming mode will last for up to 4 minutes and then the spa will begin to heat and maintain the water temperature in the Standard mode. You can exit Priming mode early by pressing “Temp”.

Temp Set (80°F - 104°F / 26.0°C - 40.0°C)

The last measured temperature is constantly displayed on the LCD.

Note that the last measured spa temperature displayed is current only when the pump has been running for at least 1 minute.

Temp

Press the "Temp" button once to display the set temperature. To change the set temperature, press the pad a second time before the LCD stops flashing. Each press of the "Temp" button will continue to either raise or lower the set temperature.

If the opposite direction is desired, release the pad and let the display revert to the current water temperature. Press the pad to display the set temperature, and again to make the temperature change in the desired direction.

After three seconds, the LCD will automatically display the last measured spa temperature.

Mode

A button combination is used to switch between standard, economy, and sleep modes. Press "Temp" followed by "Light" to enter mode programming, press "Temp" to cycle through to desired mode (LCD flashes until confirmed), then press "Light" to confirm selection.

Standard mode maintains the desired temperature. Note that the last measured spa temperature displayed is current only when the pump has been running for at least 1 minute. "Std" will appear on the display momentarily when you switch into Standard Mode.

Economy mode heats the spa to the set temperature only during filter cycles. "Ecn" will appear solid when the temperature is not current and will alternate with the temperature when the temperature is current.

Pressing "Jets" while in Economy mode puts the spa in **Standard-In-Economy mode,** ("SE") which operates the same as Standard Mode, then reverts to Economy Mode automatically after 1 hour. During this time, pressing "Temp" followed by "Light" will revert the mode to Economy immediately.

Sleep mode heats the spa to within 20°F (11°C) of the set temperature only during filter cycles. "SLP" will appear on the display until mode is changed.

Standby Mode

Pressing "Temp" followed by "Aux" or "Jets 2" or "Blower" will turn off all spa functions temporarily. This is helpful when changing a filter. Pressing any button exits Standby mode. On some systems the "Jets" button will control the pump in Standby Mode ("Drain Mode"). In this case, press any other button to exit. System will revert to previous mode after 1 hour.

Jets

Press the "Jets" button once to turn pump 1 on or off, and to shift between low and high speeds if equipped. If left running, the pump will turn off after a timeout period. The pump 1 low speed timeout on some systems may be as long as 4 hours.

On non-circ systems, the low speed of pump 1 runs when the blower or any other pump is on. It may also activate for at least 1 minute every 30 minutes to detect the spa temperature (polling) and then to heat to the set temperature if needed, depending upon mode. When the low speed turns on automatically, it cannot be deactivated from the panel; however, the high speed may be started.

Jets 2 (optional on some systems)

If your system has a second pump but your panel does not have a "Jets 2" button, use the "Aux" button to control pump 2.

Press the "Jets 2" button once to turn pump 2 on or off, and to shift between low and high speeds if it is a two-speed pump. If left running, the pump will turn off after a timeout period.

Blower (optional on some systems)

If your system has a blower (and only one pump), but your panel does not have a "Blower" button, use the "Aux" button to control the blower.

1-speed operation: on/off;
2-speed operation: med/hi/off; or
3-speed operation: lo/med/hi/off.

If left on, the blower will automatically turn off after a timeout period.

Circ Pump (optional)

If your system is equipped with a circ pump, it may be configured to work in one of three different ways:

1) The circ pump operates continuously (24 hours) with the exception of turning off for 30 minutes at a time when the water temperature reaches 3°F (1.5°C) above the set temperature (most likely to happen in very hot climates).

2) The circ pump stays on continuously, regardless of water temperature.

3) The circ pump will come on when the system is checking temperature (polling), during filter cycles, during freeze conditions, or when another pump is on.

Light

Some systems are equipped with both a spa light and a fiber optic light; however, only one can be accessed by this panel. (Larger panels may be purchased so that both the spa light and fiber optic light can be utilized.) Depending upon how your spa is equipped and configured, the "Light" button will operate in one of three ways:

1) Press the "Light" button to turn the spa light on and off, and to shift between dim and bright settings if your light is dimmable.

2) If a fiber-optic light with wheel is installed, press the "Light" button once to start the light and wheel, press it again to stop the wheel, and then again to turn the light off.

3) If a fiber-optic light without a separate wheel stop is installed, press the "Light" button to turn it on and off.

Again, both a spa light and a fiber optic light may be used simultaneously on the EL8000 and EL5000 systems with a different panel.

If any light is left on, it will automatically turn off after a factory programmed time period.

Ozone (optional)

On most systems, the ozone generator (if installed) runs during filter cycles (except when pump 1 is operating at high speed on a non-circ system) and during clean-up cycles. On some systems, the ozone generator operates whenever the pump runs.

If your system is configured with the optional ozone suppress feature, the ozone generator will turn off for 1 hour any time a function button (Jets, Jets 2, Blower, etc.) is pressed.

Clean-up Cycle (optional)

When a pump or blower is turned on by a button press, a clean-up cycle begins 30 minutes after the pump or blower is turned off or times out. The pump and the ozone generator will run for one to four hours, depending on the system (on some systems, you can change this setting; see User Preferences section.)

Freeze Protection

If the temperature sensors within the heater detect a low enough temperature, then the pumps and the blower automatically activate to provide freeze protection. The equipment stays on for at least 4 minutes, and until the sensors detect that the spa temperature is warm enough. In colder climates, an optional additional freeze sensor may be added to protect against freeze conditions that may not be sensed by the standard sensors. Auxiliary freeze sensor protection acts similarly except with the temperature thresholds determined by the switch and without a 4-minute delay in turnoff. See your dealer for details.

Locking Features

If this panel is used as a remote or additional panel, it will lock when the main panel is locked. To unlock this panel, unlock the main panel.

In the same way, the set temperature can be locked and unlocked by a main panel. When the set temperature is locked, it cannot be changed from either panel.

Preset Filter Cycles

On all systems, the pump and the ozone generator will run during filtration. At the start of each filter cycle, the blower will run briefly on its highest speed to purge the air channels. The lowest speed of any other pumps and the mister will also run briefly. On some circ systems, pump 1 may also run for the duration of the filter.

(Note: This panel cannot be used to program filter cycles for systems that are programmed by time rather than by duration. For these systems, a larger panel is needed and the following description does not apply.)

The first filter cycle ("day") begins 6 minutes after the spa is powered up. The second filter cycle ("night") begins 12 hours later. Filter duration is programmable for 1-12 hours ("F 1"-"F 12"). The default filter duration can vary from system to system. To program, press "Temp" then "Jets." Press "Temp" to select the filter duration. Press "Jets" to select the number of filter cycles. The display will show "dn" (both "day" and "night" cycles); "d" (day cycle only); or "n" ("night" cycle only). Press "Temp" to adjust, then press "Jets" to exit the programming mode. For continuous filtration, use "F 12" and "dn".

Displaying Information About Your Spa

There are several pieces of information about your spa that can be called up from the panel, but are only needed in special cases.

To access this information, press "Temp" then "Jets", then "Light". (Each press must be within 3 seconds of the previous press.) Then press "Temp" until you see "S Id" on the display. Press "Jets" to see the SSID (a series of 3 numbers, such as 100 133 10, which indicates the precise revision of the software in your spa), followed by the Mach software version number (such as 2.1), followed by "CSn" and then your spa's network ID number (consisting of both letters and digits displayed in 5 steps).

If you need to see this series of numbers again, and "S Id" is once again on the display, just press "Jets" again.

When done, press the "Light" button (more than once if necessary) until you see the normal temperature display.

User Preferences

There are several aspects of spa operation that you can customize using the User Preferences submenu.

Press "Temp" then "Jets", then "Light". (Each press must be within 3 seconds of the previous press.) At this point, if "USr" is not showing on the display, press "Temp" until you see "USr" on the display. Then press "Jets" to enter the User Preferences submenu.

Once in the User Preferences submenu, press "Temp" to cycle between these settings:

Sr – Suppress Reminders
When set to "Sr.Y", reminders are never displayed on the panel. When set to "Sr.n", reminders are displayed on the panel periodically.

tc – Temperature in Celsius
When set to "tc.Y", temperatures are displayed on the panel in degrees Celsius. When set to "tc.n", temperatures are displayed in Fahrenheit.

24 – 24-hour Time Display
When set to "24.Y", time is displayed in 24-hour (military) format (00:00 is midnight, 23:00 is one hour before midnight). When set to "24.n", time is displayed in 12-hour (am/pm) format (12:00 is midnight, 11:00 pm is one hour before midnight).

cc – Clean-up Cycle Duration (some systems only)
When set to "cc.0", Clean-up Cycles are disabled. When set to "cc. 1" through "cc.4", the number indicates how many hours each Clean-up Cycle will run.

Ad – Dolphin II Address
When set to "Ad.0", no addressing is used. Use this setting for a Dolphin I, or for a Dolphin II which is set for no address (which is the Dolphin II factory default). When set to "Ad. 1" through "Ad.7", the number is the address (see your Dolphin II manual for details).

Editing User Preferences

View the setting.

The left two characters (before the decimal point) tell you what setting you're viewing or editing, the right most character (after the decimal point) tells you the value of that setting (for example, ".Y" for Yes or ".n" for No).

If the value is flashing, you're editing it. If the value is not flashing, you're just viewing it.

Press "Jets" to switch editing of the value on (flashing) or off (not flashing).

Once you're editing the value (it's flashing), use the "Temp" buttons to change the value to the one you want.

After you change the value, you must press "Jets" again to stop the flashing before the change will register, and before you can view or edit another setting.

If you don't interact with the menu for more than 30 seconds, it may time out.

If you press "Light" to back out of the menu, or pause long enough for it to time out, while a value was flashing, the changes you were making to that setting are not remembered. But changes you previously made to other settings will be in effect.

Any User Preferences that you change will stay in effect "forever" or until you change them again (unless the spa's "persistent memory" is reset by a service technician), and will override the factory defaults for those settings.

Note: If your spa has additional functions not listed here, please refer to the section *Optional Auxiliary Panels* as listed in the Table of Contents.

Periodic Reminder Messages (Press the "Temp" button to reset a displayed reminder.*)

Message **	Frequency ***	Action Required
rPH	Every 7 days	Test and adjust pH chemical levels per manufacturer's instructions.
rSA	Every 7 days	Test and adjust sanitizer chemical levels per manufacturer's instructions.
rCL	Every 30 days	Remove, clean, and reinstall filter per manufacturer's instructions.
rt9	Every 30 days	Test & reset GFCI per manufacturer's instructions.
rdr	Every 90 days	Drain and refill spa per manufacturer's instructions.
rCO	Every 180 days	Clean and condition cover per manufacturer's instructions.
rtr	Every 180 days	Clean and condition wood per manufacturer's instructions.
rCH	Every 365 days	Install new filter.
rCA	As needed	Install new Mineral cartridge.

* User can suppress all reminders in User Preferences.

** All of these Periodic Messages can be disabled individually by the spa manufacturer.

*** Any of these frequencies may be changed by the spa manufacturer.

Note: The GFCI section does not apply on EL systems used outside the United States. This GFCI section does not apply to GL Systems.

GFCI Protection

Your spa may be equipped with a GFCI Protection feature. If your spa does have this feature enabled, the GFCI Trip Test must occur to allow proper spa function.

Within 1 to 7 days after startup, the spa will trip the GFCI to test it. (The number of days is factory programmed.) The GFCI must be reset once it has been tripped. After passing the GFCI Trip Test, subsequent GFCI trips will indicate a ground fault or other unsafe condition requiring the power to the spa to be shut off.

Warning: The Owner should test and reset the GFCI on a regular basis to verify its function.

GFCI Trip Test Procedure

The installer can cause the GFCI Trip Test to occur sooner by initiating it with the following button sequence.

Press "Temp", then "Jets", then "Light." (Each press must be within 3 seconds of the previous press.) Press the "Temp" button repeatedly until "9FC" is displayed. Press "Jets" to select it. Press the "Temp" button until "9t.n" is displayed. Press "Jets" to initiate the GFCI Trip Test.

The GFCI should trip within several seconds and the spa should shut down. If it does not, shut down the power and manually verify that a GFCI breaker is installed and that the circuit and spa are wired correctly. Verify the function of the GFCI with its own test button. Restore power to the spa and repeat the GFCI Trip Test.

Once the GFCI is tripped by the test, reset the GFCI and the spa will operate normally from that point. You can verify a successful test by navigating to the "9FC" item as described above, pressing "Jets" and then pressing the "Temp" button until you see "95.P". The code signifies GFCI Status - Passed.

The system will exit this menu in 30 seconds if no buttons are pressed.

Diagnostic Messages

Message	Meaning	Action Required
	No message on display. Power has been cut off to the spa.	The control panel will be disabled until power returns. Time of day will be preserved for 30 days with a battery back-up on EL8000 and EL5000 systems. EL1000 and some EL2000 systems reset the time of day on each power-up. Spa settings are preserved on all systems.
OHH	"Overheat" - The spa has shut down.[1] On some systems, an alarm may sound. One of the sensors has detected 118°F (approximately 47.8°C) at the heater.	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. Once the heater has cooled, reset by pushing any button. If spa does not reset, shut off the power to the spa and call your dealer or service organization.
OHS	"Overheat" - The spa has shut down.[1] One of the sensors has detected that the spa water is 110°F (approximately 43.3°C).	DO NOT ENTER THE WATER. Remove the spa cover and allow water to cool. At 107°F (approximately 41.7°C), the spa should automatically reset. If spa does not reset, shut off the power to the spa and call your dealer or service organization.
ICE	"Ice" - Potential freeze condition detected.	No action required. The pumps and the blower will automatically activate regardless of spa status.
SnA	Spa is shut down.[1] The sensor that is plugged into the Sensor "A" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)
Snb	Spa is shut down.[1] The sensor that is plugged into the Sensor "B" jack is not working.	If the problem persists, contact your dealer or service organization. (May appear temporarily in an overheat situation and disappear when the heater cools.)
SnS	Sensors are out of balance. If this is alternating with the temperature, it may just be a temporary condition. If the display shows only this message (periodically blinking), the spa is shut down.[1]	If the problem persists, contact your dealer or service organization.
HFL	A substantial difference between the temperature sensors was detected. This could indicate a flow problem.	Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. Press any button to reset.
LF	Persistent low flow problems. (Displays on the fifth occurrence of the "HFL" message within 24 hours.) Heater is shut down, but other spa functions continue to run normally.	Follow action required for "HFL" message. Heating capacity of the spa will not reset automatically; you may press any button to reset.
dr	Inadequate water detected in heater.	Check water level in spa. Refill if necessary. If the water level is okay, make sure the pumps have been primed. Press any button to reset.
dry	Inadequate water detected in heater. (Displays on third occurrence of "dr" message.) Spa is shut down.[1]	Follow action required for "dr" message. Spa will not automatically reset; you may press any button to reset.
Pr	When your spa is first actuated, it will go into Priming mode.	See the M-7 Installation Instruction Manual for complete instructions on Power-up and Pump Priming. The Priming mode will last for up to 4 minutes and then the spa will begin to heat and maintain the water temperature in the Standard mode.

[1] On some systems even when spa is shut down, some equipment may occasionally turn on to continue monitoring temperature or if freeze protection is needed.

Diagnostic Messages (continued)

Message	Meaning	Action Required
--	Temperature unknown.	After the pump has been running for 1 minute, the temperature will be displayed.
Sby	Standby Mode has been activated by pressing a button combination on the user panel.	Press any button, except "Jets", to leave Standby Mode and return to normal operation.
Std	The spa is operating in Standard Mode.	Temperature display is current after pump has been running for at least 2 minutes.
Ecn	The spa is operating in Economy Mode.	"Ecn" will appear solid on the display when the temperature is not current. "Ecn" will alternate with the temperature when the temperature is current.
SE	The spa is operating Standard-in-Economy Mode.	Operates the same as Standard mode, then reverts to Economy mode after 1 hour. Press "Temp" followed by "Light" to switch directly to Economy mode.
SLP	Sleep Mode has been activated by pressing a button combination on the user panel.	"SLP" will appear solid on the display when the temperature is not current. "SLP" will alternate with the temperature when the temperature is current.
PHL	pH is low.	Add pH increaser according to manufacturer's instructions.
PHH	pH is high.	Add pH reducer according to manufacturer's instructions.
SAL	Sanitizer is low.	Add sanitizer according to manufacturer's instructions.
SAH	Sanitizer is high.	Remove spa cover and allow sanitizer to dissipate.
drn	The pump is on during Standby Mode to assist in draining the spa.	Press "Jets" to turn off the pump when water has drained (or power off the spa.)
rtC	Hardware failure.	Contact your dealer or service organization.
PSt	Hardware failure.	Contact your dealer or service organization if message appears on more than one power up.
CrC	Firmware install problem.	Contact your dealer or service organization if message appears on more than one power up.
CFE	Configuration error. Spa cannot start up.	Contact your dealer or service organization.
GF 1	Spa could not trip GFCI.	Contact your dealer or service organization. Continued operation may be unsafe.
StU	A pump appears to be stuck on, causing the water temperature to creep up, possibly to hazardous levels.	POWER DOWN SPA IMMEDIATELY. DO NOT ENTER THE WATER. Contact your dealer or service organization.
HOt	A pump appears to have been stuck on the last time spa was powered.	POWER DOWN SPA IMMEDIATELY. DO NOT ENTER THE WATER. Contact your dealer or service organization.

Optional Auxiliary Panels

Note: Below is a partial list of optional auxiliary panels and their basic functions.
Please contact for local dealer for a complete list of options that will work with your spa.

Jets 2 (optional on some systems)

Press the "Jets 2" button once to turn pump 2 on or off, and to shift between low and high speeds if it is a two-speed pump. If left running, the pump will turn off after a timeout period.

Jets 3, Jets 4 (optional on some systems)

Press the "Jets 3" button once to turn pump 3 on or off, and to shift between low and high speeds if it is a two-speed pump. If left running, the pump will turn off after a timeout period. "Jets 4" operates the same way as "Jets 3".

Jets 5, Jets 6 (optional on some systems)

Press the "Jets 5" button once to turn pump 5 on or off. If left running, the pump will turn off after a timeout period. "Jets 6" operates the same way as "Jets 5".

Mister (optional)

Press the "Mister" button to turn the Mister on and off. If left on, the mister will automatically turn off after 15 minutes.

Option (optional)

Press the "Option" button to turn optional equipment (such as TV or Stereo) on and off (with no timeout).

TV Lift (optional)

Press the "TV Lift" button to raise and lower the TV Lift device. There is no timeout for this feature.

Blower

1-speed operation: on/off;
2-speed operation: med/hi/off; or
3-speed operation: lo/med/hi/off.
If left on, the blower will automatically turn off after a timeout period.

Fiber (optional on some systems)

If a fiber-optic light with wheel is installed, press the "Fiber" button once to start the light and wheel, press it again to stop the wheel, and then again to turn the light off. The fiber icon stands still when the fiber-optic light is on by itself, and rotates when the color wheel is also on.

Both spa light and fiber-optic light can be used simultaneously on systems that have both. If either light is left on, it will automatically turn off after a timeout period (on some systems this timeout can be as long as 4 hours.)

Use the "Light" button if your fiber-optic system is on/off only (no separate wheel stop).

Warning! Qualified technician required for service and installation.

Basic Installation and Configuration Guidelines for Mach 3 EL-Series Spa Controllers.

Use minimum 6AWG copper conductors only.

Torque field connections between 21 and 23 in lbs.

Readily accessible disconnecting means to be provided at time of installation.

Permanently connected.

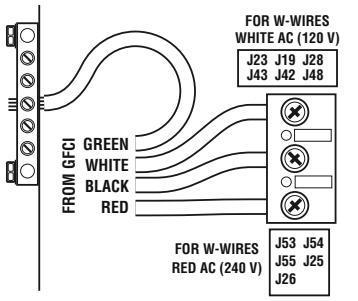
Connect only to a circuit protected by a Class A Ground Fault Circuit Interrupter (GFCI) mounted at least 5' (1.52M) from the inside walls of the spa/hot tub and in line of sight from the equipment compartment.

CSA enclosure: Type 2

Typical field connections for main power.

Refer to Wiring Diagram inside the cover of the control enclosure.

Refer to Installation and Safety Instructions provided by the spa manufacturer.



Warning: People with infectious diseases should not use a spa or hot tub.

Warning: To avoid injury, exercise care when entering or exiting the spa or hot tub.

Warning: Do not use a spa or hot tub immediately following strenuous exercise

Warning: Prolonged immersion in a spa or hot tub may be injurious to your health

Caution: Maintain water chemistry in accordance with the Manufacturers instructions.

Caution: The equipment and controls shall be located not less than 1.5 meters horizontally from the spa or hot tub.

Warning! GFCI Protection.

The Owner should test and reset the GFCI on a regular basis to verify its function.

CSA Compliance/Conformité

Caution:

- Test the ground fault circuit interrupter before each use of the spa.
- Read the instruction manual.
- Adequate drainage must be provided if the equipment is to be installed in a pit.
- For use only within an enclosure rated CSA Enclosure 3.
- Connect only to a circuit protected by a Class A ground fault circuit interrupter.
- To ensure continued protection against shock hazard, use only identical replacement parts when servicing.
- Install a suitably rated suction guard to match the maximum flow rate marked.

Warning:

- Water temperature in excess of 38°C may be injurious to your health.
- Disconnect the electrical power before servicing.

Attention:

- Toujours verifier l'efficacite du disjoncteur differentiel avant d'utiliser differentiel avant d'utiliser le bain.
- Lire la notice technique.
- Lorsque l'appareillage est installe dans une fosse, on doit assurer un drainage adequat.
- Employer uniquement a l'interieur d'une cloture CSA Enclosure 3.
- Connecter uniquement a un circuit protege par un disjoncteur differentiel de Class A.
- Afin d'assurer une protection permanente contre le danger de shock electrique, lors de l'entretien employer seulement des pieces de rechange identiques.
- Les prises d'aspiration doivent etre equipees de grilles convenant au debit maximal indique.

Avertissement:

- Des temperatures de l'eau superieures a 38°C peuvent presenter un danger pour la sante.
- Deconnecter du circuit d'alimentation electrique avante l'entretien.

Warning/Advertissement:

- Disconnect the electric power before servicing. Keep access door closed.
- Deconnecter du circuit d'alimentation electrique avant l'entretien. Garder la porte fermer.

Warning! Shock Hazard! No User Serviceable Parts.

Do not attempt service of this control system. Contact your dealer or service organization for assistance. Follow all owner's manual power connection instructions. Installation must be performed by a licensed electrician and all grounding connections must be properly installed.

P/N 40571-99_A 01/31/2006

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