EL/GL SERIES (Mach 2.0) CONTROL WITH ML400/ML200 PANEL

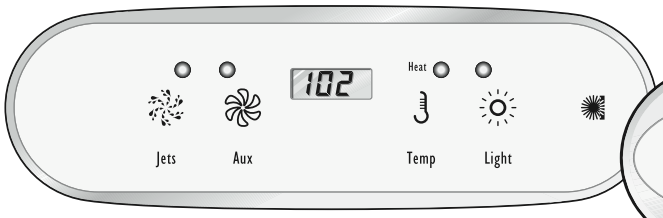
Note regarding EL and GL systems: Mach 2.0 EL and GL systems function identically, but conform to different International requirements. This reference card will refer to EL systems for the sake of simplicity, but the information given applies to both EL and GL products.

This 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.

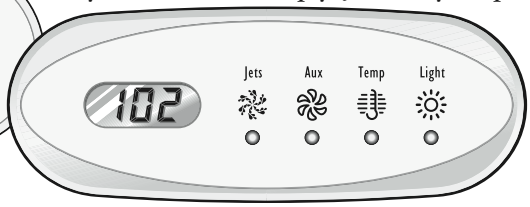
Timeouts refer to a preset length of time that a function is programmed to operate before shutting off automatically. Certain conditions (filters or freeze) can cause a function to operate longer, while faults can cause a function to operate for a shorter length of time. The system keeps track of timeouts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

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



The button labeled "Aux" on the panels shown here may be labeled "Jets 2" or "Blower" on your panel.

The button referred to as "Jets 1" in this document may be labeled as simply "Jets" on your panel.



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 the spa 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 start-up temperature is set at 100°F/37.5°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 2 minutes.

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 2 minutes. "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 1" 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 "Blower" or "Jets 2" or "Aux" will turn off all spa functions temporarily. This is helpful when changing a filter. Pressing any button exits Standby mode.

Jets 1

Press the "Jets 1" button once to turn pump 1 on or off, and to shift between low and high speeds (if equipped). If left running, the low speed turns off after 2 hours and the high speed turns off after 15 minutes.*

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 2 minutes 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 EL5000, EL2000 and EL1000)

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 15 minutes.*

Blower

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 15 minutes.*

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 4 hours.

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 the blower or another pump is on.

Preset Filter Cycles

Note: This panel cannot be used to program filter cycles for EL8000 and EL5000 systems or for the EL2000 and EL1000 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 pump and the ozone generator** will run during filtration. At the start of each filter cycle, the blower will run on highest speed for 30 seconds to clean out the air channels. The lowest speed of pump 2 will run for 5 minutes.

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 (F1-F12). The default filter time is 2 hours. To program, press "Temp" then "Jets 1." Press "Temp" to select the filter duration. Press "Jets 1" 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 1" to exit the programming mode. For continuous filtration, use F12 and "dn."

Clean-up Cycle (optional)

When the 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 hour.

**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 1, Jets 2, Blower, etc.) is pressed.

Freeze Protection

If the temperature sensors detect a drop to 44°F (approximately 6.7°C) within the heater, then the pump automatically activates to provide freeze protection. The equipment stays on until 4 minutes after the sensors detect that the spa temperature has risen to 45°F (approximately 7.2°C) or higher. 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. Aux 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.

*15-minute timeouts may be changed to 30 minutes and 2-hour timeouts may be changed to 4 hours on some models/installations.

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. EL2000 and EL1000 systems reset the time of day on each power-up. Spa settings are preserved on all systems.
OHH	"Overheat" - The spa has shut down. 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. 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. 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. 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.	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. If problem persists, contact your dealer or service organization.
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.	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.
--	Temperature not yet known.	This is normal within the first few minutes of the spa power-up.
Std	The spa is operating in Standard Mode.	Temperature display is current after pump has been running for at least 2 minutes. Press "Temp" followed by "Light" to switch modes.
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. Press "Temp" followed by "Light" to switch modes.
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.

Diagnostic Messages (continued)

Message	Meaning	Action Required
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. Press "Temp" followed by "Light" to switch modes.
Sby	Standby Mode has been activated by pressing a button combination on the user panel.	Press any button to leave Standby mode and return to normal operation.
PHL	pH is low.	Add pH increaser according to manufacturer's instructions.
PHH	pH is high.	Add pH decreaser 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.

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.
rtG	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.

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.

Balboa Instruments Incorporated

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