

BL100

pH Controller and Dosing Pump

for Swimming Pools, Hot Tubs, and Spas

BL100 pH Controller and Dosing Pump is a system engineered for maintaining the pH of swimming pools, hot tubs, and spas. Typically chlorine, whether liquid or solid, is alkaline and will raise the pH of the water that it is added to. As the pH increases above 7.4, a form of chlorine known as hypochlorite ion (OCl^-) increases. This form of chlorine is 100 times less effective at killing bacteria as compared to the other form of chlorine known as hypochlorous acid (HOCl). For this reason it is important to maintain the correct pH level in order to ensure that the more powerful hypochlorous acid form is available for disinfection. The BL100 was developed to be an inexpensive solution for the consumer to maintain the ideal pH level at all times. Simply insert the probe and injection valve in-line with the recirculation pump and provide the chemical to be dosed.

The BL100 is available in multiple configurations including a meter and probe option, a kit for in-line mounting, and a complete package that includes bypass loop and panel mounted flow cell. The kit for in-line and flow cell models include aspiration tubing with filter and dispensing tubing with injection valve.



HI10053 Amplified pH/Temperature Probe



Features



Peristaltic Dosing Pump

The BL100 has a powerful built-in peristaltic chemical feed pump that utilizes a stepper motor which does not have any gears or brushes to wear out. This design provides for a long life and little maintenance.



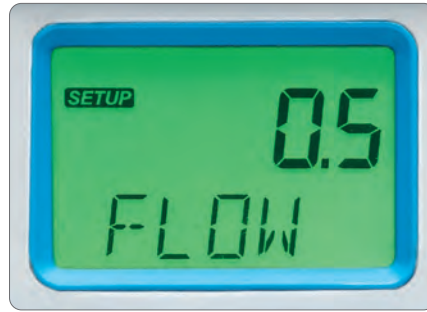
Quick Connect Probe Input

The Quick Connect DIN connector creates a waterproof seal with the controller making it ideal for reducing electrical noise issues with the connection caused by humid environments.



Acid Tank Level/Flow Switch Input

The BL100 allows for a connection to an optional level controller or flow switch. This input can be used to disable the dosing pump when there is no chemical left in the reservoir tank or there is no flow due to the pump being turned off.



Adjustable Flow Rate

The flow rate from the dosing pumps is adjustable from 0.5 to 3.5L/h. Larger bodies of water require more chemical to be dosed than smaller ones in per unit of time. The adjustable flow rate, like the proportional band, allows for better control in maintaining a desired set point



Automatic Proportional Pump Control

The peristaltic dosing pump can be controlled by simple on/off or more advanced proportional control which helps prevent overshooting of the set point. When using proportional control the flow rate that is programmed, will be impacted by the proportional band used. The closer the reading is to the set point the longer it takes for the peristaltic pump to complete one revolution. If the reading is outside the proportional band then the amount of time it takes to complete one revolution is based on the flow rate programmed.



Programmable Alarm System

Enables or disables the low and high-level alarms for pH. When an alarm is activated, all dosing will stop. For added safety, the alarm system also offers overdosing protection in that if the set point value is not corrected within a programmed time interval then the meter will go into alarm status.



For example, a controller is programmed to have a set point of pH 7.40 with a 1.00 pH unit proportional band and the flow rate at 1.0 L/h. Any reading above pH 8.4 will cause the dosing of acid to be at 1 L/h. If the reading is at pH 7.90, which is 1/2 of the band, then the dosing pump will run at half speed or deliver 0.5 L/h of chemical. The closer the reading is to the set point the longer it takes for the pump to complete one rotation. This allows for very fine control of the pH value desired.



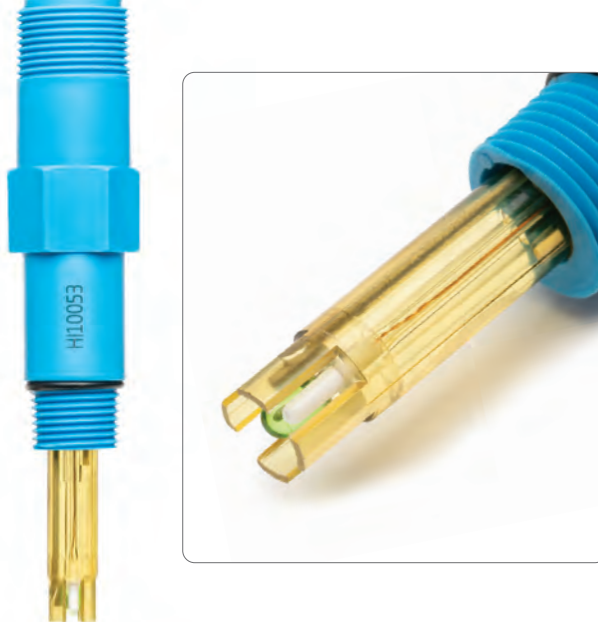
Multicolored LCD Display

The BL100 features a multi-colored LCD that provides for a quick way to see the status of the pool controller. If in control mode and operating as intended the display will be green. If control is not enabled then the display will be light green; while in an alarm state the display flashes red.

HI10053 Amplified pH/Temperature Probe

The BL100 uses the HI10053 amplified probe that incorporates both pH and temperature sensors and connects to the controller with a single waterproof Quick Connect DIN connector. The built in amplifier helps to reduce electrical noise from recirculation pumps to provide for a stable, reliable measurement. The pH glass used is ideal for low conductivity water and provides for fast response. The PVDF body of the probe has a 1/2" threaded fitting for insertion to an in-line "T" fitting or the flow cell. The probe body has a hex fitting for tightening snugly with a wrench.

As an additional safety feature, the pH sensor is designed to have 0 mV value for pH 4 and not at pH 7 like typical pH electrodes. This is very important since a 0 mV potential will result when the internal glass is cracked and shorts with the reference cell. For the HI10053 the 0 mV value will be pH 4 and this type of reading will produce an alarm state (when programmed) and disable the pump from dosing. A standard pH electrode would have a pH value close to 7 and could result in either no dosing or excessive dosing based on the actual value and programmed set point.



| Specifications | BL100 | |
|---------------------------|---------------------------|---|
| pH | Range* | 0.00 to 14.00 pH |
| | Resolution | 0.01 pH |
| | Accuracy (@25°C/77°F) | ±0.10 pH |
| | Calibration | user calibration: automatic, one or two-point with buffer solution (4.01, 7.01, 10.01 pH) Process calibration: single point, adjustable (± 0.50 pH around measured pH) |
| Temperature | Range* | -5.0 to 105°C (23.0 to 221.0°F) |
| | Resolution | 0.1°C (0.1°F) |
| | Accuracy (@25°C/77°F) | ±0.5°C (±0.9°F) |
| | Temperature Compensation | automatic |
| | Dosing Control Type | On/Off control using adjustable set point (6.00 to 8.00 pH) with adjustable hysteresis (0.10 to 1.00 pH) Proportional control using adjustable set point (6.00 - 8.00 pH) with adjustable proportional band (0.10 to 2.00 pH) |
| | Dosing Control Activation | high or low mode operation high set point dosing is activated when reading is higher than set point (dose acid) low set point dosing is activated when reading is lower than set point (dose base) |
| | Delay Start for Dosing | startup delay timer at power-on (0 to 600 sec.) |
| | Maximum Dosing Time | overfeed protection using overtime safety timer (1 to 180 min. or Off) |
| | Pump Flow Control | selectable flow rate (0.5 to 3.5 L / hour; 0.13 to 0.92 G/hour) manual control for pump priming |
| Additional Specifications | Alarms | high and low with enable / disable option triggered after 5 sec. if controller records a set of consecutive readings over / under threshold values level with enable / disable option overtime protection (1 to 180 min. or off) intuitive alarm system using red, light green, and green color-coded backlight |
| | Alarm Relay Output (1) | SPDT 2.5A / 230 VAC |
| | External Event Input | input for level controller or flow switch to disable dosing pump in the event of no chemical when using a level controller or no flow when using a flow switch - galvanically isolated |
| | Probe Input (1) | HI10053 digital pH/temperature probe with quick connect DIN connector - galvanically isolated |
| | Power Supply | 100-240 VAC, 50/60 Hz |
| | Power Consumption | 15 VA |
| | Environment | 0-50°C (32-122°F), max. 95% RH non-condensing |
| | Dimensions | 90 x 142 x 80 mm (3.5 x 5.6 x 1.8") |
| | Weight | 910 g (32 oz.) |
| | Casing | wall mounted, built-in pump, IP65 rated |

BL100-00 is supplied with BL100 controller, HI10053 pH/temperature probe, 4.01 pH buffer solution, 20 mL (3), 7.01 pH buffer solution, 20 mL (3), power connection cable, instruction manual and quality certificates for instrument and probe.

BL100-10 (with in-line mounting kit) is supplied with BL100 controller, HI10053 pH/temperature probe, pool controller aspiration filter, pool controller injector, 1/2" thread, saddle for Ø 50 mm pipe (2), PVC aspiration tubing (flexible) (5 m), PE rigid dispensing tubing (5 m), 4.01 pH buffer solution, 20 mL (3), 7.01 pH buffer solution, 20 mL (3), power connection cable, instruction manual and quality certificates for instrument and probe.

BL100-20 (with flow cell mounting kit) is supplied with BL100 controller, HI10053 pH/temperature probe, flow cell for BL100/BL101, mounting panel assembly for BL100/BL101, pool controller aspiration filter, pool controller injector, 1/2" thread, saddle for Ø 50 mm pipe (3), PVC aspiration tubing (flexible) (5 m), PE rigid dispensing tubing (15 m), barbed tubing adapter 1/2" - 6 mm (2), valves (2), 4.01 pH buffer solution, 20 mL (3), 7.01 pH buffer solution, 20 mL (3), power connection cable, instruction manual and quality certificates for instrument and probe.

Ordering Information



BL100-410
Flow cell



BL100-302
Pump cover with screw



BL100-411
Flow cell panel



BL100-450
Flow cell kit for
Ø 50 mm pipe



BL100-463
Flow cell kit for
Ø 63 mm pipe



BL100-475
Flow cell kit for
Ø 75 mm pipe



BL120-263
Injector saddle for 63
mm pipe diameter,
½" thread



BL120-250
Injector saddle for
50 mm pipe diameter,
½" thread



BL120-275
Injector saddle for 75
mm pipe diameter, ½"
thread



BL120-401
Flow-cell valve



BL120-201
Pool Controller injector,
½" thread



BL120-200
Pool Controller
aspiration filter



BL100-300
Pool Controller
peristaltic pump tubing
kit (2 pcs.)



BL120-202
Aspiration and
dispersion tubing
(10 m)



BL120-301
Peristaltic pump rotor



HI740036P
Plastic beaker set, 100
mL (10 pcs.)



HI10053
pH/temperature probe
with 2 m cable, DIN
Quick connect

BL101

ORP Controller and Dosing Pump

for Swimming Pools, Hot Tubs, and Spas

BL101 ORP Controller and Dosing Pump is a system engineered for maintaining the ORP of swimming pools, hot tubs, and spas. Typically, liquid chlorine is used as a disinfectant to keep the water safe from harmful bacteria. Chlorine, as an oxidizer, will increase the oxidation-reduction potential (ORP) of water when it is added to it. When the ORP value is greater than 650 mV then bacteria that are present will be killed within seconds. The BL101 was developed to be an inexpensive solution for the consumer to maintain the ideal ORP value at all times. Simply insert the probe and injection valve in-line with the recirculation pump and provide the chemical to be dosed.

The BL101 is available in multiple configurations including a meter and probe option, a kit for in-line mounting, and a complete package that includes bypass loop and panel mounted flow cell. The kit for in-line and flow cell models include aspiration tubing with filter and dispensing tubing with injection valve.



HI20083 ORP/Temperature Probe shown in-line



Features



Peristaltic Dosing Pump

The BL101 has a powerful built-in peristaltic chemical feed pump that utilizes a stepper motor which does not have any gears or brushes to wear out. This design provides for a long life and little maintenance.



Quick Connect Probe Input

The Quick Connect DIN connector creates a waterproof seal with the controller making it ideal for reducing electrical noise issues with the connection caused by humid environments.



Acid Tank Level/Flow Switch Input

The BL101 allows for a connection to an optional level controller or flow switch. This input can be used to disable the dosing pump when there is no chemical left in the reservoir tank or there is no flow due to the pump being turned off.



Adjustable Flow Rate

The flow rate from the dosing pumps is adjustable from 0.5 to 3.5L/h. Larger bodies of water require more chemical to be dosed than smaller ones in per unit of time. The adjustable flow rate, like the proportional band, allows for better control in maintaining a desired set point.



Automatic Proportional Pump Control

The peristaltic dosing pump can be controlled by simple on/off or more advanced proportional control which helps prevent overshooting of the set point. When using proportional control, the flow rate that is programmed, will be impacted by the proportional band used. The closer the reading is to the set point the longer it takes for the peristaltic pump to complete one revolution. If the reading is outside the proportional band then the amount of time it takes to complete one revolution is based on the flow rate programmed.



Programmable Alarm System

Enables or disables the low and high level alarms for ORP. When an alarm is activated, all dosing will stop. For added safety, the alarm system also offers overdosing protection in that if the set point value is not corrected within a programmed time interval then the meter will go into alarm status.



For example, a controller is programmed to have a set point of 650 mV with a 50 mV proportional band and the flow rate at 1.0 L/h. Any reading below 600 mV will cause the dosing of the oxidizer to be at 1 L/h. If the reading is at 625 mV, which is 1/2 of the band, then the dosing pump will run at half speed or deliver 0.5 L/h of chemical. The closer the reading is to the set point the longer it takes for the pump to complete one rotation. This allows for very fine control of the ORP value desired.

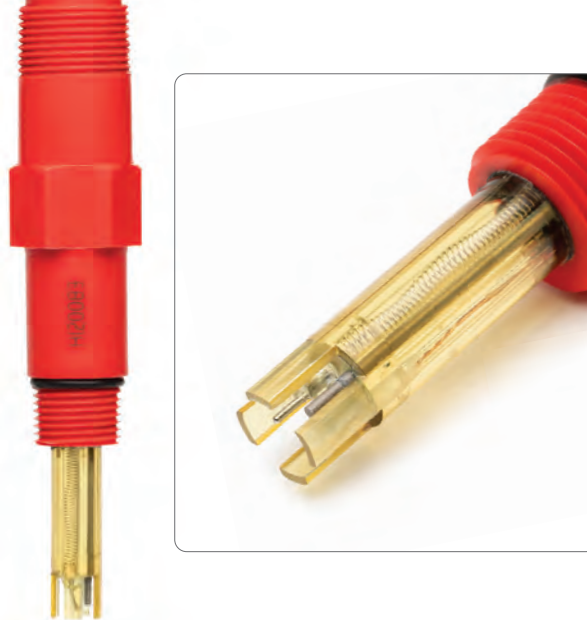


Multicolored LCD Display

The BL101 features a multi-colored LCD that provides for a quick way to see the status of the pool controller. If in control mode and operating as intended the display will be green. If control is not enabled then the display will be light green; while in an alarm state the display flashes red.

HI20083 ORP/Temperature Probe

The BL101 uses the HI20083 probe that incorporates both ORP and temperature sensors and connects to the controller with a single waterproof Quick Connect DIN connector. The PVDF body of the probe has a 1/2" threaded fitting for insertion to an in-line "T" fitting or the flow cell. The back end part of the probe has 3/4" NPT threads for submersion/tank mounting. The probe body has a hex fitting for tightening snugly with a wrench.



| Specifications | BL101 | |
|---------------------------|---------------------------|---|
| ORP | Range | -2000 to 2000 mV |
| | Resolution | 1 mV |
| | Accuracy (@25°C/77°F) | ±5 mV |
| | Calibration | process calibration: single point, adjustable (± 50 mV around measured ORP value) |
| Temperature | Range* | -5.0 to 105°C (23.0 to 221.0°F) |
| | Resolution | 0.1°C (0.1°F) |
| | Accuracy (@25°C/77°F) | ±0.5°C (±0.9°F) |
| Additional Specifications | Dosing Control Type | On/Off control using adjustable set point (200 to 900 mV) with adjustable hysteresis (10 to 100 mV) proportional control using adjustable set point (200 to 900 mV) with adjustable proportional band (10 to 200 mV) |
| | Dosing Control Activation | high or low mode operation high set point dosing is activated when reading is higher than set point low set point dosing is activated when reading is lower than set point (dose oxidizer) |
| | Delay Start for Dosing | startup delay timer at power-on (0 to 600 sec.) |
| | Maximum Dosing Time | overfeed protection using overtime safety timer (1 to 180 min. or Off) |
| | Pump Flow Control | selectable flow rate (0.5 to 3.5 L / hour; 0.13 to 0.92 G/hour) manual control for pump priming |
| | Alarms | high and low with enable / disable option triggered after 5 sec. if controller records a set of consecutive readings over / under threshold values level with enable / disable option overtime protection (1 to 180 min. or off) intuitive alarm system using red, light green, and green color-coded backlight |
| | Alarm Relay Output (1) | SPDT 2.5A / 230 VAC |
| | External Event Input | input for level controller or flow switch to disable dosing pump in the event of no chemical when using a level controller or no flow when using a flow switch - galvanically isolated |
| | Probe Input (1) | HI20083 Platinum tip ORP/Temperature probe with quick connect DIN connector - galvanically isolated |
| | Power Supply | 100–240 VAC, 50/60 Hz |
| | Power Consumption | 15 VA |
| | Environment | 0-50°C (32-122°F), max. 95% RH non-condensing |
| | Dimensions | 90 x 142 x 80 mm (3.5 x 5.6 x 1.8") |
| | Weight | 910 g (32 oz.) |
| | Casing | wall mounted, built-in pump, IP65 rated |

BL101-00 is supplied with BL101 controller, HI20083 ORP/temperature probe, ORP test solution (3), power connection cable, instruction manual and quality certificates for instrument and probe.

BL101-10 (with in-line mounting kit) is supplied with BL101 controller, HI20083 ORP/temperature probe, pool controller aspiration filter, pool controller injector, 1/2" thread, saddle for Ø 50 mm pipe (2), PVC aspiration tubing (flexible) (5 m), PE rigid dispensing tubing (5 m), ORP test solution (3), power connection cable, instruction manual and quality certificates for instrument and probe.

BL101-20 (with flow cell mounting kit) is supplied with BL101 controller, HI20083 ORP/temperature probe, flow cell for BL100/BL101, mounting panel assembly for BL100/BL101, pool controller aspiration filter, pool controller injector, 1/2" thread, saddle for Ø 50 mm pipe (3), PVC aspiration tubing (flexible) (5 m), PE rigid dispensing tubing (15 m), tubing adapter 1/2" - 6 mm (2), valves (2), ORP test solution, 20 mL (3), power connection cable, instruction manual and quality certificates for instrument and probe.

*range limited by probe.



BL100-410
Flow cell



BL100-302
Pump cover with screw



BL100-411
Flow cell panel



BL100-450
Flow cell kit for
Ø 50 mm pipe



BL100-463
Flow cell kit for
Ø 63 mm pipe



BL100-475
Flow cell kit for
Ø 75 mm pipe



BL120-263
Injector saddle for 63
mm pipe diameter,
½" thread



BL120-250
Injector saddle for
50 mm pipe diameter,
½" thread



BL120-275
Injector saddle for 75
mm pipe diameter, ½"
thread



BL120-401
Flow-cell valve



BL120-201
Pool Controller injector,
½" thread



BL120-200
Pool Controller
aspiration filter



BL100-300
Pool Controller
peristaltic pump tubing
kit (2 pcs.)



BL120-202
Aspiration and
dispersion tubing
(10 m)



BL120-301
Peristaltic pump rotor



HI740036P
Plastic beaker set, 100
mL (10 pcs.)



HI20083
ORP/temperature
probe with 2 m cable,
DIN Quick connect