Basic Water Chemistry:

The DIG-220 is designed to produce chlorine on a daily basisTo monitor the system's efficiency, the water chemistry ranges, and schedule of periodic checks—per below—should be followed.

NOTICE	**Failure to heed the following may result in equipment damage.**
	Excessively high chlorine levels can cause premature cell failure and corrosion damage to pool fixtures and equipment.

NOTICE	**Failure to heed the following may result in equipment damage.**
	Always follow the instructions on the manufacturer's label whenever handling or using chemicals.

NOTICE	**Failure to heed the following may result in equipment damage.**
	Do not use a hydrogen peroxide based chlorine neutralizer or permanent damage to the cell will occur

REFERENCE SECTION

Basic Water Chemistry Continued:

CHEMICAL	IDEAL RANGE	IDEAL TEST SCHEDULE	EFFECT OF LOW/HIGH LEVELS	CORRECTIVE ACTIONS
Free Chlorine	1 to 3 ppm	Weekly	Low free chlorine: Not enough residual chlorine to safely sanitize pool water. High free chlorine: Corrosive to metallic fixtures in pool water. Can bleach swimwear and hair.	Low free chlorine: Check for combined chlorine level and shock as necessary. Increase purifier output to maintain a 1-3 ppm residual reading. High free chlorine: Decrease purifier output. Let chlorine dissipate normally until 1-3 ppm is achieved. In extreme cases, pool water can be diluted with fresh water or a chlorine neutralizer added. (Diluting will reduce salt and CYA. Check and adjust as needed.)
Ph	7.2 to 7.8 ppm	Weekly	Low pH: (acidic) Equipment corrosion, eye/skin irritation, plaster etching, rapid chlorine consumption. High pH: (basic) Scale formation, cloudy water, eye/skin irritation, poor chlorine effectiveness	Low pH: Add sodium carbonate or soda ash High pH: Add muriatic acid or sodium bisulfate.
Total Alkalinity	80 to 100 ppm	Monthly	Low TA: Eye irritation, pH "bounce", stained/etched plaster and metal corrosion. High TA: Constant acid demand, difficulty in maintaining pH, and contributes to scale formation or cloudy water conditions.	Low TA: Add sodium bicarbonate. High TA: Add muriatic acid often, a little at a time (may take a week or more to lower the TA).
Salt	3000 to 3500 ppm	Monthly	Low Salt: Below 2,500 ppm causes premature cell failure and reduces chlorine production High Salt: Above 6,000 ppm can cause corrosion of metallic fixtures and will taste salty. Note: DIG-220 can safely operate with salt levels up to 35,000.	Low Salt: Add salt according to digital display on Pool Pilot unit or salt chart. High Salt: If undesirably high, partially drain and refill the pool with fresh water. (Diluting will reduce CYA. Check and adjust as needed.)
Calcium Hardness	200 to 400 ppm	Monthly	Low CH: Etching of plaster, equipment corrosion High CH: Scale formation, cloudy water. Rapid buildup of scale may exceed the system's self-cleaning capability and require manual cleaning of the SuperCell.	Low CH: Add calcium chloride flakes. High CH: Partially drain and refill pool with fresh water to dilute. (Diluting will reduce salt and CYA. Check and adjust as needed.) Please note – in some areas there may be higher than recommended calcium levels in the tap water. If this level is seen, call the factory for advice on this condition.
Cyanuric Acid (CYA) - Stabilizer -	60 to 80 ppm 30 to 50 ppm	Monthly	Low CYA: destruction of chlorine by the UV rays from the sun. High CYA: Requires more chlorine to maintain proper sanitizer levels. ***Note: CYA not needed for indoor or bromine pool.*** CYA can be reduced to 30 - 50 ppm for DIG-220 in colder climate regions.	Low CYA: Add cyanuric acid(1 lb/5000 gallons increases CYA 25 ppm) High CYA: Partially drain and refill pool with fresh water to dilute. (Diluting will reduce salt. Check and adjust as needed.)

Using the Saturation Index (SI):

The Saturation Index is a formula used to predict the calcium carbonate saturation of water, that is, whether your water will precipitate, dissolve, or be in equilibrium with calcium carbonate.

Water is properly balanced if the SI is 0 ± 0.3. If SI is greater than 0.3, scaling and staining will occur. If SI is less than -0.3, then the water is corrosive to metallic fixtures and aggressive to plaster surfaces and vinyl liners.

A high or low SI can cause premature damage to the cell, equipment or pool finish. As a general rule, higher concentrations of calcium, total dissolved solids, pH, and alkalinity all promote a greater tendency for scale. Scaling potential also increases with increasing temperature.

Use the chart below to determine your overall water balance. Test water for pH, water temperature, Calcium Hardness, Total Alkalinity, Salt Level, and use the equivalent Factors (TF, CF, AF, Constant) from the chart below to determine your Saturation Index. Adjust chemicals to maintain balanced water.

pH + TF + CF + AF - SC = SI

Temperature		TF
60 F	15.6C	0.4
66 F	18.9C	0.5
76 F	24.4C	0.6
84 F	28.9C	0.7
94 F	34.4C	0.8
103 F	39.4C	0.9

Calcium Hardness	CF
150 ppm	1.8
200 ppm	1.9
250 ppm	2.0
300 ppm	2.1
400 ppm	2.2
600 ppm	2.4

Total Alkalinity	AF
75 ppm	1.9
100 ppm	2.0
125 ppm	2.1
150 ppm	2.2
200 ppm	2.3
250 ppm	2.4

Salt Level	SC
0 - 1000 ppm	12.1
1001 - 2000 ppm	12.2
2001 - 3000 ppm	12.3
3001 - 4000 ppm	12.4
4001 - 5000 ppm	12.5
5001 - 6000 ppm	12.6