



ADDRESS
 Abraão de Sousa e Silva Street, 2920
 Brusque - SC, Volta Grande District, Zip Code 88355-576
 www.brustec.com.br
www.facebook.com/brustec.lazer +55 (47) 3350-3770
 Assistência Técnica: sac@brustec.com.br

CHLORINE GENERATOR BRUSTEC BR-02 (30)

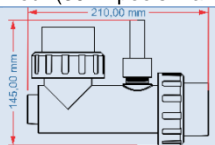
The Chlorine Generator Brustec, is an electronic equipment that through the process of electrolysis in water with salt, breaking the salt particles (NaCl) and water (H₂O) and generating the Sodium Hypochlorite (NaClO), in continuous dosage while the pump is running. This way you automate the chlorine dosage in your pool, having only to follow up according to use and time, adjusting through the buttons the volume of chlorine production that are divided into 5 levels, besides the Turbo mode in case you need to make an urgent higher dosage.

The equipment has shutdown protections in case there is some problem in the system, such as: alarm for lack and excess of salt, over current in the cell, and water level / lack of water. And also the automatic self-cleaning process of the cells, to extend the useful life of the equipment and minimize the need for checking and cleaning the titanium.

Remembering that the recommended residual chlorine level is between 1 and 3 PPM, and to raise the chlorine level, you just need to leave your pump on for a longer time and the water within the parameters of the table below. Besides, the SALT used in swimming pools is special (without additives) and must be purchased informing that it will be used in the pool.

The equipment requires basic care to ensure the production of chlorine (table below):

TECHNICAL SPECIFICATIONS AND WATER CONDITIONS TO OPTIMIZE OPERATION

PROTECTION RATING	IP63 - Protected against dust and splash water
POWER SUPPLY	100~265 VCA / 24Vcc – 8,33A (200W)
MAXIMUM POWER (watts)	0,5 kw/H
OPERATING TEMPERATURE	10 to 40 °C
PH FOR BEST PERFORMANCE	7,2 – 7,6
MAX. QUANTITY OF SALT IN WATER	4,0 g / L (minimum 3,0 g / L e maximum 4,5 g / L)
RECOMMENDED ALKALINITY	80 to 120 ppm
CALCIC HARDNESS	90 to 175 ppm
TDS	maximum 5000 ppm
chlorine stabilizer (cyanuric acid)	30 to 50 ppm
METALS/NITRATES/PHOSPHATES/SATURATION	0
SATURATION INDEX	Ideal = 0 or as close as possible
CHLORINE PRODUCTION	15 Gr / Hour (30m ³ pools max.)
CHLORINE GENERATION CELL SIZE	

RECOMMENDED MINIMUM FILTRATION TIME

The following daily filtering times for the pool water are based on a residential pool with water parameters as recommended in this manual (previous table), with 1 person per m², using the pool 2 days a week, and an average temperature of 25°C, with the equipment on production level 5. However, as for example the weather (Sun and Rain), temperature among other factors affect the volume of chlorine production produced by the equipment and the durability of the chlorine in the water, these values are not fixed rules, only a reference to start using the equipment.

Remembering that the ideal of residual chlorine is between 1 and 3ppm, when this level is low you can put the equipment in TURBO mode and increase the amount of filtration hours and when the residual chlorine index is too high, you lower the level of chlorine production and can reduce the amount of filtration hours.

*NOTE: Commercial, public, and other non-residential pools must follow the minimum hours and always follow the water parameters and the minimum chlorine level in PPM that are stated in the norms in effect. The control is done by measuring with test kits, chlorine production levels in the equipment, along with the amount of hours of water circulation in it.

In the table below, the values in red are the minimum amount of hours of water circulation to start using the equipment. When it reaches between 1 and 3ppm you can reduce the production level or the number of hours the pump is on.

Model Equipment	10 m ³	20m ³	30m ³	40m ³	60m ³
BR 02	4	6	-	-	-

FIRST SALT DOSAGE

For the first dosage of salt, you will have to verify with the store or manufacturer the volume in liters of your pool model, and we will try to reach the ideal value of 3.5 grams per liter which is done by the example calculation below:

$$\text{Total volume of Liters of water} \times 3.5 = \text{Total Grams of Salt}$$

$$12,000 \text{ Liters} \times 3.5 \text{ (g/chlorine)} = 42,000 \text{ grams} / 1000 = 42 \text{ KG of salt}$$

OBS: To avoid errors and waste of water, in the first dosage, always put a little less salt than the previously calculated, and then add salt little by little, always with water at room temperature, and if possible, turn off the water heating system, if any, until you reach the ideal level of salt. The ideal is to do the salt dosage with the water below 28°C if possible.

Add salt little by little, diluting with the pool water in a bucket to prevent salt stones from entering the pump, after each salt application, let the water circulate for 15-20 minutes and measure the salt level in the water with the measuring kit or appropriate device. Do this procedure until it reaches around 3.0 and 3.2 g/L which would be a little below the IDEAL and then turn on the engine for 12 hours and only after this period turn on the Chlorine Generator.

After turning on the Chlorine Generator, wait 1 hour and then add more salt to the water always diluting beforehand in a bucket until the equipment display shows "GO (GOOD = Good Level of SALT)". After some time in operation, it may show HI (HIGH = High Level of Salt) or LO (LOW = Low Level of Salt), because in some cases it takes a longer time for the salt to dilute in the total volume of the pool. Even though it shows these HI or LO alarms, the Chlorine Generator will still work. Leave the equipment running for 3-4 days and monitor the Salt levels, if on the 5th day there is any HI or LO alarm or other alarm, follow the procedures described in the "DESCRIPTION OF ALARMS AND DISPLAY INFORMATION" table.

IMPORTANT INFORMATION

- ✓ Only use the power supply that came with the equipment, never use transformers, as damage to the equipment may occur.
- ✓ Always follow the installation guidelines recommended in NBR5410 and use a qualified professional for such installation and parameters.
- ✓ Use a protection system for the electrical circuit that feeds the power supply, such as DR and circuit breakers properly sized according to the standards in force.
- ✓ Install the equipment in parallel with the power supply of the circulation pump so that when the pump turns on the chlorine generator is fed and then will start to generate chlorine.
- ✓ Install, whenever possible, the electronic control unit outside the machine room (protected from sunlight and rain) in order to see if the equipment is working or malfunctioning.
- ✓ The titanium plates must be inspected every 3 months and, if necessary, cleaned with an appropriate acid (EX: PH Reducer), and the acid must not be in contact with the titanium for more than 30 minutes.
- ✓ Attention to the chemical parameters of the water, since a PH higher than 7.6 for example reduces the chlorine capacity produced by the equipment.
- ✓ All metallic parts (Ex: stainless steel devices) and electronic equipment must be grounded. Over time, these parts may deposit by-products on them and need to be cleaned.
- ✓ If you notice that the equipment is not raising the chlorine volume in the water, check with the appropriate test kit the amount of SALT in the water, always respecting the minimum of 3.0ppm.

The control board has protection against overheating. If the equipment is installed in a very hot environment, it will automatically reduce the level of chlorine production to prevent damage to the electronic board and other components.

The self-cleaning process integrated in the equipment does not eliminate the need for inspection of the cells from time to time by the equipment user, it only extends the inspection interval.

TERMINAL IDENTIFICATION

Below is the identification of each terminal of the electronic control and the path of the PP cable that interconnects the control with the generating cell, which must be connected to the respective terminal, following the color pattern.



24v	24 vdc supply from Source
0v	Negative 0v from Source
NIV	Water Level Sensor (Yellow Channel)
+ (Brown)	Cell Positive (Brown channel)
- (White)	Negative Cell (White Channel)

BUTTON IDENTIFICATION



ON OFF	Turns the equipment on and off
+	Key to increase the chlorine dosage.
-	Key to reduce the dosage of chlorine.
T	Turns on TURBO mode of chlorine generation.
○	LED indicating the chlorine production levels.

DESCRIPTION OF ALARMS AND DISPLAY INFORMATION

The table below shows the Alarms and Faults and possible solutions, should they ever show up in your equipment:

DISPLAY	ALARM / FAULTS / INFORMATION	SOLUTION / INFORMATION
E – 02	Power supply voltage below or above 24VDC or overheating.	The equipment has a tolerance of +/- 2 volts, in case the voltage is outside this tolerance, replace the source. In case of overheating, verify ventilation obstruction, or if the environment is too hot, it is necessary to remove the control and install it in another place.
E – 03	Low water level in chlorine generator cell. Calcified sensing pin, Oxidation of electrical connections.	Check if the pump is on and if there is water inside the cell, also check if there are closed valves preventing the passage of water through the cell. Clean the sensing pin. Check, retighten, and clean the electrical connections.
E – 04	Cell failure	Clean the cells, removing impurities on the plates with appropriate acid, check that the wire connections are tight.
E – 05	Overcurrent	Check the integrity of the titanium and the electrical connections of the chlorine generator cell and the electronic control.
LO	Low level of salt	<p>Measure amount of SALT in water with appropriate test kit. Inspect the titanium cells for cleanliness, if necessary, perform cleaning procedure.</p> <p>Calculate the difference between what is shown in the test kit minus the standard of 3.0g/L and multiply by the number of liters of the pool, so you have the amount of salt to be added.</p> <p>Example of calculation: Salt measurement with test kit = 2.5g/L Ideal measurement of the amount of SALT = 3,5 g / L Pool volume in liters = 12.000L</p> <p>$3,5\text{g/L} - 2,5\text{g/L} = 1,0\text{g/L}$ $1,0\text{g/L} \times 12.000\text{L} = 12.000$ grams of salt (12 kg)</p> <p>Apply the salt to the water and let the pool water circulate for 10 - 12 hours. Then take another measurement of the amount of SALT in the water and check if it is necessary to correct, being the minimum 3.0 g/L and the maximum 4.0 g/L.</p> <p>Low levels of SALT can damage the generator cell.</p>
GO	GOOD level of SALT	When it is showing GO = GOOD, that means the good level of SALT in the water.
—	Water Measuring Times.	At this point the equipment takes the water measurements.

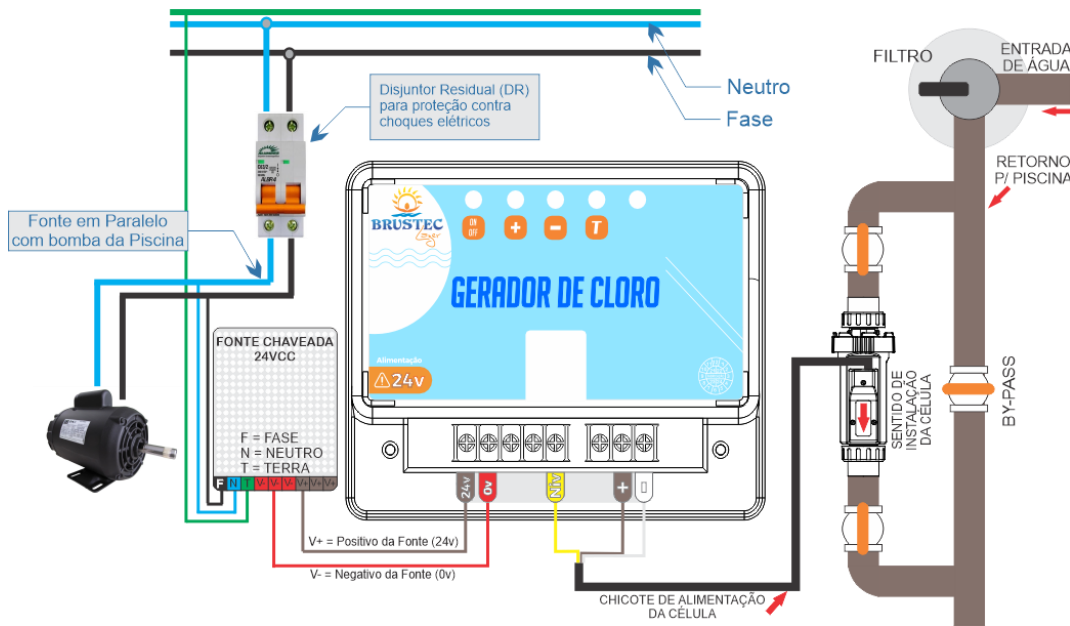
HI	High Salt Level	<p>Below calculation for adjustment in case of High Salt level: Example of calculation: Salt measurement with test kit = 5.50 g / L Ideal measurement of the amount of SALT = 3,5 g / L Pool volume = 12.000L Maximum limit = 4,0 g / L</p> <p>$5,50\text{ g / L} - 3,5\text{ g / L} = 2,0\text{ g / L}$ $2,0\text{g/L} \times 12.000 = 24.000\text{g}$ (Excess salt value) $24,000\text{g} / 4,0\text{ g/L} = 6000$ liters to be removed.</p> <p>If you cannot measure the flow in the drain/sewer, lower the pool water level little by little and add new water, and let it filter for 10-12 hours and then measure with a test kit the amount of SALT, if necessary lower the level again because the generating cell working with excess SALT can damage the titanium.</p>
-----------	-----------------	--

PROBLEMS x POSSIBLE CAUSES x WHAT TO DO

PROBLEM	POSSIBLE CAUSE	SOLUTION / INFORMATION
Green Pool Water	Low chlorine level in the equipment.	Increase to Turbo, apply Algaecide, and leave the equipment on for 24 hours. Remember to wash the filter.
	Water parameters deviating from recommended.	Adjust the water parameters according to the table on Page 1.
Coloured Water	Contamination by metals contained in the water.	Check all water parameters, call a professional if necessary to identify the contamination.
Turbid Water	Water parameters deviating from recommended.	Adjust the water parameters according to the table on Page 1
	Low water flow level.	Check the motor integrity and if it is correctly dimensioned, and if the valves are 100% open.
	Short Filtration Time.	Page 1 of this manual contains the minimum recommended number of hours per m ³ for each equipment model.
	Low Residual Chlorine Level	Make sure the chlorine level is between 1 and 3 ppm.
White Granules in the Water	May occur during self-cleaning of the equipment (day to day).	Keep the water parameters within the ideal levels.
Equipment does not generate chlorine	Bad contact in the connections and wires.	Check the tightening of the screws in the electrical connections.
	Calcification of the titanium cells.	Perform cell cleaning procedure.
Leakage in the cell connections	Loose connections or defective O-ring seals	Retighten the plastic nuts and if necessary change the sealing O-rings.

ELECTRICAL AND HYDRAULIC INSTALLATION SCHEMATICS

- The equipment must always be installed horizontally and level and always protected from sunlight.



Source in Parallel with Pool pump

Residual Circuit Breaker (DR) for protection against electric shocks

Neutral

Phase

FILTER

WATER INPUT

SWIMMING POOL RETURN

CHLORINE GENERATOR

KEYED SOURCE 24VCC

F: PHASE

N: NEUTRAL

T: GROUND

V: Source Positive (24v)

V: Source Negative (0v)

POWER SUPPLY HARNESS OF THE CELL

DIRECTION OF CELL INSTALLATION

BY-PASS

- If ozone treatment is used, whenever possible install it after the chlorine generation cell, otherwise if installed before, a minimum distance of 1 meter is required to avoid damage and maintain chlorine production.

WARRANTY

BRUSTEC equipment has a one-year warranty as of the sales invoice from the store, if installed according to the manual's norms and covering only factory defects that will be evaluated by the company's technical assistance sector.

HOW TO PROCEED IF THERE IS A POSSIBLE DEFECT IN YOUR EQUIPMENT

1. contact the store that sold you the equipment, requesting support to find a possible solution or if possible the visit of the technician in loco for analysis.
2. If it is not possible to find the cause of the problem, contact the technical assistance sector in our company and explain the problem to them, so that some tests can be performed in order to detect the defect.

Telephone for contact: +55 (47) 3350-3770

E-mail: sac@brustec.com.br

CELL CLEANING PROCEDURE

In every Chlorine Generator, due to the electrolysis process, which is the process of breaking down the salt particles, calcification of the titanium cells occurs with a white calcium layer. Therefore it is important to make this cell inspection every 90 days or if there is a perception that is not generating enough chlorine, make the titanium cleaning procedure.

Follow below the cleaning procedure:

1. Turn off all electrical circuitry and motors
2. Remove the electrical cable from the chlorine generator control unit.
3. Close the water flow valves and remove the machine room cell.
4. Wash the internal titanium and the cell under running water using a hose. Do not use water jetting equipment to avoid damaging the cell.
5. Close one side of the cell in a way that it is possible to keep the cleaning solution inside the cell for 20-30 minutes maximum and with the help of a plastic jar, pour the solution until it covers all the internal titanium of the cell. After this time, remove the cleaning solution and rinse with water. If it does not remove all the calcification from the titanium, redo this step.
6. After removing all calcification you can install the equipment again and your cell will be ready for another period of chlorine production.

NOTE: Be careful not to pour the cleaning solution around the cell on the outside, as this may damage the existing electrical connections. And always wear PPE because of the acid in the cleaning solution.

CLEANING SOLUTION - HOW TO DO IT?

One way to make a solution is to use 1 liter of pH reducer or muriatic acid, 4 liters of clean water, and 1 bucket.

Just dilute 1 liter of acid to 4 liters of water in a bucket and stir to homogenize.