# Puritron Salt-Water Chlorinators

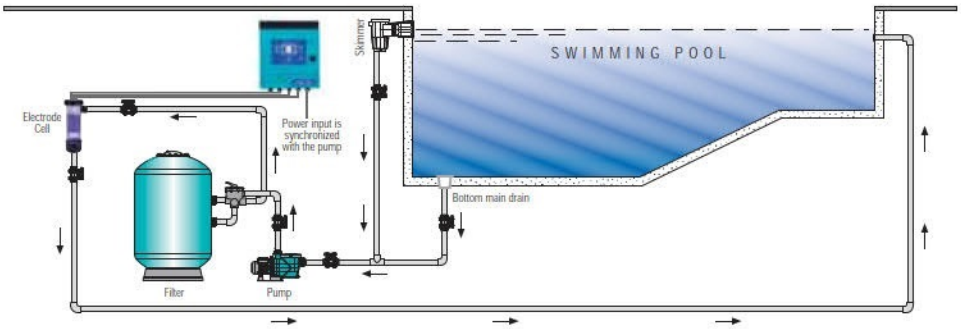
Designed for midsize hotel and apartment complex pools. The device produces chlorine by electrolysis of pool water with salinity of teardrop. It has a standart cleaning cycle process against calcification. **Electrodes are made of titanium and have a 20.000 hours long life.** Corrosion resist stainless steel body. Electrods cell made of methacrylate and transparent. It has a LCD screen. Device is switched mode. All models can be used with seawater.


| Description | Code | Pieces/ box | Weight Kg | Volume $m^3$ |
|---|---|---|---|---|
| • Puritron GSC - 75 | **06435** | 1 | 15,000 | |
| • Puritron GSC - 100 | **06436** | 1 | 20,000 | |
| • Puritron GSC - 150 | **06437** | 1 | 25,000 | |

| Model | Pool Volume ($m^3$) | Chlorine Production (g/h) | Voltage (VAC) | Voltage (VDC) | Current (A) | Power Consumption (W) | PVC Pipe (mm) | Weight (kg) | Device Dimensions (mm) | Cell Measurements (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| GSC75 | 200 - 250 | 75 | 220 | 24 max. | 100 | 350 | 63 | 15 | 300x250x150 | 140 x 531 |
| GSC100 | 250 - 300 | 100 | 220 | 24 max. | 150 | 500 | 90 | 20 | 300x250x150 | 140 x 531 |
| GSC150 | 300 - 350 | 150 | 220 | 24 max. | 200 | 670 | 90 | 25 | 300x250x150 | 140 x 531 |

**Note:** The above pool capacities have been calculated with the principle that the pool operates for 12-14 hours per day.

**INSTALLATION DIAGRAM:**




## Salt - Water Chlorinator Capacity Measurement:

### A- Daily Chlorine Requirement:

1- Loss From Swimmers: The number of swimmers should be determined or estimated. This number should be considered according to busiest day. Daily lost per swimmer in meditarranean Region is 10 gr/day.

2- Loss From Sun Light (The Destructive effects of UV light on chlorine): This lost is on average 2,5 gr per each pool $m^3$ in meditarranean belt.

**Daily Chlorine Requirement (gr)** = The Number of Swimmers x 10 gr + Pool Volume ($m^3$) x 2,5 gr
For example: The Pool that 250 swimmer's daily use and 1000 $m^3$ pool volume.
Daily Chlorine Requirement = 250 x 10 gr + 1000 $m^3$ x 2,5 gr/$m^3$ = 5000 gr

With 12 hours filtration = 5000 gr/12h = 416 gr/h ▶ GSC 500
With 24 hours filtration = 5000 gr/24h = 200 gr/h ▶ GSC 250

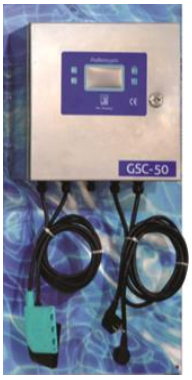

"Pool Technology"

# GEMAS GSC MODEL
# PURITRON COMMERCIAL POOLS SALT-WATER CHLORINATOR
# TECHNICAL DATA SHEET

Designed for midsize hotel and apartment complex pools. The device produces chlorine by electrolysis of pool water with salinity of teardrop. It has a standart cleaning cycle process against calcification. Electrods are made of titanium and have a 20.000 hours long life. Corrosion resist stainless steel body. Electrods cell made of methacrylate and transparent. It has a LCD screen. Device is switched mode and can be used with seawater.

| Model | Pool Volume ($m^3$) | Chlorine Production (g/h) | Voltage (VAC) | Voltage (VDC) | Power Consumption (W) | PVC Pipe (mm) | Control Unit Dimensions (mm) | Cell Measurements (mm) |
|---|---|---|---|---|---|---|---|---|
| **GSC50** | 150-200 | 50 | 220 | 24 max. | 250 | 63 | 300x250x150 | 140x531 |
| **GSC75** | 200-250 | 75 | 220 | 24 max. | 350 | 63 | 300x250x150 | 140x531 |
| **GSC100** | 250-300 | 100 | 220 | 24 max. | 500 | 63 | 300x250x150 | 140x531 |
| **GSC150** | 300-350 | 150 | 220 | 24 max. | 670 | 63 | 300x250x150 | 140x531 |

**PS:** Above capacities are calculated for 12-14 working hours.



# Puritron®

SALT WATER CHLORINATOR

Natural,
Environmentally Friendly,
Healthy, Safe and
Low cost
Chlorine Production

GEMAS

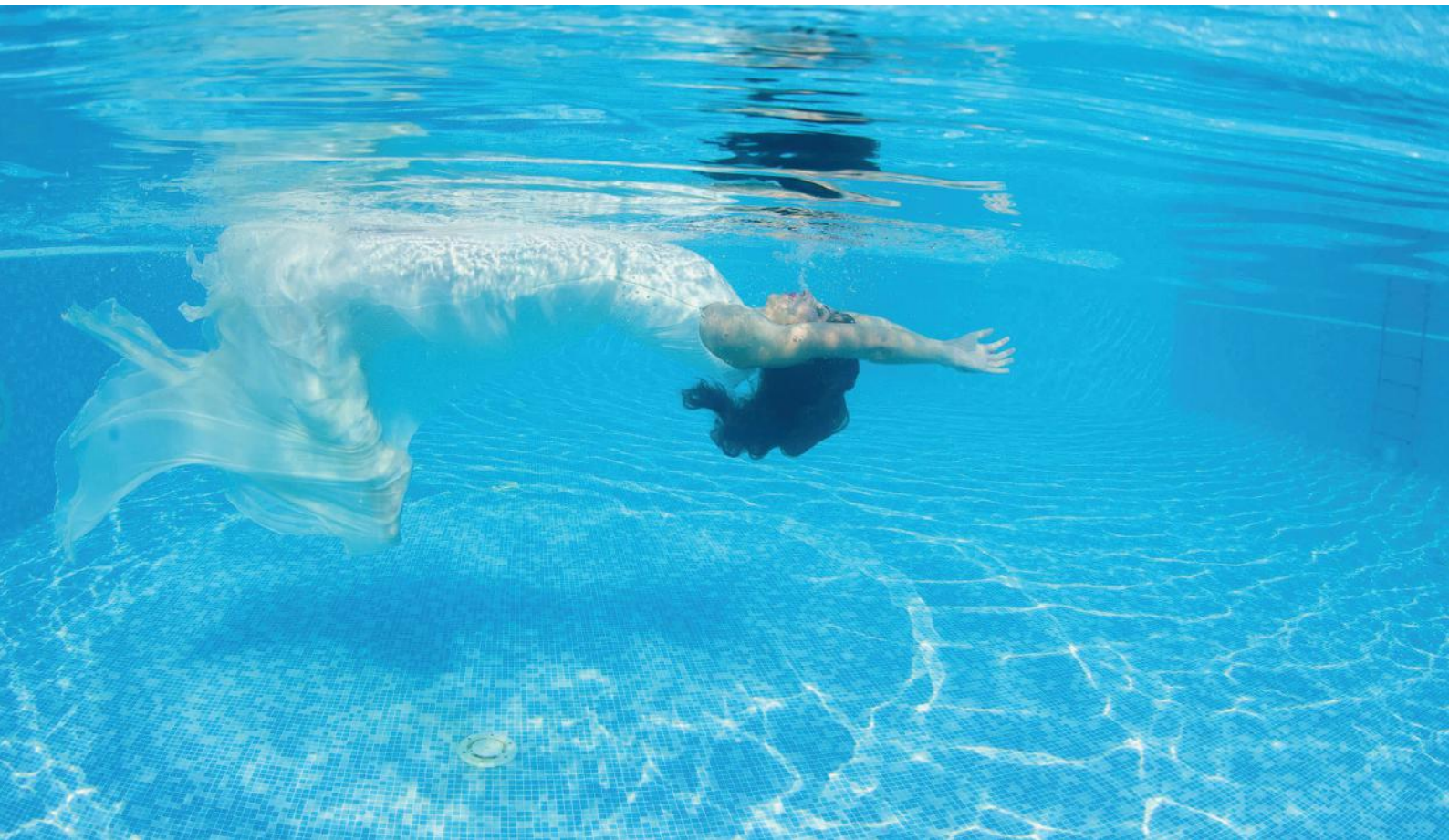
# Salt Electrolysis

Salt water chlorination is a water treatment method whereby the disinfectant agent is directly generated from the water by means of an electrolytic process. This technique avoids the use of chemical compounds and is particularly well adapted to swimming pools. Salt water chlorination provides many advantages compared with traditional disinfection methods such as:  water quality obtained treatment costs, health impact and easy automatic operation.

The shortness of storage time of the purchased hypo solutions in summer conditions, loss of concentration due to heat and abuse risks that malicious sellers can make in concentration; significantly increases the attractiveness of the system.

In addition, with the high oxidation effect of the produced oxygen radicals as well as chlorine in the process, an extremely bright and clear water quality can be achieved.
System; It works synchronously with the filtration system of the pool and makes the disinfection continuously. The convenience of the system in practice is at least as high as the superior water quality and hygiene it provides.

**“Luminous and Hygienic Pool Water Obtained by Process, Ease of Operation Provided, Big Savings in Operation Costs and Operational Safety”** are the main features that make the system indispensable.



# Working Principles

When an electrolytic process is generated in salt water, chloride ions coming from these dissolved salts are oxidized on the anode surface and combined to form gaseous chlorine which is immediately dissolved in the water.

$$2Cl \longrightarrow Cl_2 + 2e$$

This process, thus, provides a source of pure chlorine from the water dissolved salts. Once chlorine has been generated it triggers a powerful disinfection process under different chemical forms (hypochlorous acid, hypochlorite ion, etc.). These species neutralize microorganisms and oxidize organic matter and other contaminants. Once the disinfection cycle has ended, chlorine comes back to its original state as a dissolved salt.

This chlorine generation process requires a certain amount of dissolved salts in the water in order to provide a sufficient quantity of chloride ions. In a swimming pool this is easily achieve by adding table salt to the water until a concentration of a few grams per liter (usually 5 g/l) is reached. This small concentration provides, by itself, an antiseptic action and a very pleasant contact with the skin. The latter is one of the most appreciated qualities of a salt chlorinated swimming pool. It has to be said that the salt concentration required is much lower than sea concentration (35 g/l) and even lower than a physiological solution (9 g/l) commonly used in eye care.

Gemas Puritron systems generate chlorine in line with no need for tanks or dosing pumps and they are capable of generating from a few grams per hour for a private swimming pool to several kilograms per hour required in big installations.

In most cases, as it's been explained, added salt is a source of advantages. However there exist a number of situations (Olympic swimming pools, drinking water treatment, etc.) where salt concentration can't be altered. In these cases, it is still possible to obtain chlorine from the small amount of natural salts existing in the water. This requires a more sophisticated electrolytic system with much higher chemical performance. Ecochlor® fresh water system has been developed to effectively generate chlorine in such circumstances.

# Production Technology

## Advantages of Switch Mode Power Supplies

Puritron chlorinators use Switch Mode power supplies to polarize the electrode. This allows very precise control over the electrode's working point, which notably minimizes its wear and tear. Control of chlorine production is not executed by varying the power, as is the case with conventional chlorinator, but by interrupting polarization at a certain frequency. This has a direct effect over the duration of the electrodes and electrical consumption. The origin of Switch Mode feed sources is to be found in the IT industry, the same originally designed for reduced powers. They have had to be adapted to generation of electrolysis with the consequent design difficulties that this involves. Apart from the above-described advantages our chlorinators benefit from the scarce consumption, volume and weight of this type of source.

## Efficiency

Switch Mode power supplies operate more than 95% more efficiently than conventional linear AC-DC converters. For this reason, GEMAS SALT-CHLORINE GENERATORS produce MORE CHLORINE with less energy.

## Control

Switch Mode technology makes it possible to control the current values at the output very exact and precisely. Our electrodes always operate at the most optimal point of the power curve. This enables the charging time to be controlled consistently; it creates an advantage that cannot be mixed with traditional methods. Much more chlorine is produced in a much shorter time; electrode life is greatly extended.

## Heat Generation

Switch Mode power supplies produce less heat; allows device design in much narrower volumes. It eliminates the need of fan cooling.

## Dimensional Advantage

GEMAS SALT-CHLORINE devices are small and lightweight compared to many competitors for the reasons explained above, thus providing ease of assembly and cheap transportation.

## Ease of Service

Switch Mode power supplies used in our devices have IP67 protection class and are not affected by the humidity in the environment. The device is completely compact and has no mechanical components that will require service and may be affected by the environment.

# Bipolar Electrodes

Our electrolytic cells use a more advanced technique to obtain chlorine, which is denominated bipolar electrolysis. What is achieved with this technique is that one same electrode will behave like an anode over one face and like a cathode over the other, this in simultaneous fashion.

This produces unique distribution of the potential inside the electrolytic housing, allowing a reduction of its dimensions. It is particularly adapted for use as Switch Mode feed sources, with this technique notably reducing the intensity of the necessary current for production of chlorine, conferring extraordinary performance and resistance to the system.

All ours models use solid high-grade titanium plate for the cell's cathode and anode. The anode coating process is strictly controlled to assure a uniform lining of a few microns that will guarantee performance of the cell during many years.

# Advantages

## Effective

Chlorine disinfection is much more effective than in a conventional dosing system. Pure form of chlorine, Cl2, is continuously generated in the cell. This led to the formation of high percentage of hypochlorous acid that has a much higher oxidant power than the hypochlorite ion coming from the commercial chlorine products (sodium or calcium hypochlorite). The high chlorine concentration existing in the cell is capable of destroying contaminants, such as chloramines or remains of body lotions, that commercial chlorine can't eliminate. An additional oxidizing effect is provided by the electromagnetic field existing in the cell. The result is a double and more powerful sanitizing effect. As the disinfection occurs continuously in the cell, an exceptional water quality can be obtained even without any residual chlorine level in the pool. Swimming pools treated with salt chlorination are known for their astonishing crystal-clear water.

## Healthy

The system avoids the use of chemical products and prevents from isocyanic preservatives exposure. Chlorine is obtained in a pure chemical form that minimizes the formation of toxic by-products. After completing its disinfection cycle, chlorine converts back to salt in the pool. Chemicals storage is no longer needed. The disinfectant power of the process is superior to conventional chlorination due to the strong oxidizing conditions in the cell. Chloraminated compounds, responsible of skin and ocular irritation and of the characteristic "chlorine odor" of conventional treated swimming pools, are destroyed in the cell. The small concentration of salt in the water acts as a natural antiseptic against algae and bacteria and provides.

## Comfortable

The salt concentration, close to the human tear salt concentration, provides a very pleasant isotonic sensation to the skin and eyes. The skin no longer swells or dehydrates, the hair does not get dry, and the eyes can be opened into the water without sting. There is no chlorine odor over the skin and no need to take a shower immediately after the bath. Besides, salt composition accelerates tanning.

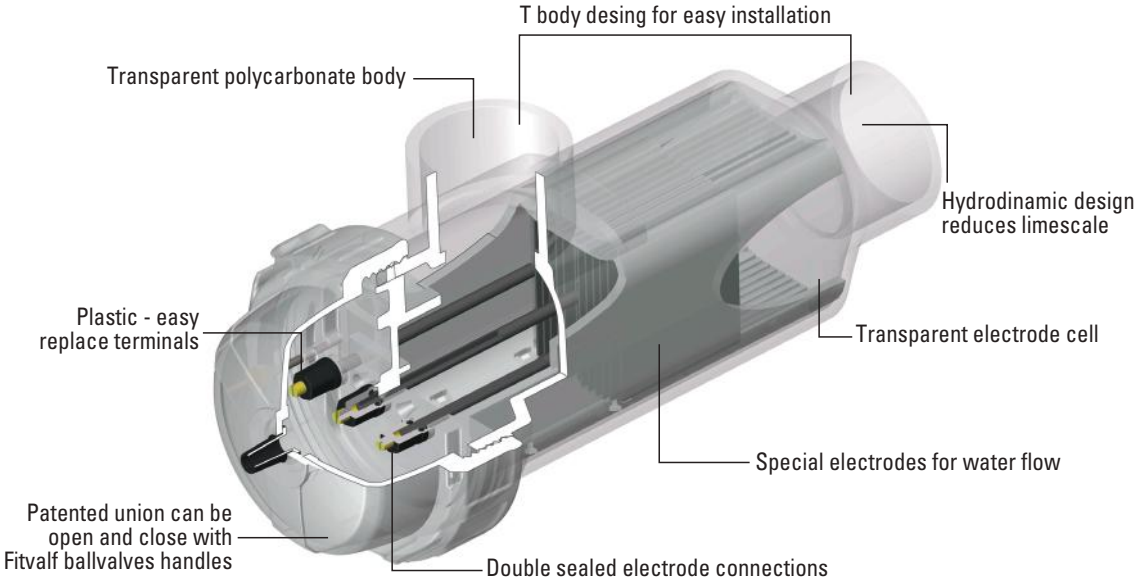
## Secure

Chlorine is produced and immediately dissolved in the water automatically. There is no manipulation or storage of chemical products and, therefore, no risk of fire or explosion. The system eliminates the corrosive ambient conditions in the filter rooms, providing better working conditions and longer equipment life span.

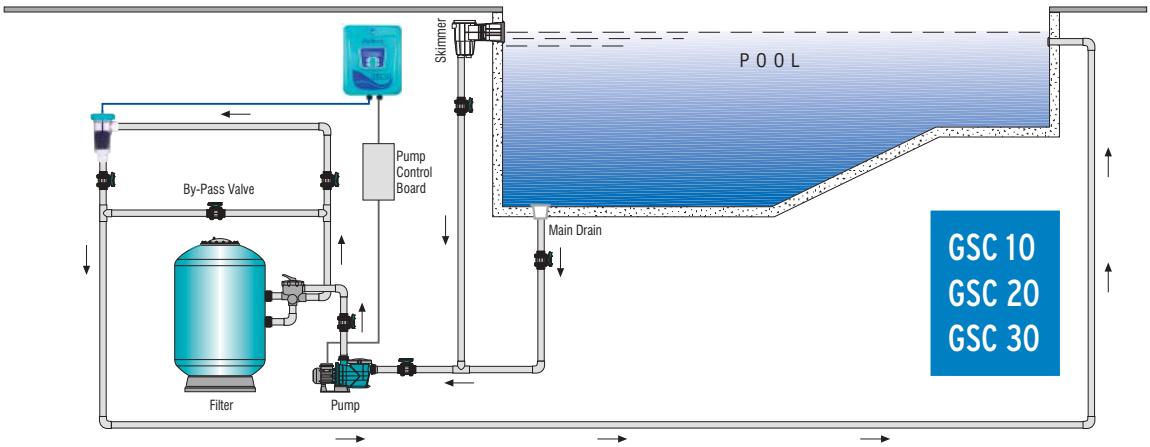
## Ecological

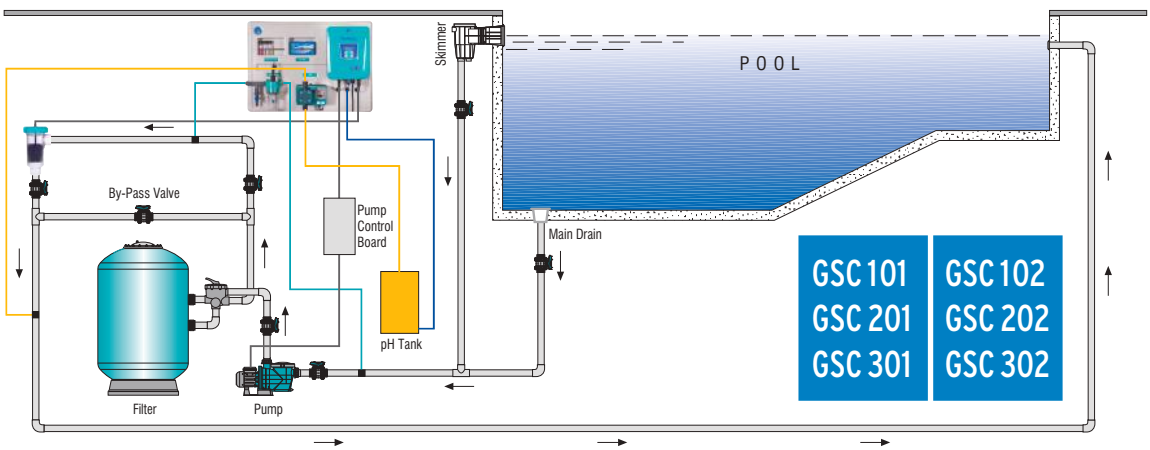
Chlorine is generated without preservatives from salt in a renewable process and it becomes salt again at the end of the disinfection cycle. Water is treated without adding any external compound to the water. The local chlorine production avoids $CO_2$ and energy consumption due to transport as well as accidental toxic dumping.

# Salt Electrochlorinisation

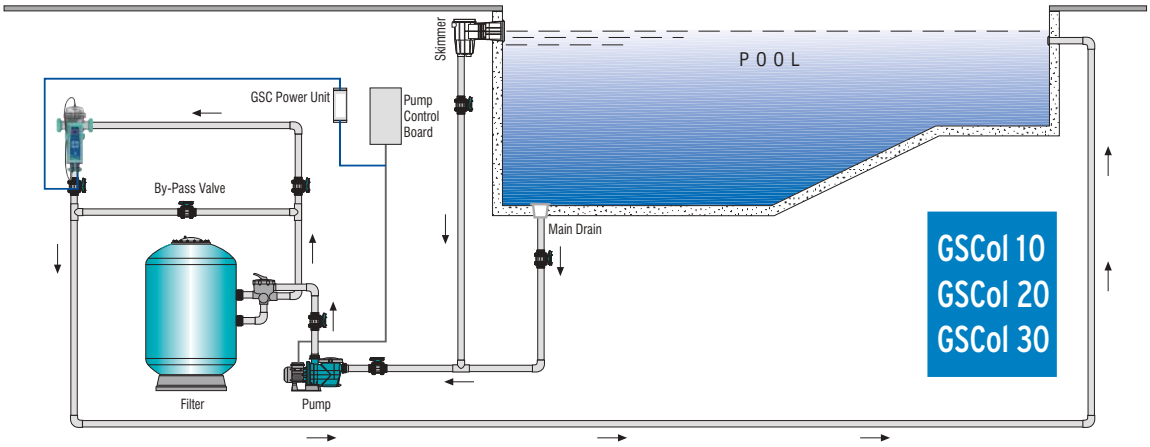


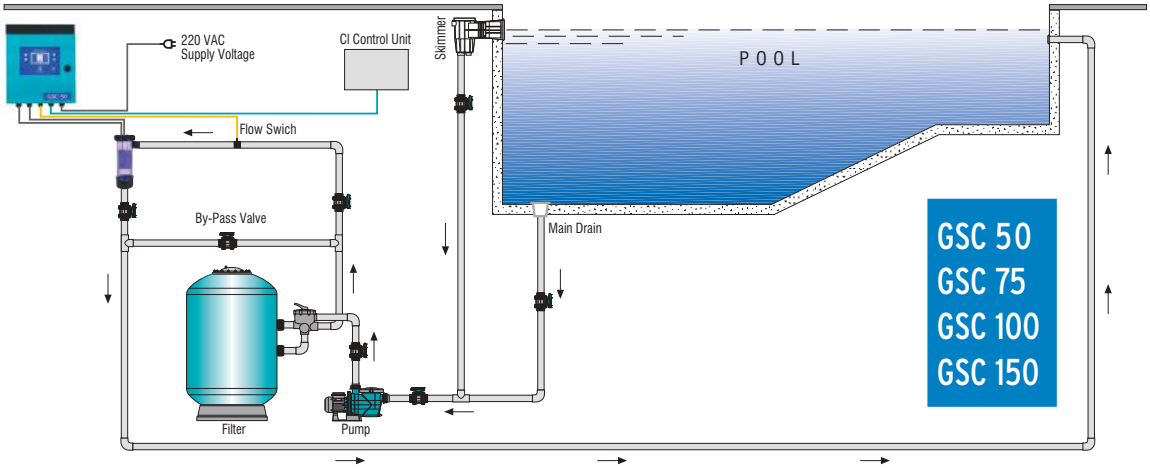

# Assembly and Installation Schemes

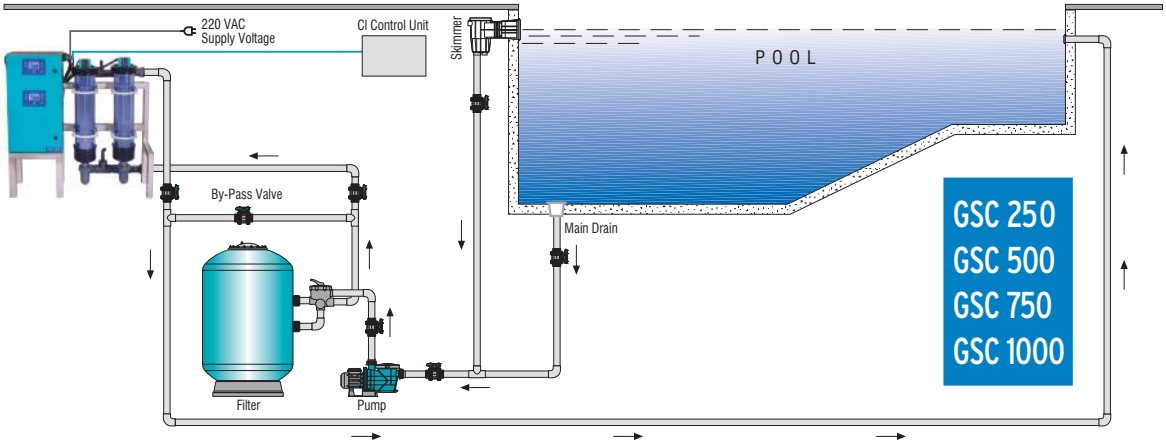


# Assembly and Installation Schemes



# How to Choose Correct Salt Chlorinator

To ensure a proper performance of our equipment in public swimming pools, we should not rely only on its volume as in the private pool, but we must consider other parameters such as the number of daily bathers and the hours of filtration. Serve as a guide the following table (these calculations are made only for outdoor pool) and we recommend that, if you have any questions, send us the form you will find on the following page so we can indicate the chlorinator needed for your installation.

## Daily Chlorine Requirement:

**1- Loss from Swimmers:** The number of swimmers should be determined or estimated. This number should be considered according to busiest day.

Daily lost per swimmer in Mediterranean Region is 10 g/day.

**2- Loss from Sun Light (The Destructive effects of UV light on chlorine):** This lost is on average 2,5 g per each pool $m^3$ in Mediterranean belt.

**Daily Chlorine Requirement (g) = The Number of Swimmers x 10 g + Pool Volume ($m^3$) x 2,5 g**

**For example:**

The Pool that 250 swimmer's daily use and 1000 $m^3$ pool volume.

Daily Chlorine Requirement = 250 x 10 g + 1000 $m^3$ x 2,5 g/$m^3$ = 5000 g

With 12 hours filtration = 5000 g/12h = 416 g/h ▶ GSC 500

With 24 hours filtration = 5000 g/24h = 200 g/h ▶ GSC 250

# Recommended Model for Commercial Pools

| Bathers Per A Day | POOL WATER VOLUME ($m^3$) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 | 200 | 400 | 500 | 750 | 1000 | 1500 |
| 50 | GSC 75<br>GSC 50 | GSC 100<br>GSC 75 | GSC 150<br>GSC 150 | GSC 150<br>GSC 150 | GSC 250<br>GSC 250 | GSC 300*<br>GSC 300* | GSC 500<br>GSC 500 |
| 100 | GSC 100<br>GSC 75 | GSC 150<br>GSC 100 | GSC 150<br>GSC 100 | GSC 250<br>GSC 150 | GSC 250<br>GSC 250 | | |
| 200 | GSC 150<br>GSC 100 | GSC 250<br>GSC 150 | GSC 250<br>GSC 150 | GSC 300*<br>GSC 250 | GSC 250<br>GSC 250 | GSC 500<br>GSC 500 | |
| 300 | | | GSC 300*<br>GSC 150 | | GSC 500<br>GSC 300* | | GSC 750*<br>GSC 500 |
| 400 | | | | GSC 500<br>GSC 250 | | | |
| 500 | | | | | | GSC 750*<br>GSC 500 | GSC 1000*<br>GSC 500 |

Models recommended for 12 h filtration - Model recommended for 24 h filtration

* GSC 300, GSC 750 and GSC 1000 models are produced after order.
During design, machine room conditions should be taken into consideration.

# GSC 10
# GSC 20
# GSC 30

# Technical Features


- User friendly interface and menu system with multiple functions.
- Digital control and display system
- IP67 isolation class SWITCH MODE power supply. Completely protected in corrosive and high humidity conditions thanks to no forced ventilation IP67 power supply.
- Low maintenance compact bipolar cell.
- More efficient and accessible cell
- Electrode transparent housing for easy access.
- Water resistant cell connection without nuts.
- Leakage current protection
- Easy installation with independent mounting part
- Optional Wi-Fi connection
- Optional Flow switch
- Self-cleaning electrodes

| MODEL | | GSC 10 | GSC 20 | GSC 30 |
|---|---|---|---|---|
| Chlorine production | g/h | 10 | 20 | 30 |
| Recommended pool volume | $m^3$ | 0 - 40 | 30 - 90 | 80 - 150 |
| Recommended salt level | gr/l | 4 | 4 | 4 |
| Cell duration | h | 14.000 | 14.000 | 14.000 |
| Max. flow | $m^3/h$ | 27 | 27 | 27 |
| Max. operation pressure | kpa | 480 | 480 | 480 |
| Cell housing pressure drop | kpa | 2,5 | 5 | 5 |
| Output voltage | VDC | 24 | 24 | 24 |
| Output Current | A | 2 | 4 | 6 |
| Input Voltage | VAC | 220 | 220 | 220 |
| Power consumption | W | 50 | 100 | 150 |
| Cell housing material | | Polycarbonate | Polycarbonate | Polycarbonate |
| Cell material | | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 |
| Polarity time | | 1 to 12 h | 1 to 12 h | 1 to 12 h |
| Plumbing | mm | 50 | 50 | 50 |
| Weight | kg | 4,5 | 4,5 | 4,5 |
| Packaging dimensions (L/M/H) | mm | 600 x 350 x 150 | 600 x 350 x 150 | 600 x 350 x 150 |

# GSC 101
# GSC 201
# GSC 301

# Technical Features

- User friendly interface and menu system with multiple functions.
- Digital control and display system on LCD screen.
- IP67 isolation class SWITCH MODE power supply.
  Completely protected in corrosive and high humidity conditions thanks to no forced ventilation IP67 power supply.
- Mounted on panel.
- Low maintenance compact bipolar cell.
- More efficient and accessible cell.
- Electrode transparent housing for easy access.
- Water resistant cell connection without nuts.
- Leakage current protection.
- Easy installation with independent mounting part.
- Optional Wi-Fi connection.
- Optional Flow switch connection.
- Optional pH control software and hardware.
- With 2 l/h design pump. Peristaltic and magnetic model dosing pump options.
- Self-cleaning electrodes.

| MODEL | | GSC 101 | GSC 201 | GSC 301 |
|---|---|---|---|---|
| Chlorine production | g/h | 10 | 20 | 30 |
| Recommended pool volume | $m^3$ | 0 - 40 | 30 - 90 | 80 - 150 |
| Recommended salt level | gr/l | 4 | 4 | 4 |
| Cell duration | h | 14.000 | 14.000 | 14.000 |
| Max. flow | $m^3/h$ | 27 | 27 | 27 |
| Max. operation pressure | kpa | 480 | 480 | 480 |
| Cell housing pressure drop | kpa | 2,5 | 5 | 5 |
| Output voltage | VDC | 24 | 24 | 24 |
| Output Current | A | 2 | 4 | 6 |
| Input Voltage | VAC | 220 | 220 | 220 |
| Power consumption | W | 50 | 100 | 150 |
| Cell housing material | | Polycarbonate | Polycarbonate | Polycarbonate |
| Cell material | | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 |
| Polarity time | | 1 to 12 h | 1 to 12 h | 1 to 12 h |
| Plumbing | mm | 50 | 50 | 50 |
| Weight | kg | 11,5 | 11,5 | 11,5 |
| Packaging dimensions (L/M/H) | mm | 810 x 600 x 240 | 810 x 600 x 240 | 810 x 600 x 240 |

# GSC 102
# GSC 202
# GSC 302

# Technical Features


- It produces chlorine in the salt concentration in the same proportion as the tear salinity.
- It has a user-friendly interface that provides ease of use with an LCD screen.
- It has an automatic electrode cleaning feature against calcification.
- Thanks to the measurement and control feature between 0 - 14 pH, the pool always remains at the desired pH.
- It allows the pool to produce as much as for chlorine thanks to ORP measurement between 0-1000 mV.
- It has a long-lasting titanium electrode.
- It has an electrode life of 16.000 hours.
- It offers the opportunity to adjust to the optimum level by increasing or decreasing the pole change time for cleaning the electrodes.
- Thanks to the LCD screen, it provides the opportunity to display the current at the moment of operation.
- The device records the total working time.
- It can be easily applied to the existing pool.
- The minimum recommended salinity is 4.000 ppm (4kg/$m^3$).
- The device can also be used in seawater with 35.000 ppm.

| MODEL | | | GSC 102 | GSC 202 | GSC 302 |
|---|---|---|---|---|---|
| Chlorine production | | g/h | 10 | 20 | 30 |
| Recommended pool volume (Max.) | **Temperate** | $m^3$ | 50 | 100 | 170 |
| | **Tropical** | | 35 | 65 | 110 |
| pH measurement-control | | pH | 0 - 14 | 0 - 14 | 0 - 14 |
| ORP measurement-control | | mV | 0 - 1000 | 0 - 1000 | 0 - 1000 |
| Cell duration | | h | 16.000 | 16.000 | 16.000 |
| Max. flow | | $m^3/h$ | 27 | 27 | 27 |
| Max. operation pressure | | kpa | 320 | 320 | 320 |
| Cell housing pressure drop | | kpa | 5 | 5 | 5 |
| Output voltage | | VDC | 24 | 24 | 24 |
| Output Current | | A | 2 | 4 | 6 |
| Input Voltage | | VAC | 220 | 220 | 220 |
| Power consumption | | W | 50 | 100 | 150 |
| Salt concentration | | gr/l | 4 - 35 | 4 - 35 | 4 - 35 |
| Cell housing material | | | PMMA | PMMA | PMMA |
| Cell material | | | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 |
| Polarity time | | | 1 to 12 h | 1 to 12 h | 1 to 12 h |
| Weight | | kg | 11,5 | 11,5 | 11,5 |
| Packaging dimensions (L/M/H) | | mm | 810 x 600 x 240 | 810 x 600 x 240 | 810 x 600 x 240 |

# GSCol 10
# GSCol 20
# GSCol 30

# Technical Features

- User friendly interface and menu system with multiple functions.
- Digital control and display system
- IP67 isolation class SWITCH MODE power supply. Completely protected in corrosive and high humidity conditions thanks to no forced ventilation IP67 power supply.
- Low maintenance compact bipolar cell.
- More efficient and accessible cell
- Electrode transparent housing for easy access.
- Water resistant cell connection without nuts.
- Leakage current protection
- Easy installation with independent mounting part
- Optional Wi-Fi connection
- Optional Flow switch
- Self-cleaning electrodes

| MODEL | | GSCol 10 | GSCol 20 | GSCol 30 |
|---|---|---|---|---|
| Chlorine production | g/h | 10 | 20 | 30 |
| Recommended pool volume (Max.) **Temperate** | $m^3$ | 50 | 100 | 170 |
| **Tropical** | | 35 | 65 | 110 |
| Recommended salt level | gr/l | 4 | 4 | 4 |
| Cell duration | h | 16.000 | 16.000 | 16.000 |
| Max. flow | $m^3/h$ | 27 | 27 | 27 |
| Max. operation pressure | kpa | 320 | 320 | 320 |
| Cell housing pressure drop | kpa | 5 | 5 | 5 |
| Output voltage | VDC | 24 | 24 | 24 |
| Output Current | A | 2 | 4 | 6 |
| Input Voltage | VAC | 220 | 220 | 220 |
| Power consumption | W | 50 | 100 | 150 |
| Cell housing material | | PMMA | PMMA | PMMA |
| Cell material | | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 |
| Polarity time | | 1 to 12 h | 1 to 12 h | 1 to 12 h |
| Plumbing | mm | 50 | 50 | 50 |
| Weight | kg | 4,5 | 4,5 | 4,5 |
| Packaging dimensions (L/M/H) | mm | 410 x 250 x 180 | 410 x 250 x 180 | 410 x 250 x 180 |

Commercial Pools

# GSC 50
# GSC 75
# GSC 100
# GSC 150

# Technical Features


- Designed for mid-size hotel and complex pools.
- IP67 isolation class SWITCH MODE power supply. Completely protected in corrosive and high humidity conditions thanks to no forced ventilation IP67 power supply.
- Titanium electrodes duration is 14.000 hours.
- Stainless steel body
- User friendly interface and menu system with multiple functions.
- Digital control and display system on LCD screen
- Self-cleaning electrodes
- Low maintenance compact bipolar cell.
- More efficient and accessible cell
- Water resistant cell connection without nuts.
- Software and hardware for automatic pH control. (with pH control options)
- Optional Wi-Fi connection
- Complete with flow switch.

| MODEL | | GSC 50 | GSC 75 | GSC 100 | GSC 150 |
|---|---|---|---|---|---|
| Chlorine production | g/h | 50 | 75 | 100 | 150 |
| Recommended pool volume | $m^3$ | 150 - 200 | 200 - 250 | 250 - 300 | 300 - 350 |
| Recommended salt level | gr/l | 4 | 4 | 4 | 4 |
| Cell duration | h | 14.000 | 14.000 | 14.000 | 14.000 |
| Max. flow | $m^3/h$ | 27 | 27 | 27 | 27 |
| Max. operation pressure | kpa | 480 | 480 | 480 | 480 |
| Cell housing pressure drop | kpa | 2,5 | 5 | 5 | 5 |
| Output voltage | VDC | 24 | 24 | 24 | 24 |
| Output Current | A | 10 | 15 | 20 | 30 |
| Input Voltage | VAC | 220 | 220 | 220 | 220 |
| Power consumption | W | 250 | 375 | 500 | 750 |
| Cell housing material | | Polycarbonate | Polycarbonate | Polycarbonate | Polycarbonate |
| Cell material | | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 |
| Polarity time | | 1 to 12 h | 1 to 12 h | 1 to 12 h | 1 to 12 h |
| Plumbing | mm | 63 | 63 | 63 | 63 |
| Weight | kg | 13 | 15 | 20 | 25 |
| Packaging dimensions (L/M/H) | mm | 600 x 350 x 150 | 600 x 350 x 150 | 600 x 350 x 150 | 600 x 350 x 150 |

Commercial Pools

# GSC 250
# GSC 500
# GSC 750
# GSC 1000

## Technical Features


- Designed for mid-size hotel and complex pools.
- IP67 isolation class SWITCH MODE power supply. Completely protected in corrosive and high humidity conditions thanks to no forced ventilation IP67 power supply.
- Titanium electrodes duration is 20.000 hours.
- User friendly interface and menu system with multiple functions.
- Digital control and display system on LCD screen
- Self-cleaning electrodes
- Low maintenance compact bipolar cell.
- High performance electro chlorinators for intensive commercial exploitation and high capacity - public installations.
- Electronics in good in insulated cabinet without external ventilation. IP65
- Electronic current control + Temperature and waterflow control.
- Extended salinity range: 500 - 35.000 ppm (sea water)
- Compact assembly design with integrated cell and housing.
- Transparent cell body to ease inspection.
- Reverse polarity cell easily accessible and of a low maintenance.
- Electrodes of a low current density and long life 20.000 hours.
- Includes a flow switch.

| MODEL | | GSC 250 | GSC 500 | GSC 750 | GSC 1000 |
|---|---|---|---|---|---|
| Chlorine production | g/h | 250 | 500 | 750 | 1000 |
| Recommended pool volume | $m^3$ | Calculation | Calculation | Calculation | Calculation |
| Recommended salt level | gr/l | 4 | 4 | 4 | 4 |
| Cell duration | h | 14.000 | 14.000 | 14.000 | 14.000 |
| Max. flow | $m^3/h$ | 27 | 27 | 27 | 27 |
| Max. operation pressure | kpa | 480 | 480 | 480 | 480 |
| Cell housing pressure drop | kpa | 5 | 5 | 5 | 5 |
| Output voltage | VDC | 24 | 24 | 24 | 24 |
| Output Current | A | 50 | 100 | 150 | 200 |
| Input Voltage | VAC | 220 | 220 | 220 | 220 |
| Power consumption | W | 1200 | 2400 | 3600 | 4800 |
| Cell housing material | | Polycarbonate | Polycarbonate | Polycarbonate | Polycarbonate |
| Cell material | | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 | Titanium grade 1 |
| Polarity time | | 1 to 12 h | 1 to 12 h | 1 to 12 h | 1 to 12 h |
| Plumbing | mm | 63 | 63 | 63 | 63 |
| Weight | kg | 40 | 60 | 100 | 120 |
| Packaging dimensions (L/M/H) | mm | | | | |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GSC 30 TUZ KLOR JENERATÖRÜ

# ELEKTROMANYETİK UYUMLULUK (EMC) TEST RAPORU

ECP Engineering Certification Project

| ECP |
|---|
| ECP.18.10<br>R00 |
| 09-18 |

| | |
|---|---|
| **Müşteri**<br>*Client* | : GEMAŞ GENEL MÜHENDİSLİK MEKANİK SAN. VE TİC. A.Ş. |
| **Adres**<br>*Address* | : MİMAR SİNAN MAH. YASEMİN SOK. NO.:16 34075 KEMERBURGAZ EYÜP İSTANBUL |
| **İmalatçı**<br>*Manufacturer* | : GEMAŞ GENEL MÜHENDİSLİK MEKANİK SAN. VE TİC. A.Ş. |
| **Deney Numunesi**<br>*Test Sample* | : GSC 30 TUZ KLOR JENERATÖRÜ |
| **Marka**<br>*Trade Mark* | : PURITRON |
| **Deney Metodu**<br>*Test Method* | : TS EN 61000-6-2:2006(TS EN 61000-6-2/AC),<br>TS EN 61000-6-4:2007(TS EN 61000-6-4/A1:2011),<br>TS EN 61000-4-2:2014,TS EN 55011:2016 (TS EN 55011/A1:2017)<br>Elektromanyetik Uyumluluk(EMU) Testleri/*Electromagnetic Compatibility (EMC) Tests* |
| **Deney Tarihi**<br>*Date of Test* | : 13.09.2018 |
| **Toplam Sayfa Sayısı**<br>*Total Number of Pages* | : 10 |

**Deney ve/veya ölçüm sonuçları ve deney metotları, bu raporun tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.**
*The test and / or measurements results and test methods are given on the following peges which are part of this report.*

**Bu rapor, laboratuvarımızın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz raporlar geçersizdir.**
*This report shall not be reproduced other than in full except with the permission of the laboratory.Testing reports without signature and seal are not valid.*

| **Mühür**<br>*Seal* | **Tarih**<br>*Date* | **Hazırlayan**<br>*Prepared by* | **Onaylayan**<br>*Approved by* |
|---|---|---|---|
| | 17/09/2018 | Mehmet BİLGİÇ | İlkay BAYKAN |

**İçindekiler**
*Contents*

## 1. Numunelerin Tanımı
*Definition of the Samples*

### 1.1 GSC 30 TUZ KLOR JENERATÖRÜ

| | | | |
|---|---|---|---|
| Numune Kabul Tarihi<br>*Date of Receive* | | : | 13.09.2018 |
| Kutup Sayısı<br>*Number of Poles* | | : | 1 |
| Beyan Gerilim<br>*Rated Voltage* | $U_n$ | : | 220VAC |
| Beyan Çalışma Gerilimi<br>*Rated Operational Voltage* | $U_e$ | : | 220VAC |
| Beyan Akım<br>*Rated Current* | $I_n$ | : | 0.8A |
| Beyan Frekans<br>*Rated Frequency* | $f_n$ | : | 50-60Hz |
| Numune Boyutları<br>*Dimensions of the Sample* | m | : | - |
| Numune Ağırlığı<br>*Weight of the Sample* | kg | : | - |
| Sınıf<br>*Class* | | : | II |

## 2. Deney Sonuçları
*Test Results*

: Deney sonuçları, sadece deneyi yapılan numunelere aittir.
*Test results are just belong to the tested samples.*

| Numune<br>*Sample* | Uygulanan Deney<br>*Applied Test* | Sonuç<br>*Result* |
|---|---|---|
| GSC 30 TUZ KLOR JENERATÖRÜ | Elektro Statik Boşalma Bağışıklık Deneyi<br>*Electrostatic Discharge Immunity Test* | OLUMLU<br>*PASSED* |
| | Bağlantı Ucu Bozulması Ölçüm Deneyi<br>*Conducted Emissions Test* | OLUMLU<br>*PASSED* |
| | Yayılım Bozulması ölçüm Deneyi<br>*Radiated Emissions Test* | OLUMLU<br>*PASSED* |

## 3. Çevre Şartları
*Environmental Conditions*

**3.1 Ortam Sıcaklığı** : (28±3) °C
*Ambient Temperature*

**3.2 Ortam Nemi** : (50±3) %Rh
*Ambient Moisture*

## 4. Deney Metodundan Sapma,Ekleme ve Çıkarmalar :
*Deviations , Additions & Cutbacks from the Test Method*

Deneyler; standart deney metoduna göre uygulanmıştır.
*Tests were made according to the clauses of the relevant standards.*

## 5. Şartnamelere Uygunluk (Gerekli Hallerde) :
*Conformity to Specifications (If Necessary)*

Uygun
*Conformable*

## 6. Ölçüm Belirsizliği :
*Uncertainty of Measurement*

**Beyan edilen genişletilmiş ölçüm belirsizliği, standart belirsizliğin k=2 olarak alınan genişletme katsayısı ile çarpımı sonucunda bulunan değerdir ve % 95 oranında güvenilirlik sağlamaktadır.**
*The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2 which for a normal distribution corresponds to a coverage probability of approximately 95 %.*

| | | | |
| --- | --- | --- | --- |
| 7. | **Açıklama** *Explanation* | : | Deneyler, GEMAŞ GENEL MÜHENDİSLİK MEKANİK SAN. VE TİC. A.Ş.'nin İTOB Organize Sanayi Bölgesi 10001 Sokak No:28 Tekeli Menderes / İZMİR adresinde bulunan üretim sahasında gerçekleştirilmiştir. |
| 8. | **Dağıtım Bilgileri** *Distribution Information* | : | Bu kopya GEMAŞ GENEL MÜHENDİSLİK MEKANİK SAN. VE TİC. A.Ş.'ne aittir. |

## 9.Deneyler
*Tests*

### 9.1 Deney Parametleri :
*Test Parameters*

**TS EN 61000-6-2**

**BAĞIŞIKLIK-MUHAFAZA** *IMMUNITY ENCLOSURE*

| DENEY | Test Spesifikasyonu | Birim | Standart |
| --- | --- | --- | --- |
| Elektrostatik Boşalma Bağışıklık Deneyi *ESD* | ± 4 Contact discharge<br>± 8 Air discharge | kV (charge voltage)<br>kV (charge voltage) | TS EN 61000-4-2 |

**TS EN 61000-6-4**

**YAYILIM** *EMISSION*

| Port | Frekans | Limit | Temel Standart | Notlar |
| --- | --- | --- | --- | --- |
| AA hatları | 0.15-0.5 MHz | 79 dB(µV) quasi peak<br>66 dB(µV) average | EN 55011 | - |
| | 0.5-5 MHz | 73 dB(µV) quasi peak<br>60 dB(µV) average | | |
| | 5-30 MHz | 73 dB(µV) quasi peak<br>60 dB(µV) average | | |

| Port | Frekans | Limit | Temel Standart | Notlar |
| --- | --- | --- | --- | --- |
| Muhafaza | 30-230 MHz | 40 dB(µV/m) quasi peak, measured at 10 m | EN 55011 | 10 metre mesafede ölçüm yapıldığında limitler 10db arttırılarak uygulanır. |
| | 230-1000 MHz | 47 dB(µV/m) quasi peak, measured at 10 m | | |

**9.2 Açıklamalar :**
*Explanation*

İlave Çevresel Şartlar: -
*Additional Environmental Conditions*

Destek Ekipmanları: -
*Auxiliary Equipments*

Deneyin gerçekleştirilmesi için gerekli olan özel koşullar: Her deneyle ilgili olarak deney ve ölçüm bilgileri bölümünde açıklanmıştır.
*Special Conditions for testing*

Deneyin gerçekleştirildiği ortam için özel çevre koşulu: Her deneyle ilgili olarak deney ve ölçüm bilgileri bölümünde açıklanmıştır.
*Special Conditions for the Environment where the test was applied*

Kullanılan herhangi özel koşul(örneğin kablo uzunluğu veya tipi, ekranlama veya topraklı veya DGC'nin çalışma sınırı sağlanması için gerekli çalışma koşulları): -

Deney numunesindeki Modifikasyonlar: -
*Modification for the test sample*

**9.3 BAĞLANTI UCU BOZULMA GERİLİMİ ÖLÇÜM DENEYİ :**

Deneyden geçen cihaz TS EN 55011 standardına uygun olarak kurulmuş bir deney düzeneği içerisinde deneye tabi tutulmuştur.Deneyden geçen cihaz toprak düzlemi üzerine konmuştur.Frekans bölgesi 150kHZ-30MHZ aralığında belirlenmiştir.Faz(L1) ve Nötr(N) hatlarından Deney Alıcısı ve Voltaj Probu kullanılarak sözde tepe ve ortalama dedektörleri kullanılarak deney gerçekleştirilmiş ve sonuçlar kaydedilmiştir.

**Bağlantı Ucu Bozulma Gerilimi Ölçüm Deneyi-L1**
*CONDUCTED EMISSION*

| NO | FREQ. (kHz.) | EMISSION LEVEL(dBuV) | | LIMIT(dBuV) | | Sonuç *Results* | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | QP | AV | QP | AV | QP | AV |
| 1 | 188 | 35.18 | 22.86 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 2 | 202 | 41.37 | 28.15 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 3 | 224 | 39.55 | 26.02 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 4 | 351 | 35.44 | 22.09 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 5 | 405 | 44.17 | 31.63 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 6 | 432 | 50.02 | 37.48 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |

**Bağlantı Ucu Bozulma Gerilimi Ölçüm Deneyi-LN**
*CONDUCTED EMISSION*

| NO | FREQ. (kHz.) | EMISSION LEVEL(dBuV) | | LIMIT(dBuV) | | Sonuç *Results* | |
|---|---|---|---|---|---|---|---|
| | | QP | AV | QP | AV | QP | AV |
| 1 | 191 | 33.42 | 20.93 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 2 | 205 | 38.25 | 25.11 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 3 | 221 | 35.40 | 22.83 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 4 | 353 | 33.38 | 19.27 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 5 | 403 | 42.62 | 29.68 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |
| 6 | 430 | 49.16 | 36.04 | 79 | 66 | UYGUN *PASS* | UYGUN *PASS* |

**9.4 IŞIYAN BOZULMA ÖLÇÜM DENEYİ :**

Deneyden geçen cihaz TS EN 55011 standardına uygun olarak kurulmuş bir deney düzeneği içerisinde deneye tabi tutulmuştur. Ölçmeler 30MHz-1000MHZ frekans aralığında sözde tepe ölçme alıcısı ile yapılmıştır.Anten ile DGC arasındaki mesafe 10 m'dir.Ölçümler yatay ve dikey polarizasyonlarda gerçekleştirilmiştir. Deney sonuçları kaydedilmiştir.

**Işıyan Bozulma Ölçüm Deneyi**
*RADIATED EMISSION*

| NO | FREQ.(MHz) | EMISSION LEVEL(dBuV/m) | LIMIT(dBuV/m) | Sonuç *Results* | POLARISATION |
|---|---|---|---|---|---|
| 1 | 39.5 | 21.17 | 40.00 | UYGUN *PASS* | Vertical |
| 2 | 44.8 | 19.53 | 40.00 | UYGUN *PASS* | Horizontal |
| 3 | 121.7 | 22.88 | 40.00 | UYGUN *PASS* | Vertical |
| 4 | 138.4 | 17.41 | 40.00 | UYGUN *PASS* | Horizontal |
| 5 | 155.3 | 24.56 | 40.00 | UYGUN *PASS* | Vertical |
| 6 | 182.2 | 27.13 | 40.00 | UYGUN *PASS* | Horizontal |

## 9.5 ELEKTRO STATİK BOŞALMALARA KARŞI BAĞIŞIKLIK DENEYİ (TS EN 61000-4-2):

Deneyden geçen cihaz zeminde duran cihazlar için TS EN 61000-4-2 standardına uygun olarak kurulmuş bir deney düzeneği içerisinde deneye tabi tutulmuştur.Kalibre edilmiş bir ESD deney üretecine bağlı ESD tabancası ile önceden belirlenmiş noktalara aşağıda açıklanmış ESD gerilimi uygulanmıştır.Tesis sonrası deneyleri uygulanmamıştır.

Standartta Klimatik Koşullar aşağıdaki gibi belirlenmiştir;

Sıcaklık: 15-35 Derece
Nem: %30-%60
Basınç: 86KPa(860mbar)-106KPa(1060mbar)

**HAVADAN BOŞALMA:**ESD gerilimi deneyden geçen cihazın normal olarak ulaşılabilir noktalarına uygulanmıştır. Deney aşağıdaki şekilde uygulanmıştır;

-Tekli Boşalma
-±8kV havadan boşalma
-ESD jeneratörü şiddet seviyesi gereken maksimum seviyelere göre ayarlanmıştır.
-Her noktaya en az 10 deşarj uygulanmıştır.(pozitif ve negatif)
-Deşarj aralıkları en az 1 saniye olarak belirlenmiş ve uygulanmıştır.

**TEMASLA BOŞALMA:** ESD gerilimi deneyden geçen cihazın normal olarak ulaşılabilir noktalarına uygulanmıştır.Deney aşağıdaki şekilde uygulanmıştır;

-Tekli Boşalma
-±4kV temasla boşalma
-ESD jeneratörü şiddet seviyesi gereken maksimum seviyelere göre ayarlanmıştır.
-Her noktaya en az 10 deşarj uygulanmıştır.(pozitif ve negatif)
-Deşarj aralıkları en az 1 saniye olarak belirlenmiş ve uygulanmıştır.

## 10. Deney ve Ölçüm Bilgileri
*Test & Measuring Arrangements*

### Deneyde Kullanılan Cihazlar ve Malzemeler
*Items and equipments which are used during test*

| **Cihaz** *Device* | **İmalatçı** *Manufacturer* | **Seri No / Kod** *Serial Number / Code* | **Sertifika No** *Certificate Nr* | **Kalibrasyon Tarihi** *Cal.Date* |
| --- | --- | --- | --- | --- |
| SPECTRUM ANALYZER | DNS TECH | 125047 | 17040157 | 15.04.2019 |
| 470Kx2 RESISTOR | - | 125051 | - | Cal. Not Required |
| BNC CABLE | DNS | 125048 | 17040156 | 15.04.2019 |
| ESD SIMULATOR | ANDY HISH | 06234 | 17040154 | 15.04.2019 |

**11. Numune Fotoğrafları**
*Photos of sample :*