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Circular letter No. 018 dated 25.05.2022

Dear Partners,

This letter will be useful to you when selecting an automatic dosing station CRYSTAL for a particular pool.

Crystal P – a station with peristaltic pumps having a maximum capacity of 2.4 l/h at 1.5 bar of back pressure in the pipeline. During the operation of the peristaltic pump, the hose gradually stretches, it flattens and the pump stops pumping the reagent, especially on sodium hypochlorite. The hose performance time depends on many factors: pool load, pool volume, sodium hypochlorite quality, etc. On average, it is from 6 to 10 months (in some pools it may not work for 3 months). Therefore, it is preferable to install such pumps on small (up to 90 cubic meters) **private** pools, hydromassage baths, hot tubs for **one family**. Otherwise, you must be prepared for frequent replacement of hose fittings (Article 03-25-001-00).

Crystal M – a station with membrane pumps having a maximum capacity of 4.2 l/h (previously 5.2 l/h) at 1.5 bar backpressure in the pipeline. This station is for public pools, hydromassage baths, hot tubs or private pools, it does not require frequent change of hose fittings (these pumps do not have it).

In addition, upon request, we can complete the Crystal M station with more powerful membrane pumps 7.2 l/h (previously it was 11 l/h).

Crystal 4-20 – a station without metering pumps. It allows to connect **only the membrane pumps**! - with which you are accustomed to work. It supports control signal: pulse, analog 4-20mA, analog 0-10V.

According to regulatory documents, 2 grams of active chlorine per hour for indoor pools are necessary per 1 cubic meter of the circulation flow performance (pump/filtration capacity). This is the norm for public pools. The Germans tacitly believe that if the pool is private for one family, then 1 gram of chlorine per 1 cubic meter is enough for the circulation flow performance. We can agree with this.

Let's make a calculation for the membrane pump that we use in the Crystal M station: the metering membrane pump has the capacity of 4.2 l/h x 120 g (the amount of active chlorine in 1 liter of 12% sodium hypochlorite) = 504 gCL/h - this is the maximum possible amount of active chlorine, which the pump can dose during its continuous operation.

Continuous operation of the membrane pump is a bad thing; the pump needs time to “rest”. Therefore, let's take the mode: 70% - the pump is working, 30% - “is resting”, we get: 504 gCL/h x 0.7 = 353 gCL/h - this is the maximum possible amount of active chlorine that the pump can dose in the mode: 70% - the pump is working, 30% - “is resting”. Many prefer the 50/50 mode - it's up to you.

Now let’s determine the maximum possible circulation flow performance (pump/filtration capacity): 353 gCL/h : 2 gCL/h = 176 cub.m/h.

Further, in order to determine the maximum volume of the pool for this station, it is necessary to know the water exchange of the pool (the time during which the entire volume of the pool passes through the filter unit). Suppose that the water exchange of the pool occurs in 4 hours, then the maximum volume of the pool will be: V = 176 cub.m/h x 4 hours = **704 cub.m**. If water exchange occurs in 6 hours: V = 176 cub.m/h x 6 hours = **1,056 cub.m**. If water exchange occurs in 8 hours: V = 176 cub.m/h x 8 hours = **1,408 cub.m**.

Accordingly, if the pool is private for one family, that you can safely multiply by two the maximum pool volumes obtained.

And vice versa, **if the pool is located on the street, then the calculated value of the maximum volume of the pool should be divided by 5** (according to regulatory documents, 10 grams of active chlorine per hour for pools located on the street are necessary per 1 cubic meter of the circulation flow performance (pump/filtration capacity).

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Do not forget that sodium hypochlorite tends to decompose, so already in a month from the date of production, the concentration of active chlorine can drop from 12% to 10.5%, and after 6 months to 6.5-7%!

One last thing: you can adjust the number of injections of the reagent per pulse of the dosing command in the membrane pump! See Circular Letter No. 2 of 23.03.2020 on our website in the section Technical Support, Circular Letters.

Sincerely yours,

DARIN

P.S.

Automatic stations CRYSTAL on our website: https://darin7.ru/avtomatic