DDS MultiAction

Technical manual

(Installation, use, maintenance)

Version 10.12

LIST OF CONTENTS

Declaration of conformity and Patent reference	3
Presentation	4
How it works	5
Versions	5
System components	7
Installation	11
Notices and starting the system	17
Maintenance	18
Troubleshooting	19
After-sales service	19
Spare parts	20
Warranty	21

DECLARATION OF CONFORMITY

EC STATEMENT OF COMPLIANCE

Manufacturer: **Engineering Corporation srl**
(Producer)

Address: **Via Allende, 14 – 41051 Castelnuovo Rangone (MO) ITALY**
(address)

Hereby states that the appliance:

Hereby states that the device known as:

MODEL: ***DDS-Multiaction dosing system***

(Model) *Patent pending* No. PCTIB2010000474

is in conformity with the following EC directives: 73/23EC, 89/336EC, 92/31EC, 93/68EC, as amended and implemented under Italian law.

The machinery meets the requirements set by the following EEC Directives:

Directives 73/23CE, 89/336CE, 92/31CE, 93/68CE, as amended and implemented under Italian law

The following National Standards transposing Harmonized EC regulations have been applied :

The following national standards and technical specifications, conforming to EEC Harmonized Regulations, were followed:

EN 61000-6-4 (2002/10), EN 61000-6-2 (2002/02), EN 55011 (1999/05) CEI EN 61000-3-2 (2002/04), CEI EN 61000-3-3 (1977/06), EN 61010-1 (2001/11)

Castelnuovo Rangone 31/10/2009

ENGINEERING CORPORATION S.r.l.
Il° amministratore
Baranelli. Corrado

*The company **ENGINEERING CORPORATION s.r.l.***
*would like to thank you for preferring the **DDS-Multiaction** system.*

PRESENTATION

The ***DDS-Multiaction*** system (hereinafter called ***DDS-MA***) is a dilution system for biocides in tablets or briquettes (Trichloroisocyanurate acid, Sodium dichloroisocyanurate, Bromine, Oxygen), with max recommended size of 20 g for biocides with low solubility such as Trichloride and Bromine and with larger sizes for very-high solubility biocides such as Dichlorides and Oxygen.

The system is ideal for ensuring utmost operator safety (working at atmospheric pressure only) and requires very little maintenance, thanks to the absence of electronic parts and to the complete dilution of the biocide agent.

Thanks to the special odour-proof swinging cover, bad smells are prevented from entering the environment.
DDS-MA allows diluting and dosing biocides in a hazard-proof and inexpensive way once a measuring instrument, generally a control unit, has determined need.

For private swimming pools, where there is not always a control instrument, dosing can be automated using an automatic system (for example the **QTC-Evo** device) for the timed control of the solenoid of the hydraulic panel **PEV-1000**.

The design of the ***DDS-MA*** system and the materials used to make it enable it to be easily and effortlessly maintained.

OPERATING PRINCIPLE

In designing ***DDS-MA*** two essential characteristics which the new appliance must have were taken into consideration:

- Safety for operators and people near the machine
- Machine reliability without the need for continuous maintenance, and ease of use

On the basis of these principles, designing this wonderful dosing and diluting appliance proved to be very easy; first of all, working in an environment under pressure was avoided (in fact, operation is at environment pressure) and contact of people with the chemical products has been reduced to the utmost during the hopper loading phase (large loading mouth and anti-odour closing swinging cover).
Secondly, in order to achieve low maintenance, it was necessary to eliminate moving parts and in any case always keep the system perfectly clean: simple isn't it ?
DDS-MA does not in fact have any moving parts and is continuously self-cleaning thanks to a recycling system that uses water from the pool.

HOW IT WORKS

The water from the pool is taken between the filtering pump and the pool filter. From here, it is conveyed to the ***DDS-MA*** through the ***PEV-1000*** panel, directly onto the bottom part of the diluter, passing through the floating safety valve. From the bottom of the diluter, through the " ***Venturi*** " system, it is sucked up into the pool recycling system.
This is shown on installation diagrams **1** and **2** .
This way, the water is constantly recycled and this keeps the tank and all the hydraulic lines in contact with the biocide solutions clean .

When a ***biocide*** request is made by the control unit (e.g., **Telepool LC** or **Telepool Professional**), the **EV** solenoid of the ***PEV-1000*** panel is triggered and this allows the water from the recycling pump to enter the basket of the ***DDS-MA*** through the spray jet and to therefore spray and dissolve the product tablets.
The obtained *disinfectant* solution, by falling into the tank underneath, where the water circulates, is further diluted and, by means of the ***Venturi system*** is sucked up into the pool circuit .
Inside the tank are 2 hydraulic safety floats: the first (GL1) controls tank filling, the second (GL2) instead regulates the flow of water conveyed to the basket for dissolving the tablets.

NOTE.

An **ESSENTIAL CONDITION FOR PERFECT DDS-MA OPERATION** is that the rate of water flow coming from the pool recycling pump (or from the manifold in the case of several pumps) be always higher than the solution flow rate taken from the ***Venturi system***.
In these conditions, the safety floats, which are of the proportionate type, position in such a way as to **equalize** the two flow rates (inflow and outflow) keeping the system perfectly balanced.

VERSIONS

2 versions of the ***DDS-MA*** system are available

DDS-Multiaction for pools with a capacity of : 50 – 250 m^3, if Trichloride or Bromine are used

100 - 800 m^3 if Dichloride or Oxygen are used

Product basket capacity around 25 kg
PEV-1000 panel with 350 l/h max flow meter
Venturi system Ø 1'' ½

DDS-Multiaction Plus for pools with a capacity of: 100 - 600 m^3 if Trichloride or Bromine are used

150 - 1500 m^3 if Dichloride or Oxygen are used

Product basket capacity around 40 kg
PEV-1000 panel with 600 l/h max flow meter
Venturi system Ø 1'' ½

MAXIMUM BIOCIDE DILUTION CAPACITY

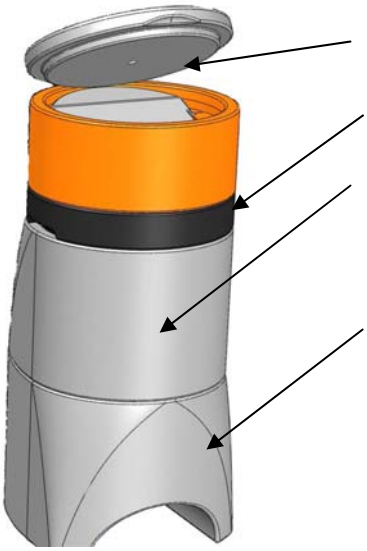
product	*size*	***DDS-Multiaction***	***DDS-Multiaction Plus***
Trichloroisocyanurate acid	20 g tablets	0.6 kg/h	1 kg/h
Sodium dichloroisocyanurate	20 g tablets	4 kg/h	6 kg/h
Bromine	20 g tablets	0.2 kg/h	0.4 kg/h
Oxygen	20 g tablets	4 kg/h	6 kg/h

SPECIFICATIONS OF THE TWO VERSIONS

	DDS-Multiaction	***DDS-Multiaction Plus***
Operating conditions:		
Operating temperature	4 – 35 °C	4 – 35 °C
PEV-1000 panel supply pressure	0.5 – 1.5 ATE	0.5 – 1.5 ATE
Max water flow rate to PEV-1000 panel	800 l/h	1000 l/h
Venturi pipe pressure delta	≥ 20 %	≥ 20 %
Specifications:		
Dimensions	D. 50 cm – H. 110 cm	D. 50 cm – H. 130 cm
Weight	13 kg	15 kg
Basket capacity	25 kg	40 kg

SYSTEM COMPONENTS

Diluter

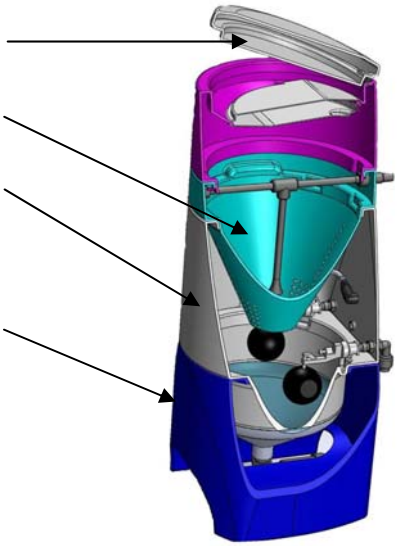


Cover with swinging device

Product basket

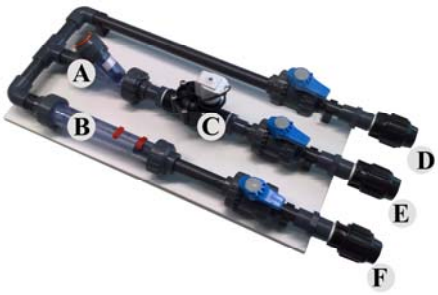
Mixing tank

Base



PEV-1000 panel

Control panel for controlling the flow of water to the system Diluter



(A) Anti-impurity filter

(B) Flow meter

(C) Solenoid **24V**ac

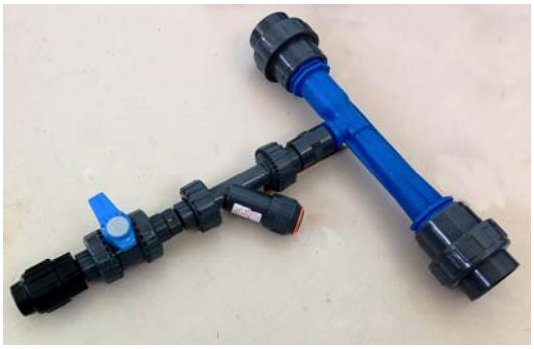
(D) Outlet to tank

(E) Outlet to basket

(F) Water inlet

Venturi system

Venturi pipe system complete with check valve, suction closing valve and basic connections for installation.



ACCESSORIES

Product basket extension

To be used with low-solubility products (*Trichloride and Bromine*)

Sprayhead extension

Recommended with high-solubility products (*Dichloride and Oxygen*)

“Mist effect” sprayhead

For high flow rate systems on EV bypass

“Rain effect” sprayhead

For low flow rate systems on EV bypass

USE WITH HIGH-SOLUBILITY PRODUCTS

For high-solubility products (Sodium dichlorocyanurate, Oxygen in tablets) the dilution sprayhead is fitted directly inside the product basket, using the relative extension.

Accessories to be used

High flow rate

Low flow rate

Using the *cristall* pipe 14x19 provided with the system, connect the fittings (**a0**) and (**a1**)

USE WITH LOW SOLUBILITY PRODUCTS

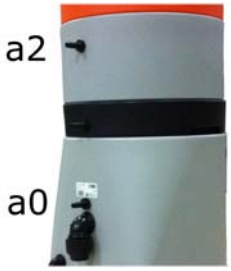
For low-solubility products, we advise using DDS-MA PLUS. The dilution sprayhead is fitted in the upper part so as to increase the contact surface and thus improve the dissolving of the product.

Accessories to be used

High flow rate

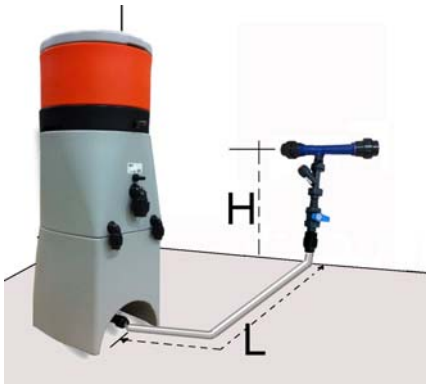
Low flow rate

Using the *cristall* pipe 14x19 provided with the system, connect the fittings (**a0**) and (**a2**)



INSTALLATION

Install the ***Venturi*** system horizontally, as shown in the attached illustrations and diagrams and keep to the recommended measurements.

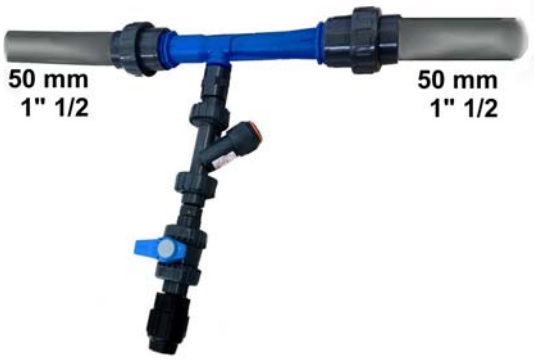


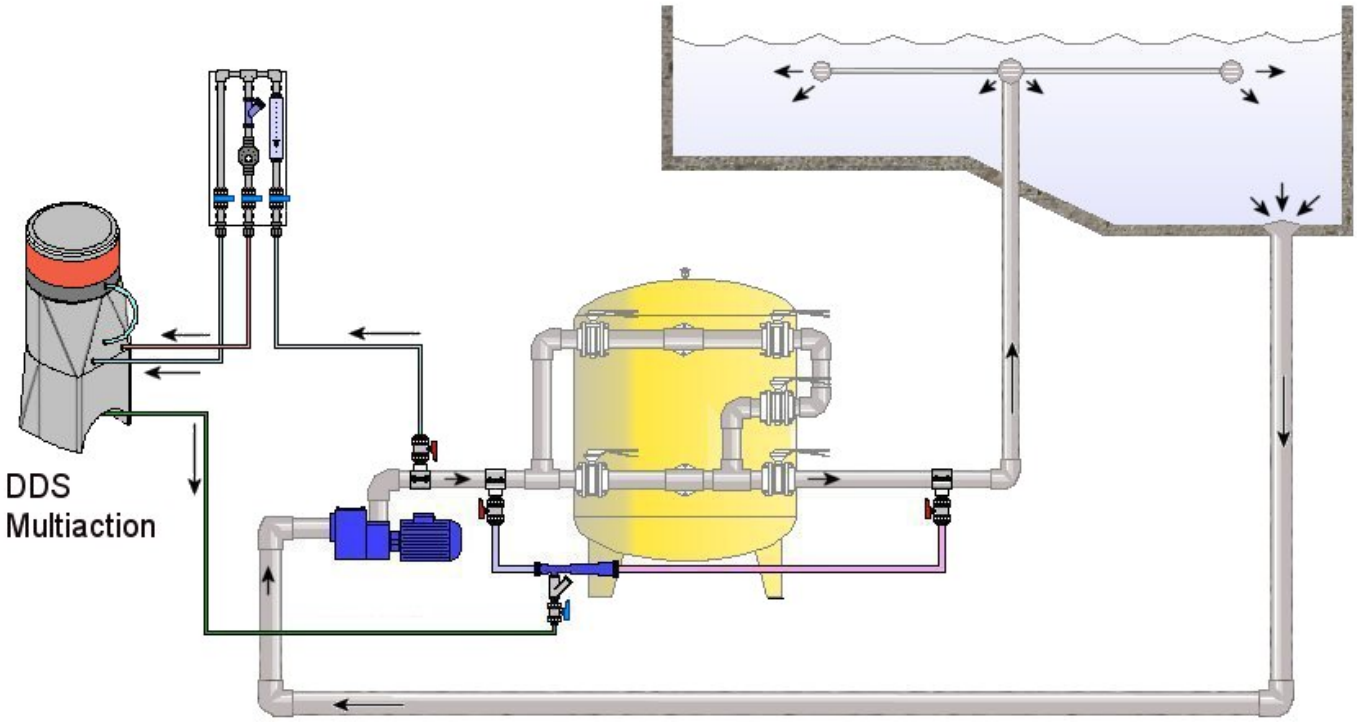
H = max **50** cm

L = max **3** m

For the correct operation of the system, use pipes, valves and fitting accessories with diameter **NOT** less than the dimension of the installed ***Venturi*** system.

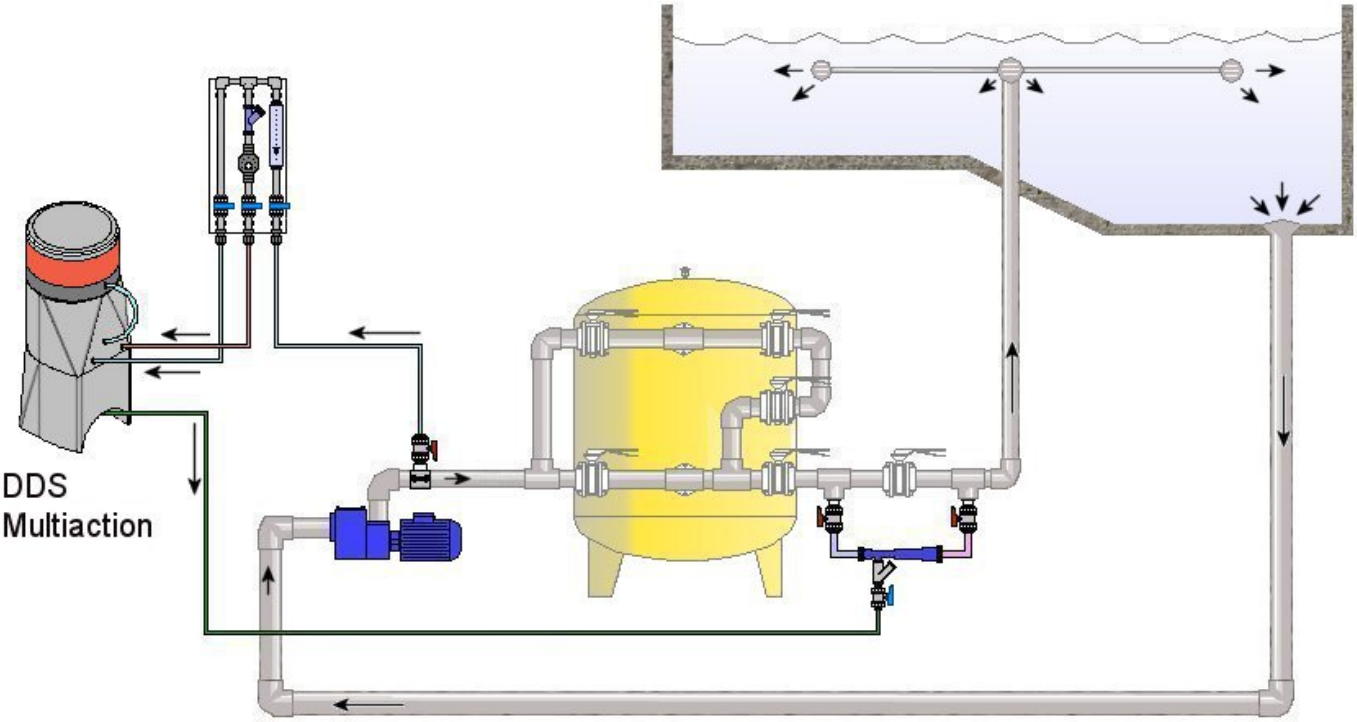
1" ½ Venturi
pipes / accessories with minimum Ø ***1" ½*** (***50mm***)





***1st** Recommended installation diagram.*

Note: The position of the components is purely approximate.



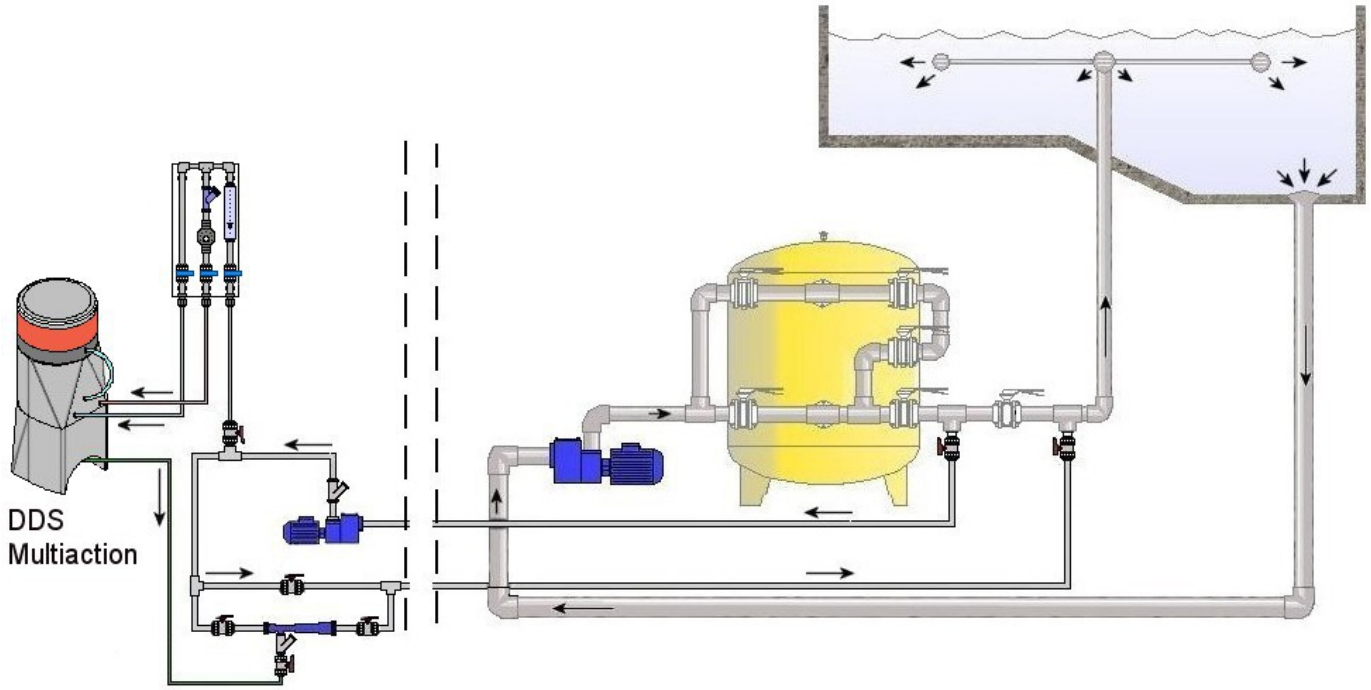
***2nd** Recommended installation diagram.*

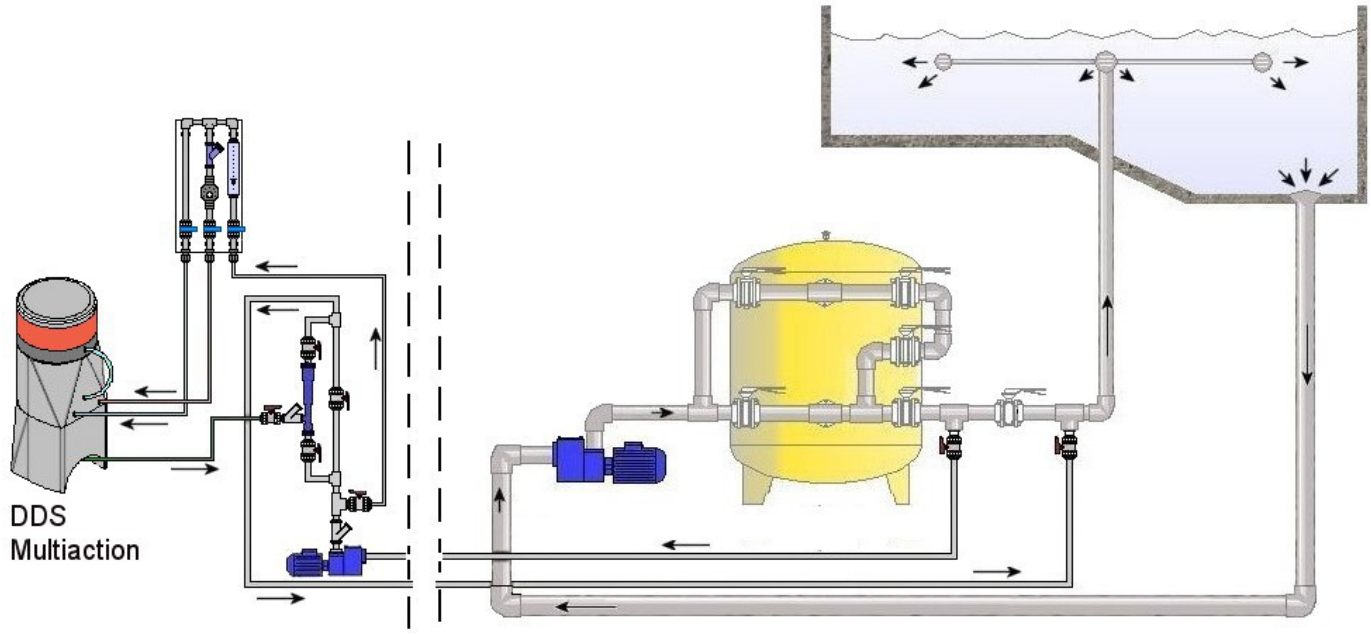
Note. The position of the components is purely approximate.

IMPORTANT

In the event of having to place the ***DDS-MA*** in a position very far away from the disinfectant solution injection point, it may be necessary to make an auxiliary hydraulic circuit to feed the Venturi System and the solenoid panel using a dedicated recirculation pump. This solution is advisable if the quantity of biocide diluted in the unit of time has to be increased.

See illustrations below.

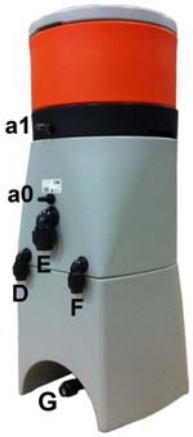




Position the ***DDS-MA*** diluter near the ***Venturi pipe***, so as to have the shortest possible suction section.
Fasten the ***PEV-1000*** to the wall and start the hydraulic connections.

Using the PVC *Flex* ***Ø20*** pipe provided:

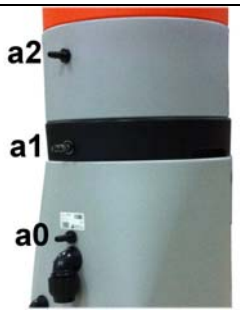
1. Connect the fitting **A** to the valve fitted to the pipe between the pump and the filter.
2. Connect the fitting **C** to the fitting **D**
3. Connect the fitting **B** to the fitting **F**
4. Connect the fitting **G** to the ***Venturi system***
5. Connect the fitting **E** to a pipe for dispersion in a dedicated “Emergency overflow” site.



Keep the pipes of adequate length.

Hydraulic connections of the system.

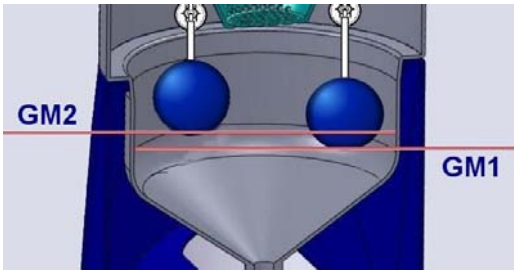
Using the *Cristall 14x19* pipe provided:
Join the fitting **a0** of the tank to the fitting **a1** of the basket or to the fitting **a2** of the extension.
(*depending on the product used*)



Electrically connect the solenoid (**24 Vac 2W**) at the output of the control unit.
The recommended supply pressure on the panel is between 0.5 and 1.5 bar, ensuring a flow rate of at least 1000 l/h.
Important:
In the event of the unit output being of a voltage other than **24 Vac**, use an adequate power voltage transformer to supply the solenoid provided.

Level check

The floating level sensors **GM1** and **GM2** are set during assembly so as to have a distance of about 5 cm between the level controlled by **GM1** and that controlled by **GM2**. The floats are set so **GM1** closes about 3 cm before **GM2**.



(***Optional***)

In case there is no electronic unit, the ***QCT-Evo*** device can be used to control enabling of solenoid valve **EV** at programmable times.

PRECAUTIONS WHEN INSTALLING THE VENTURI SYSTEM

1. For assembly, use fittings and pipes of the same dimensions as the Venturi.

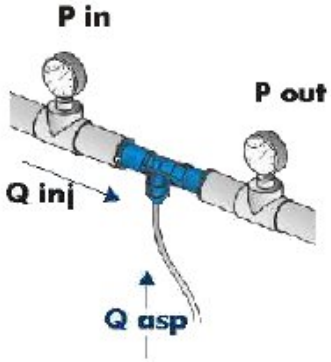
2. Fit pressure gauges on inlet and outlet to determine the operating conditions by means of the attached table (Pin, Pout, injector flow rate (Qinj), and suction flow rate (Qasp)).

3. Each section of pipe between the injector and any other accessory must have a minimum length of 50 cm.

4. The condition required for correct operation of the injector is that the pressure delta (P) % be:

$$\Delta P\% = \frac{Pin - Pout}{Pin} \times 100 \geq 20\%$$

Example: Pin=2 Bar Pout=1.5 Bar ΔP=25%



P in: Inlet pressure

P out: Outlet pressure

Q inj: Venturi flow rate

Q asp: Suction flow rate

START-UP PROCEDURE

As has already been said on the previous pages of the manual, the aim of this appliance is mainly that of ensuring EASY and SAFE preparation of solutions of disinfectants and biocides.
The DDS-MA installation kit contains various accessories suitable for the type of product to be used.

The IMPORTANT thing is that once the disinfectant to be diluted in the DDS-MA has been chosen, different biocides are not mixed together.

To avoid such an error, before starting to use the DDS-MA, the client must affix the irremovable sticker to the diluter cover, which indicates, by colour and logo, the type of biocide disinfectant that will always be used in that appliance.
This operation is essential so as to prevent unfortunate errors and problems for personnel using the appliance.

Do not use calcium hypochlorite in tablets in the DDS-MA. For this disinfectant another DDS unit (DDS-EVO & DDS-EVO Plus) is required, conceived and designed especially for this biocide in tablets.

PRECAUTIONS CONCERNING THE USE OF THE CHEMICAL PRODUCT

DO NOT SMOKE , KEEP THE CHEMICAL PRODUCT AWAY FROM OPEN FLAMES OR HEAT SOURCES

SERIOUS FIRE AND/OR EXPLOSION HAZARD

Only use the **DDS-MA** with a single product.

UNDER NO CIRCUMSTANCES must different products be mixed.

KEEP OUT OF THE REACH OF CHILDREN

VERY IMPORTANT

Once the biocide to be used has been defined, the special coloured sticker must be affixed to the cover of the *DDS-MA* in order to prevent the subsequent mixing with different products.

STARTING THE SYSTEM

- Open the valves of the ***PEV-1000*** panel and of the ***DDS-MA*** diluter outlet.
- Wait until there is enough water in the tank and open the ***Venturi System*** valve.
- Examine all the pipes of the system to determine whether there are any leaks.
- Manually tighten the connections in case of any leaks.
- Finally, insert the product to be diluted in the basket.
- The tank has a capacity of about *25 kg*. But there is no point filling it to the brim.
- Check water flow daily and make sure the flow rate is always correct.

MAINTENANCE

The ***DDS-MA*** system does not normally require maintenance. It is nevertheless best to schedule a plant operation check once a month.

To clean the system, proceed as follows:

- Close the valves of the ***PEV-1000*** panel, of the ***DDS-MA*** outlet and of the ***Venturi System.***
- Lift the tablet basket and then pour the remaining contents into a clean and dry bucket.
- Rinse any deposits off the basket grille using a jet of water or soak it in a solution of ***DDS Cleaner*** (in case any deposits are hard to remove).
- Make sure there are no deposits on the lower part of the black floats of the safety valves. This does in fact come into contact with the chlorinated solution. Check the operation of the floating valves. Moving them when the system is in operation.
- If necessary, well rinse the lower tank of the **DDS-MA**.
- Fit everything back together again and return the product to the basket.
- Open the inlet-outlet valves of the **DDS-MA** system again, being careful to make sure that the inlet flow rate is higher than that of system extraction

DO NOT use metal tools that could damage the plastic parts.

If necessary, only use plastic tools (brushes, spatulas, etc.etc.)

Only ever tighten and loosen the valves and fittings manually.

TROUBLESHOOTING

Problem	*Causes*	*Solution*
The tank of the DDS-MA empties and the *Venturi System* sucks up air	The cause could be that the filling flow rate is below the suction flow rate.	Make sure the recirculation pump basket and anti-impurity filter of the *PEV-1000* are clean and if necessary clean them.
The DDS-MA fails to dose enough biocide.	Wrong programming of the control unit.	Check programming and normal operation of same.
	Not enough dosing time with semi-automatic timed systems.	Increase dosing time and consequently the opening frequency of the solenoid valve of the PEV-1000 panel.
	Not enough water from product basket sprayhead.	Check available flow rate, check normal operation of control float and if necessary clean the filter and solenoid valve of the *PEV-1000* panel.

ASSISTANCE SERVICE

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SPARE PARTS

Code	*Description*	*Image*
120299103	**1'' ½** Venturi system kit	
166402002	**24 Vac 2W** solenoid valve (*PEV-1000 panel)*	
140499005	**100/1000** l/h flow meter (*PEV-1000 panel)*	
164802010	Impurity filter (*PEV-1000 panel)*	
120299114	Level sensor with GM1 float (*tank control*)	
120299116	Level sensor with GM2 float (*chlorination control*)	

DDS-MULTIACTION WARRANTY

Engineering Corporation warrants the product is without material and workmanship faults, under normal use conditions, for a period of two(2)years.

The warranty starts on the date of product purchase, certified by the sales slip and the warranty form which must be completed and sent to Engineering Corporation within 60 days from the delivery date.

Failure to send the warranty form duly completed shall invalidate the warranty itself. In the event of faults being discovered during the warranty period, Engineering Corporation shall, at its discretion, repair or replace the faulty unit. The warranty shall not be valid in the following cases:

- If the product is used or stored in anomalous conditions or if it undergoes incorrect maintenance.
- If repairs, changes or alterations are made not expressly authorised in writing by Engineering Corporation.
- If the product has been improperly used or stored, appears seriously tampered with, has been inadequately packed, suffers accidents or natural calamities.
- If the product has not been correctly installed.
- If the label bearing unit safety indications has been damaged or is missing.
- If products are used other than those indicated in the manual.

Engineering Corporation disclaims liability for accidents and/or damage or injury to things and persons during product use, or for other problems caused by incorrect use of the appliance.

Under no circumstances shall Engineering Corporation be held liable for direct, special or deriving damage, including: damage to or loss of assets or equipment, loss of profits or proceeds, costs of replacing assets or costs or problems caused by interruption of services.

Under no circumstances shall any refund exceed the purchase price of the unit.

To request jobs under warranty, contact the registered offices of Engineering Corporation. You may be asked to produce the purchasing invoice to prove the unit is under warranty.

The units returned to Engineering Corporation must be carefully cleaned, packed and sent by courier carriage free.

The spare parts listed below are covered by a 1 year warranty: solenoid valve, flow meter and impurity filter.