

# Operation manual „Foot bath sputtering system with disinfection“

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## **1. Instructions for the manual**

### **1.1 Validity**

This manual describes the installation, taking into operation and operation of the unit.

### **1.2 Target group**

Only instructed people are allowed to operate the unit. Connection works can only be done by qualified craftsmen.

### **1.3 Storage of the manual**

The manual has to be stored in the direct surrounding of the installed unit. It has always to be accessible.

### **1.4 Further information**

For further information please contact [WDT](#).

### **1.5 Used symbols**

	<p><b>Attention!</b> Warning of danger!</p> <p>Failure to observe this warning may result in serious injury or death and/or damage to the unit</p> <p><b>Every explanation of this sign has to be considered!</b></p>
	<p><b>Attention!</b> Warning of hazardous electrical voltage!</p> <p><b>Danger, Hazardous Voltage:</b> Hazardous electrical current! Failure to observe this warning may result in injury or even serious injury or death.</p> <p><b>Every explanation of this sign has to be considered!</b></p>
	<p><b>Advise!</b></p> <p>This sign refers to circumstances that can affect the functioning of the unit in a positive as well as in a negative way.</p>

## 2. Safety

### 2.1 Technical safety advices

WDT does not take the liability for damages that occur due to not considering this manual. The easy and safe operation of the unit assumes a correct transport, storage and installation of the unit. Respect the following advices to minimize the risk in injury or even serious injury or death.

	<p>The installation of the unit has to be done in accordance with the safety norms (e.g. DIN/ VDE) and all other relevant governmental norms and laws.</p> <p>During the operation all covers of the unit have to be closed.</p> <p>Disconnect unit components from power supply prior to maintenance or repair work.</p>
 	<p><b>General</b></p> <p>Obey all safety notes and warnings present on the unit. In case of a malfunction, switch off the unit immediately and prevent a restart. Repair malfunctions promptly. After any repair work, have qualified personnel check the safe operation of the unit. Use original spare parts only. Additional national safety regulations also fully apply to the operation of this unit.</p>
	<p><b>Accident Prevention Regulations</b></p> <p>Comply with the accident prevention regulation Accident Prevention Regulation Electrical Systems and Equipment (VBG4/BGVA2) to prevent injury to yourself and others.</p>
	<p><b>Operation of the Unit</b></p> <p>Do not perform any work which compromises the safety of the unit. Regularly check that all safety and monitoring devices are functioning normally. Do not remove or disable safety devices.</p>
	<p><b>Installation, Dismantling, Maintenance and Repair of the Unit</b></p> <p>Disconnect unit components from power supply prior to maintenance or repair work. Attaching or installing <b>additional components</b> is permitted only with the <b>consent</b> of the manufacturer.</p> <p><b>Work on the electrical system</b> must be performed by qualified personnel. Disconnect unit components from power supply prior to work. In case of a malfunction in the electrical power supply, switch off the unit immediately. Use only original fuses with the appropriate amperage rating.</p>

### **2.3 Use in accordance with regulations**

The unit is only designed for the operation in the described use. Other fields of use are not allowed.

### **3. Delivery**

- Please look after transport damage when the unit arrived.
- Do not let the goods fall down, do not throw the goods .....!
- Open package carefully!



**Note:** The operator is responsible for the disposal of unit components as required by law.



**Attention: Installation and work on the electrical system** must be performed by qualified personnel. Disconnect unit components from power supply prior to work.



**Advise! We recommend:**

- Use only water with a total hardness below 6°dH.
- Flush the water tubing before taking the unit into operation.
- We recommend to install an in-line strainer to protect the water supply of the whole SPA center.



**Work on the electrical system** must be performed by qualified personnel. Disconnect unit components from power supply prior to work. In case of a malfunction in the electrical power supply, switch off the unit immediately.  
Use only original fuses with the appropriate amperage rating.

**Advise! We recommend:**

- All installation parts in the basins must be chlorine resistant.

#### **4. Programme flow – adjustments**

The programme is activated by a push-button. The guest has the choice between a cold or warm water treatment. After pressing the button the filling of the basin starts automatically. It stops when an adjustable water level is reached. The adjustment of the water level is done by a pressure switch. The according LED at the controller “level footbath” is indicating that the adjusted water level is reached.

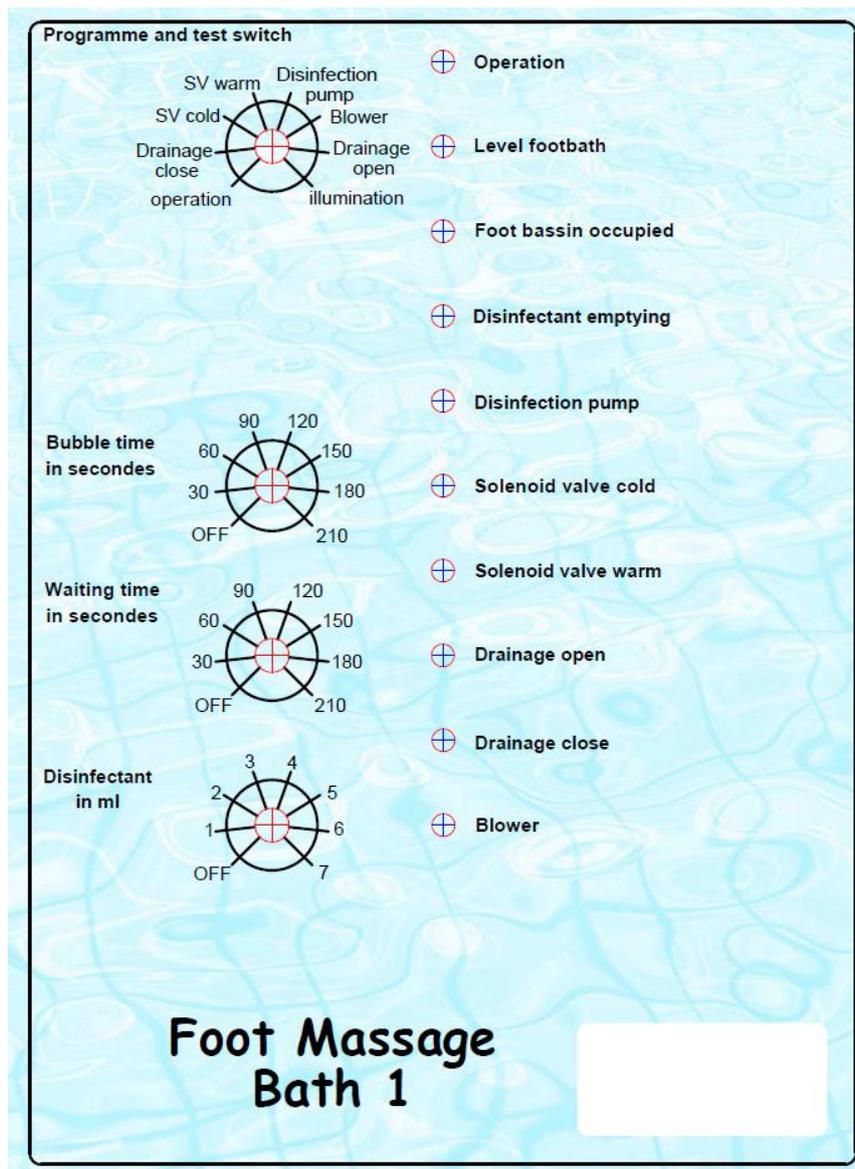
After a fix defined time of 5 seconds (delay time) the sputtering starts automatically for an adjustable time by the activation of the blower. The according LED at the controller “blower” is shining during this period. The operation time of the blower is adjusted at the rotary knob “**Bubble time in seconds**” from 30 – 210 seconds. 30 seconds before the lapse of the sputtering time a chlorine solution is dosed into the drain pipe to disinfect the basin. The disinfectant is conveyed to the basin by the air flow and is distributed there.

After the lapse of this time the blower switches off, the sputtering stops and a dwell time of 5 seconds follows. This time is adjusted at the rotary knob “**Waiting time in seconds**” from 30 – 210 seconds. During this time the sputtering process can be restarted by pressing the according warm or cold button again. The buttons are illuminated blue during the whole foot spa procedure.

After the lapse of the “Waiting time” the according basin is emptied automatically by opening the motor ball valve. Afterwards the unit is ready for a refill.

Both basins can be operated independent from each other.

The following graphic shows the front plate where all adjustments can be done:



**Programme and test switch:**

This rotary knob is to test every function of the system and to set the demanded operation mode. The function of the according component is indicated by a shining off the according LED. Before the test the unit has to be switched on by the main switch at the control housing! After the test the rotary knob has to be put on position "operation".

**Bubble time in seconds:**

Adjustment of the operation time of the blower from 30 – 210 seconds.

**Waiting time in seconds:**

Adjustment of the time between the lapse of the sputtering and the opening of the motor/ drainage ball valve. Restart possible during this time.

**Disinfectant in ml:**

Adjustment of the dosing performance (according to bassin size).

## 5. Installation

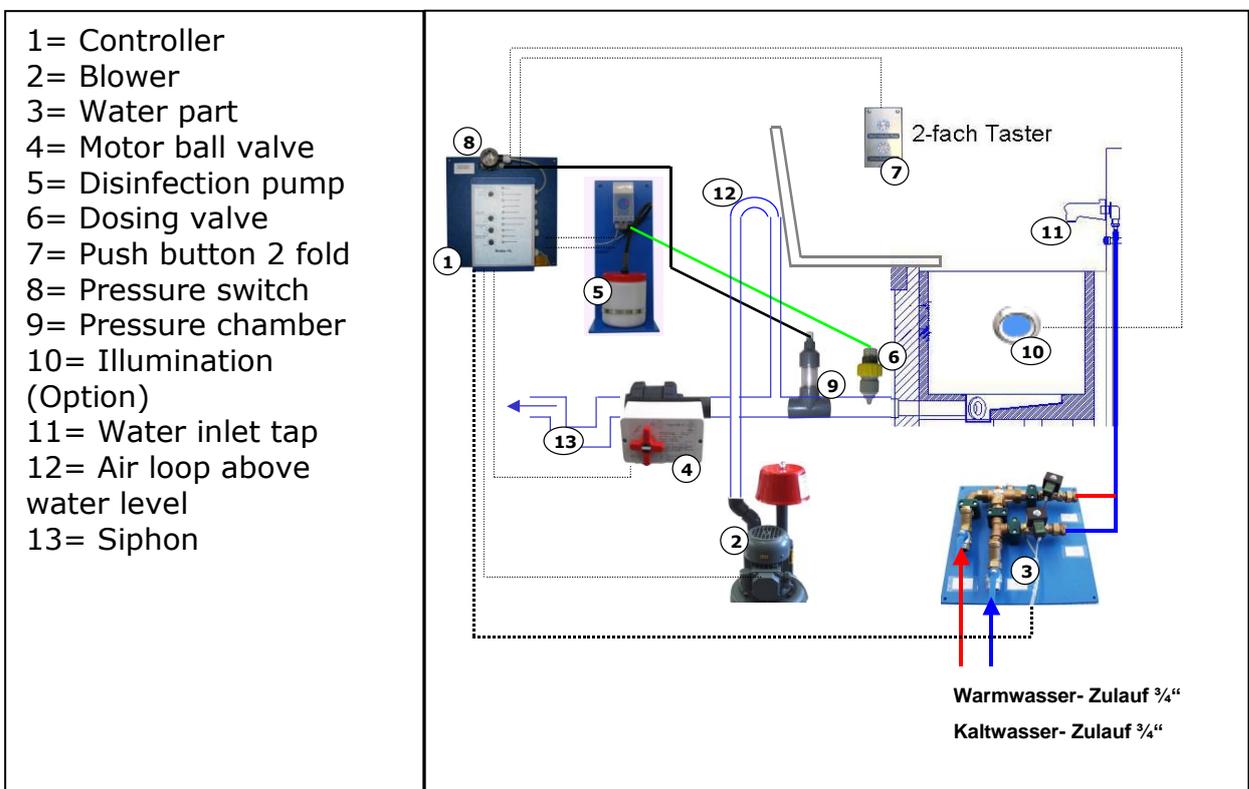
The single components have to be installed at a capable place. We recommend installing the controller with the pressure switches, the disinfection pump and the blower in the plants room. The motor ball valve, the dosing valve for disinfectant and the pressure chamber can be installed under the bench.

At the "rough installation" you have to prepare the water pipe(s) from the solenoid valves to the water inlet tap, the outlet pipe from the basin and the air pipe from the blower to the outlet of the basin.

**The air pipe has to be necessarily installed with a loop that goes above the possible water level/ edge of the pool (see schema below)! Furthermore it has to be as close as possible to the basin.**

Additionally 6 empty conduits have to be prepared: 2 for the cables of the buttons/ 2 for the hose pipe of the disinfection/ 2 for the hose pipe from the pressure chamber to the pressure switches.

Installation shema, example of 1 foot bath sputtering system:



### Dimensions of the tubing:

Water supply to the water part	DN 20
Tubing to the basins	DN 20
Drain	DN 40
Air pipe	DN 25
Dosing hosse for disinfectant PTFE 4x1	
Hose pipes from pressure chamber to pressure switches PTFE 4x1	

## 5.1 Installation of the push button

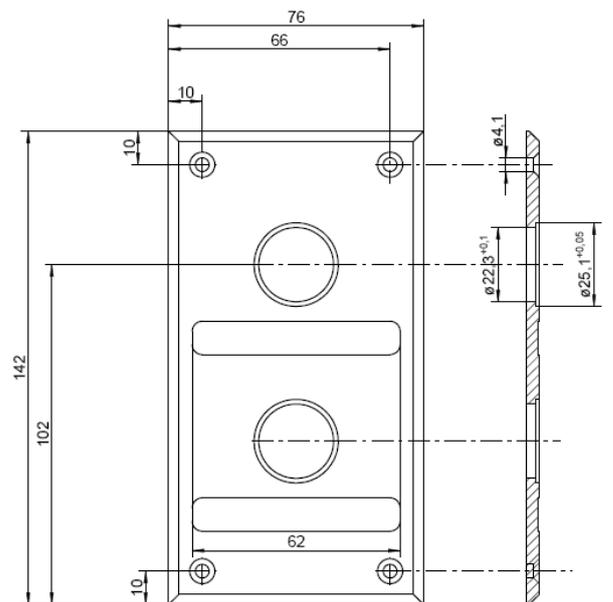
The hot and cold water programmes of the system are started by 2 x 2 fold push button plates. Hot and cold button for each basin, a bonnet for flush mounting of the push button plates is also incl. in the scope of delivery.



### **Advise! We recommend to consider the following points for the installation of the push button plate:**

- We recommend using the WDT bonnet for flush mounting for the installation of the buttons.
- The bonnet has to be mounted according to the enclosed manual.
- The empty-conduit for the button cable has to have an internal diameter of 25mm. The min. bending radius should be 30cm.
- The cable for the button is ready-made and has a plug on both ends. The length of the cable is 7m. On demand the cables can be extended.
- If the push-button plate is installed in humid rooms it has to be sealed against the wall. This has to be done with an elastic sealing kit such as silicon. The executive person is responsible for the sealing.

### **2 fold push button plate**



**Schnitt A-A**

### Bonnet for flush mounting



bonnet for 1 fold push-button plate: D52mm/W65mm/H99mm

bonnet for 2 fold push-button plate: D52mm/W65mm/H142mm

bonnet for 3 fold push-button plate: D52mm/W65mm/H165mm

bonnet for 4 fold push-button plate: D52mm/W65mm/H198mm

## 6. Function / components

The foot bath system consists of the following components:

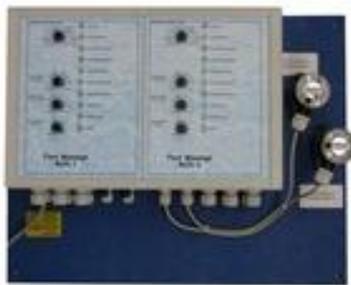
Side channel blower for the sputtering.



Water part.



Control boards for each basin in housing with pressure switches mounted.



Pressure switch and pressure chamber to be installed in the pipe for detection of water level.



Motor ball valve for drainage.

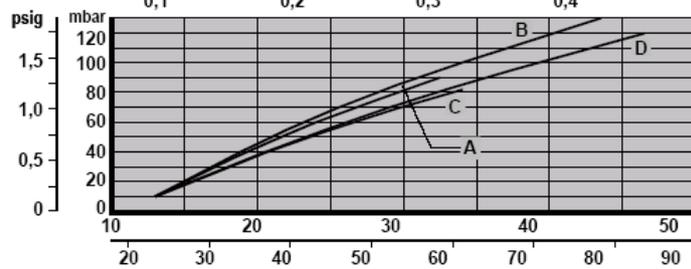
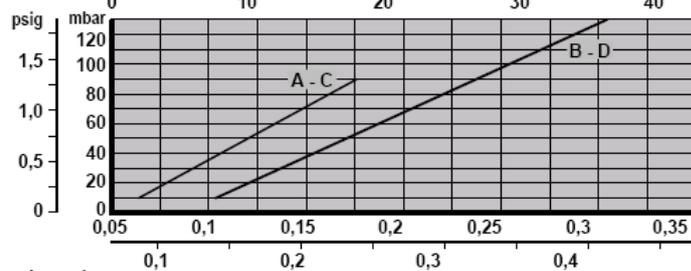
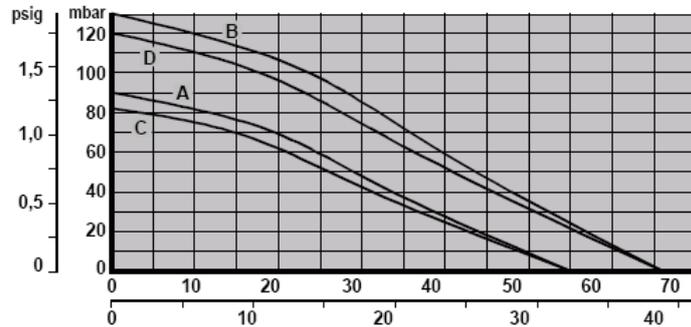


Disinfection pump incl. console and reservoir for disinfectant.



## 7. Technical data (of the single components)

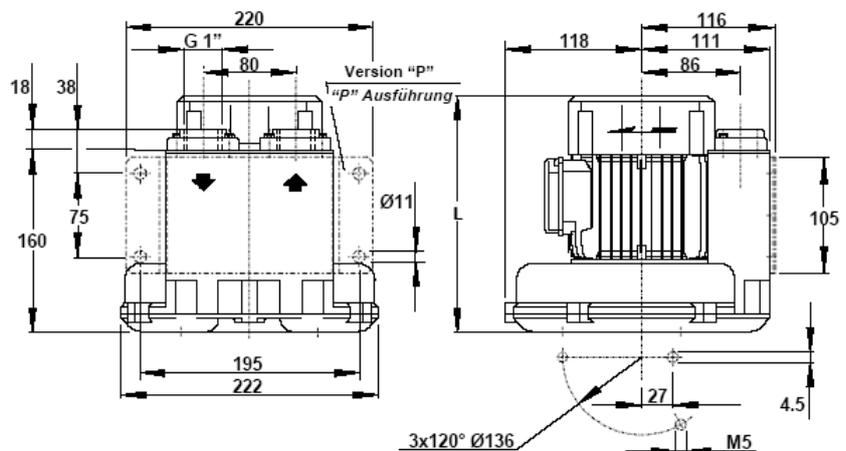
### 7.1 Side channel blower



	P <sup>(1)</sup>		Δp <sup>(2)</sup>		Q <sup>(3)</sup>	
	kW	mbar	psig	m³/h	cfm	
<b>DRUCKBETRIEB - COMPRESSOR</b>						
<b>A 50 Hz - 2900 rpm</b>						
	0.2	90	1.30	0	0	
<b>B 60 Hz - 3500 rpm</b>						
	0.23	80	1.16	32	19	
	0.4	130	1.88	0	0	
<b>SAUGBETRIEB - EXHAUSTER</b>						
<b>C 50 Hz - 2900 rpm</b>						
	0.2	82	1.18	0	0	
<b>D 60 Hz - 3500 rpm</b>						
	0.23	80	1.16	28	16	
	0.4	120	1.74	0	0	

kW	H	m
50 Hz - 60 Hz		Kg
0.2 - 0.23	235	6.5
0.4	235	7.1

MAXIMALER SCHALLDRUCKPEGEL MAXIMUM NOISE LEVEL	
	Lp dB(A)
50 Hz - 2900 rpm	58
60 Hz - 3500 rpm	59



Für einen einwandfreien Betrieb muß die Maschine MINDESTENS mit einem ANSAUGFILTER und einem SICHERHEITSVENTIL ausgerüstet sein. Weiteres Zubehör auf Anfrage.

- (1) Motorleistung.
- (2) Maximaler Differenzdruck bezogen auf installierte Motorleistung.
- (3) Ansaugvolumenstrom bei max. Differenzdruck bezogen auf installierte Motorleistung

Die angegebenen Leistungsdaten beziehen sich auf die Förderung von Gas bei einer Ansaugtemperatur von 15° C, Dichte von 1,23 kg/m<sup>3</sup> und einem absoluten Druck von 1013 mbar (Ansaugbedingungen bei Druckbetrieb / Ausblasbedingungen bei Vakuumbetrieb). Maße in mm. Schalldruckpegel gemessen in 1 m Abstand mit angeschlossener Verrohrung. Die angegebenen Werte unterliegen einer max. Toleranz von ±10%, sind unverbindlich und können von FPZ ohne vorherige Ankündigung geändert werden

To allow the perfect performing of the machine, it has to be equipped with the INLET FILTER and the SECURITY VALVE AT LEAST; other accessories available on request.

- (1) Installed power.
- (2) Maximum differential pressure referred to installed motor.
- (3) Inlet flow at max differential pressure per installed motor.

The characteristics data given, refer to the handling of gas with inlet temperature of 15°C, normal density of 1,23 kg/m<sup>3</sup> and absolute pressure of 1013 mbar in suction in case of performing as compressor, in discharge in case of performing as exhauster. Dimensions in mm. Noise level measured at 1 m distance with in/outlets piped. Tolerance on given values ±10% - unbinding and can be changed without prior notice.

## 7.2 Motor ball valve

2-way ball valve with electrical actuating drive S 5.10

### Actuating drive:

**Operation voltage:** 230V/50 Hz;

**Protection class:** IP 54

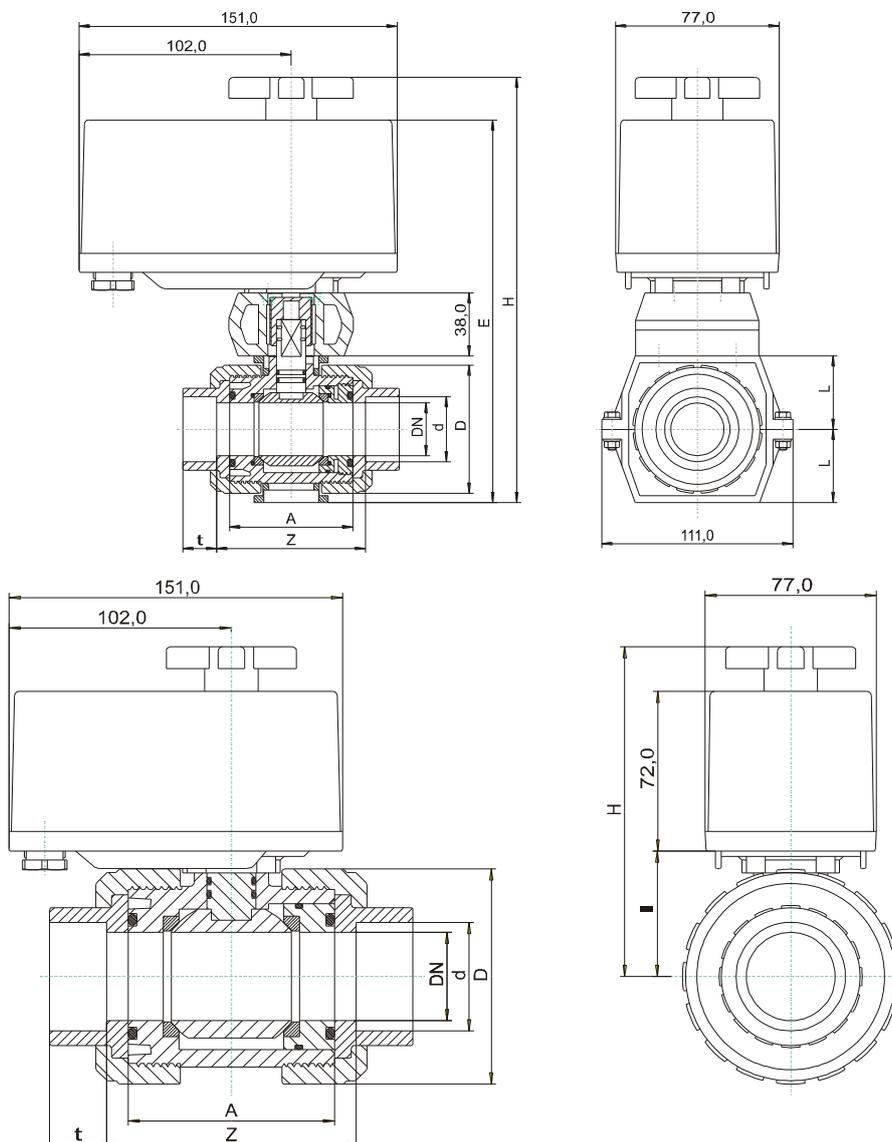
Switch-on time 60% / 20 min

Performance: 3,8 Watt

### Measures

DN	A	B	D	E	F	I	H	K	Z	t	Bar*
40	71	102	98	77,5	77	56,5	148,5	151	81	31,5	3

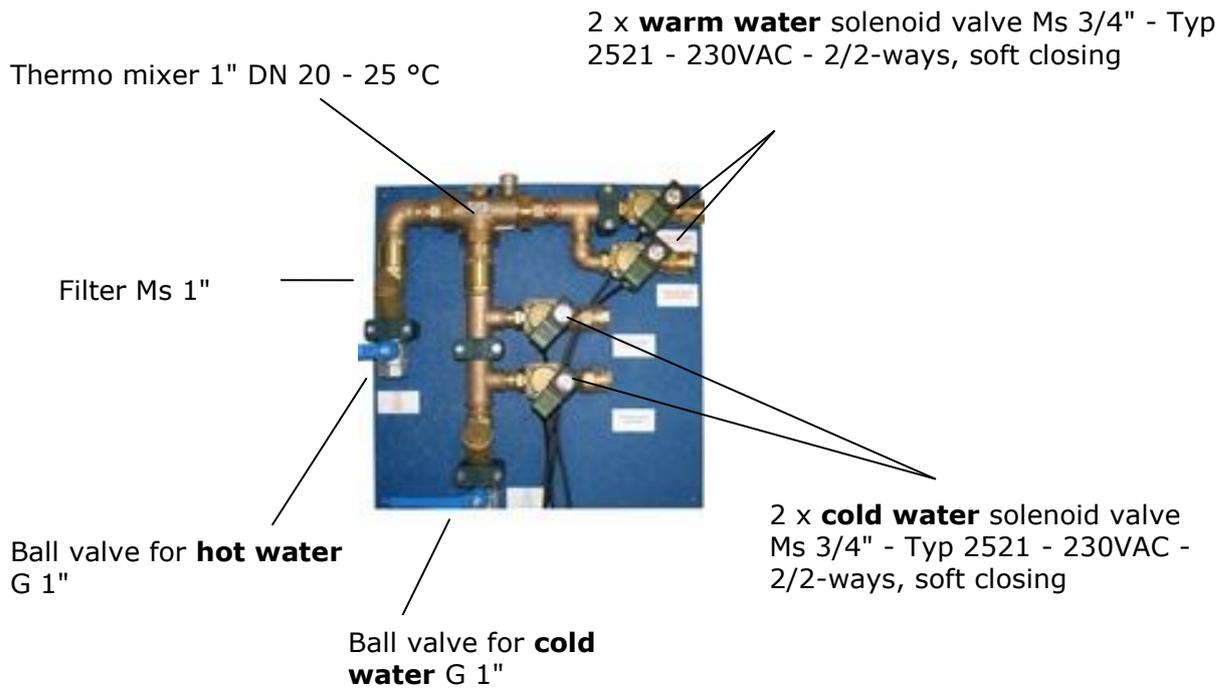
(DN 32 - DN 50: without Console)



### 7.3 Water part

Water supply	2 x 1" female thread
Outlet to the 2 basins	4 x solenoid valve 3/4"
Measures	W 50cm x H 50cm x D 15cm
Weight	10Kg

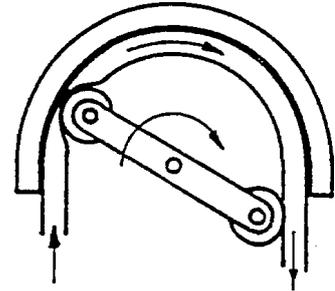
Water consumption according to basins dimensions!



## 7.4 Disinfection pump

### 7.4.1. Function principle

This type of peristaltic pump will reliably meter a chemical solution to the injection point particularly when low dosing rates are required with products which 'gas off' (i.e. self priming). The advancing roller occludes the tube which, as it recovers, draws in fluid that then becomes trapped by the next roller and later expelled from the pump. The technique offers the following advantages:



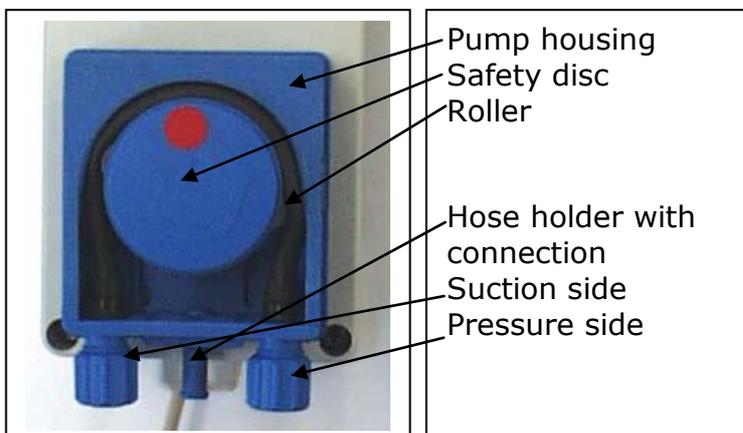
- No contamination of the fluid or the pump as the fluid is contained in the tube
- Gentle pumping action with accurate flow rates
- The pump is self priming and can run dry
- The pump is quiet running and very simple to handle
- The used dosing hose is resistant against most chemicals: not hydrochloric acid

### 7.4.2. Dosing performance

The dosing performance conveys with constant performance when the pump gets voltage 230V/AC by the controller. Adjustable at the housing.

### 7.4.3. Hose set (exchange)

For the change of the dosing tube remove the cable strap carefully from the tube nozzle and push on the ends of the new hose to the nozzles. Pay attention that the marks at the ends of the hose are in front of the hose kit and not twisted! Fix again the hose ends by means of the new cable straps. Fit the hose kit as described above.



#### **Attention**

The hose must not be fitted twisted.

**Note: The housing of the pump must not be opened. Therefore special tools are required.**

For transport and storage, the peristaltic hose kit is not fitted into the pump to prevent deformation of the hose. For fitting push in the hose holder into the slides at bottom of the pump housing, turn the roller so that the hose comes to the flat part, push the hose into the housing by turning through the roller. After some turns the hose is in the right working position. Then fit the safety disc onto the shaft and the protection cover onto the housing

The dosing valve is screwed into the injection point in the tubing of the air pipework. The dosing/ pressure pipe from the pressure side of the pump to the valve has to be PTFE 4x1 and has to be lead to the valve in an empty conduit.



**Advise! We recommend to consider the following points for the installation of the disinfection pump:**

- All installation parts in the basins must be chlorine resistant.
- The back pressure of the non-return valve might not be higher than 0,5bar.
- Use only original WDT injection valves.
- Don't crack the dosing tube!
- Only use PTFE dosing tubes when you inject chlorine solution!

#### **7.4.4. Maintenance**

The pump head should be checked frequently to assess condition of the peristaltic hose and the roller springs (i.e. no corrosion/wear), if so change peristaltic hose and if necessary roller too. At least once a year the peristaltic hose should be replaced. If not checked, leakage could occur and damage the pump. For exchange cut off suction and injection tube at tube connector, fit the new ends to the connectors of the new peristaltic hose and fit it as described above.

**When the unit will be taken out of operation for a longer period of time** please release the hose holder with the hose to avoid wear. Clean the dosing valve.

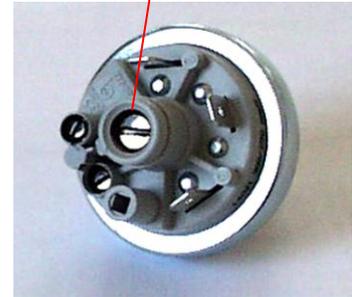
## **8. Taking the unit into operation / Adjustment of the water level**

Before taking the unit into operation all pipes have to be connected according to the schema above. Test the single functions.

At this point the pressure switch for the water level control has to be adjusted.

### **Procedure (see also page 7 for the rotary knobs) "Programme and Test Switch":**

Adjustment screw



- Close the motor ball valve by knob "Drainage close"
- Fill the basin by "SV cold" until the demanded water level.
- If the demanded water level will be reached put the "Programme and test switch" on "Operation".
- Adjust the switching point of the level switch by the adjustment screw.
- The switching point is indicated by the LED "Level footbath".
- If the switching point is reached turn the adjustment screw 5° to the left due to tolerances of the pressure switch.

*turn right: level higher*

*turn left: level lower*

## **9. Disinfection**

To operate the foot bath system under hygienically circumstances it is unavoidable to use the disinfection system.

The system works with a peristaltic pump that injects an app. 12% NaCl (liquid chlorine) solution. The disinfection pumps starts 30 seconds prior to the end of the sputtering. The injection point with the incl. dosing valve has to be placed between the drainage point of the basin and the connection of the blower. The disinfectant is conveyed to the pool by the air flow.

### **9.1 Adjustment of the dosing performance**

The dosing performance has to be adjusted according to the volume of the basin. The performance is adjusted at the control housing (see page 7) in ml but depends on the hose size of the dosing hose:

#### **Adjustable dosing performances 0,8 hose:**

0,25; 0,5; 0,75; 1; 1,25 und 1,5 ml

#### **Adjustable dosing performances 1,6 hose:**

1; 2; 3; 4; 5 und 6 ml

The chlorine concentration in the water shall be at 2ppm.

As the liquid chlorine loses its chlorine concentration quite fast during the storage the adjustment of the dosing performance shall be checked once a week. This means the chlorine concentration in the water shall be measured manually and the performance readjusted if necessary.

In general liquid chlorine shall not be used for longer than 3 months.

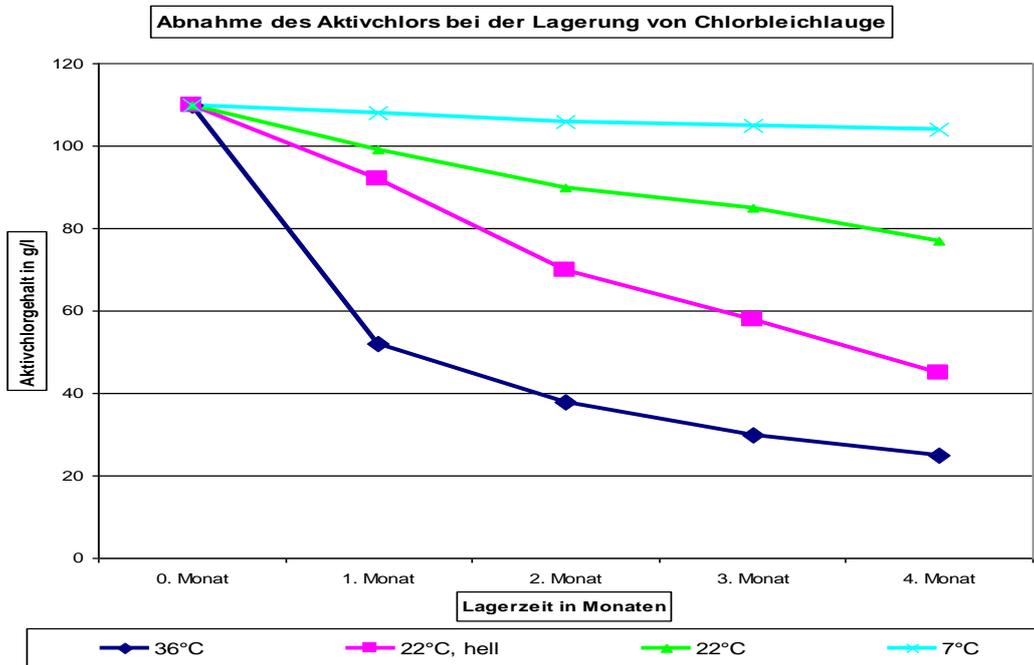


Chart - Dosing performance in comparison to the water volume in the basin when liquid chlorine with a concentration of 12% is used:

Dosing performance in ml	Water volume of the basin in ml
6 ml	375 l
5 ml	312 l
4 ml	250 l
3 ml	188 l
2 ml	125 l
1,5 ml	95 l
1,25 ml	78 l
1 ml	62 l
0,75 ml	46 l
0,5 ml	31 l
0,25 ml	16 l

## 10. Spare parts list

### Water part:

13194	Ball valve Ms 1"
13193	Filter Ms 1"
17146	Solenoid valve Ms 3/4" - 230VAC 2/2-ways
13082	Plug for solenoid valve LED with cable 1,5m / 230V
17808	Thermo mixer 3/4" DN 20, adjustable 30-45°C complete with 3 screwings (2 with non return valves)

### Dosing technique:

17630	Peristaltic pump-0-230V Compact - 230V - 50Hz
13412	Hose set 1,6x1,6-Ph-SA-2x 2 hoses 1,6x1,6-Ph SA 4 hose clamps
13482	Hose set 0,8x1,6-Ph Sa 2 hoses 0,8x1,6-Ph SA 4 hose clamps
13411	hose holder Sa 1,6 complete with dosing hose 1,6x1,6 Ph
13735	hose holder Sa 0,8 complete with dosing hose 0,8x1,6 Ph
16663	Dosing valve 3/8" - 1KFa
10432	Dosing hose PTFE di 4x1mm

### Controller:

15995	Controller ED-SeD
11361	Fuse 5x20 träge1,25A
11031	Rotary knob 6 mm
17338	Steckachsen für Poti 15mm

### Components:

14946	Blower 230V - 50 Hz
15584	Motor-ball valve 2-ways PVC DN32 PTFE/EPM 230VAC D40 S5 max. 3,5 bar
14939	Level control

## 11. Wiring diagramme