POOL**SPA**

Shared SPA Bath
public version

assembly and operation manual

Dear Customer,

Thank you for the confidence expressed in buying our product. We have tried hard to make a product which entirely meets your expectations
For many years we have offered the highest world quality products. We pay particular attention to the durability, reliability and safety of our products. The highest quality of materials used, interesting styling and ergonomics guarantee that you will bathe in comfort.

We wish you satisfaction with our products.

CONTENTS

This instruction contains information necessary for the installation and use of the SPA bath. Before starting hydromassage please read all chapters carefully.

The SPA bathtub is intended for public use.

I. GENERAL INFORMATION

AIR MASSAGE:
- Blower 1,3 kW 1 x 230 V.
- Air holes at the bottom and the seats of the SPA bathtub.

WATER MASSAGE:
- hydromassage pump 2.0 kW (Olivia, Sunflower or an option with 32 jets - 2 pumps)
- filtration pump 2.65 kW
- jets: 6 - 32 pieces depending on the model
- air regulators

WATER FILTRATION AND HEATING:
- Sand filter diameter 1200 mm,
- UV lamp (option)
- 9 kW heater with flow rate measurement and heating intensity (Olivia, Sunflower – 12 kW), optionally, pipe water-water heat exchanger 44 kW

UNDERWATER LED LAMP or multi-point LED lighting

CHARACTERISTICS:

- SPA bathtubs capacities:

Janette:	900 litres	Vesta:	1600 litres
Octavia:	1050 litres	Olivia:	2100 litres
Victoria:	1100 litres	Sunflower:	2000 litres
Classic:	1400 litres	Olimpia:	2000 litres
Natalie	1300 litres	Mila	1380 litres

II. TECHNICAL DRAWINGS

Janette

Octavia

Victoria

310 · 455 · 545 · 655
1580 · 1800 · 2280 · 2490
105 · 240 · 105
160
50 · 240
380 · 800 · 570
620 · 850 · 1080 ± 20

Classic

2610 · 2040 · 1930
235 · 225
500 · 600 · 640 · 770
1750 · 1860 · 2340
90 · 190 · 55
130
40 · 170
375 · 630 · 845 · 1020

Natalie

1045
975 · 780
310 · 360
1740 · 1950 · 2525
85 · 200 · 105
140
40 · 195 · 540
330 · 765 · 1020

Vesta

1200
1070 · 850
300 · 540
2100 · 2300 · 2900
100 · 200 · 95
135
45 · 170
305 · 540 · 810 · 1110
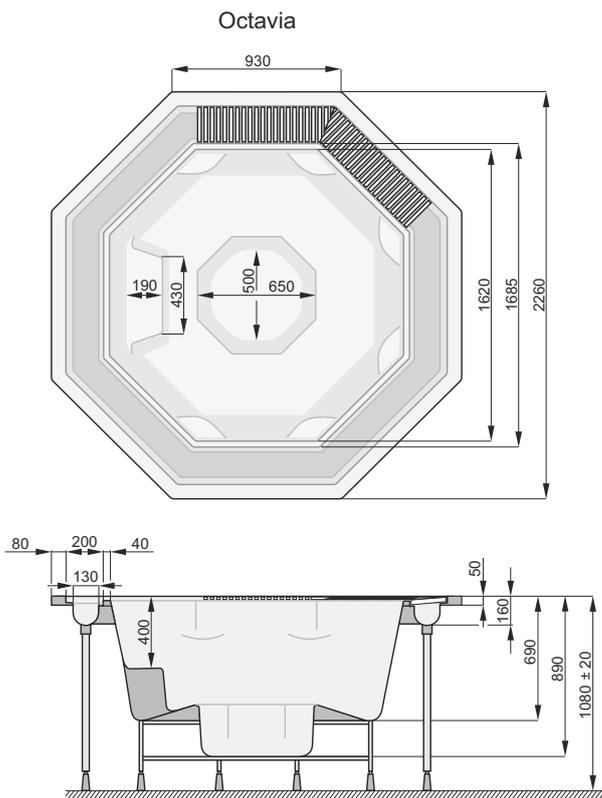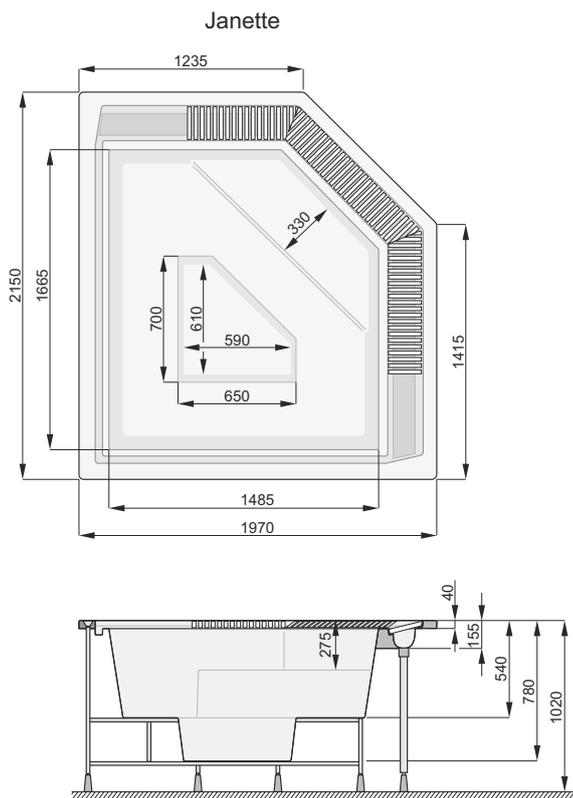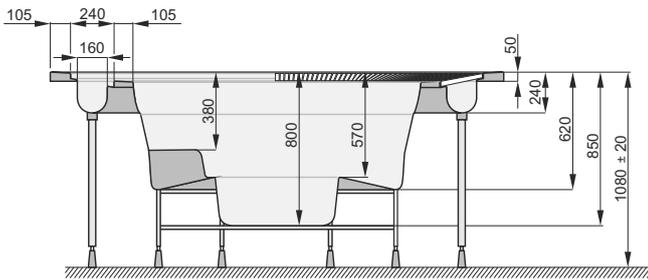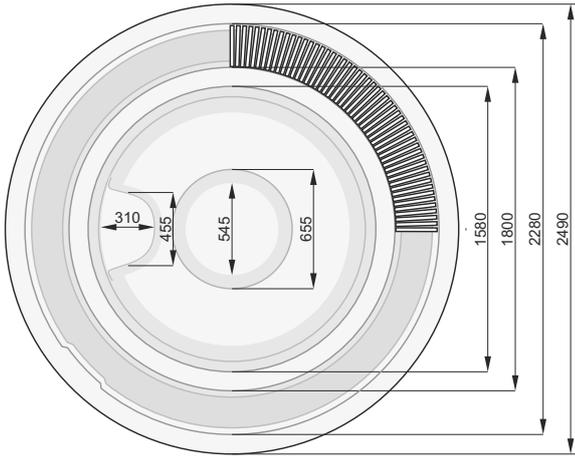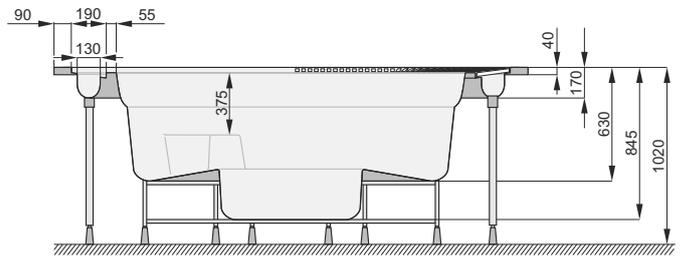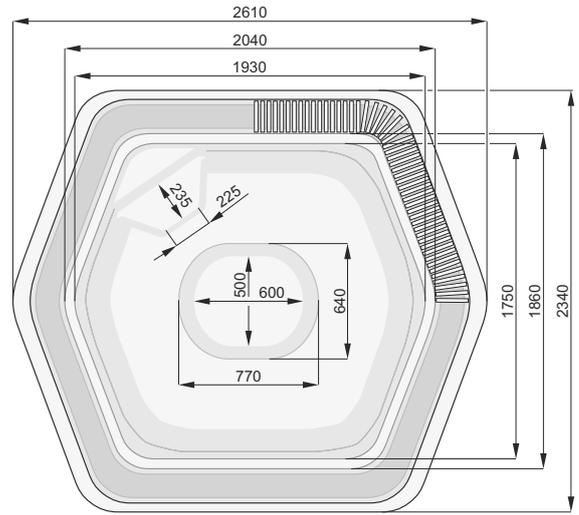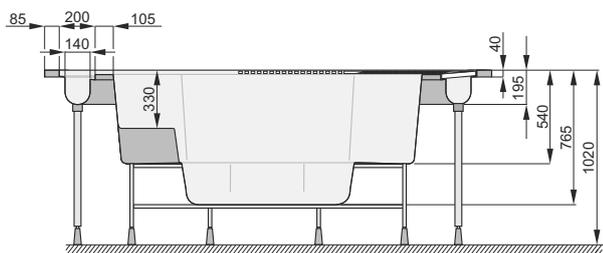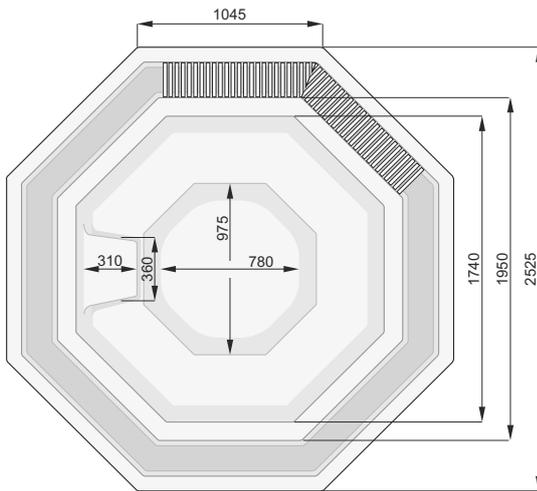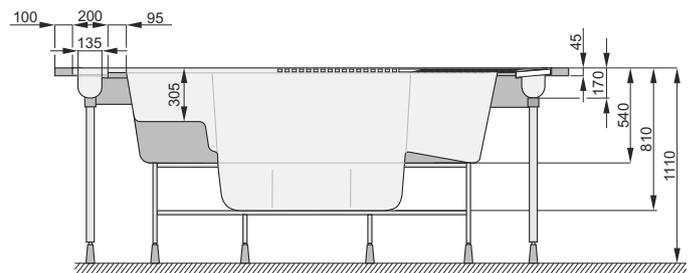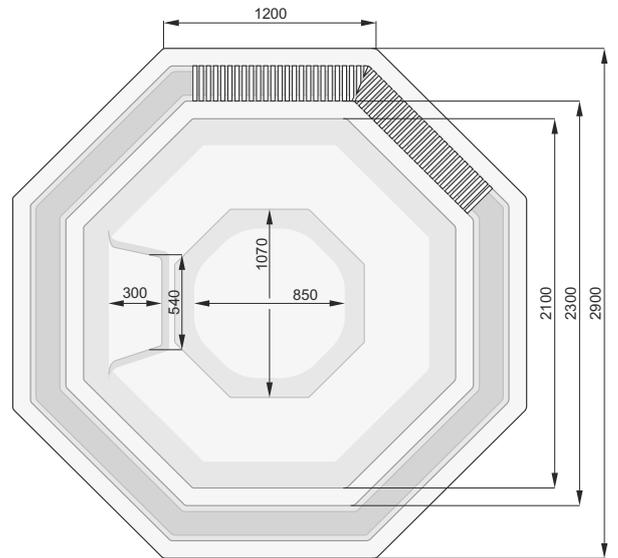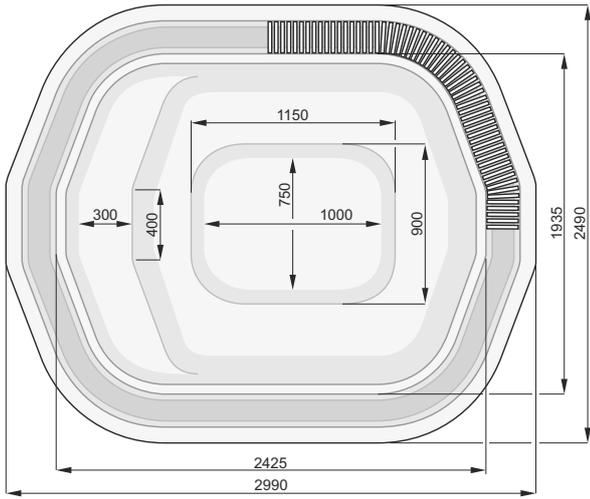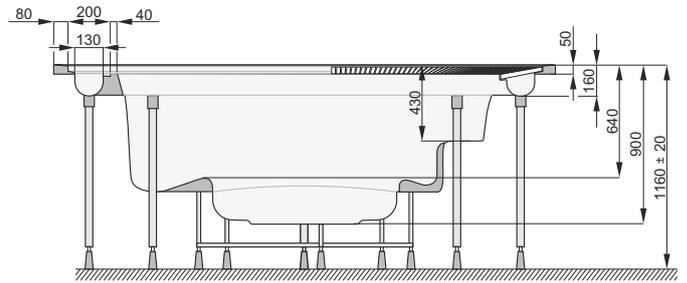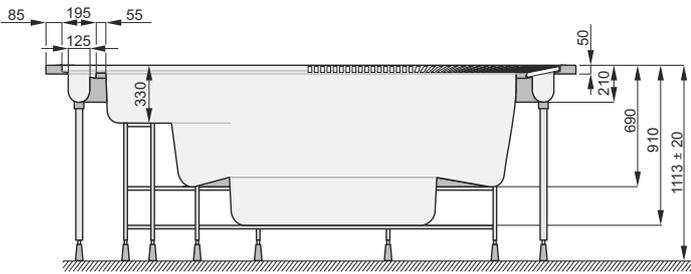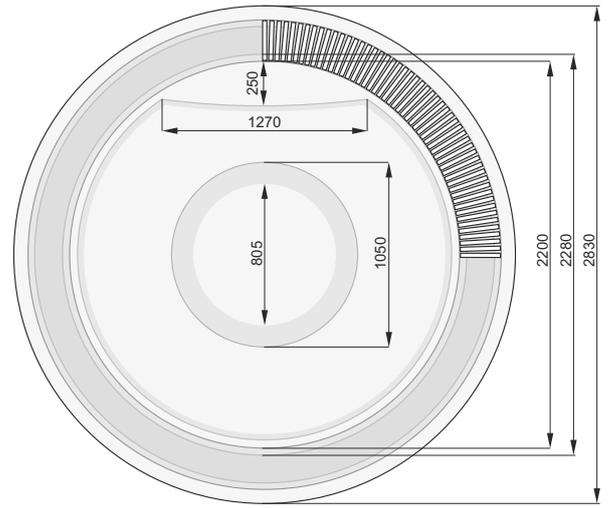
Olivia

Sunflower

Olimpia
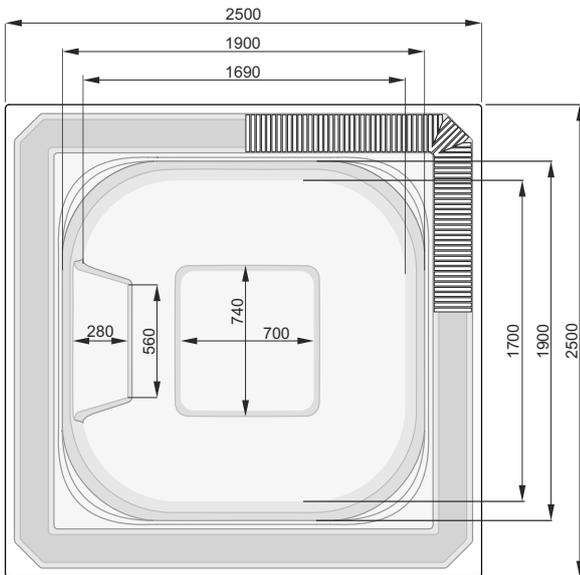
Mila
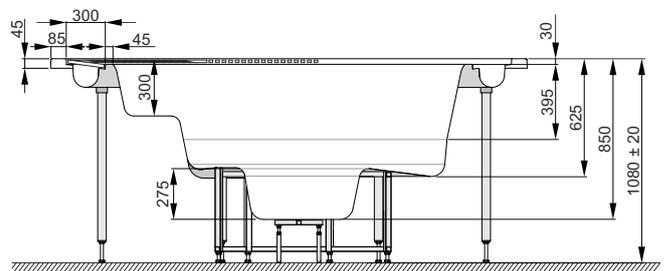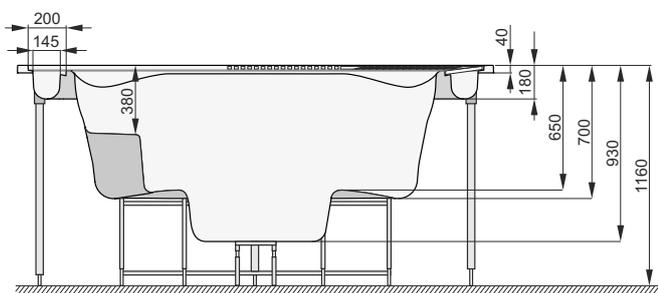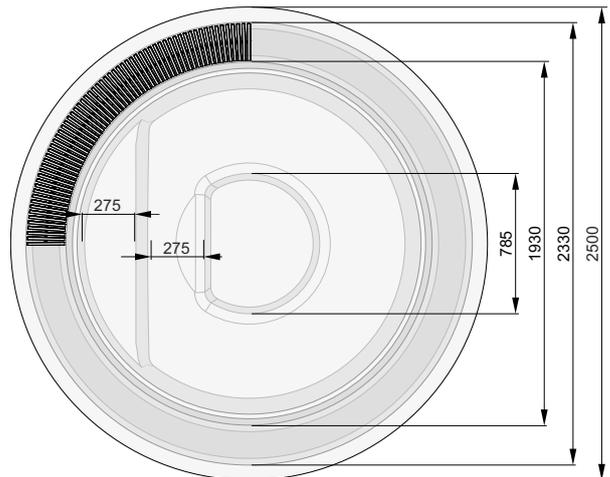
- Tank capacity: 1100 litre
- Tank dimensions: 1400 x 700 x 1400 mm
- Number of people: 3-8 depending on the model
- Electrical supply: 3 x 400 V
- Maximum Power Consumption ~15 kW (Olivia, Sunflower ~20 kW)

- Machine room palettes:
• palette with filtration pump, heater, UV lamp (according to the client's order): 1590 x 1280 mm, weight approx. 111 kg
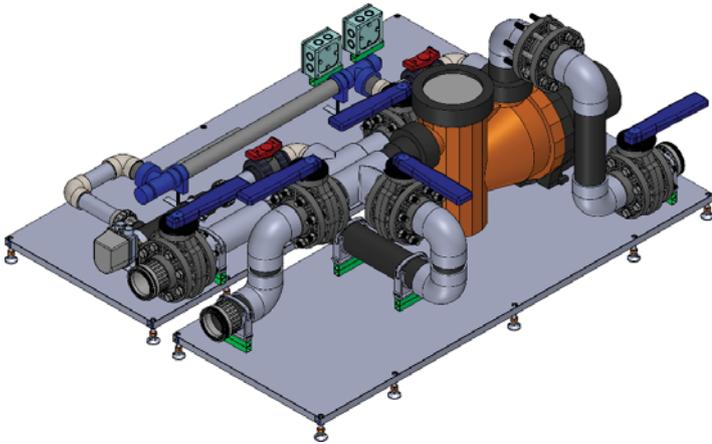
• palette with blower and water pump: 700 x 700 mm, weight approx. 46 kg
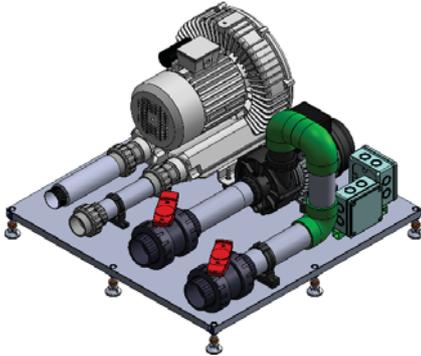
• palette only with water pump - additional (for Olivia, Sunflower bathtubs and with the option with 32 jets): 600 x 400 mm, weight 15.5 kg
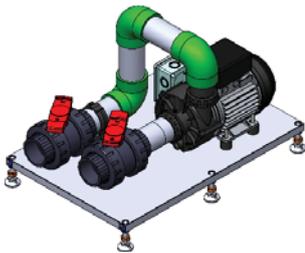
1. SAFETY RULES
The SPA bath will be supplied to the customer in its original packaging. After the package is removed and before starting the installation, the SPA bath should be carefully checked. The manufacturer's service should be informed about any abnormalities found.

Do not raise the bath and filtering equipment when holding their piping elements.
Always put the bath on its legs, do not prop it on its side.
Ensure that the bath is properly protected during installation works in its close vicinity.

Connection of the bath electrical system to power network and execution of water connections should be performed by authorized installers.

2. INSTALLATION PLACE PREPARATION
- The SPA bath can operate in both closed and open spaces.
- The SPA bath should be installed on a hard substrate to avoid equipment settlement.
- When the SPA bath is located in a closed space, enough space should be provided to carry the equipment in.
- Dimensions of a foundation plate on which the SPA bath is to be installed should be large enough to enable proper arrangement of legs, conduits and cables.
- A method of the SPA bath emptying should be kept in mind. The substrate must be leveled.
- Note also walls and ceiling material. They should be resistant against water vapour volatizing during the SPA bath operation.
- Because of water splashing during SPA bath use, its substrate must be made of highly water-resistant material, such as glace or plastic coatings. Floor finish must be appropriately protected against bacteria breeding in a wet environment. Special rugs or floor finishes applied in sailing should be used. Parquet or other wooden floor are not recommended, unless they were subjected to an appropriate processing like wood used for gardening or outdoor constructions. Ensure that the floor hydraulic gradient towards the local floor sewer inlet is 2%.

3. INSTALLATION OF SPA BATH AND ACCESSORIES
- Proper SPA bath operation requires its installation on a durable and carefully leveled substrate, e.g. on 10 cm thick concrete plate, to avoid equipment settlement.
- Weight of the fully water-filled SPA bath with 3 bathing persons amounts to about 1200 kg. The pressure exerted on the substrate amounts to 360 kg/m^2.
- After the bath installation height is set, a concrete block on which both stationary and telescopic legs will lean should be prepared.
- Pit and concrete block dimensions should be large enough for proper placement of legs, piping and cables.
- After telescopic legs are installed, bath crown should be leveled.
- Fasten legs to the concrete block in such a way they are not able to move accidentally.
- All connections of accessories to the bath should be made of glue-joined pipes and fittings. Do not use metal pipes and components.
- After the bath is filled with water check joints and connections for their leakproofness.
- Do not fill the space around the bath with any material. Access to all pipes and connections should be ensured.
- Accessories should be installed very carefully. It is the best to install them in an air-conditioned space and in a distance to the bath not exceeding 10 m horizontally. Height of foundation plate on which accessories are installed should not be bigger than that of the bath foundation plate. Also, accessories should not be installed more than 2,5 m below the bath level. When distances are larger consult manufacturer service.
- It is advisable to locate a floor sewer inlet within the bath installation area and below its level.

4. ELECTRICAL CONNECTION
Electrical system connection to the power network should be performed by an authorized electrician.
Internal connections of accessories are factory-made.

The SPA bath electrical system should be protected with balanced-current circuit breaker with 30 mA rated switch-off value, as well as with 40 A magnetic - thermal circuit breaker equipped with all poles disconnection mechanism and at least 3 mm opening distance. Both circuit breakers should be located outside safety zones marked on Figure 1.

4.1. Grounding
Proper operation of balanced-current circuit breaker requires a grounded system according to provisions in force, as well as equalizer connections installed in the apartment.

4.2. Feeder cable location
The SPA bath feeder cable should be permanently connected to the electrical network, in no case through a wall socket.

Electrical system should be made according to the requirements for low voltage systems in force. Therefore it is important to have in mind that the SPA bath installation creates 4 safety zones as shown in Figure 1. So, the feeder cable should be located in zone 3 or on an suspended ceiling more than 2.25 m overhead.

4.3. Power supply connection
When connecting the power supply, note that:

- The SPA bath electrical power supply should be permanently connected to the power network.
- Cable used should fulfill appropriate low voltage system requirements. It should be remembered that yellow-green grounding wire should be at least 40 mm longer than phase and neutral wires so as to be disconnected as the last one in case of violent pulling.
- Power supply connection under the SPA bath can be made only when at least IPX5 protection level is ensured and the connection is at least 20 cm above the floor.

Figure 1.
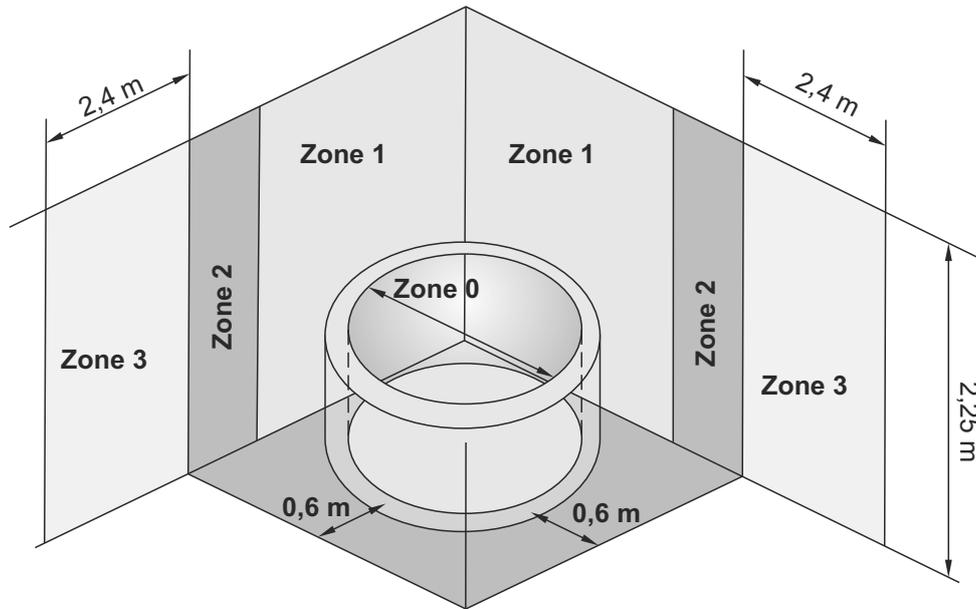
⚠ Very important: Ensure total tightness (IPX5 level) of electrical connections.

5. WATER CONNECTIONS
Use PVC conduits and appropriate glue for water connections. Do not use metal pipes.

Ensure that there are no air plugs or water in the SPA bath filling and emptying connection. Emptying the system should ensure excellent SPA bath emptying. When the water outlet state enables it, the water trap can be installed to avoid an unpleasant smell.

Moreover, install the return valve in filling and emptying system to avoid reverse water flow,.
All bath and accessory connections are successively numbered. Joining the bath and accessory components should be based on their numbers. Installation of valves between each joint and accessory is recommended, so as to facilitate the preparation for maintenance works – then the SPA bath emptying is not required.
To avoid reverse water flow, blower PVC pipe should be located at least 30 cm above the upper SPA bath crown

After the installation is finished, switch the equipment ON and check connections tightness. Mark water level in the bath and after 24 hours check if it did not drop.

Check if the motor rotates in proper direction. If not, change phase wires on its terminals.

Check if the pressure in nozzles is correct. In case of gridlock remove its cause and then put the bath into its final position.

6. SPA BATH FILLING AND EMPTYING
Never use air blower system for the SPA bath filling.
The SPA bath can be connected to the water-pipe network permanently or through separable, flexible conduit installed to fill in the SPA bath only.
Filling the SPA bath is made through ½" pipe (point b) located in the SPA-bath nozzle conduit.
The SPA bath drain must be connected to the compartment or apartment (point a) sewerage system. To avoid unpleasant smell, use of a water plug is recommended.

Figure 2. SPA baths - gutter (connection).

do kanalizacji
to sewage system

z dmuchawy -
50 mm zasilanie
from the blower -
50 mm supply

z filtra - 63 mm powrót filtracji
from filter - 63 mm filtration return

spust wody z kanałów
water drainage from channels

do pompy 2 - 63 mm zassanie hydromasażu
to pump 2 - 63 mm hydromassage aspiration

z pompy 2 - 63 mm zasilanie hydromasażu
from pump 2 - 63 mm hydromassage aspiration

z pompy 1 - 63 mm zasilanie hydromasażu
from pump 1 - 63 mm hydromassage aspiration

do pompy 1 - 63 mm zassanie hydromasażu
to pump 1 - 63 mm hydromassage aspiration

odpływ rynny - 110 mm
channel outlet - 110 mm

napełnianie zbiornika wodą
filling the water tank

przelew awaryjny
emergency overflow

do pompy filtracji - 63 mm
to filtration pump - 63 mm

odpływ rynny - 110 mm
channel outlet - 110 mm

7. VENTILATION

High water temperature (40^{0}C max) in the SPA bath causes emission of large water vapour amounts.

Vapour condenser installation is recommended in a compartment where the SPA bath is installed. The effective ventilation should be ensured so as to keep air humidity on the same level and to avoid vapour condensation on the ceiling and floor.

If the compartment contains wooden elements air RH should not be higher than 65% to ensure their proper maintenance. Air humidity can be kept constant using humidistat-controlled fans or dehumidifiers appropriate for compartment size. Ask their distributors or fitters for advice. No vapour condenser is necessary when air condition is installed. Similarly, vapour condenser are superfluous when the SPA bath is located outdoors or in an open compartment.

8. FROST PROTECTION

When SPA bath is installed outdoors, winter brings a risk of freezing. The following recommendations should be considered:
- When a case of heating system malfunction due to outdoor conditions is found, the bath, pipes, the pump and filters must be completely emptied. Otherwise pipes can break due to ice expansion during the solidification process.
- Hot water cannot be used to thaw pipes or the bath Sudden temperature change can destroy the material they are made of. Frozen parts must thaw out at room temperature.
- When there is a likelihood that some frozen water still remains within the system do not start the pump nor the blower.
- Do not turn valves if suspected frozen. Otherwise valves can be destroyed and the system unsealed due to ice expansion during solidification.
- Ask equipment fitter for a permanent heating system installation possibility.
- If the heater is to be switched permanently ON, ask equipment fitter about the frost detectors installation possibility, so as to avoid consequences of power supply failure or heater and/or filtration pump switch off.
- Do not use any antifreeze liquids without appropriate sanitary guarantees.

9. SPA BATH MASSAGE SYSTEM

The SPA bathtub has two massage systems: **water and air.**

The **water massage** system is composed from the following elements:
- A set of 6-32 water and air jets that lead water or a mixture of water and/or air to the SPA bathtub water space,
- The filtration pump and the hydromassage pump that forces water movement in the entire water circulation until it reaches the middle of the SPA bathtub.
- Water aeration regulators (Venturi) installed on the top edge of the SPA bathtub ad used to set the aeration degree of the water.
- Water aspirator.

The **air massage** system consists of approx. 100 small holes using which the r is blown into the middle of the SPA bathtub.

10. WATER FILTRATION SYSTEM

The filtration circuit includes the following elements:
- Overflow duct with a duct covering grate and an overflow tank
- Filtration pump
- Six-function valve
- Water filter.
- Water aspirator.
- PVC pipes and fittings.

10.1. Overflow duct and tank

The overflow duct is an integral part of a SPA type bathtub and is used to lead water from the bathtub to the balance tank connected together with the pipe of 110 mm diameter. The grate that covers the overflow duct protects the filtration system against larger foreign bodies and has a decorative function.

The overflow tank is used to gather water pushed upwards by bathing people. A standard capacity overflow tank (1100 l), suitable for all SPA bathtubs with overflow ducts manufactured by POOL-SPA is installed in the machine room. In the place of installation of the balance tank, a sewage terminal needs to be prepared, diameter. 63 mm (safety tank overflow). The overflow tank is equipped with water level sensors, a stream gauge and the following terminals:
- inlet to the tank, diameter 110 mm in top or side wall,
- outlet, diameter 63 mm in the bottom or side wall,
- safety overflow, diameter 63 mm placed in the top part of one of the side walls.

10.2. Maintenance of the filtration pump

Filtration pump is equipped with a crude air purification filter in the form of a basket placed in the pump aspiration chamber that stops thick contamination and foreign objects (e.g. hair).
Gathering large amounts of contamination in the aspiration basket makes water circulation worse. Remaining in that

sate may lead to electric heater damage due to overheating, caused by too low water flow rate. In order to clean the aspiration basket, perform actions like before cleaning the filter, disassemble the filtration pump cover and remove contamination gathered in the basket.

10.3. Six-function valve
A six-function valve is used only with sand filter, makes it possible to use the filter and control its operation.

10.4. Operating the water filter with a sand bed
Operating the filter boils down to periodic cleaning of the sand bed. In order to do that, set the six-function valve in the "Cz" position and activate the filtration pump. Cleaning time depends on the contamination level of the sand bed. After cleaning the filter and stopping the filtration pump, set the valve in the "P" setting and restart the filtration pump in order to settle the sand bed.

In order to change the sand filter level valve position, you have to DISABLE the filtration circulation pump.

Fig. 3. Six function valve diagram
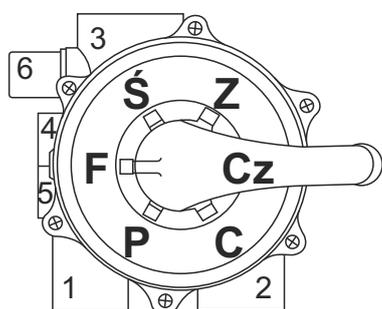
F – filtration (normal operation)
Cz – filter cleaning
Ś – draining into the sewage system
P – sand bed rinsing and makeup
C – circulation – the filtration system operates without the filter
Z – closed (do not start the filtration pump)

10.5. Substances used during SPA bath transport
During transport, acrylic surface is coated with a thin wax layer. Before starting the operation of the SPA bathtub, first wash all surfaces on which silicon will be applied with an organic solvent (grease makes it impossible to make a connection).

Metallised elements were coated with silicon oil in order to protect them. Before filling the SPA bathtub with water, first wipe the oil using a degreasing product.

11. HEATER AND LIGHTING
In case of activation of the heater thermal protection measure, wait until it fully cools down, then unscrew the protection plug present near the thermostat knob and then press the RESET button.

Lighting the SPA bathtub is carried out using a LED lamp or multi-point LED lighting (24 points).

12. CONTROL SYSTEM
The SPA bath control system consists of a panel with three ON and OFF functions:
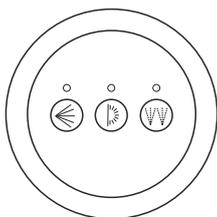
1. Water massage: Enables and disables the hydromassage pump and the filtration pump, starting water massage this way. When water massage is enabled, a red LED diode lights up. This function is activated only when there is enough water in the SPA bathtub.

Enhancing water massage with air: The amount of air can be regulated using air regulator which are located in the top surface of the SPA bathtub.

2. Air massage: Enables and disables the blower needed for air massage. When air massage is enabled, a red LED diode lights up. This function is activated only when there is enough water in the SPA bathtub.

3. Underwater light: Lights up and extinguishes light in the SPA bathtub. The lamp will be activated only when there is enough water in the SPA bathtub.

12.1. STB-3 control system
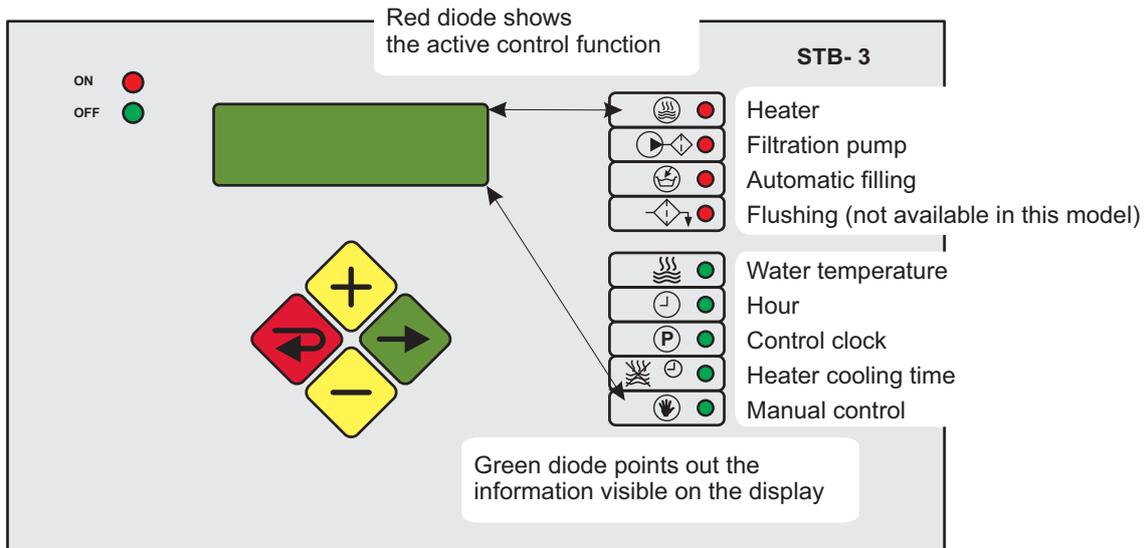
STB-3 system controls temperature, water level and SPA bath filtration process once a week.

To control the temperature and water filtration level daily, one of two cycles can be selected. Selection of filtration process cycle with low (L) temperature level (factory set SPA bath control), or of the second cycle with high (H) temperature level is recommended. L and H markings cover a theoretical temperature range between 0^0C and 42^0C, but the system operates properly within the 6^0C to 36^0C range with $\pm 0,5^0C$ accuracy.

In the active mode of particular functions the coresponding red diode is lit.

⍟ heater

◐◇ filtration pump

☺ automatic filling

◇ flushing (not available in this model)

🌡 water temperature

🕐 hour

Ⓟ control clock

☿ 🕐 heater cooling timei

✋ manual control

12.1.1. Displayed information
In the standard mode the display shows parameters of function selected and green diode is lit.
The user can change the function by pressing the pushbutton ➡.

12.1.2. Functions available
- Temperature: the first and second (large) digits show current water temperature whereas the third and fourth digits (small) show temperature entered to the current programme memory.

- Hour: shows current hour (in 24-hour system).

- Control clock: consecutively shows all parameters of programmes entered into the memory (day number: 1-7), programme number (1 or 2), programme temperature level (L or H), hour of filtration process start in the programme, hour of filtration process stop in the programme.

- Heater cooling time: shows information entered into the programme memory on time added to the selected filtration time and necessary for cooling the heater from its switch-off time (cooling takes 0 to 50 minutes).

- Manual control: if the SPA bath contains enough water and level sensor is active, single push of ⊕, switches the filtration pump ON, the second push of ⊕ pushbutton switches the heater ON. Pressing pushbutton ⊖, cancels the above settings.

12.1.3. Programming

After the function is selected, holding pushbutton ◆ for at least 3 seconds activates function programming mode. Pushbuttons ⊕ and ⊖ are used for parameters change. The pushbutton ◆ schanges a parameter for a consecutive one; when all function parameters are modified, the system exits programming mode and modified parameters remain saved. The pushbutton ◆ is used to exit programming mode with changes not saved, except control clock function ⓟ for which the pushbutton serves to exit programming mode with changes saved.

12.1.3.1. Water temperature setting ⑩

The function is selected with pushbutton ◆ Changing L and H level values at any moment within 0^0C to 42^0C range is possible.
1. Push pushbutton and hold ◆ it over 3 seconds.
2. With ⊕ or ⊖ pushbutton set L level temperature (low, economic).
3. Pushbutton ◆.
4. With ⊕ or ⊖ pushbutton set H level temperature (high, comfort temperature).
5. Pushbutton ◆.

12.1.3.2. Hour set ◷

This function is selected with pushbutton ◆:
1. Push pushbutton and hold ◆ it over 3 seconds.
2. With ⊕ or ⊖ pushbutton set hour (A).
3. Pushbutton ◆.
4. With ⊕ or ⊖ pushbutton set minutes (B).
5. Pushbutton ◆.
6. With ⊕ or ⊖ pushbutton set day (C) (e.g.: 1 = Monday).
7. Pushbutton ◆.

12.1.3.3. Weekly programme setting ⓟ

The weekly programming consists in the assignment of two programmes (P1, P2) to each (1-7) weekday, for which temperature level (L, H) and filtering process start and stop time is set.
During functioning of these programmes the filtration pump ⊙◇ and ⊛ heater are active, keeping the set water temperature level.

When P is selected as the day and appropriate programmes (P1, P2) are entered, all P1, P2 parameters will be automatically saved for days 1 to 5.

When the SPA bath user does not want a program (P1, P2) to start filtration pump and heater, programme start and stop hour should be set to 0. Then the programme will not be activated.

This function is selected with pushbutton ◆.
1. Push pushbutton and hold ◆ it over 3 seconds, P1 programme for the current day will be ON.
2. With ⊕ or ⊖ pushbutton select day (C) (1-7 or P).
3. Pushbutton ◆.
4. With ⊕ or ⊖ pushbutton select level (B) (L or H).
5. Pushbutton ◆.
6. With ⊕ or ⊖ pushbutton select programme (A) start hour.
7. Pushbutton ◆.
8. With ⊕ or ⊖ pushbutton select programme (B) start minute.
9. Pushbutton ◆.
10. With ⊕ or ⊖ pushbutton select programme (A) termination hour.
11. Pushbutton ◆.

12. With ⬥ or ⬦ pushbutton select programme (B) termination minute.

13. With pushbutton ⬦ go to P2 programme for the selected day and act as above to modify parameters.

After parameters modification push pushbutton 🔴, to save changes and quit programming mode.

12.1.3.4. Heater cooling time setting ⚒ ⏱

The function is selected with pushbutton ⬦. Setting can be changed between 0 and 50 minutes at any moment.

1. Push pushbutton and hold ⬦ it over 3 seconds.

2. With ⬥ or ⬦ pushbutton set minutes for each 10 minutes beginning from 10 minutes (0 to 50).

3. Pushbutton ⬦.

12.1.3.5. Manual control ✋

The function is selected with pushbutton ⬦. The following operations can be made:

1. ⏱ Pressing pushbutton ⬥ once activates the filtration pump.

2. ♨ Pressing pushbutton ⬥ again activates the heater.

3. Pressing pushbutton ⬦, cancels all functions previously programmed.

12.1.4. Control system operation

The control system automatically controls the filtration pump operation in two cycles saved for one week period, with regard to water temperature and level simultaneously.

If float sensor does not confirm the appropriate tank water level at the moment when the SPA bath power supply is ON, automatic bath filling solenoid valve activates and red diode is lit to show that the function is active 🔴.

When tank water level decreases (float sensor signals water level decrease), solenoid valve of automatic filling activates and red diode of automatic filling function blinks. 🔴.

If programmes saved in the memory have the same filtration start hour, the programme set for higher temperature is always activated.

12.1.5. Maximum working time and temperature calibration procedure

1. Switch the equipment OFF.
2. Switch the equipment ON.
3. During initialization process press button ⬦.
4. Press button ⬥ or ⬦ to enable determination of difference between temperature displayed and real. If e.g. display shows 37^0C and the real temperature is 25^0C, select 12.
5. Confirm the selection pressing button ⬦
6. Press buttons ⬥ or ⬦ to define maximum working time (0- means that bathub will work constantly).
7. Confirm the selection pressing button ⬦.
8. Confirm settings pressing button ⬦.

13. ACRYLIC COATING MAINTENANCE

The following precautions concerning the SPA bath cleaning and maintenance should be considered:

- Abrasive and aggressive products cannot be used for the SPA bath cleaning. They can destroy the coating.
- If the SPA surface is shining, removing of possible scratches is possible. Use wet abrasive paper of 800 grade then, to restore initial shine, use solvent-free polishing agent like that used for car body lacquering.
- Do not use alcohol nor other alcohol-based product to clean plastic components like electronic panel. To remove calcium remains use strongly diluted vinegar (acetic acid). Do not use store-bought chemicals.

14. GENERAL INFORMATION ABOUT THE MEASURING EQUIPMENT

Autodos M is designed for the measurement and dosing of chemicals in SPA. The device is equipped with 2 channel for measuring free chlorine and pH.

Autodos M is delivered in two parts – the flow cell and an electrode kit.

The flow cell is made up of a measuring unit and an control unit, including connections and system manual.

The electrode kit is made up of electrodes, calibration fluids, electrode connection components and electrode manual.

Autodos M can measure and regulate pH (alkali or acid dosing) and chlorine in the form free chlorine.

Alarms can be triggered based on the flow stop setting in the flow cell for dosing error and measurement values outside of limit values.

A two-digit LED display continually displays the pool water condition within the following limits:

Free chlorine: -.99–9.99 mg/l (ppm)

pH: 0.00–14.0

The measurement range is normally approx.:

pH: 3.00–11.0

Free chlorine: electrode dependent

Via a press on the button, the displays can be made to show uncalibrated values.

Control is programmed in configuration mode.

Separate high and low alarms (limits can be set) are indicated via flashing alarm LED(s) and a common alarm relay.

The alarm is shown as "Lo" or "Hi" on display 1–2 while the Reset button [15] is held depressed.

pH value outside of limit values stops chlorine dosing. This is indicated by a flashing AUTO LED on the chlorine channels and the alarm text "PHF". Chlorine dosing is stopped until the pH value has returned to a permitted value.

Flow alarm (PNP potential-free connector/turbine sensor that can be deactivated in configuration mode) is indicated via alarm LED and alarm relay in alarm mode. The registered alarm is also shown as "FLo" on display 1–2 while the Reset button [15] is held depressed. There is no automatic dosing during stop in flow.

All alarms have a 5-second delay, except for flow alarm, high alarm and low alarm. For the high and low alarms, delay can be set (in Setup) between 5 and 600 seconds. The flow alarm delay can be set (in Setup) between 0 and 30 minutes.

Alarm for dosing error can be selected in configuration mode (time in minutes > 0).

Dosing error is indicated (if dosing time is selected in configuration mode) via flashing alarm LED(s) and a common alarm relay.

The alarm is shown as "doS" on display 1–2 while the **Reset** button [15] is held depressed.

Dosing is stopped until the alarm is reset. The dosing time counter is always zeroed with a reset.

A dosing error is generated in the following conditions:

On/Off dosing. An alarm is triggered if dosing is continual for a longer time than the specified max. time in minutes (1-60 as specified in configuration mode). An alarm is also triggered if manual dosing is too long.

15. TECHNICAL DATA

Measurement computer	Autodos M2
Display 7 segments LED	2 x 3 digits
Current output	2 x 4–20 (0–20) mA
Relay outputs for dosing	2 x 1A resistive load
Fuses	3 x T1A 5x20 mm
Weight	5,3 kg
Height/Width/Depth (mm)	740x410x127
Power supply	230 VAC +15% -10%
Power consumption	12 VA

Temperature sensor connection	Screw terminal
Flow switch input	14 VDC, PNP, approx. 6 mA
Electrode connection pH	BNC
Electrode connection, redox	BNC
Electrode connection, free chlorine	Electrode dependent
Electrode connection, total chlorine	4–20 mA current input
Standby	PNP, approx. 14 VDC, approx. 5 mA
Level	PNP, approx. 14 VDC, approx. 5 mA
Alarm output relay	Closing/opening 1 A resistive load
Maximum load, current outputs	400 Ohm
Enclosure rating	IP54
Ambient temperature	5–40ºC
Nominal flow (min-max)	30 (20–60) l/h

Autodos M2
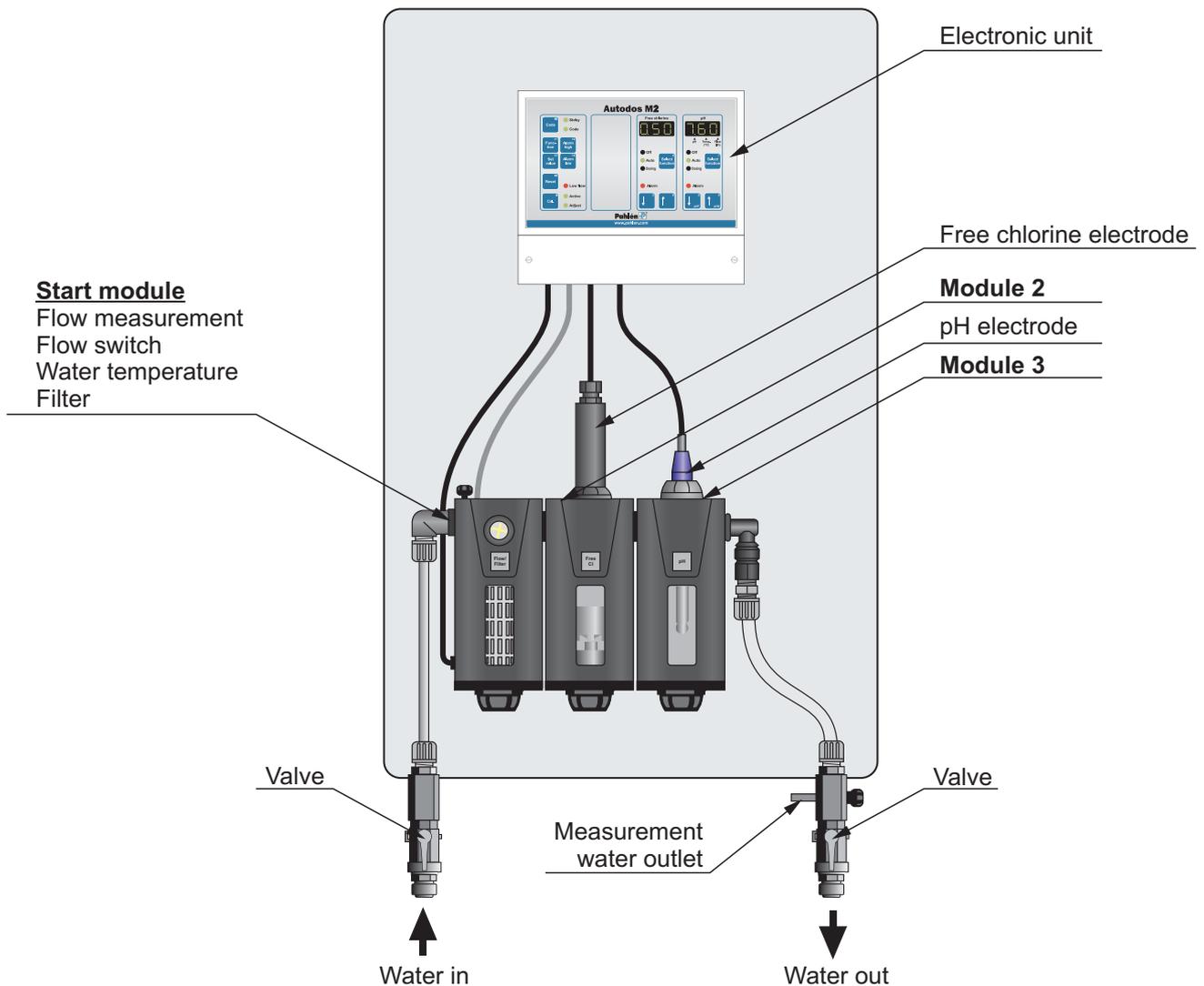
16. SAFETY

Separate the chlorine dosing point and the acid/alkali dosing point to prevent direct contact between the chemicals.

Lock the dosing pumps to the circulation pump using the motor guard or the flow switch.

For best results, use a photometer during calibration.

Proper installation and care is required to prevent invalidation of the warranty.

"Persons (including children) with limited physical or mental capabilities must not use the device without instructions on how to use it in a safe manner," as per IEC 60335-1.

17. INSTALLATION

17.1. General

Install Autodos M at a dry and vibration-free location.

The flow cell should be positioned as close to the monitoring point as possible to prevent unnecessarily long response times.

If the position of the Autodos puts it at risk of freezing, the flow cell modules must be emptied of all water and the electrodes must be stored frost-free standing in water (save the electrode packaging for this purpose).

The display must be well visible and the buttons easily accessible. Note the direction of flow.

When installing Autodos M with free chlorine electrode in pools where organic chlorine (Trichlor or Dichlor) was previously used, all water must be drained and replaced with new water as the cyanuric acid content in the pool water from the organic chlorine produces a significantly higher chlorine value in a DPD no. 1 test. This makes correct calibration impossible.

The system can be installed at any time point without consideration to the life span of the electrodes as these are delivered separately and can even be delivered at a later point in time.

When installing electrodes check that the electrode kit being used has the right configuration for the system.

Refer to configuration in the chapter on variants.

17.2. Installation, pipes

The outlet from the flow cell should be kept free from pressure, e.g. by leading outlet water to an equalization tank or a drain. For installations in which the flow cell outlet cannot be routed without pressure to a drain or equalization tank, the measurement water should be sampled after the filter and the return of the pump suction line.

Connections only need to be tightened by hand.

Monitoring and dosing points are most easily made with saddle clamps.

In order to prevent air from being mixed in with the measurement water (which could affect the measurement value), the measurement connection on the pipes should not sit at the highest point.

Autodos M2 schematic diagram
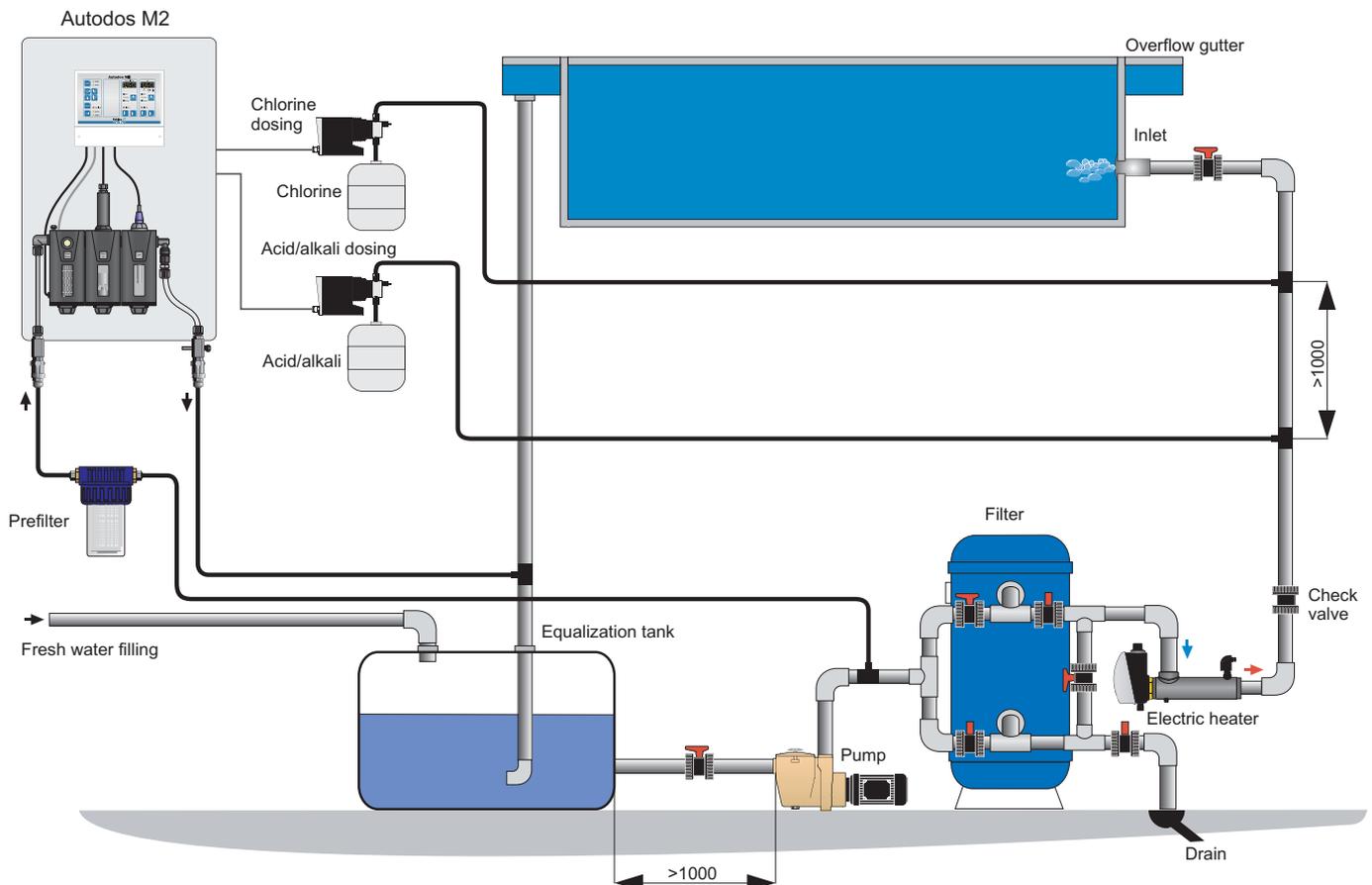
17.3. Installation, electrics

Electrical installation must only be carried out by an authorized electrical installation technician.

Electrical installation must be performed after pipe installation is complete.

The equipment must be permanently grounded and monitored by a residual current device (RCD) with a maximum leakage current of 30 mA.

The equipment should be supplied via an additional 2-pin switch.

Inputs/outputs for cables as per figure below.
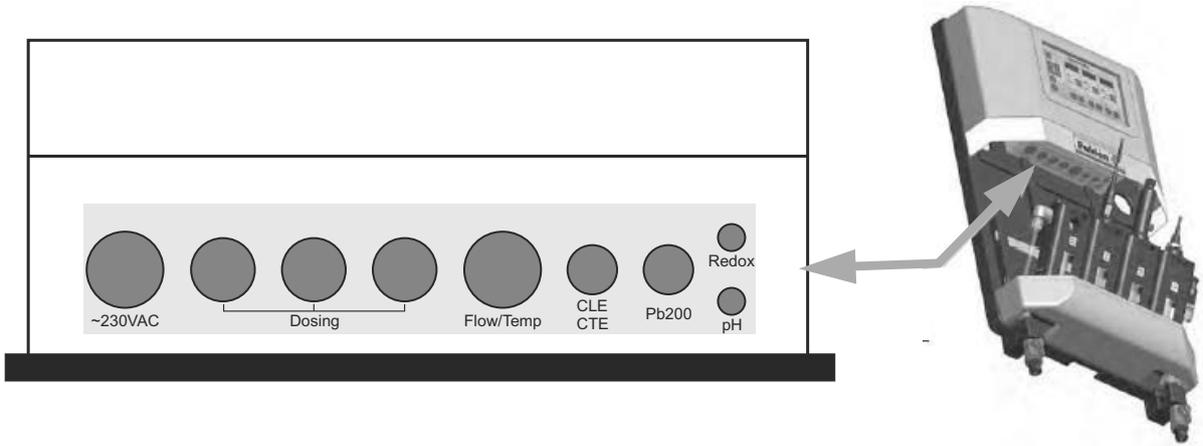
View from below

The following is an example of how connections are to be made.

Connection Autodos M2

	Pb200 chlorine electrode
GND free chlorine — 28	Chlorine electrode (CLE2.2)
Current input free chlorine (4-20 mA) — 27	GND
24 VDC — 26	V– / V+
Flow meter (white cable)/- GND current outputs — 25	
Current output 1 (pH) 4-20 mA (0-20 mA) — 24	
Current output 2 (redox/chlorine) 4-20 mA (0-20 mA) — 23	
22	
PNP in STDBY — 21	
Flow meter (green cable) /NPN in flow switch — 20	
PNP in, level switch (alarm upon closed input) — 19	
Flow meter (brown cable) /16 VDC PNP input — 18	
17	
- GND temperature sensor — 16	
Temperature sensor — 15	
14	
Twin-cable communication with PC — 13	

Pump
E.g.
On/Off
dosing

L
N

1A (0,5A ind) — 10 / 9
1A (0,5A ind) — 8 / 7
1A (0,5A ind) — 6 / 5
4
3
N 2 — 230 VAC N
L 1 — 230 VAC L

18. OPERATION
18.1. Displays, buttons and LEDS – general
The panel is divided into 4 groups. Group 1 (on the left) handles all activities and the others show values and handle limit and value settings.

• Displays
Depending on the Autodos M module, the values are shown in one, two or three separate displays: free chlorine, and pH. The display to the far right can also be used to show flow and temperature.
The displays can also show simple text messages.
In displays where different values can be shown in the same field, the actual display is marked by the position of the decimal point. An arrow and explanatory text are found under the illuminated decimal point on the display.

• Buttons
Each button has a unique number in the top right-hand corner. In this manual, reference is made to this number with [ ]. The function is described below.

• LEDs
Function activation is indicated with a green LED and all types of alarms are indicated with a red LED.

Group 1

Button no.	Function
0	Calibration
10	Authorization
11-14	Activity
15	Reset

Group 2

Button no.	Function
1	Function selection
2	Level -
3	Level +

Group 3

Button no.	Function
4	Function selection
5	Level -
6	Level +

Group 4

Button no.	Function
7	Function selection
8	Level - / Temp
9	Level + / Flow
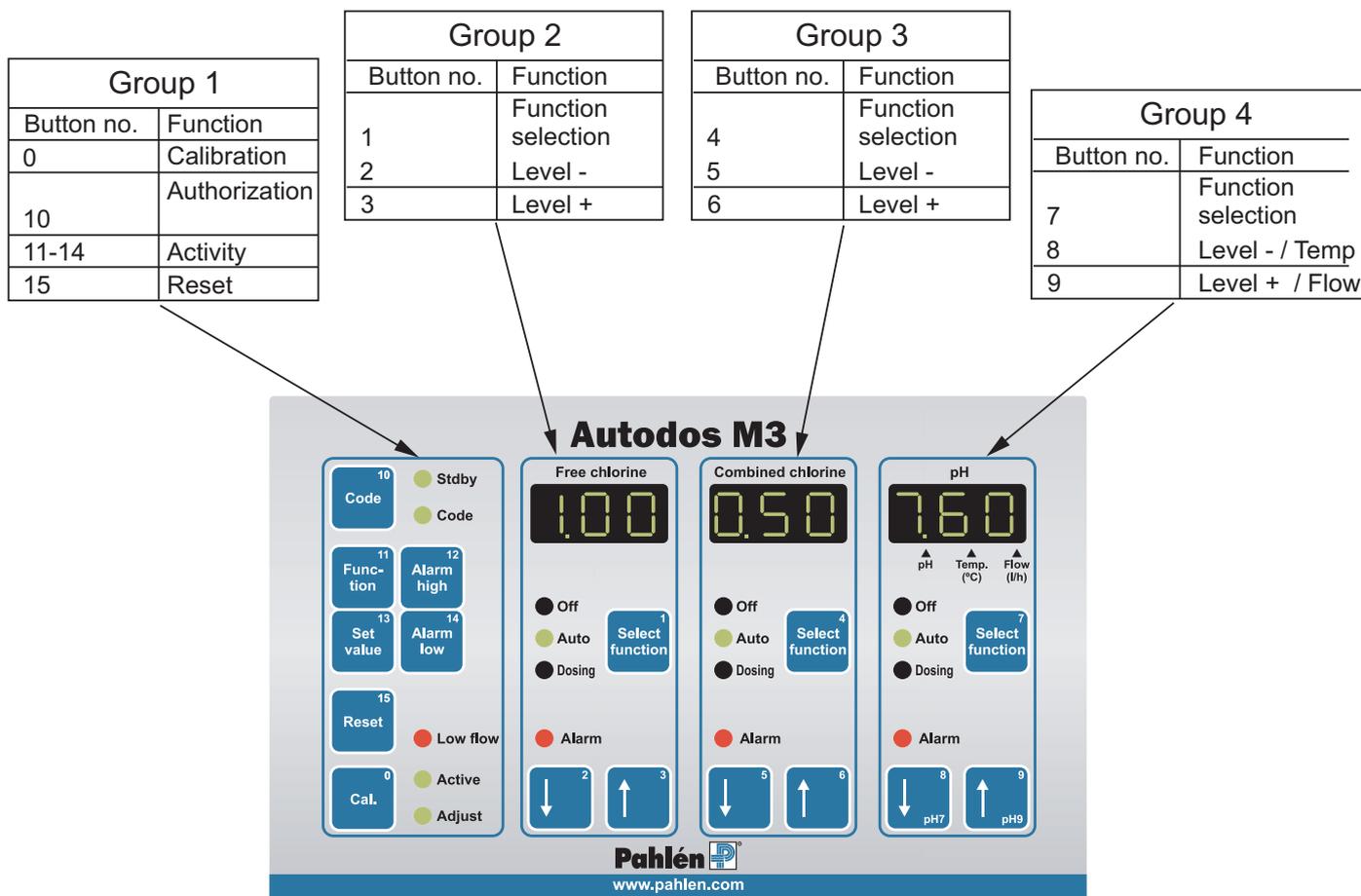
18.2. Authorization
To avoid unintentional changes to settings and unauthorized use, two authorization codes can be set.

Authorization	Explanation
Normal mode	No settings can be altered; only Reset is possible
Authorization code 1	Set values, alarm limits and control parameters can be changed. Calibration is also possible.
Authorization code 2	All available changes, including system configuration, are possible.

18.2.1. Activate authorization
If no codes are set, authorization level 2 is accessed automatically when the Code button [10] is pressed.
When the Code button [10] is held depressed, the opening code can be entered using the buttons indicated below:

Autodos M2: Buttons 0 and 4–9

Reset [15] clears the display and up to six digits can be entered for the code. If the entered code is the same as opening code 1 you access authorization level 1 and if the entered code is the same as opening code 2 you access authorization level 2 when the **Code** button [10] is released. This is indicated via the "**Code**" LED being illuminated for authorization level 1 and flashing for authorization level 2.

18.2.2. Set authorization code

The opening code can only be changed in authorization level 2. If you forgot the code for authorization level 2, it can be displayed by pressing **Code** [10] during the start-up sequence (after the countdown of seconds has begun).

Enter the opening code (for authorization level 1 or level 2):
1. Access authorization level 2.
2. Enter calibration mode.
3. Hold the Code button [10] depressed and enter the opening code with buttons [0] – [9]. Use Reset [15] to clear the display and enter up to six digits for the code. The display shows "Cd1" when the Code button [10] is pressed the first time. "Cd2" is shown the next time the button is pressed. The display then switches back and forth each time the button is pressed. The text indicates which code (for authorization level 1 or 2) should be entered.

18.3. View/change set values

M2	Press and hold the **Set value** button [13] to display the set value - for chlorine on display 1 - for pH on display 2 To change the set value, hold the button depressed while pressing ↑ or ↓ under the relevant display.

18.4. View/change alarm limits

HIGH ALARM	Press and hold the Alarm high button [12] to display the high alarm limit value on the relevant display. To change the limit value, hold the button depressed while pressing ↑ or ↓ under the relevant display. At least authorization level 1 is required in order to make changes.
LOW ALARM	Press and hold the Alarm low button [14] to display the low alarm limit value on the relevant display. To change the limit value, hold the button depressed while pressing ↑ or ↓ under the relevant display. At least authorization level 1 is required in order to make changes.

18.5. Showing other information on the display

Show **Uncalibrated values**	Press and hold the Set value [13] and Alarm low [14] buttons simultaneously to show uncalibrated values on the relevant display.
Show **Flow**	Press and hold the ↑ button [9] to display flow in litres per hour.
Show **Temperature**	Press and hold the ↓ button [8] to display temperature in °C.
Show **Version**	Press and hold the Alarm high [12] and Alarm low [14] buttons simultaneously to display the program version.
Show **Serial number**	Press and hold the Function [11] and Alarm high [12] buttons simultaneously to display the factory-programmed serial number.

18.6. Dosing selection

Select **Function**	Press the **Select function** button [1], [4] or [7] to switch dosing selection between Off and Auto. Dosing can be deselected in configuration mode. Press and hold the Select function and Set value [13] buttons simultaneously to access manual dosing. Deactivate manual dosing by pressing the **Select function** button.

Off   No dosing
Auto   Automatic dosing based on set parameters (normal setting)
Dosing   Continual dosing (including when there is an error; stopped if there is a dosing time error)

18.7. Other buttons

Reset	Press and hold the **Reset** button [15] to display triggered alarms for the respective channel in the form of a brief text. If the button is depressed for less than about one second, the alarms are reset and the common alarm relay is de-energized. The dosing time counter is always zeroed with a reset.
Cal.	Press the **Cal.** button [0] to page in calibration mode between Off – Active – Adjust ... This is indicated via unlit LEDs (Off), illuminated Active LED or illuminated Active and Adjust LEDs. (Exit calibration mode by pressing and holding **Cal.** [0] until the LEDs go out.)
↑ ↓	Use the arrow buttons to adjust set values, limits and calibration values on the relevant display. If an arrow button is held in, a "fast forward" function engages after about one second.

18.8. LED indicators

LEDs – dosing indicators

Off	Dosing of pH-regulating or chlorine-regulating agent is deactivated
Auto	Dosing of pH-regulating or chlorine-regulating agent is regulated automatically
Dosing	Dosing of pH-regulating or chlorine-regulating agent is in progress

If neither LED "**Off**" nor "**Auto**" is illuminated, then manual dosing is selected. If dosing does not occur at this time (LED "**Dosing**" is not lit), then dosing was deselected at setup. It may also be deactivated due to excessively long dosing time if this function has been selected. If this is the case the "**Alarm**" LED will also flash (or be illuminated).

If the pH value is outside of alarm limits, there is an alarm on the chlorine channel if chlorine dosing is active. Chlorine dosing is stopped until the pH values are once again within permitted limits. The alarm is indicated via a flashing "**Auto**" LED on the chlorine channel and the alarm test "PHF" at Reset.

LEDs – alarm indicators

Low flow	Insufficient flow in the flow cell
Alarm	High alarm, low alarm, dosing error or flow error

If the "**Alarm**" LED flashes, there is an error that has not been cleared. If an error has been cleared but remains active, the LED is illuminated with a steady glow.

LEDs – indicators for calibration in progress

Active	Calibration in progress; calibration of pH7, pH9 and chlorine zero points possible.
Adjust	Calibration in progress; calibration of chlorine values possible.

If the "**Active**" LED flashes, it indicates you are in configuration mode. To exit configuration mode, press and hold the **Cal.** button [0] until the "**Active**" LED stops flashing.

LEDs – indicators for other functions

Code	Indicates code mode (change of settings possible), steady = authorization level 1, flashing = authorization level 2.
Stdby	Indicates input that switches off alarm and dosing; the alarm relay is activated when the input is activated.

18.9. Text on the display
18.9.1. Runtime texts

A list of texts that may be displayed during normal program operation and the contexts in which they occur is found below:

- - - EEP Er1	at first start-up or EEPROM error; reset gives default setting.
dEL SEC # # #	restart performed, # # # indicates the time before start delay is finished.

18.9.2. Error codes

Code	Cause
EL1	active electrode error 1 (low calibration point < min)
EL2	active electrode error 2 (low calibration point > max)
EL3	active electrode error 3 (high calibration point < min)
EL4	active electrode error 4 (high calibration point > max)
noC	chlorine value too low; calibration not possible

The following error codes can occur when the **Reset** button [15] is held depressed:

Code	Meaning
FLo	active flow error on channel X
Lo	active low alarm on channel X
Hi	active high alarm on channel X
doS	incorrect dosing
PHF	stopped chlorine dosing because pH value outside permitted limits
SbY	standby
LoL	active level switch alarm
- - -	everything OK

18.10. Start-up sequence

When Autodos M is started up, a text (see below) is shown. The three digits in the text indicate how many seconds are left until the end of the start-up sequence. The waiting time during start-up is intended to avoid problems with alarms

being triggered because the measurement values have not had time to stabilize, etc. (The start delay can be bypassed by pressing and holding the **Reset** button [15] for about one second.)

Autodos M2: "SEC 059"

18.11. Adjusting set value – Chlorine regulation (free chlorine)

Set value adjustment for free chlorine regulation is carried out by pressing and holding the Set value button [13].
The selected chlorine set value is then shown in the display.
To change the set value, press and hold the button while pressing ↑ or ↓ under the display. Pressing and holding an arrow button for about one second triggers a "fast forward" function until the button is released.
The set value can be adjusted within the interval 0.00–9.99

18.12. Adjusting set value – pH regulation

Set value adjustment for pH regulation is carried out by pressing and holding the **Set value** button [13].
The selected pH set value is then shown in the display. To change the set value, hold the button depressed while pressing ↑ or ↓ under display 3. Pressing and holding an arrow button for about one second triggers a "fast forward" function until the button is released.
The set value can be adjusted within the interval 0.00–14.0

18.13. Setting high alarm

High alarm setting is done by pressing and holding the **Alarm high** button [12]. The high alarm limits for free chlorine, combined chlorine and pH are then displayed in the measurement value windows.

To change the limit, press and hold the button while pressing ↑ or ↓ for the relevant channel.
Pressing and holding an arrow button for about one second triggers a "fast forward" function until the button is released.
High alarm limits can be adjusted within the intervals:
free chlorine   -.99–9.99 ppm
pH   -.99–9.99

18.14. Setting low alarm

Low alarm setting is done by pressing and holding the Alarm low button [14]. The low alarm limits for free chlorine, combined chlorine and pH are then displayed in the measurement value windows.

To change the limit, press and hold the button while pressing ↑ or ↓ for the relevant channel.
Pressing and holding an arrow button for about one second triggers a "fast forward" function until the button is released.
Low alarm limits can be adjusted within the intervals:
free chlorine   -.99–9.99 ppm
pH   -.99–9.99

18.15. Alarm LEDs

The alarm LEDs indicate an alarm by flashing. The alarm relay is de-energized when the LED flashes (thus, a shutdown device triggers an alarm). The LED is illuminated with a steady glow after reset if the alarm remains active or goes out if no alarm is active.
Indication is made for low alarm, high alarm, dosing error and flow error.

Dosing is affected by alarm as follows:

Flow error	stops all dosing (starts when flow is correct)
Low alarm pH	stops chlorine dosing (starts when value is within limits)
High alarm pH	stops chlorine dosing (starts when value is within limits)
Low alarm free chlorine	no effect on dosing
High alarm free chlorine	no effect on dosing
Dosing error pH	stops all dosing (starts after reset)
Dosing error free chlorine	stops chlorine dosing (starts after reset)
Alarm level switch	no effect on dosing

All alarms have a 5-second delay.

18.16. Alarm delay
The high and low alarms have a delay of 5–600 seconds (set in electrode-specific configuration).
The flow switch alarm has a delay of 0–30 minutes (set in system configuration).

The alarm delay works as described below.
• Delay time is counted up when an "alarm condition" applies.
• Delay time is counted down when an "alarm condition" does not apply.
• "Alarm" is activated (LED flashes) when delay time has reached the set delay time limit.
• "Alarm" is deactivated when the alarm is reset with the **Reset** button [15] and when delay time has been counted down to zero.

18.17. Alarm relay delay
The alarm relay has a delay of 0–30 minutes (set in system configuration). Function as follows:
• The delay time is counted up when there is an alarm that has not been reset and when the alarm delay time has not been zeroed.
• The delay time is reset when it is not counted up (as per condition above).
• The alarm relay is activated when the delay time has reached the set delay time limit.
• Reset deactivates the alarm relay and resets the delay time.

18.18. Alarm reset
Alarm reset is carried out by pressing and holding the **Reset** button [15] for about one second until the LEDs stop flashing and the alarm relay is de-energized.
While the **Reset** button [15] is held depressed, the display(s) show text indicating which alarms were active when the button was pressed (see chapter on text display on page 14).
If several alarms are active, these are displayed at a 1-second interval.
The acknowledged, non-active alarms disappear when the button is released. Pressing the button again will display the remaining active alarms.
Reset is not possible while in calibration mode.
The dosing time counter is always zeroed with a reset.

18.19. Showing uncalibrated values
Display of the factory-calibrated values (as if no calibration was carried out since delivery from the factory) can be carried out by pressing the **Function** [11] and **Alarm low** [14] buttons simultaneously (also works during calibration).

18.20. System configuration
If there is a need to change the factory-programmed settings, access configuration mode. Do this by accessing authorization level 2 with the code and activating calibration mode.
(The unit comes from the factory with no authorization code programmed.)

NOTE: Check that the setting for channel-specific SETUP on line 01 of the respective channel (chlorine or pH) matches the electrical connection (On/Off or Frequency dosing) in the relevant wiring diagram. If the wiring diagram is not followed, the circuit board will be destroyed and will have to be replaced.

Factory-set system configuration:

	Free chlorine	pH
Set value	1.00	7.40
Low alarm	0.40	6.80
High alarm	2.00	7.80

18.20.1. Enter configuration mode
Press and hold the Code button [10], enter the opening code and then release the button. The "**Code**" LED flashes as confirmation.
Press the **Cal.** button [10] to enter configuration mode. The "**Active**" LED illuminates as confirmation.
There are different configuration modes depending on the Autodos model. However, they all have a common mode in which settings made affect basic functions and a mode with specific settings for the different electrodes.

The following button combinations are used to enter the different configuration modes:

Basic functions:	**Function** [11] + **Reset** [15]
Configuration for electrode 1:	**Set value** [13] + **Select function** [1]
Configuration for electrode 3:	**Set value** [13] + **Select function** [7]

Flashing LEDs confirm which configuration mode you accessed when the buttons are released:
Active configuration is indicated by the "**Active**" LED flashing. If any of the electrode-specific configuration modes are active, the LEDs "**Off**" and "**Auto**" flash for the relevant electrode.

18.20.2. Changing text/value
<u>Autodos M2</u>
Select the line for which you want to change the setting on by pressing ↑ or ↓ under display 2.
When the arrow button is held depressed, display 3 shows the actual line number and display 2 shows the selected configuration type (e.g. "FCL" "-01").
When the buttons are released, display 2 shows a text indicating which setting can be changed and display 3 shows a text or a numeric value.
To change a text or value, press ↑ or ↓ under the relevant display.
The selected configuration type is indicated via one of the following texts: "SEt", "FCL", "CCL", "ACi" or "bAS".

18.20.3. Configuration of basic functions
Proceed as follows to configure all channels: press the buttons **Function** [11] + **Reset** [15].

This is indicated via the text "SEt UP" and the "**Off**" and "**Auto**" LEDs being unlit.
To exit configuration, press the **Cal.** button [0] or scroll past the last line.

18.20.4. Configuration – Autodos M2 free chlorine, pH

Line	Text	Setting	Explanation
-01	FLo		Selection of flow switch and alarm for low flow.
		oFF	No flow switch. Flow alarm OFF.
		Son	Flow switch that closes with flow. Flow alarm ON.
		Pof	Turbine flow meter. Flow alarm OFF.
		Pon*	Turbine flow meter. Flow alarm ON.
-02	FCL		Selection of electrode type for chlorine measurement.
		Pb*	PB200, CLE2.2
		Cur	4–20 mA sensor, e.g. CLE3
-03	C-o		Selection of chlorine measurement
		FCL*	Free chlorine
-04	FCC		Selection of compensation of free chlorine against flow and/or pH.
		non	No compensation.
		Flo	Compensated against flow.
		PH-	Compensated against pH.
		FPH*	Compensated against flow and pH
-05	PHd		Selection of pH-adjusted dosing.
		ACi*	Doses acid (doses when actual value > set value).
		bAS	Doses alkali (doses when actual value < set value).
-06	PHc		Selection of pH calibration point 2. Calibration point 1 = pH 7.00
		PH9*	Calibration point 2 = pH 9.00
		PH4	Calibration point 2 = pH 4.00
-07	PC		Setting of access from PC.
		No*	No access (display only).
		rES	Alarm reset only.
		Prg	Fully programmable.
-08	Sio	001-255 (001*)	Selection of Modbus ID number.
-09	FLd	000-030 (000*) [minutes]	Flow alarm delay time.
-10	rEL	000-030 (000*) [minutes]	Alarm relay delay time.
-11	SbY		The Stdby input blocks all dosing plus the alarm relay.
		rEL*	Activates the alarm.
		non	Does not activate the alarm.

*factory default!

18.20.5. Electrode-specific configuration – general

Text inside ( ) in the tables indicates dosing setting (on line -01).

Autodos M2

Select the desired line with the ↑ or ↓ button under the relevant display.
While the ↑ or ↓ button is depressed, display 2 shows the selected configuration type (e.g. "FCL" "-01") and display 3 shows the actual line number.

When the button is released, display 2 shows a text indicating which setting can be changed and display 3 shows a text or a numeric value.
To change a text or value, press ↑ or ↓ under the relevant display.

18.20.6. Electrode-specific configuration – free chlorine (PB200)

For configuration of free chlorine electrodes: press the buttons **Set value** [13] + **Select function**.

This is indicated via the text "SEt FCL" and flashing of the "**Off**" and "**Auto**" LEDs.
To exit configuration, press the **Cal.** button [0] or scroll past the last line.

The following can be modified in the channel-specific configuration – Free chlorine:

Line	Text	Setting		Explanation
-01	doS			Selection of dosing outlet and function.
		oFF		No dosing.
		ono*		On/Off dosing.
		Pdo		Pulse width dosing.
		FrE		Frequency dosing.
		Cur		Dosing via current output.
-02	P	0.10-2.00 (0.20*)	ppm	P-band. (Pdo, FrE, Cur)
-03	I	000-100 (000*)	minutes	I-time 000 = no I-regulation. (Pdo, FrE, Cur)
-04	d	000-100 (000*)	seconds	D-time, 000 = no D-regulation. (Pdo, FrE, Cur)
-05	dF	010-180 (100*)	strokes/minute	Max. frequency dosing. (FrE)
-06	Pdo	005-015 (010*)	minutes	Pulse width during pulse width dosing. (Pdo)
-07	Ldt	000-060 (000*)	minutes	Long dosing time alarm, 0 = no function.
-08	oFt	000-600 (000*)	seconds	Min. time OFF for relay, 0 = no function. (ono)
-09	ont	000-600 (000*)	seconds	Min. time ON for relay, 0 = no function. (ono)
-10	Cur	- - 0 / - - 4 (- - 4*)		Current output, selection of range 0–20 mA/4–20 mA.
-11	C-L	0.00-9.99 (0.00*)	ppm	Current output, value for 0/4 mA.
-12	C-H	0.00-9.99 (9.99*)	ppm	Current output, value for 20 mA.
-13	AHd	005-600 (005*)	seconds	Delay time for high alarm.
-14	ALd	005-600 (005*)	seconds	Delay time for low alarm.

*factory default!

18.20.7. Electrode-specific configuration – pH

For configuration of pH electrodes: press the buttons Set value [13] + Function [11].

This is indicated via the text "SEt ACi" or "SEt bAS" (depending on whether acid or alkali dosing is selected) and flashing of the "**Off**" and "**Auto**" LEDs.
To exit configuration, press the **Cal.** button [0] or scroll past the last line.

The following can be modified in the channel-specific configuration – pH:

Line	Text	Setting	Explanation
-01	doS		Selection of dosing outlet and function.
		oFF	No dosing.
		ono*	On/Off dosing.
		Pdo	Pulse width dosing.
		FrE	Frequency dosing.
		Cur	Dosing via current output.

-02	P	0.10-2.00 (0.20*)	pH	P-band. (Pdo, FrE, Cur)
-03	I	000-100 (000*)	minutes	I-time 000 = no I-regulation. (Pdo, FrE, Cur)
-04	d	000-100 (000*)	seconds	D-time, 000 = no D-regulation. (Pdo, FrE, Cur)
-05	dF	010-180 (100*)	strokes/minute	Max. frequency dosing. (FrE)
-06	Pdo	005-015 (010*)	minutes	Pulse width during pulse width dosing. (Pdo)
-07	Ldt	000-060 (000*)	minutes	Long dosing time alarm, 0 = no function.
-08	oFt	000-600 (000*)	seconds	Min. time OFF for relay, 0 = no function. (ono)
-09	ont	000-600 (000*)	seconds	Min. time ON for relay, 0 = no function. (ono)
-10	Cur	- - 0 / - - 4 (- - 4*)		Current output, selection of range 0–20 mA/4–20 mA.
-11	C-L	0.00-9.99 (6.00*)	pH	Current output, value for 0/4 mA.
-12	C-H	0.00-9.99 (8.50*)	pH	Current output, value for 20 mA.
-13	AHd	005-600 (005*)	seconds	Delay time for high alarm.
-14	ALd	005-600 (005*)	seconds	Delay time for low alarm.

*factory default!

19. CALIBRATION

At a minimum, authorization level 1 is required to access calibration mode, i.e. the "Code" LED must be illuminated or flash.

During calibration, no settings can be made and high alarm, low alarm and flow alarm are not activated. Automatic dosing is stopped during calibration.

Calibration mode "Active" is accessed by pressing and holding the Cal. button [0] until the "Active" LED illuminates. Dosing stops automatically during calibration and output signals on the current outputs are frozen at the last measured value before calibration.

In calibration mode "Active" calibration of pH7, pH9 and chlorine zero points is possible.

Calibration mode "Adjust" is accessed by pressing and holding the Cal. button [0] until the "Adjust" LED illuminates (presuming the "Active" is already lit). If combination with pH exists, no pH value is displayed. "- - -" is instead displayed to indicate that pH calibration is not possible.

Calibration mode "Off" is accessed by pressing and holding the Cal. button [0] until the "Adjust" and "Active" LEDs go out.

To exit calibration mode, press the Code button [10]. The LED goes out as confirmation.

19.1. Calibration – pH

Calibration is done at two points – normally pH7 and pH9.

1. Activate calibration mode "**Active**".

2. Take the cleaned and rinsed pH electrode and place it in the pH7 calibration solution (not in the buffer bottle).
Move the electrode up and down for a good reading. Give the measurement value time to stabilize (5-30 seconds).
Then press the calibration button **pH7** [8] until the display shows "- - -".

3. Rinse the electrode and then place it in the pH9 calibration solution (not in the buffer bottle). Move the electrode up and down a little for a good reading. Give the measurement value time to stabilize (5-30 seconds). Then press the calibration button pH9 [9] until the display shows "- - -".

4. pH calibration is complete. Exit calibration mode by pressing the Cal. button [0] twice until the "Adjust" and "Active" LEDs go out.

5. Discard used buffer solution after calibration.

NOTE: If the electrode voltage during zero point calibration deviates too greatly from the expected value, electrode error is indicated with the text "EL1", "EL2", "EL3" or "EL4" while the calibration button is held depressed.
When the button is released, Autodos M uses the calibration values that applied before the failed calibration attempt.

Text meaning:

EL1	active electrode error 1 (low calibration point < min)
EL2	active electrode error 2 (low calibration point > max)
EL3	active electrode error 3 (high calibration point < min)
EL4	active electrode error 4 (high calibration point > max)

19.2. Zero point calibration

Press and hold the ↓ button for 4 seconds until the display shows: -, -, -, - - -. Calibration is then complete.

To reset zero point calibration to the factory settings, press and hold ↑ for 4 seconds until the display shows: F, F, F, FFF; the reset is then complete.

NOTE: If electrode voltage during zero point calibration deviates too much from the expected value, electrode error is indicated with the text "EL1", "EL2" while the calibration button is held depressed.

When the button is released, Autodos M uses the calibration values that applied before the failed calibration attempt.

The amplification setting is limited both up and down by limits for feasible electrode signal.

The chlorine value can be calibrated down to 0.05 ppm.

Text meaning:

EL1	active electrode error 1 (low calibration point < min)
EL2	active electrode error 2 (low calibration point > max)

Two-point calibration (zero point and amplification) to value measured with photometer (e.g. DPD no.1).

If zero point calibration is not required, skip point 2 below (with correct flow).

19.3. Calibration – free chlorine: PB-200 chlorine electrode

1. Activate calibration mode by pressing and holding the **Cal.** button [0] until the "**Active**" LED illuminates.
2. Zero point calibration is carried out by lifting the electrode out of the flow cell, waiting about 1 minute and then pressing the ↓ button under display 1. Before calibration to the laboratory-measured value is possible, the electrode must be
3. refitted in the flow cell and allowed to measure in the cell for about 2 minutes to obtain a correct value.
4. Access calibration mode by pressing and holding the **Cal.** button [0] until the "**Adjust**" LED illuminates.
The meter stores the last measured electrode signal.
5. Take a water sample and determine the correct chlorine value with DPD1.
6. Set the correct chlorine value with the ↑ and ↓ buttons under display 1.
7. Access calibration mode by pressing and holding the **Cal.** button [0] until the "**Adjust**" and "**Active**" LEDs go out.

20. MAINTENANCE

Flow cell

On a daily basis, check that the water flows as it should. Flow should be approx. 30 litres per hour.

Clean the water filter before the flow cell as necessary.

Electrodes

Refer to the electrode manual.

Water quality

As water quality varies and electrodes wear over time, measurement values should be checked regularly. This can be done with "amplification calibration" (calibration point high) and should be carried out once a week.

Zero point calibration is done less frequently.

Two-point calibration (i.e. both zero point and amplification calibration) is carried out upon initial start-up and when electrodes are replaced.

21. TROUBLESHOOTING

Error	Probable cause	Action
Meter completely dead	No power supply.	Check the electrical connection.
Measurement value fluctuates greatly up and down.	Electrode not connected.	Check the connection.
	Cable fault.	Check the cable.
	Electrode without measurement water.	Check the flow cell.
Incorrect measurement values (pH or chlorine).	Dirty electrode.	Clean the electrode.
	Incorrectly calibrated meter.	Carry out calibration with fresh buffer solution.
	Defective electrode.	Try shaking the electrode (if there is an air bubble in the glass ball); otherwise replace the electrode.
Calibration cannot be carried out.	Defective electrode.	Replace the electrode.
	Poor contact with the meter.	Check the cables, including the cables on the inside connecting the BNC connectors on the outside with the circuit board.
	Defect buffer solution.	Check the buffer solution.
Electrodes give sluggish but correct value in buffer solution but incorrect during measurement	Dirty electrode.	Clean the electrode.
	Electrode used up.	Replace the electrode.
Measurement value stuck at pH = 7 and 0 mV or 0 mg/l	Short-circuit of measurement signal.	Check electrode, cables and connections.
Meter is not dosing, dosing lamp is not illuminated or AUTO is flashing.	Meter in "manual" mode.	Put the meter in "auto" mode.
	"PHF" error.	Determine the cause and reset the alarm; chlorine dosing starts when the pH value is correct.
The meter is not dosing, the dosing lamp is illuminated.	Dosing equipment is not connected correctly.	Check connection.
	Dosing relay defective	Return the meter for repair.
Incorrect chlorine measurement values (Prominent measuring cell).	Air bubbles in the membrane.	Carefully tap on the outside of the electrode's glass casing or temporarily increase flow past the cell.
	Dirty membrane.	Clean the membrane and fill with fresh electrolyte.
	Pressure changes.	Depressurize the outlet from the flow cell.
	Unstable pH value.	The pH value must be stable during chlorine measurement; adjust pH to 7.4
	Incorrectly calibrated meter.	Calibrate chlorine.
Chlorine value too low to be adjusted to measured value (Prominent measuring cell).	Poor electrolyte.	Replace the electrolyte or wipe off the gold tip of the measuring cell with a napkin.
	Oxides on the gold tip of the measuring cell.	Carefully polish with wet grinding paper.
Incorrect chlorine measurement values (PB-200 measuring cell).	Test water flow too low.	Ensure that the flow through the measuring cell is correct.
	Unstable pH value.	The pH value must be stable during chlorine measurement; adjust pH to 7.4
	Incorrectly calibrated meter.	Calibrate chlorine.
Chlorine value shows zero all the time (PB-200 measuring cell).	Cable connection to metal cylinder loose.	Fasten the cable connection.
No "click" during dosing; dosing lamp is illuminated.	Dosing relay defective.	Return the meter for repair.

GUARANTEE CONDITIONS

We would like to thank you for your purchase and to congratulate you on having acquired a high-quality product.

Our company, POOL-SPA Sp. z o.o., guarantees its products against all manufacturing or operational defects under the conditions set out here.

After installing the Spa, please fill with installer in manual the card with the details requested to ensure validity of warranty. Please remember to get from sales agent confirmation of purchasing date.

1. The product must be installed strictly in accordance with the installation instructions that come with the product, and respecting all the measurements and indications given.

2. For the warranty to be operative, all work done during the warranty period must be carried out by a authorized service. The list of authorized service is available by Your sales agent.

3. The warranty period.
POOL-SPA Sp. z .o.o. provides a full guarantee for the Spa for a period of 2 years from the date of installation. During this full guarantee period, any manufacturing or operating defect will be repaired at no cost to the user (excluding the bulbs).
If the product is installed in a country other than the country of acquisition, the period and terms of the warranty will be restricted to the general warranty cover stipulated by regulations in the country concerned.
After 2 years from the date of installation, POOL-SPA Sp. z o.o. provides post-warranty payable service.

4. The warranty will not be valid in these cases:
a) A fault or faulty operation resulting from anomalies or non-compliance with the product-specific installation rules or arising in the hydraulic, electrical or gas systems.
b) Corrosion, scaling or abrasion caused by a lack of cleaning and/or maintenance, improper use, careless storage or ill treatment, breakages, damage resulting from the use of water at temperatures of over 50ºC, wear from abnormal usage, or any other cause not stemming from the appliance.
c) If the Spa, after use, is not secured by thermal cover against sun radiance.
d) If installation has been done by non-authorized service, or if non-original spare parts were used.
e) If it is found that the Spa has been in use for a period longer than the warranty period.

5. In particular, POOL-SPA Sp. z o.o. declines all liability for any harm to people or damage to things that may have resulted from any of the excluded causes specified in the preceding section.

6. Any other demand stemming from grounds not specified in the above sections is excluded unless the law of the land expressly attributes liability.

Recommendations:
Before using the equipment, read carefully through the instructions included with the Spa.

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TECHNICAL PRODUCT SHEET

MODEL, FITTINGS

FACTORY NUMBER

DATE OF PRODUCTION AND TESTING

NOMINAL POWER REQUIREMENTS

FUSING REQUIREMENTS

80A

VOLTAGE / FREQUENCY

3x 400V/50 Hz

THERMAL PROTECTION

F

QUALITY CONTROL

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