

Installation and Operating Instructions



WATERFRIEND MRD-1 *exclusiv*



Water treatment for pH and active oxygen
optional with web server and Internet connection



Technical Data

WATERFRIEND *oxygen*

Nominal voltage	1/N/PE 230V/50Hz
Metering pump pH	Peristaltic pump
Metering pump oxygen	Peristaltic pump
Flow rate pH	0 to 10 L / h
Flow rate oxygen	0 to 10 L / h
Protection class	IP 20
Housing size	500 x 390 x 130
Humidity	0 to 95%, non condensing
Surrounding temperature	0 to 40 °C
Measuring water pressure	max. 2 bar



Made by OST

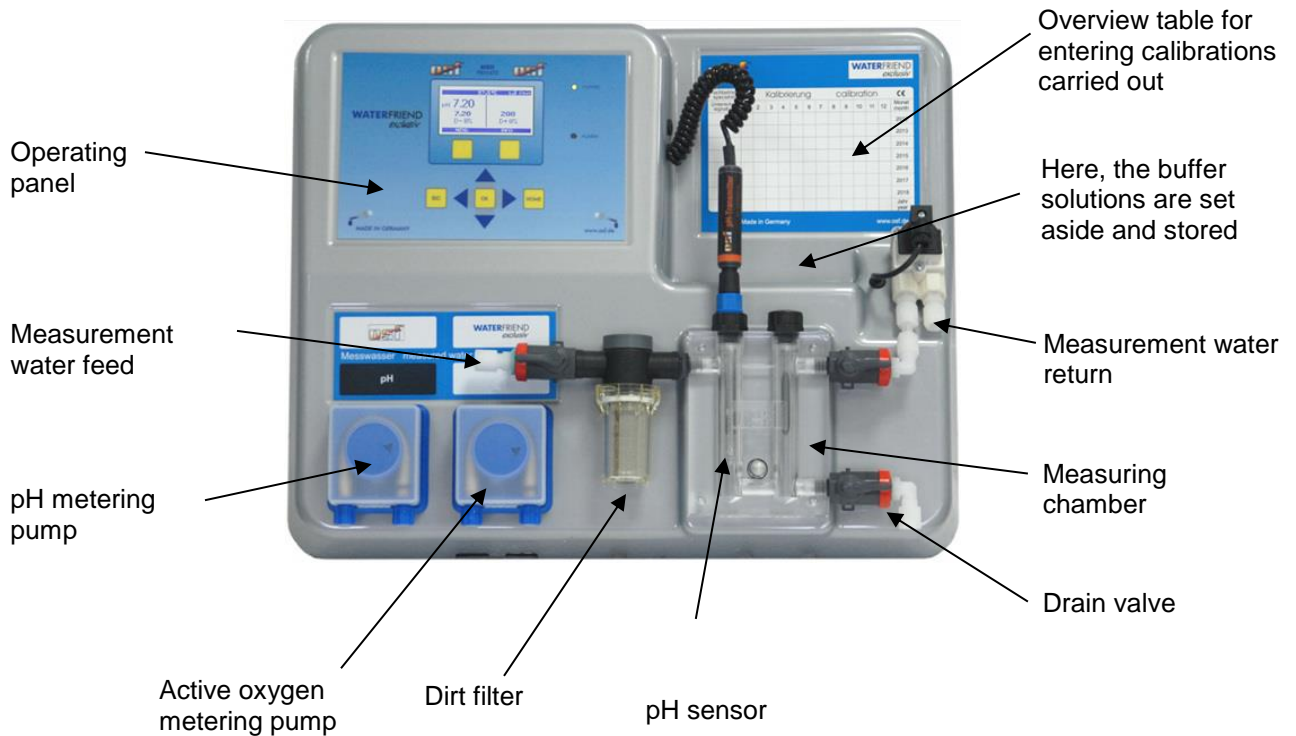
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General



Safety information

Installation and operating manual

This operating manual contains important information which must be observed during installation, operation and maintenance of the metering unit. For this reason, it is imperative that this operating manual is read by the fitter and the responsible specialist personnel or equipment owner before installation and initial start-up. It must be continuously available at the device installation location.

Caution

The metering liquids used are corrosive or highly flammable. The two pressure hose ends at the hose pumps must never be hanging freely, otherwise corrosive or highly flammable liquids can be discharged.

Canister

The canisters containing the metering liquids must be placed in **tsi** interception troughs. They may never be placed directly underneath the controller. Gas-emitting chemicals can cause damage to the sensitive controller.

Personnel qualification

The personnel who will be operating, maintaining, inspecting and installing the device must have appropriate qualifications for this work. The plant operator must precisely define the areas of responsibility, responsibilities and monitoring of the personnel. If the personal does not have the required knowledge, they must be trained and instructed. This can be carried out by the manufacturer or supplier on behalf of the owner if required. Furthermore, the owner must ensure that the contents of this operating manual have been understood by his personnel in all respects.

Installation

You have purchased a high-quality measuring, regulating and metering device with the WATERFRIEND. The device is a precise and sensitive system which needs to be handled carefully at all times. Please handle the protective cover carefully as well. It may not be allowed to fall down or come into contact with chemicals. The protective cover should be cleaned using a soft cloth and a little water if necessary.

All regulations and provisions applicable to the place of installation must be observed during installation. The swimming pool must be constructed such that a possible technical malfunction, power failure or a defective metering system may not cause any consequential loss.

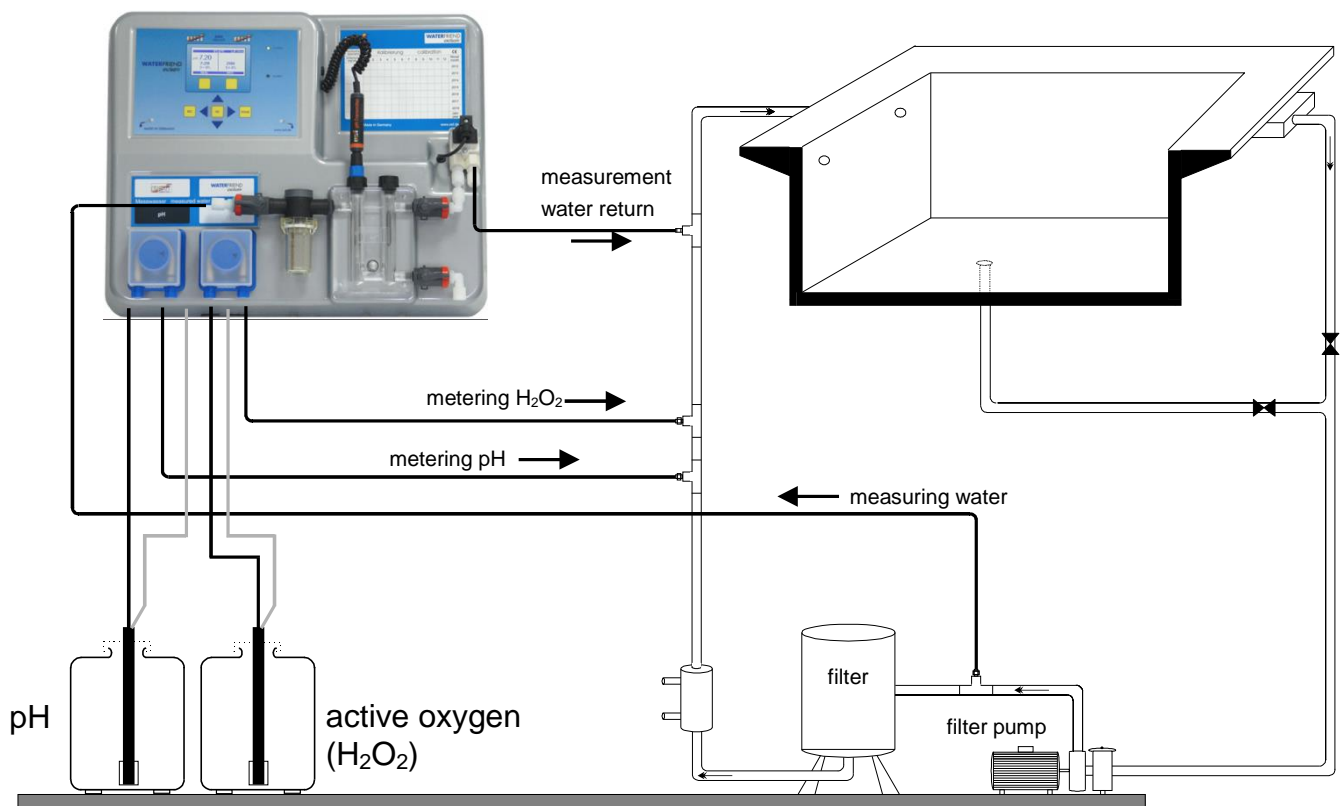
Installation

The bottom housing section is fixed vertically and permanently to a solid wall with suitable load-bearing capacity. Please ensure that the measuring cells are vertical after this has been carried out. The installation location must be protected against dust and water in order to guarantee correct and proper functioning of the device. The surrounding temperature must be between -0°C und $+40^{\circ}\text{C}$ and should be kept as constant as possible. Humidity at the installation site may not exceed 95%, and no condensation may take place. Please avoid direct heat or sun irradiation onto the device.

Installation in the water circuit

Please observe all valid safety regulations when carrying out installation work, and ensure that this is carried out carefully. Disconnect the measuring, regulation and metering device and all other electrical consumers such as filter pumps and heaters from the power supply.

 WATERFRIEND MRD-1



General information on installation in the water circuit

- Before carrying out initial start-up, ensure that the injection valves open and close reliably.
- All hoses must be routed free of kinks.
- Avoid routing hoses over sharp edges.
- Connect all hoses carefully and check to ensure that they are tightly fitted to their connections.
- Avoid unnecessarily long hose lengths.
- Hoses may not be routed directly over pipes carrying heat or over other devices.

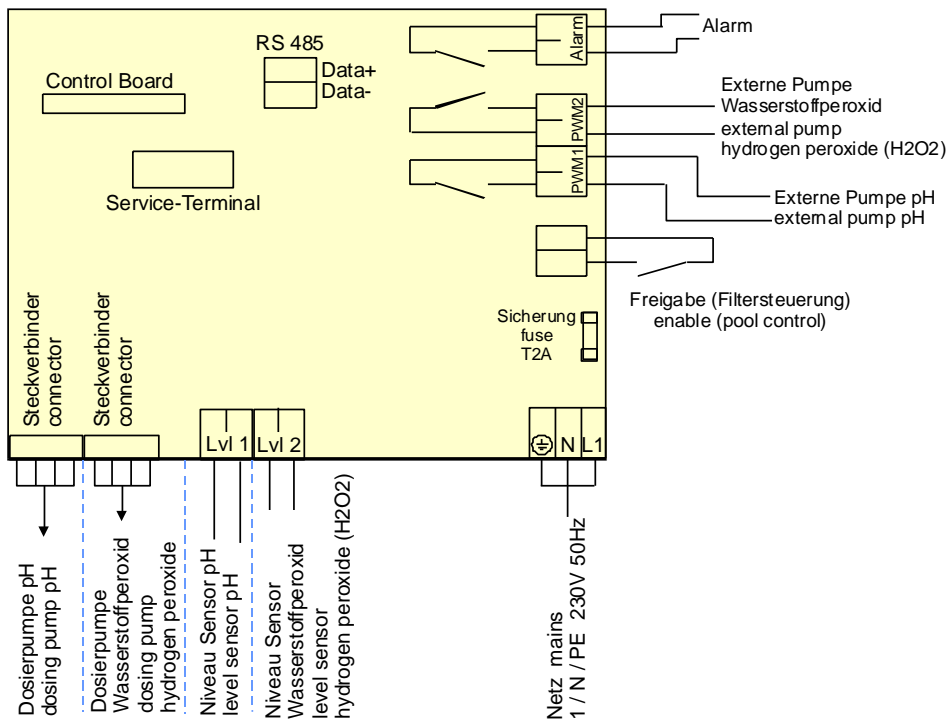
Electrical power supply

The controller must be mounted protected against moisture in accordance with its protection class. The device must be powered via a multi-pole main switch with a contact opening width of at least 3mm and a residual current circuit breaker with $I_{FN} \leq 30\text{mA}$. **The device must be isolated before opening the housing. Electrical power supply connections, in addition to alignment and service work, may only be carried out by approved electricians. The attached circuit diagrams and all applicable safety regulations must be observed.**

Low-voltage cables

Low-voltage cables may not be routed together with three-phase or alternating current cables in one cable duct. Routing of low-voltage cables in the vicinity of three-phase or alternating current cables should generally be avoided.

Wiring diagram



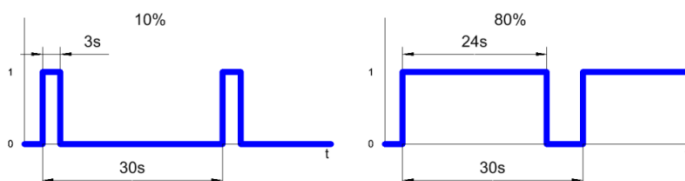
Alarm

An external acoustic or optical alarm can be connected to these terminals. These terminals can also be used for connection to group error messaging systems. The terminals can be loaded with maximum 230V 1A.

External pumps

These connecting terminals are control contacts for external metering pumps. The terminals can be loaded with maximum 230V 1A.

These outputs deliver clock signals with pulse duty factors that are proportional to the current dosing rate of the built-in dosing pumps and thus enable the stepless control of external pumps.



For safety reasons, the two outputs are interlocked, i.e. when the pH metering pump is working, the oxygene metering pump is always switched off.

Enabling

These connecting terminals are used for interlocking with a filter control unit. Opening the floating contact within the filter control unit causes interruption of the metering process.

RS-485

These terminals are used for connection to the **nsi** Euromatik.net filter control unit. A screened, twisted, 2-core cable (twisted pair) with a cross-section of at least 0.22 mm² is required for the connection. (e.g. Li2YCY(TP) 2 x 0.22 mm²). Screening improves the electromagnetic compatibility (EMC). The cable length of the complete bus-system may not exceed 1200 m. The polarity (DATA+ and DATA-) must be observed.

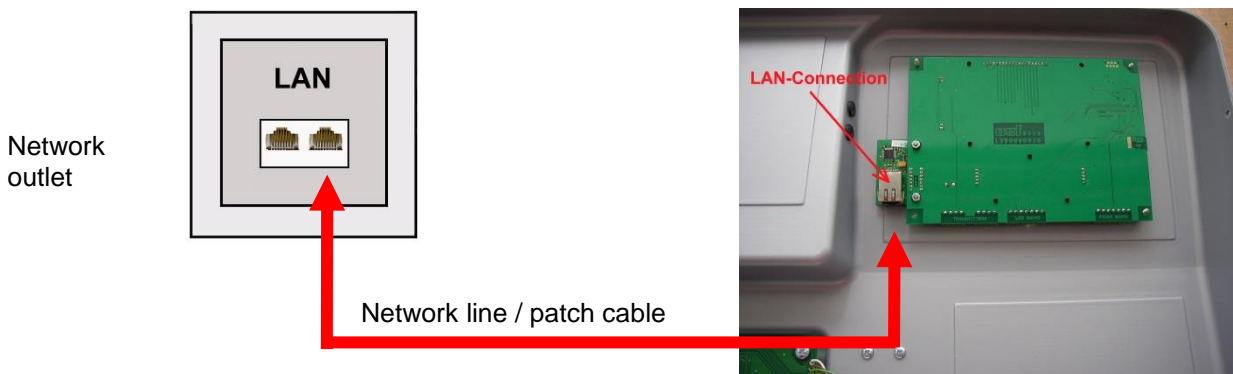
Connecting to EUROMATIK.net

External Touch-Panel

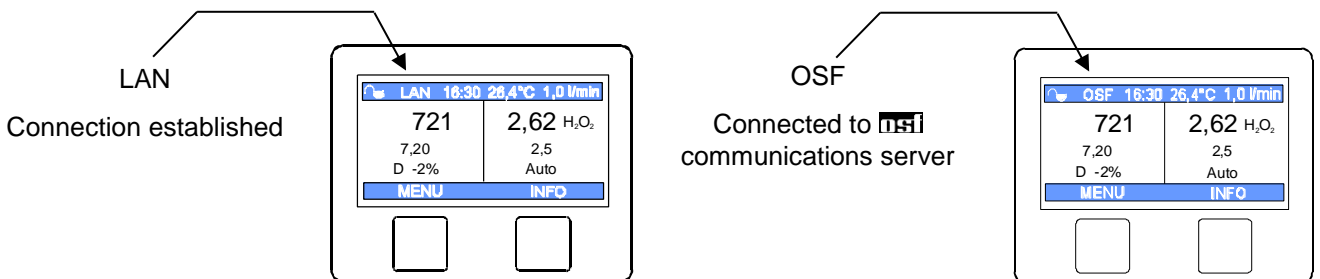
The RS-485 connection terminals are used for data transmission to the EUROMATIK.net. Thus it can be accessed from the external touch panel of EUROMATIK.net to the water treatment WATERFRIEND MRD-1. Please note the instruction manual of the EUROMATIK.net.

Connecting to the computer network (optional)

Connection to the Internet is only possible for dosing controls with integrated **nsi** web server (option) and is carried out by the **nsi** communication server. The WATERFRIEND MRD-1 is connected using a standard Ethernet patch cable into the network wall outlet, the powerline adapter, the wireless LAN access point or other suitable facilities.

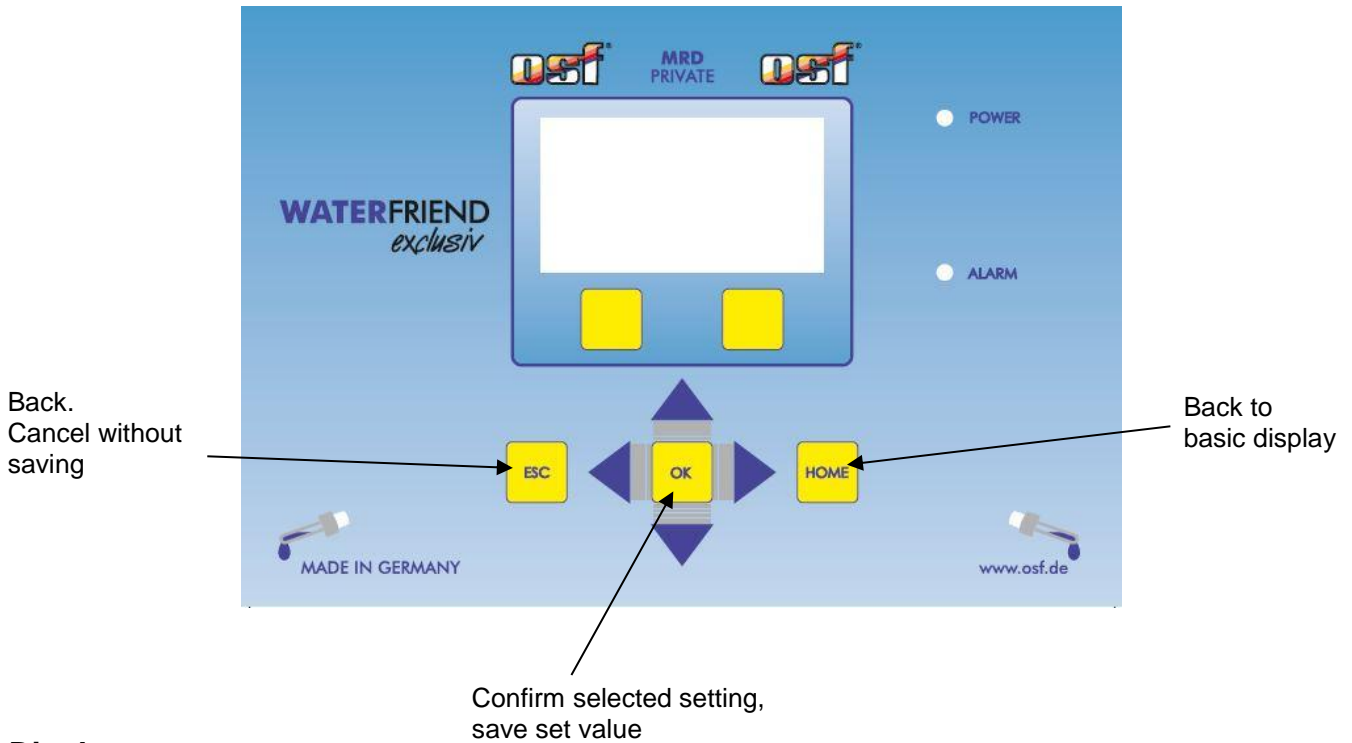


After the WATERFRIEND was connected to an active network outlet, the power supply can be turned on. The web server in WATERFRIEND now searches autonomously for the communication server and logs on to the database.

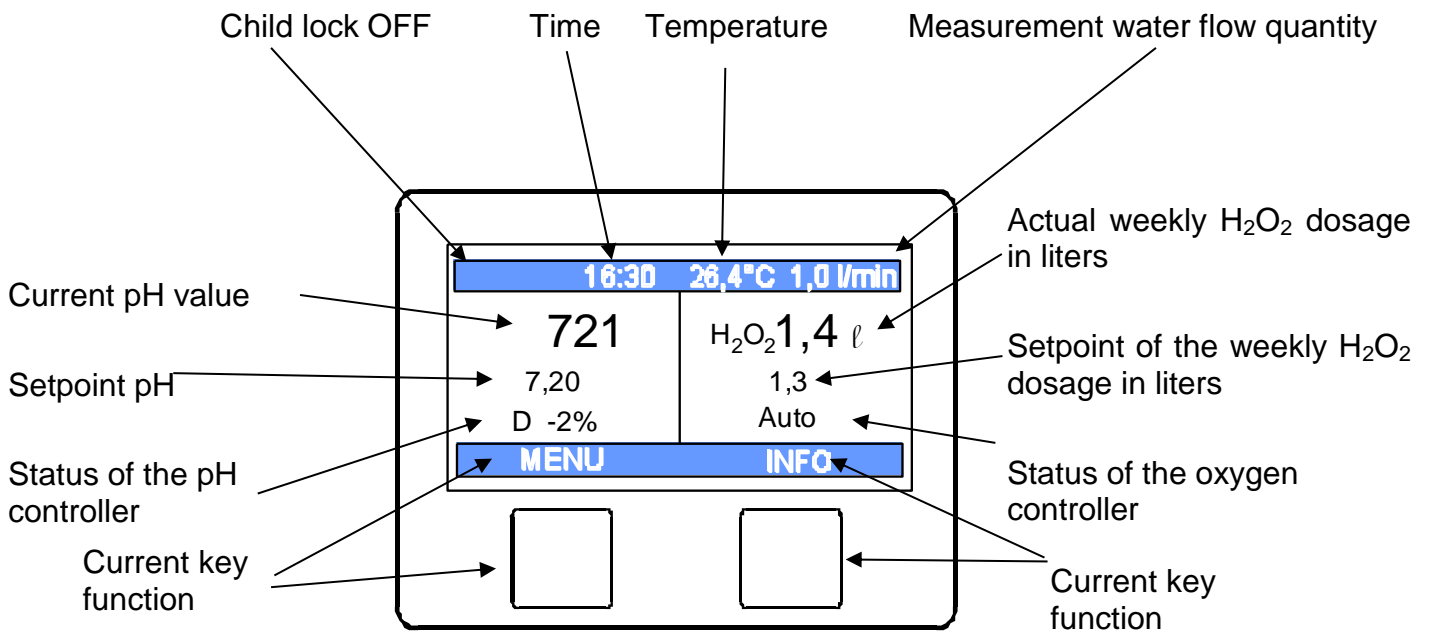


If the "OSF" icon in the monitor is visible (see chart), the WATERFRIEND has logged on to the **nsi** communication server.

Operation



Displays



Temperature

The displayed temperature is the measurement water temperature within the flow fittings. This can deviate from the actual water temperature in the swimming pool depending on the pipeline routing and surrounding temperatures.

Measurement water flow quantity

Quantity of water flowing through the measuring chamber.

Regulation status

In the "Regulation status" fields, additional information about the respective operating status of the individual controllers is displayed:

Display	Meaning
off	The controller is out of order
D ± xx %	Display of the current dosing rate and the dosing direction
too high	The measured value has exceeded the specified upper alarm limit value.
too low	The measured value has exceeded the specified lower alarm limit value.
flow	The control was temporarily interrupted because the sample water flow rate is outside the permissible limits and therefore no reliable measurement is possible.
ext. lock	The regulation was blocked by the enable signal of the filter control.
delay	The control is not yet active because the switch-on delay for stabilizing the measured values has not yet ended
tank	The chemicals canister is empty.
pH too high	The oxygen dosing is temporarily blocked because the pH value is too high for reliable chlorine control.
pH too low	The oxygen dosing is temporarily blocked because the pH value is too low for reliable chlorine control.
dos. time	Dosing is blocked because the specified maximum dosing time has been exceeded. After eliminating the cause of the error, this error message must be acknowledged by pressing the start button on the info page.
meas. err	Dosing is blocked because the sensor is not delivering a valid measured value.
pH problem	The oxygen dosing is blocked because the pH sensor is not delivering a valid measured value.
transmitt.	Dosing is blocked because the measured value transmitter is not working.
error	Dosing is blocked because the control electronics are not working.

Child lock


This symbol shows the child lock status



The child lock is switched off as supplied.

To switch off child lock, press the  key for 5 seconds

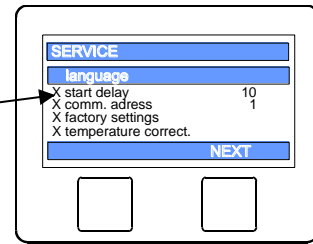
To switch child lock on, press the  key for 5 seconds

All keys are blocked if the child lock is switched on! Only the  key is active and enables querying of the device type.

Professional level

The WATERFRIEND offers protection against unauthorised changes to important operating parameters.

This safety function is activated as supplied. All the parameters marked with X in the display are blocked.



Safety function OFF



Safety function ON (no symbol)



To switch the safety function off, press the ◀, ▲ and ▶ keys simultaneously.

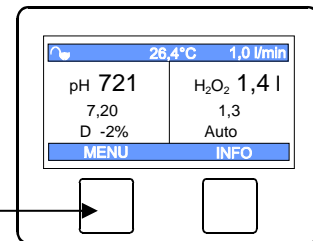
The safety function switches itself on again automatically one hour after the last time one of these keys was actuated.

Bleed metering hose


The WATERFRIEND offers the facility for switching the metering pump on manually so that the meeting hoses can be bled.

Procedure:

Press the "MENU" key

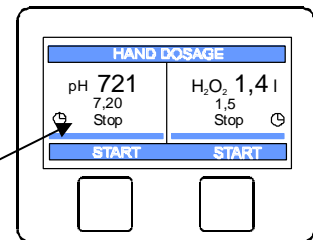


Move the cursor (blue backed text) to the line "hand dosage" by pressing the keys ▲ or ▼.

Press the  key.

Each metering pump can be switched on and off individually by pressing the appropriate keys. While doing so, please observe the corresponding status display. The maximum runtime is limited to 60 seconds. Once this time has elapsed, the pumps will be switched off automatically. The remaining runtime is shown graphically in the display.

Runtime



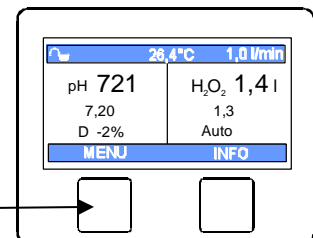
pH regulation

Switching off pH regulation

In the menu there is a setting to turn on and off the automatic pH control.

Procedure:

Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys ▲ or ▼.

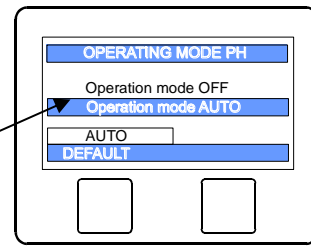
Press the  key.

Move the cursor (blue backed text) to the line "operating mode" by pressing the keys ▲ or ▼.


Press the  key.

By pressing the arrow keys \triangle and ∇ the cursor can be moved and the desired operating mode can be selected.

Operating mode:
OFF or AUTO



Factory setting: AUTO

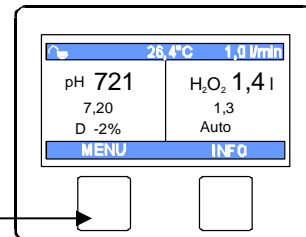
Press the  key to save the settings.

Setting the pH target value


There is a setting facility for the required pH value in the menu.

Procedure:


Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys \triangle or ∇ .

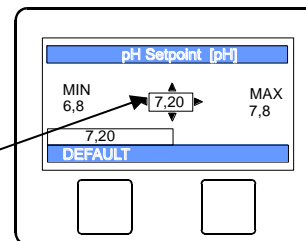
Press the  key.


Move the cursor (blue backed text) to the line "setpoint" by pressing the keys \triangle or ∇ .

Press the  key.

You can move the cursor by pressing the arrow keys \triangleleft and \triangleright and also use the \triangle and ∇ arrow keys to set the target value. The maximum and minimum possible values are shown right and left in the display.

Setpoint



Press the  key to save the settings.

Setting the alarm limit values



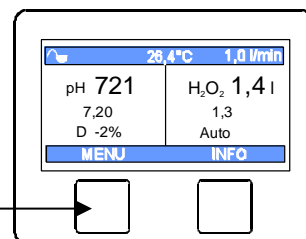
These settings may only be adjusted by a specialist.

Setting the lower pH alarm

There is a setting facility for the required alarm limit value in the menu.

Procedure:

Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys \triangle or ∇ .

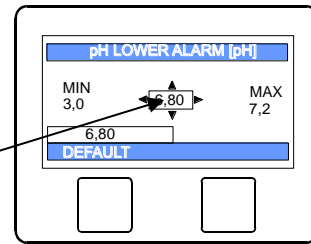
Press the  key.

Move the cursor (blue backed text) to the line "lower alarm" by pressing the keys \triangle or ∇ .


Press the  key.

You can move the cursor by pressing the arrow keys \triangleleft and \triangleright and also use the \triangle and ∇ arrow keys to set the target value. The maximum and minimum possible values are shown right and left in the display.

Target value



Factory setting: 6,0

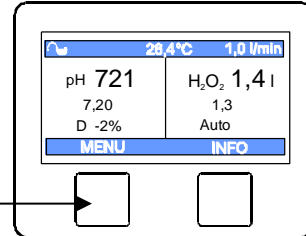
Press the  key to save the settings.

Setting the upper pH alarm


There is a setting facility for the required alarm limit value in the menu.

Procedure:


Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys \triangle or ∇ .

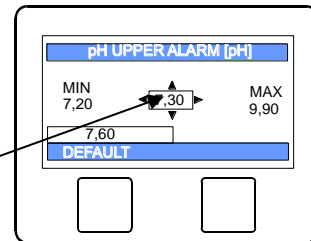
Press the  key.

Move the cursor (blue backed text) to the line "upper alarm" by pressing the keys \triangle or ∇ .


Press the  key.

You can move the cursor by pressing the arrow keys \triangleleft and \triangleright and also use the \triangle and ∇ arrow keys to set the target value. The maximum and minimum possible values are shown right and left in the display.

Target value

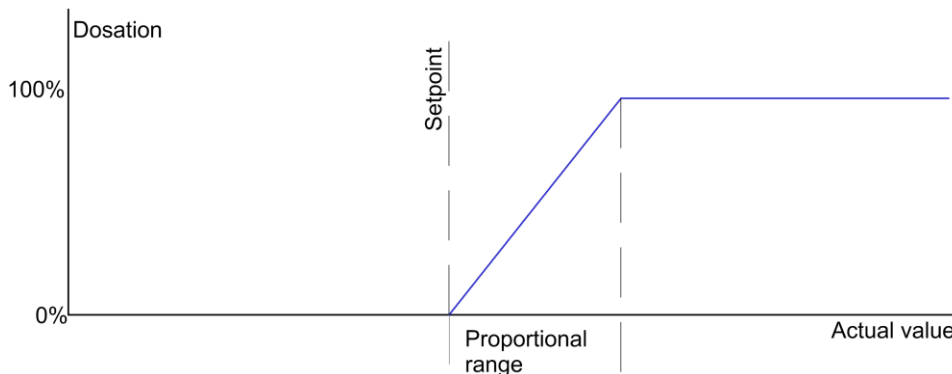


Factory setting: 8,0

Press the  key to save the settings.

Setting the pH proportional range

The controller offers the facility for setting the regulation proportional range in order to adapt the WATERFRIEND to the requirements of the specific swimming pool. This value influences the delivery quantity by optimising the pulse-width modulation. This means that the duty cycle is modulated at constant frequency. The numeric value specifies the regulating conductance. At a deviation of the measured actual value from the desired value, which is greater than the P range, the metering pump operates with maximum power. If the actual value approaches the target value inside the proportional range, the metering performance decreases proportionally. This means that the pump is working at reduced power.



Increasing the p-range leads to a slower approach to the target value with less overshoot.

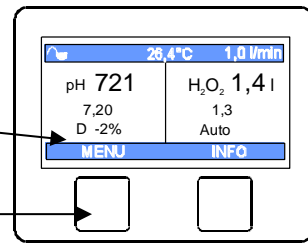



The proportional range may only be adjusted by a specialist.

Procedure:

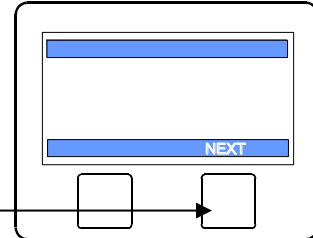
Metering pump flow rate in %


Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys \triangle or ∇ .
Press the  key.

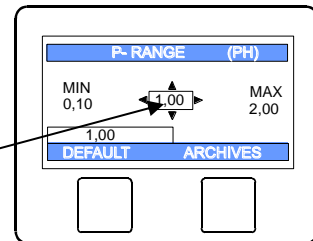
Press the "NEXT" key




Move the cursor (blue backed text) to the line "p-range" by pressing the keys \triangle or ∇ .
Press the  key.

You can move the cursor by pressing the arrow keys \triangleleft and \triangleright and also use the \triangle and ∇ arrow keys to set the proportional range. The maximum and minimum possible values are shown right and left in the display.

Proportional range



Press the  key to save the settings.

Factory setting: 1,00

Meaning of the proportional range

Adjustment	Benefits	Disadvantages	Diagram
Small P-range	Fast, accurate control	When switching on an overshoot can occur	
Wide P-range	No overshoot	Slow control, small deviations between desired and actual values possible	

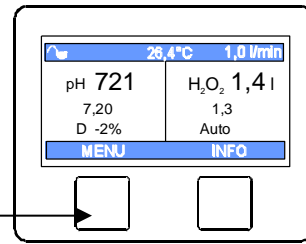
Setting the maximum pH metering time

The metering time limit is a safety function and prevents dangerous overdosing in cases of breakdown. Attention! The higher the maximum dosing time is set, the more acid can be released in an uncontrolled manner in case of any damage of the dosing tube.

The metering time must be adapted to the actual pool size.

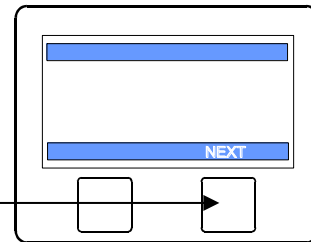
Procedure:

Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys \triangle or ∇ .
Press the key.

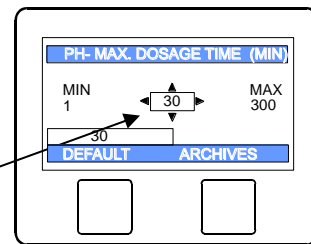
Press the "NEXT" key



Move the cursor (blue backed text) to the line "max. dosage time" by pressing the keys \triangle or ∇ .
Press the key.

You can move the cursor by pressing the arrow keys \triangleleft and \triangleright and also use the \triangle and ∇ arrow keys to set the maximum time. The maximum and minimum possible values are shown right and left in the display.

Max. Time



Factory setting: 60 minutes

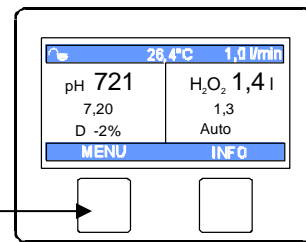
Press the key to save the settings.

pH metering pump flow rate

The integrated speed control for the metering pumps enables optimum adaptation of the regulation to the pool size.

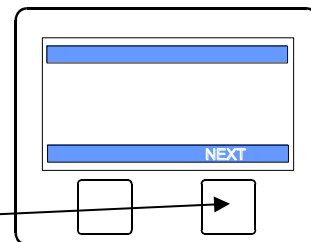
Procedure:

Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys \triangle or ∇ .
Press the key.

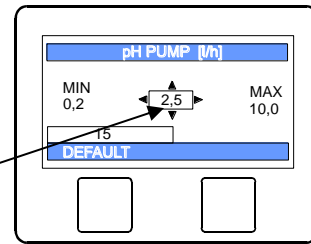
Press the "NEXT" key




Move the cursor (blue backed text) to the line "pH pump [l/h]" by pressing the keys \triangle or ∇ .
Press the key.

You can move the cursor by pressing the arrow keys ◀ and ▶ and also use the ▲ and ▼ arrow keys to set the capacity. The maximum and minimum possible values are shown right and left in the display.

Capacity



Factory setting: 1,5 l/h

Press the  key to save the settings.

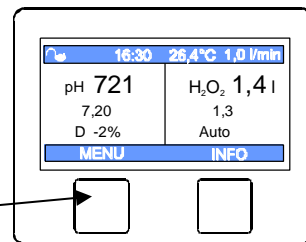
pH Power-on delay

The controller only starts up after a delay period once the power supply has been provided and once external enable has been switched on (e.g. filter control unit). This power-on delay is necessary because a period specific to the overall system elapses once the filter pumps have been switched on before the completely mixed water reaches the sensors. This mixing process is mainly dependent on the pool size, the dimensions of the filter pump, the pipe length and the filter itself.


The delay period can, if required, be adapted to the actual pool size.

Procedure:

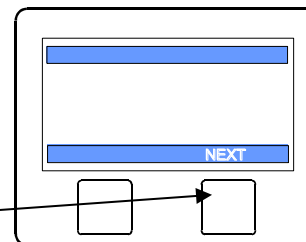
Press the "MENU" key




Move the cursor (blue backed text) to the line "set pH" by pressing the keys ▲ or ▼.

Press the  key.

Press the "NEXT" key

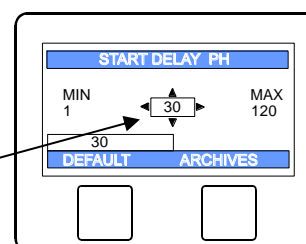


Move the cursor (blue backed text) to the line "delay pH" by pressing the keys ▲ or ▼.


Press the  key.

You can move the cursor by pressing the arrow keys ◀ and ▶ and also use the ▲ and ▼ arrow keys to set the delay (in minutes). The maximum and minimum possible values are shown right and left in the display.

Delay



Factory setting: 30 minutes

Press the  key to save the settings.

H₂O₂ dosation

Interesting facts about the active oxygen dosage

The amount of hydrogen peroxide (H₂O₂) to be dosed depends, among other things, on the water temperature, the pool volume, the degree of use, solar radiation and other factors. Furthermore, the concentration and the nature of the hydrogen peroxide used is a decisive factor for the dosage to be set.

In order to achieve optimal water quality, the WATERFRIEND MRD-1 must be adapted to the conditions of the swimming pool during commissioning by adjusting the dosage accordingly. The WATERFRIEND MRD-1 has automatic temperature compensation so that temperature fluctuations in the pool water are compensated for.

Main dosage

The dosing amount for the weekly water treatment is set depending on the swimming pool constellation. The WATERFRIEND MRD-1 distributes this dosage amount to the weekly main dosage and the daily top-up dosages.

The main dosing takes place any day of the week. The day of the week and the time of the main dosing can be set in the menu. The dosing amount of the main dosing is temperature-compensated so that more disinfectant is dosed when the water temperature rises.

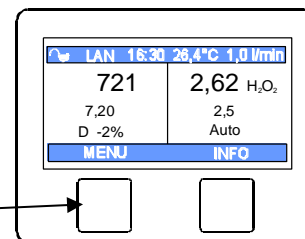
Top-up dosage

In addition to the main dosage, there is a daily refresh dosage on the following days. The time corresponds to the time of the main dosage. The dosing amount depends on the setpoint setting for the dosing amount. The refreshing dose is also temperature compensated.

Switch off active oxygen control

Procedure:


Press the "MENU" key



Move the cursor (blue backed text) to the line "set H₂O₂" by pressing the keys \triangle or ∇ .

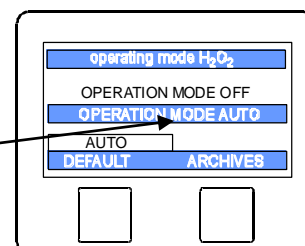
Press the  key.


Move the cursor (blue backed text) to the line "operating mode" by pressing the keys \triangle or ∇ .

Press the  key.

By pressing the arrow keys \triangle and ∇ the cursor can be moved and the desired operating mode can be selected.

Operating mode:
OFF or AUTO



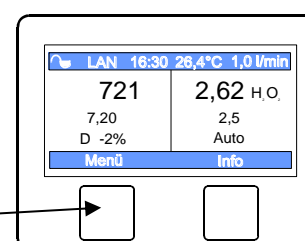
Press the  key to save the settings.

Set the parameters for active oxygen


Set the dosing volume



Procedure:


Press the "MENU" key







Move the cursor (blue backed text) to the line "set H₂O₂" by pressing the keys \triangle or ∇ .


Press the  key.

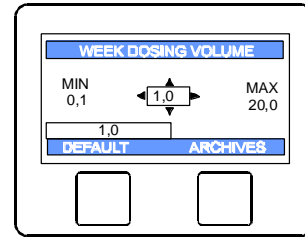
Move the cursor (blue backed text) to the line "dosing volume" by pressing the keys  or .

Press the  key.

The cursor can be moved by pressing the  and  arrow keys and the setpoint can be set using the  and  arrow keys. The maximum and minimum possible values are shown on the right and left of the display.

This setpoint is the total weekly dose in liters.

Press the  key to save the settings.

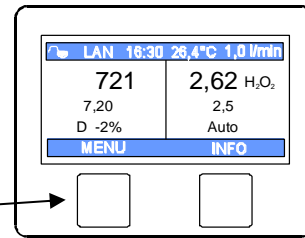




Factory setting: 1 liter / week


Set the time of the main dosage



Procedure:


Press the "MENU" key







Move the cursor (blue backed text) to the line "set H₂O₂" by pressing the keys  or .


Press the  key.

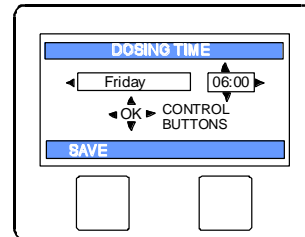
Move the cursor (blue backed text) to the line "dosing time" by pressing the keys  or .

Press the  key.

The cursor can be moved by pressing the  and  arrow keys and the day of the week and the time can be set using the  and  arrow keys.

The weekday is the day of the main weekly dosage.

Press the  key to save the settings.



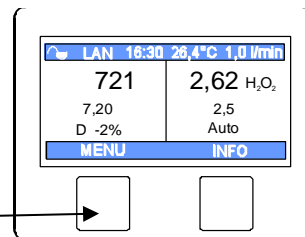
Factory setting: Friday 6:00 a.m.



Set the dosing plan


In this menu, the already set dosing volume is distributed over the main dosing and the top-up dosing.



Procedure:

Press the "MENU" key





Move the cursor (blue backed text) to the line "set H₂O₂" by pressing the keys  or .


Press the  key.

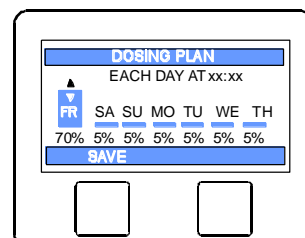
Move the cursor (blue backed text) to the line "dosing plan" by pressing the keys  or .

Press the  key.

The dosing amount of the main dosing can be set by pressing the arrow keys  and . The remaining dose is automatically divided equally between the top-up doses.

Please note the information on the display.

Press the  key to save the settings.

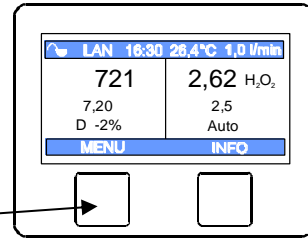


Factory setting: Dosing quantity 1 liter; 94% main dosage, 1% per top-up dosage


Set the delivery rate of the pump

Procedure:

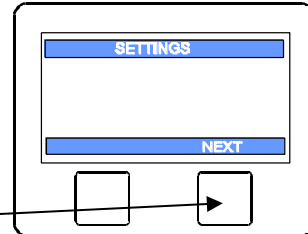
Press the "MENU" key




Move the cursor (blue backed text) to the line "set H₂O₂" by pressing the keys \triangle or ∇ .

Press the  key.

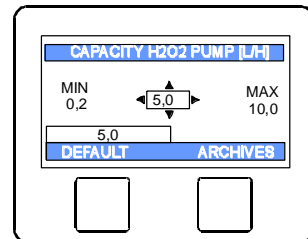
Press the "NEXT" key




Move the cursor (blue backed text) to the line "H₂O₂ pump [l/h]" by pressing the keys \triangle or ∇ .

Press the  key.

The cursor can be moved by pressing the \triangleleft and \triangleright arrow keys and the delivery rate of the dosing pump can be set using the \triangle and ∇ arrow keys. The maximum and minimum possible values are shown on the right and left of the display.



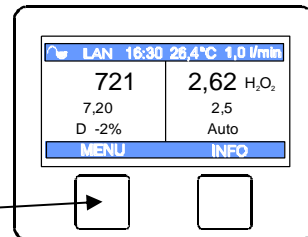
Press the  key to save the settings.

Factory setting: 1,5


Set the power-on delay of the controller

Procedure:

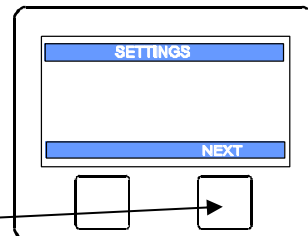
Press the "MENU" key



Move the cursor (blue backed text) to the line "set H₂O₂" by pressing the keys \triangle or ∇ .

Press the  key.

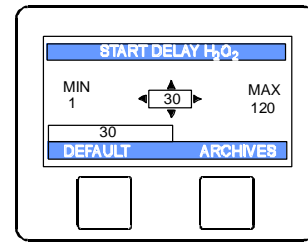
Press the "NEXT" key




Move the cursor (blue backed text) to the line "delay H₂O₂" by pressing the keys \triangle or ∇ .

Press the  key.

You can move the cursor by pressing the arrow keys \triangleleft and \triangleright and also use the \triangle and ∇ arrow keys to set the delay (in minutes). The maximum and minimum possible values are shown right and left in the display.



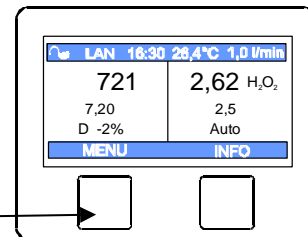
Press the  key to save the settings.

Factory setting: 30


Set the temperature compensation

Procedure:


Press the "MENU" key



Move the cursor (blue backed text) to the line "set H₂O₂" by pressing the keys \triangle or ∇ .

Press the  key.

Move the cursor (blue backed text) to the line "temp. compensation" by pressing the keys \triangle or ∇ .

Press the  key to select the desired temperature compensation "OFF" "NORMAL" "LOW" or "HIGH".

„OFF“ => no temperature compensation

„NORMAL“ => delivery rate 100%

„LOW“ => delivery rate 50%

„HIGH“ => delivery rate 150%

Factory setting: NORMAL

Calibration



Calibration may only be performed by suitably qualified maintenance personnel. Proper control of the dosing quantities is only possible with correctly calibrated sensors. With incorrectly calibrated sensors, correct dosing of the chemicals cannot be guaranteed and dangerous overdosing can occur!

Once the sensors have been connected, every input must be calibrated during initial start-up. Calibration is necessary even if an electrode is replaced by a new one. The WATERFRIEND checks the calibration procedures for plausibility during the process (slope and offset). Non-calibrated and "badly" calibrated measurement inputs are displayed in plain text.

Time delays occur due to the electrode start-up times when the device is switched on.

Buffer solution

The use-by date must be observed for the buffer solutions. The solutions must always be stored in a cool, dark place. Buffer solutions may not be soiled during use. For this reason, electrodes may not be immersed in different buffer solutions successively without cleaning them with distilled water first. It is also important not to rub the electrodes with a cloth, because this causes static charging and incorrect measurements. The necessary **tsi** buffer solutions for pH 4 and pH 7 and **tsi** spare electrodes are available from the **tsi** "WATERFRIEND" metering unit supplier.

Electrodes

The electrodes must be free of impurities, oils and fats etc before they are inserted in the flow fittings. Furthermore, the diaphragms (small spots at the probe point) must be free of coatings, soiling and crystallisation deposits. Do not touch the glass body with your hands to avoid impurities.

Calibrating the pH electrode

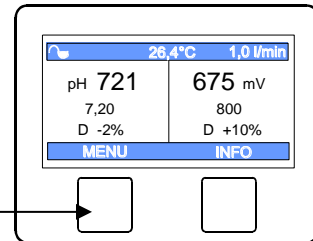
The pH electrode can generally be calibrated as a 1-point calibration. This can be done using the pH 7 buffer solution, or, on the fly; be done with the help of a photometer.

If the measured values deviate significantly, a 2-point calibration with 2 buffer solutions can also be carried out. The buffer solutions used must be free of impurities and fresh.

Calibrate current working point or upper value (pH 7).

Procedure:

Press the "MENU" key



Move the cursor (blue backed text) to the line "set pH" by pressing the keys \triangle or ∇ .

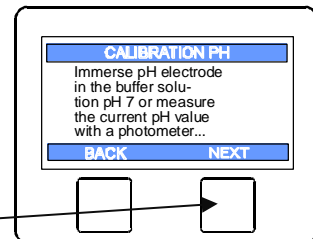
Press the key.

Move the cursor (blue backed text) to the line "calibration" by pressing the keys \triangle or ∇ .

Press the key.

If the calibration is to be carried out using a photometer during operation as a one-point calibration, the actual pH value of the pool water should now be determined using a photometer. If the calibration is to be carried out using buffer solutions, the pH electrode must be unscrewed from the flow fitting and then immersed in the green "pH 7" buffer solution.

Press the „NEXT“ key.

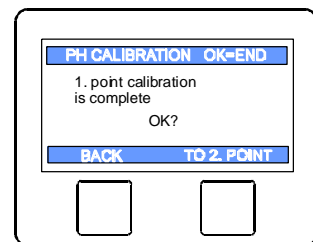
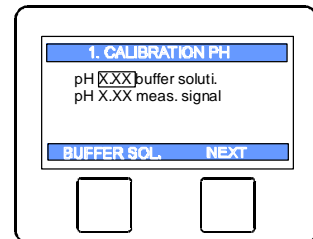


If a calibration is carried out at a pH value that deviates from pH 7, this value must first be entered after pressing the "BUFFER SOL." button.

The display shows the current values of the pH electrode (based on the last calibration). Only when the value shown on the display no longer changes (this takes several minutes), the reference value may be saved with the "OK" or "Next" button.

If a one-point calibration should be carried out, this can now be completed by pressing the key.

If a two-point calibration is desired, the second measuring point can be calibrated by pressing the "TO 2. POINT" button.

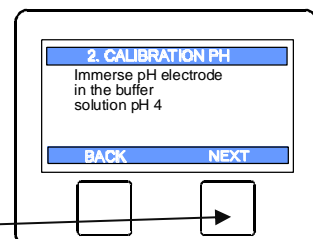


Setting the lower value (pH 4)

In the second step, the lower point (pH 4) is calibrated. To do this, the pH electrode, previously cleaned with distilled water, is immersed in the pH 4 buffer solution.

Caution: It is also important not to rub the electrode with a cloth, because this causes static charging and incorrect measurements.


Press the „NEXT“ key.

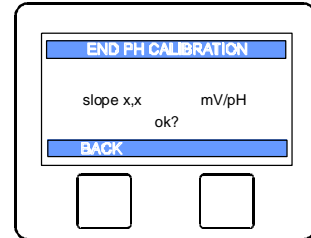
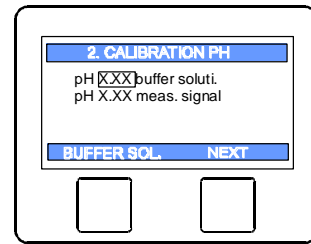


If a calibration is carried out with a buffer solution that deviates from pH 4, this value must first be entered after pressing the "BUFFER SOL." button.

The display shows the current values of the pH electrode (based on the last calibration). Only when the value shown on the display no longer changes (this takes several minutes), the reference value may be saved with the "OK" or "Next" button.

After the calibration, the slope of the electrode is shown on the display. The slope must be in a range between 45.0 to 65.0 mV. Otherwise the message "Big deviation" appears in the display.

Press the  button to save the setting



pH calibration errors

If the calibration was not able to be completed and the "Big divergence" is shown in the display, the following causes are possible:

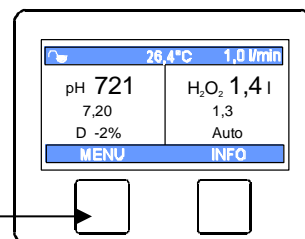
- The pH electrode (combination electrode) is worn. The electrode service life is limited depending on the water quality and its care.
- You have mixed up the buffer solution sequence (1st pH 7, 2nd pH 4). This sequence must be strictly observed.
- You used the same buffer solution twice. Correct calibration can only be carried out with two different buffer solutions.
- The buffer solutions are used up or contaminated. In this case, use new buffer solutions.
- The electrode was connected to the wrong transmitter. The pH electrode must be connected to the black transmitter.
- The electrical connection between electrode and transmitter, or that between transmitter and controller, is damaged.



Service settings

Time and date



Procedure:

Press the "MENU" key







Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys  or .

Press the  key.

Move the cursor (blue backed text) to the line "time & date" by pressing the keys  or .

Press the  key.

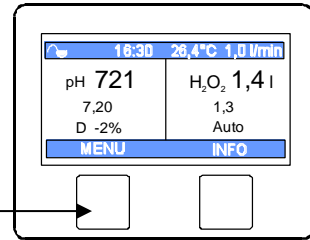
You can now move the cursor by pressing the arrow keys  and , and you can change the settings by use of the arrow keys  and .

Press the  key to save the settings.


Selecting the language

Procedure:

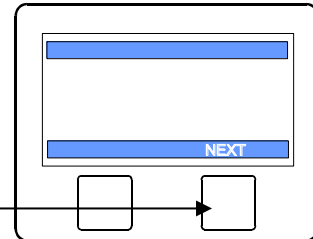
Press the "MENU" key




Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

Press the  key.


Press the "NEXT" key

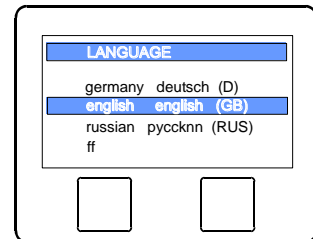


Move the cursor (blue backed text) to the line "language" by pressing the keys \triangle or ∇ .

Press the  key.

By pressing the arrow keys \triangle and ∇ , the cursor can be moved to select the language.

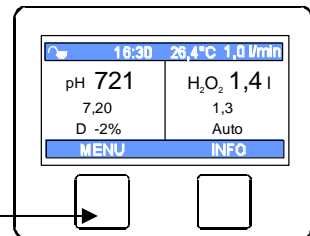
Press the  key to save the settings.



Operating hours after the last calibration

Procedure:

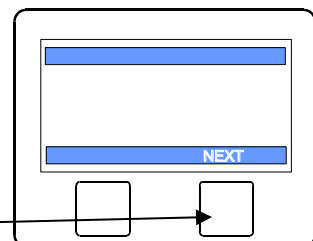
Press the "MENU" key



Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

Press the  key.

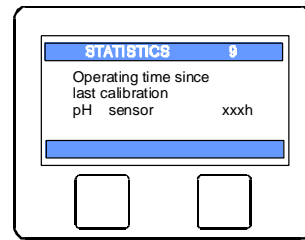
Press the "NEXT" key



Move the cursor (blue backed text) to the line "Operating hours" by pressing the keys \triangle or ∇ .

Press the  key.

In the display you see the operating time since the last calibration.

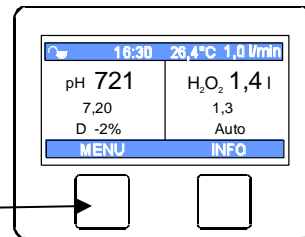


LAN settings


Access control (PIN numbers)

Procedure:

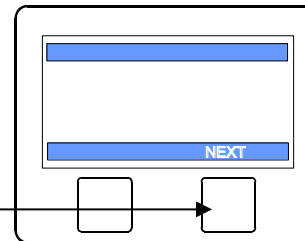
Press the "MENU" key




Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

Press the  key.

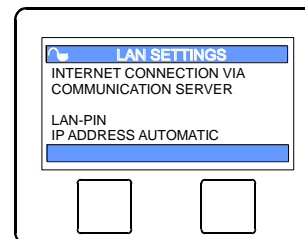
Press the "NEXT" key



Move the cursor (blue backed text) to the line "LAN settings" by pressing the keys \triangle or ∇ .

Press the  key.

Now the cursor can be moved by pressing the arrow keys \triangle and ∇ , and the desired settings can be made.



LAN-PIN is the password for the low-level area, which enables some parameters to be adjusted. The most important settings are blocked for users with this password.

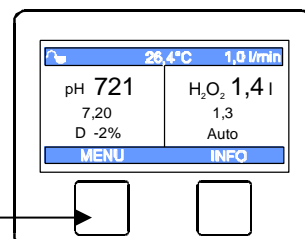
PRO is the password for the high-level area. This password enables all parameters to be adjusted.

Reset all settings to factory settings

You can use this function to reset all parameters to the factory settings (condition as delivered).

Procedure:

Press the "MENU" key



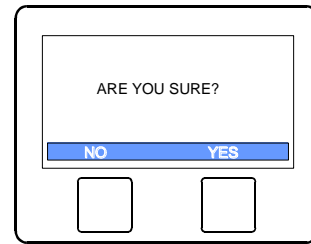
Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

Press the  key.

Move the cursor (blue backed text) to the line "factory settings" by pressing the keys \triangle or ∇ .

Press the  key.

If you want to reset all the settings to the factory settings, then press the "YES" key.

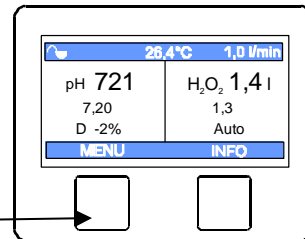


Adjustment of temperature display


If the display screen shows a temperature different to the actual temperature present at the sensor in the flow fittings, you can adjust the display. This can be the case, for example, after a temperature sensor has been replaced. The temperature can be changed by up to 10° (+/-).

Procedure:


Press the "MENU" key



Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

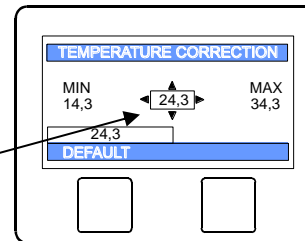
Press the  key.


Move the cursor (blue backed text) to the line "temperature correct." by pressing the keys \triangle or ∇ .

Press the  key.

By pressing the arrow keys \triangleleft and \triangleright , the cursor can be moved and the temperature display can be adjusted by pressing the arrow keys \triangle and ∇ . The maximum and minimum possible values are shown right and left in the display.

Temperature



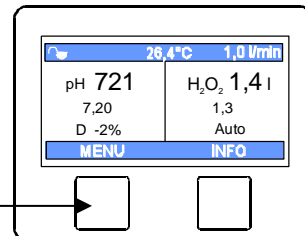
Press the  key to save the settings.

Acoustic error message


The WATERFRIEND has a facility for switching off the acoustic alarm.

Procedure:

Press the "MENU" key



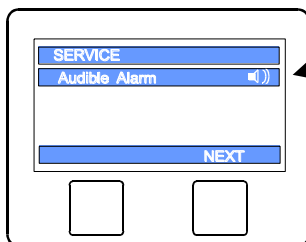
Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

Press the  key.

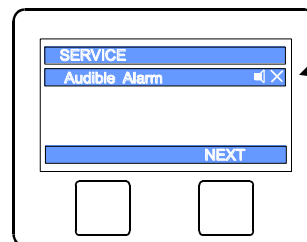
Move the cursor (blue backed text) to the line "Audible Alarm" by pressing the keys \triangle or ∇ .

By pressing the  key, the acoustic alarm can be switched on or off.

Press the "Back" key, which saves the setting.



Alarm ON



Alarm OFF

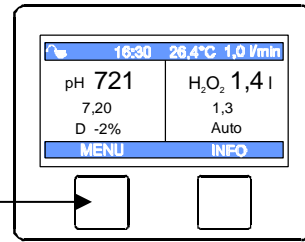
Factory setting: ON

Increase pH <=> decrease pH

The controller offers the facility to select between operating modes "increase pH" or "decrease pH" in order to adapt the WATERFRIEND to the requirements of the specific swimming pool.

Procedure:

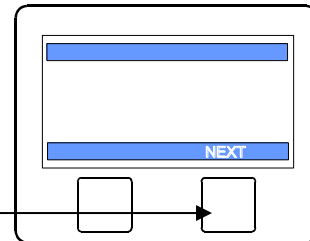
Press the "MENU" key



Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

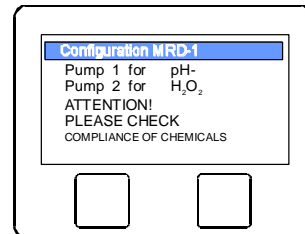
Press the key.

Press the "NEXT" key



Move the cursor (blue backed text) to the line "Configuration MRD-1" by pressing the keys \triangle or ∇ .

Press the key.



Press the key.

Move the cursor (blue backed text) to the desired operating mode by pressing the keys \triangle or ∇ .

Press the key to save the settings.



Note: When changing between pH-decreasing chemicals and pH-raising chemicals, the suction lances, the metering hoses, the flow fittings and the injection valves must be rinsed out with water and thoroughly cleaned.

Alarm / error message

There is an error if the red "Alarm" indicator lamp blinks. If you press the "Info" key, the error message will be shown on the display in plain text.

Acknowledging an error message

If you press the key, the acoustic alarm will be switched off.

Measuring chamber colors

Behind the pH and redox electrodes are multi-colored RGB light-emitting diodes, which signal different states.

When a new WATERFRIEND is installed and the electrodes have been calibrated, the color light will turn green. As the operating time progresses, the color changes steadily over yellow, orange and red. At the latest when the color light is red, the corresponding sensor must be calibrated.



Meaning of the individual colors

Blue:

The flow rate of the measuring water is too low and the dosage is therefore blocked. The flow rate must be between 0.2 and 2.0 l / min. (Recommended 0.7)

Red:

The electrodes must be calibrated.

Green:

The electrodes are calibrated.

Yellow/orange:

Various operating hours have passed since the last calibration.

Flashing red:

Error message. Please press the info key and read more information in the display.

Using the osf communication server

There are four servers available for communication. They each display different information, designed to suit the needs of different user groups.

<p>Mypool.osf.de</p>	<p>This server is designed for pool owners. The entire pool system including all web-enabled osf products is displayed on one page on the monitor. The key data for all devices can be retrieved with a single tap of a button.</p>	
<p>Service.osf.de</p>	<p>This server is designed for pool installers. The top-level page shows all registered pool installations in a clear layout on the monitor. All main parameters and any fault indicators for every customer system are visible at a glance.</p>	
<p>Devices2.osf.de</p>	<p>This server provides the usual technical view for all connected osf devices.</p>	<p>Geräteübersicht</p>
<p>Devices.osf.de</p>	<p>For the time being it is still possible to use this familiar server, which has been available for many years. For new installations, however, we recommend the "mypool.osf.de" and "service.osf.de" servers, and "devices2.osf.de"</p>	<p>Geräteübersicht</p>

Communication server for pool owners

You can access this osf communication server at the address mypool.osf.de



You must first register as a new user:

The image shows a web browser window displaying the registration page of the osf communication server. The page has a blue header with the title 'Register'. Below the header, there is a note: 'Fields with * are required for registration and must be completed correctly. To complete the registration please confirm on the link in the email you received.' The main content area is a blue box with several white input fields: 'Username:*', 'First Name:', 'Last Name:', 'E-Mail:*', 'Password:*', and 'Repeat Password:*'. There is also a dropdown menu for 'language' set to 'en'. To the right of the password fields, there is a captcha image showing the text 'IGZ8E' and a white input field for the captcha code. Below the captcha, there is a note: 'Please confirm the captcha code!'. At the bottom right, there is a checkbox with the text: 'Please accept our Terms License Agreement, Disclaimer and our Privacy Policy to continue.' At the bottom center, there is a red 'Save Registration' button.

Within a few minutes you should automatically receive an e-mail for confirming your identity. (Check your Spam folder if the e-mail does not arrive). Click the activation link in the e-mail to activate your account.

Registering a new device with the server

Once you have personally registered, you can log in and then register your new device in your user profile.

Each web-enabled osf control unit has a DEVICE ID (identification number). This DEVICE ID must be entered in the correct column in order to register the device with the communication server. You can find the DEVICE ID of your device displayed on its Information page (see below). When finished, save the information you have entered.

Imprint Privacy Policy Login user Your devices

Username: _____
First Name: _____
Last Name: _____
E-Mail: _____
language: de (Deutschland)
Password: • _____
Repeat Password: • _____

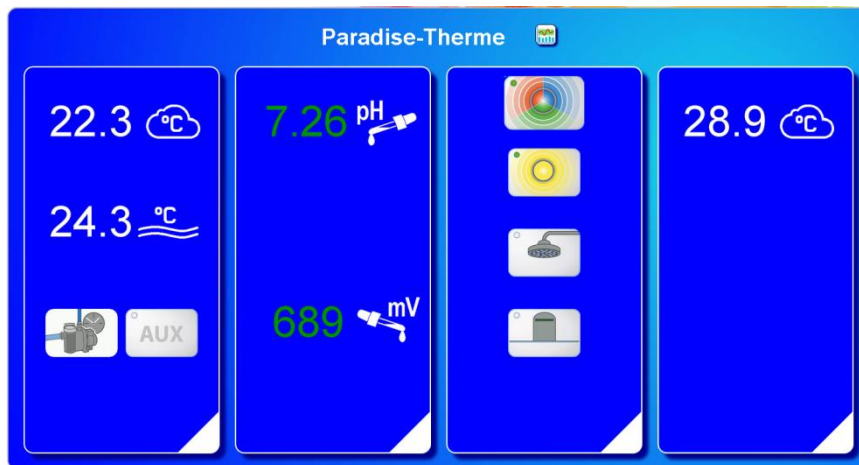
Nr	Object name	ID #1	ID #2	ID #3	ID #4
1					
2					
3					
4					

Submit

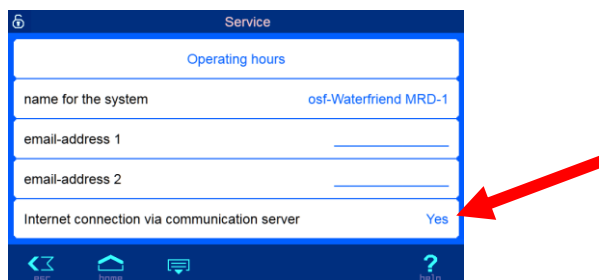
Complete the form

Enter the DEVICE ID

If you press the “Your devices” button, your device is now displayed in your Device panel and can be operated via the communication server:



In order to use the communication server, the option "Internet connection via communication server" must be enabled in the control unit itself (default factory setting):



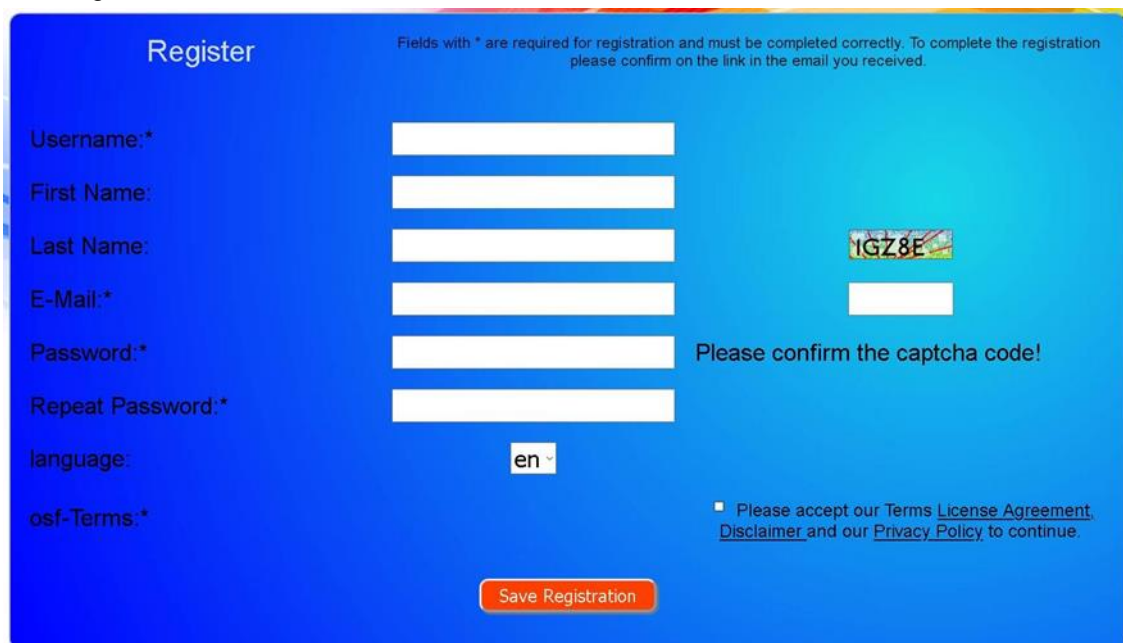
Communication server for pool installers

You can access this osf communication server at the address service.osf.de



The screenshot shows the 'Online-Device-Control' website. At the top, there is a navigation bar with the 'osf CONTROLS' logo on the left and three language selection flags (Germany, UK, France) on the right. Below the navigation bar are three buttons: 'Imprint', 'Privacy Policy', and 'Register'. The main content area features a blue 'Login' form with two input fields for 'Username:' and 'Password:'. Below these fields are two buttons: 'Forgot Password' and 'Login'.

You must first register as a new user:



The screenshot shows the 'Register' form. At the top, it says 'Register' and includes a note: 'Fields with * are required for registration and must be completed correctly. To complete the registration please confirm on the link in the email you received.' The form contains several input fields: 'Username:*', 'First Name:', 'Last Name:', 'E-Mail:*', 'Password:*', and 'Repeat Password:*'. There is also a 'language:' dropdown menu currently set to 'en'. A 'captcha' image with the code 'IGZ8E' is displayed, along with a text prompt 'Please confirm the captcha code!' and a corresponding input field. At the bottom right, there is a checkbox for 'Please accept our Terms License Agreement, Disclaimer and our Privacy Policy to continue.' and a 'Save Registration' button at the bottom center.

Within a few minutes you should automatically receive an e-mail for confirming your identity. (Check your Spam folder if the e-mail does not arrive). Click the activation link in the e-mail to activate your account.

Registering a new control unit with the server

Once you have personally registered, you can log in and then register your new device in your user profile.

Each web-enabled osf control unit has a DEVICE ID (identification number). This DEVICE ID must be entered in the correct column in order to register the device with the communication server. You can find the DEVICE ID of your device displayed on its Information page (see below). When finished, save the information you have entered.

Imprint Privacy Policy Login user Your devices

Username:

First Name:

Last Name:

E-Mail:

language: de (Deutschland)

Password:

Repeat Password:

Nr	Object name	ID #1	ID #2	ID #3	ID #4
1					
2					
3					
4					

Submit

Complete the form

Enter the DEVICE ID

If you press the "Your devices" button, your pool installations are now displayed in your Device panel. This lists the pool installations for all your customers in a table. You can see all the main information at a glance. Fault indicators are highlighted for each pool individually. To display and operate a specific device via the communication server, simply press the associated button for this device:

Connected to the osf communication server

Server connection lost at ...

Customer name

The Paradise-Therme baths contain 4 web-enabled osf devices

Display graphs

Paradise-Therme						
Euromatik.net	osf			23.2 °C		21.6 °C
MRD-2	osf	7.26 pH	689 mV		0.52 l/min	
Color-Control.net	osf					
Silversteam	osf			28.1 °C		
Mustermann, Königstraße						
PC-45-exclusiv		27.06.2019 10:06		27.6 °C		27.7 °C
Euromatik.net	osf			23.2 °C		21.6 °C
MRD-2	osf	18.03.2019 10:15	7.20 pH	699 mV		0.78 l/min
Kundengerät						
PC-40.net	osf			30.0 °C		
MRD-2	osf	21.05.2019 03:26	7.23 pH	657 mV		0.00 l/min

In order to use the communication server, the option "Internet connection via communication server" must be enabled in the control unit itself (default factory setting):

Service

Operating hours

name for the system osf-Waterfriend MRD-1

email-address 1

email-address 2

Internet connection via communication server Yes

esc home help

Communication server with technical view

You can access this osf communication server at the address devices2.osf.de



You must first register as a new user:

The image shows the registration page of the 'Online-Device-Control' system. The page has a blue background and is titled 'Register'. At the top right, there is a note: 'Fields with * are required for registration and must be completed correctly. To complete the registration please confirm on the link in the email you received.' The form contains several input fields: 'Username:*', 'First Name:', 'Last Name:', 'E-Mail:*', 'Password:*', 'Repeat Password:*', and 'language:' (with a dropdown menu showing 'en'). There is also a checkbox for 'osf-Terms:*'. To the right of the form, there is a captcha image showing the text 'IGZ8E' and a text prompt: 'Please confirm the captcha code!'. Below the captcha is a checkbox with the text: 'Please accept our Terms [License Agreement](#), [Disclaimer](#) and our [Privacy Policy](#) to continue.' At the bottom center of the form is a red button labeled 'Save Registration'.

Within a few minutes you should automatically receive an e-mail for confirming your identity. (Check your Spam folder if the e-mail does not arrive). Click the activation link in the e-mail to activate your account.

Registering a new device with the server

Once you have personally registered, you can log in and then register your new device in your user profile.

Each web-enabled osf control unit has a DEVICE ID (identification number). This DEVICE ID must be entered in the correct column in order to register the device with the communication server. You can find the DEVICE ID of your device displayed on its Information page (see below). When finished, save the information you have entered.

Imprint Privacy Policy Login user Your devices

Username: _____
 First Name: _____
 Last Name: _____
 E-Mail: _____
 language: de (Deutschland)
 Password: • _____
 Repeat Password: • _____

Nr	Object name	ID #1	ID #2	ID #3	ID #4
1					
2					
3					
4					

Submit

Your device is now displayed in your Device panel and can be operated via the communications server:

osf CONTROLS Online-Device-Control

Imprint Privacy Policy Login user Your devices Your profile

Device panel

Paradise-Therme

- osf-EUROMATIK-net Demo: 22.0, Die Heizung ist an Filterbetrieb
- osf-MRD-2 (Demo): 7.26, 689
- osf-Color-Control.net DEMO: [Color control interface]
- osf-Silver-Steam DEMO: 26.9 °C, SILVERSTEAM ist ausgeschaltet

Mustermann, Königstraße

- osf-PC45-exklusiv (Nr.10): 24.3, Die Wärmetauscher-Heizung ist an Filterbetrieb
- osf-EUROMATIK-net Demo: 22.0, Die Heizung ist an Filterbetrieb
- osf-MRD-2 (an.185): 7.20, 699
- osf-PC45-exklusiv (Nr.4): 7.5, heating is off standby

In order to use the communication server, the option "Internet connection via communication server" must be enabled in the control unit itself (default factory setting):

Service

Operating hours

name for the system: osf-Waterfriend MRD-1

email-address 1: _____

email-address 2: _____

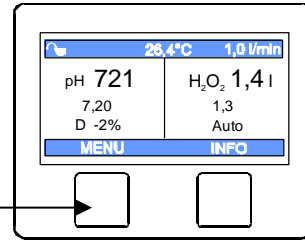
Internet connection via communication server: Yes

ESC home help

Read device ID on the display of the dosing control

Procedure:

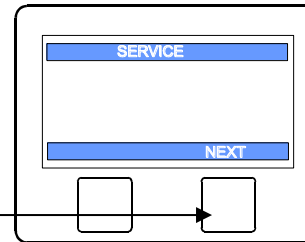
Press the "MENU" button



Move the cursor (blue backed text) to the line "SERVICE" by pressing the keys \triangle or ∇ .

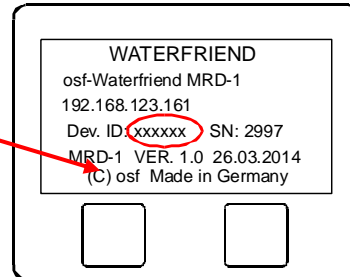
Press the key.

Press the "NEXT" button

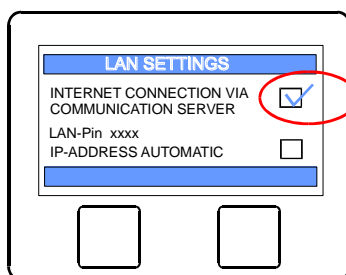
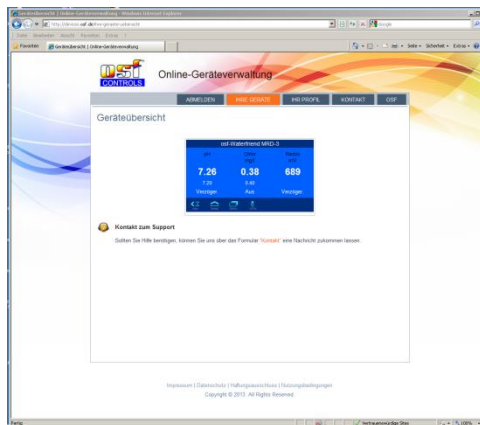


Move the cursor (blue backed text) to the line "About dosage systems" by pressing the keys \triangle or ∇ .

Read the Device ID and enter it in the user profile of the osf communication server.



After that, your device will appear in your device overview and can be operated using the communication server:



For the use of the communication server, the Internet connection via the communication server must be enabled.

Factory setting: osf Communications Server enabled

Changing the PIN (password)

The MRD-1 contains 2-level password protection for access via the LAN. The User PIN lets you operate the control unit and adjust the essential main functions. The Service PIN is needed to perform service functions and to change settings at the Service level. The following PINs are factory-set:


- User PIN: 1234
- Service PIN: 5678

The MRD-1 must be connected to the Internet in order to be able to change the PINs. You make the change to a PIN via the WEB interface of the communication server.

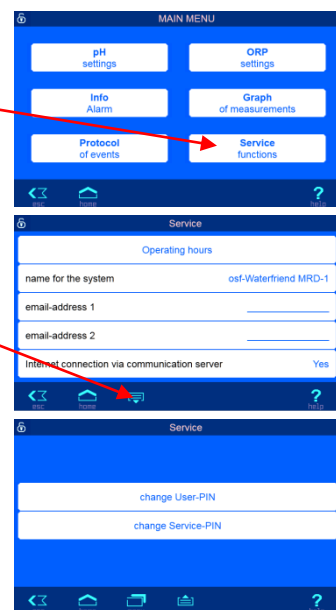
Assigning a new PIN

1. Log in as usual to the communication server
2. Then log in with the Service PIN
3. In the Home page, press the “menu” button

4. In the main menu, press the „Service“ button

5. Scroll down 3 pages by pressing the  button

6. You can now assign new values to each PIN



Make sure you make a note of the PINs!

Naming the unit

Entering an e-mail address

In order to be able to identify different control units during online access, each osf device has a facility for assigning a name.

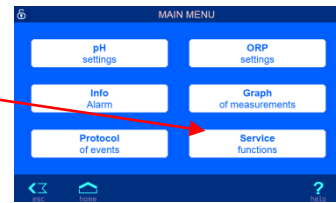
The MRD-1 is able to send any fault indicator messages via e-mail. The control unit must be connected to the Internet for this feature to work. You enter the relevant e-mail addresses (2 maximum) via the WEB interface of the communication server.

Entering an e-mail address

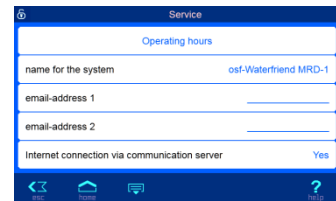
Assigning a name

1. Log in as usual to the communication server
2. Then log in with the Service PIN
3. In the Home page, press the “menu” button

4. In the main menu, press the „Service“ button



5. You can enter the name of the unit and the e-mail addresses here



Update

The MRD-1 has a software update facility. The MRD-1 must be connected to the Internet for updating to work. You can perform the update via the WEB interface of the communication server.

Checking for updates

You can use this function to check whether an update is available for your device.

1. Log in as usual to the communication server
2. Then log in with the Service PIN

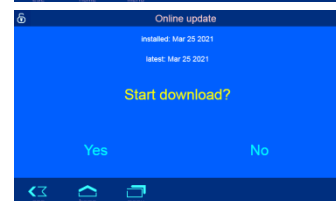
3. On the Home page, press the „esc“ button



4. On the Info page, press the “Check for Update” button



5. You can now start the download and install the update



Explanations

Storage, Transport

During transport and storage it is important to note that the pH-sensor is frost resistant down to minus 10 ° C. For lower temperatures, we have special pH sensors in the delivery program.

Maintenance

Service work may only be carried out on de-pressurised, voltage-free equipment which has been protected against unauthorised switching on.

The metering unit should be serviced by specialist personnel at regular intervals.

6-monthly service

Sealtightness

Check all connections for sealtightness at regular intervals.

Dirt filter

The filter screen should be checked for soiling and accumulations at regular intervals. The filter screen must be cleaned or replaced if necessary.

Injection valves

The injection valves should be checked for soiling and accumulations at regular intervals. They should be cleaned if necessary.

pH electrode

The electrode function is checked at regular intervals using the two buffer solutions (pH7 and pH4). If there are any noticeable variations, the electrode should be calibrated or replaced (see above in manual, "Calibrating pH electrode").

Metering pumps



Protect yourself against the metering media, wear appropriate protective clothing.

Once the pump has cooled down, check the hose for any possible damage. The pump hose must be circular and may not show any signs of leakage or damage. Any damaged hoses must be replaced.

Annual service

Replacing the pH electrode

The electrode should be replaced at intervals of one year (see above in manual, "Calibrating electrodes").

Replacing the metering hose



Protect yourself against the metering media, wear appropriate protective clothing.

The metering hoses should be replaced at intervals of one year.

Decommissioning

If the metering unit will not be used for long periods, for example during the winter, the following measures are necessary.

Electrode

Take the electrode out of the flow fitting and insert it in the case in which it was delivered.

Flow fitting

Empty the flow fitting.

Metering pumps

Rinse out the metering hoses thoroughly with hot water. Empty the metering hoses and remove them from the metering pumps.

Wear parts

The following components are wear parts for which no guarantee can be provided:

- electrode (combination electrodes)
- metering pump hoses
- buffer solutions

Interfacing with building automation systems

The MRD-1 contains an HTTP web server, which is designed to allow the control unit to be operated using any web browser from any web-enabled terminal.

The HTML pages generated by this web server can also be accessed by a building automation system and can be interpreted for display on EIB visualization devices. For the purpose of controlling the MRD-1, the building automation system can generate IP messages, in the same way as they would be generated by a web browser when you click on controls on the HTML pages. In other words, the building automation system must emulate a web browser.

Instead of using directly the predefined HTML pages designed by **tsi** for displaying on web browsers, you (as user) can also design your own control file to obtain the data you require in "custom" form, and save this file on the SD card in the MRD-1. This means that the interface to the building automation system is then unaffected by potential design changes to the **tsi** HTML pages.

This control file must be saved as an ASCII text file with the extension ".HTM" in the "HTML" folder on the SD card. The file name must not exceed 8 characters in length. Although it has the "HTM" extension, this file need not necessarily be a valid HTML file, but can be formatted to suit the requirements of the building automation system.

This control file can contain variables in the format "\$\$nnnn", which the web server then replaces with the data that is currently valid. A list of available variables appears at the end of this document.

A control file "ISTWERTE.HTM" containing the following:

```
pH value: $$0001 pH
Temperature: $$0004 °C
```

would, on opening "http://xxx.xxx.xxx.xxx/istwerte.htm", return the following text for example:

```
pH value: 7.26 pH
Temperature: 25.6 °C
```

These control files can also be used selectively to read specific datapoints, e.g. "PHWERT.HTM" containing the following:

```
$$0001
```

returns

```
7.26
```

In order to make changes to data in the control unit from the building automation system, the building automation system must emulate sending an HTML form. This is done by a URL invocation in the form "http://xxx.xxx.xxx.xxx/modify?nnnn=data", where nnnn is the number of the variable to be changed, and data represents the data to be stored.

Before the building automation system can change any variables, it must first log in by sending a valid PIN number to the variable 0003:

„http://xxx.xxx.xxx.xxx/modify?0000=dddd“, where dddd is the user PIN configured in the unit.

Variables can be set after successful login, e.g. set the pH value to 7.50:

„http://xxx.xxx.xxx.xxx/modify? 0011=7.50“.

Afterwards, the building automation system should log out by writing to the variable 0003 again with any invalid value:

„http://xxx.xxx.xxx.xxx/modify?0000=0000“

A similar call sequence can be used, for example, to switch the operating mode of the oxygen control:

„http://xxx.xxx.xxx.xxx/modify?0000=dddd“	Login
„http://xxx.xxx.xxx.xxx/modify?0032=i“	Switch operating mode
„http://xxx.xxx.xxx.xxx/modify?0000=0000“	Logout

Variables available for communication with the building management system:

Number	Description	Read/Write	Data format	Range	Info
0000	LAN-PIN	W	„#####“	„0000“ - „9999“	Login
0001	Actual value pH	R	„#.##“		pH
0003	Weekly dosage H ₂ O ₂ (temperature compensated)	R	„##.##“		Liter
0004	Actual value temperature	R	„##.##“		°C
0005	Actual value water flow	R	„#.##“		l/min
0011	Setpoint pH	R/W	„#.##“	„6.00“ - „8.00“	pH
0013	Setpoint weekly dosage H ₂ O ₂	R/W	„##.##“	„00.1“ - „20.0“	Liter
0021	Status message pH controller	R	Text		
0023	Status message H ₂ O ₂ dosage	R	Text		
0026	Current dosing rate pH	R	„##.##“		l/h
0027	Current dosing rate H ₂ O ₂	R	„##.##“		l/h
0031	Operating mode pH controller	W	ASCII	'0', '1', 'i'	0: Auto mode on 1: Auto mode off i: Switch modes
0032	Operating mode H ₂ O ₂ dosage	W	ASCII	'0', '1', 'i'	0: Auto mode on 1: Auto mode off i: Switch modes
0041	Lower alarm limit value pH	R/W	„#.##“	„3.00“ - „8.00“	pH
0051	Upper alarm limit value pH	R/W	„#.##“	„6.00“ - „9.99“	pH
9000	Collective fault message	R	'#'	'0' - '1'	'0'=Off, '1'=On
9031	Status variable pH control	R	'#'	'0' - '1'	'0'=Off, '1'=Automatic
9032	Status variable H ₂ O ₂ dosage	R	'#'	'0' - '1'	'0'=Off, '1'=Automatic

We wish you a lot of fun and relaxation in your swimming pool!

Further information can be found on the Internet at the following address:

<https://osf.de/download/documents/documents.php?device=MRD-1>



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Subject to changes! **osf** 04/2021



Shipment of the dosing system



WATERFRIEND



Declaration of non-objection

If you have to return a **WATERFRIEND**, you must send this form, filled out, back with every return device.

Type:

Serial number:

We hereby guarantee that we have professionally cleaned the device before shipping. It is free of corrosive substances and other chemical substances which could cause a health hazard. This means that there are no hazards caused by residual contamination. This form has been correctly and completely filled out and the device has been shipped in accordance with the statutory requirements.

If the manufacturer has to carry out cleaning work, all costs incurred will be invoiced.

Please fill out legibly:

Company:

Road: Postcode, town

Country: Telephone:

E-mail: Fax:.....

Surname: First name:.....

Date:

Signature: Stamp:

Detach this page and use it for the return shipment!

osf Hansjürgen Meier · Elektrotechnik und Elektronik GmbH & Co KG

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