### Wasserentkeimung METASYS WEK

Gerätedokument Einbau, Betrieb und Wartung

## Water Decontamination System METASYS WEK

Equipment Logbook Assembly, operation and maintenance

## Système de decontamination de l'eau METASYS WEK

Livret d'appareil Installation, fonctionnement et entretien

## Decontaminatore idrico METASYS WEK

Verbale d'installazione Montaggio, funzionamento e manutenzione

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Practice personnel, technicians

#### 1. Index

The header on each page defines the user group particular information is aimed at.

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#### 2. Explanation of the pictograms

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Information

Caution!



General warning sign

## **General information**

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#### 3. General information



The safety, reliability and performance of the appliance is only guaranteed by METASYS if the following instructions are observed:

- Assembly, alterations or repairs may exclusively be carried out by authorized service personnel in compliance with EN Standard 60601-1 (International Standard for Medical Electrical Apparatus, in particular Part 1: General Rules for Safety).
- The electrical installation must comply with the regulations of the IEC (International Commission for Electrical Engineering).
- The apparatus must exclusively be used in conformity with the instructions for installation, operation and maintenance.
- Only original parts may be used for repairs or replacements.
- All the guidelines provided by the manufacturer on the correct use of the water decontamination system WEK must be followed.
- Following the commissioning of the apparatus, the Installation Proof must be completed and returned to METASYS to establish the guarantee period.
- Every inspection and servicing must be recorded in the Equipment Logbook.
- When requested by an authorized engineer, METASYS agrees to make all documents available for the use of technically qualified service personnel.
- METASYS accepts no responsibility for damages caused due to external factors, such as wrong installation, improper use of the apparatus or unauthorized technical intervention.
- Users must study equipment and assure themselves of its good condition before every use.



The equipment is not suitable for use in explosive or combustible environment.

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#### 4. Application

The METASYS water decontamination system (WEK) is a system which enables decontamination of the water supply and pipes using the special disinfectant GREEN&CLEAN WK.

In addition to its primary water decontamination function, the WEK also has a cascade (with DVGW-registration) to guarantee the separation of decontaminated water from tap water.

The WEK is used to supply water-bearing apparatuses and instruments (syringe, turbine, water glass filler, etc.) with decontaminated water.

The METASYS water decontamination system supplies all consumers of the dental unit. Their water consumption averages at:

- syringe: 100 130 ml / minute
- turbine, handpiece and angle piece: 50 70 ml / minute
- water glass: 150 ml / glassfull

#### 5. Construction

To ensure optimal user and service friendliness, the water decontamination system consists of several **modules**:

- Module 1 Electronic control system
- **Module 2** Pressure container; this generates the water pressure. In addition to the container, this module contains a magnetic valve, a pressure switch and a check valve
- **Bodule 3** Membrane pump; includes pump and check valve

4 Module 4 Mixing container; here, water is mixed with the disinfectant (after the cascade section). This module includes the container, filling and overflow sensor, 2 magnetic valves and the disinfectant sensor

- **5** Module 5 Double membrane pump and membrane break sensor
- **G** Module 6 Water unit; consists of a flow rate limiter and dosing valves
- Module 7 Compressed air unit; this is a pressure regulator

Module 8 Housing (optional); consisting of housing, mounting plate, main water tap with prefilter (80 μm), transformer and main tap

# Explanation of the type plate · Technical data

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#### 6. Explanation of the type plate

9 See illustration

The type plate is attached to the top of the auxiliary housing.

- **9.1** Equipment type name
- (9.2) Mains supply data Built-in unit (UN = 24 V AC) Floor model (UN = 230 V AC)
- (9.3) Maximum power consumption
- **9.4** Maximum water flow rate
- **9.5** Permitted water pressure
- **9.6** Serial number
- **9.7** Address of manufacturer
- **9.8** CE conformity mark



#### 7. Technical data

Versions	floor model / built-in unit
Voltage	230 V AC (floor model)/ 24 V AC (built-in unit)
Frequency	50/60 Hz
Maximum power consumption	100 mA (floor model)/ 1.2 A (built-in unit)
Permitted water pressure	1 - 6 bar
Permitted air pressure	3.5 - 8 bar
Operating pressure (water)	2.5 bar
Operating pressure (air)	3.5 bar
Maximum water flow rate	1 l/min
Disinfectant	GREEN&CLEAN WK hydrogen peroxide, 2% solution
Mixing ratio	1:85 standard setting, 1:42 intensive decontamination
Working solution	235 ppm
<b>10</b> see figure Dimensions (H x W x D)	335 x 265 x 160 mm



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## **Functional description**

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#### 8. Functional description

**1** See illustration

When the water tap **1.1** is opened and the system is switched on, the dosing valve 1 **1.2** and the safety valve 5 **1.3** open and 150 ml water are supplied to the mixing container **1.4**.

The water level in the mixing container is monitored by an electronic probe A **1.5**. Once the contact on the probe is set off, the magnetic valves 2 **1.6** (compressed air) and 3 **1.7** (GREEN&CLEAN WK) open. This activates the compressed air driven double-membrane pump **1.8**, causing approx. 1.75 ml hydrogen peroxide to be withdrawn from the chemical bottle and added to the mixing container.

If the water level drops below probe A, the dosing valve opens again until overflow probe B **1.9** is reached. By the time the water reaches this probe, the mixing container has been filled with 300 ml of water. Magnetic valves 2 and 3 open again, and add another 1.75 ml of chemical to the mixing container. This ensures that the required concentration of disinfectant in the solution is continuously maintained.

In the mixing container, the water inlet is in the form of a cascade (1.10), ensuring that the WEK is separated from the water supply as required by the DVGW (German Gas and Water Association) (DIN 1988, Part 4). This ensures that water contaminated with microorganisms or mixed with chemicals cannot flow back into the water supply system. If a waterfed consumer is activated, the decontaminated water flows from the mixing container, via the pressure container (1.11) to the appropriate instrument.

Naturally, this causes the water level in the pressure container to drop, together with the water pressure. A pressure switch **1.12**, fitted to the pressure container and adjusted to 2.5 bar, activates the membrane pump **1.13** which is responsible for emptying the mixing container, filling the pressure container and maintaining the required water flow pressure.

An air cushion in the pressure container compensates the water level. If necessary, the air cushion is topped up with compressed air (magnetic valve 4) – all this is done to ensure a stable water jet for the instrument. The air cushion probe C  $\boxed{1.14}$  ensures that the air pressure is kept constant.

The disinfectant is withdrawn from the chemical bottle **1.15**.

A disinfectant sensor **1.16** controls the availability of the chemical. If no more chemical can be withdrawn (e.g. the bottle is empty), an error message occurs.



Please note that only METASYS GREEN&CLEAN WK may be used, as the electrical sensors are adjusted to this product!

## **Installation options**

Technicians

#### 9. Installation options

The modular design of the WEK Water Decontamination System allows the following installation options:

#### **2** Integration into the treatment unit

Direct integration of the WEK Water Decontamination System into the treatment unit is the preferred option in order to keep the water and compressed air pipes supplying the WEK as short as possible.

Care should be taken to ensure vibration-free attachment of the unit to weight-bearing parts of the treatment unit.

#### Filter:

If not already integrated into the treatment unit, a filter with maximum mesh size of 80  $\mu m$  must be applied before the water supply connection of the WEK.

#### Integration in the auxiliary housing

If the direct integration of the water decontamination system into the dental treatment unit is not possible, it can be installed as a floor model with a shapely housing.

The housing requires only a minimum amount of floor space and should be mounted onto the junction box of the treatment unit. The external display and a transformer are already incorporated into the housing.

#### Main switch:

It must be ensured that the power supply is connected downstream of the main instrument/ practice switch.



Please note that the transformer is still energised if the main switch of the unit is turned off! The unit has to be disconnected from the power supply with the main instrument/practice switch, before any installations or repairs are performed!



Technicians





#### 10. Hose connections

See illustration

(1.1) Compressed air connection Permitted pressure at entry: 3.5 - 8 bar PUR tubing I.D. = 2.5 mm / 0.D. = 4 mm

(1.2) Water connection (fresh water)
Permitted pressure at entry: 1-6 bar
PA tubing (with KTW authorisation)

- I.D. = 4 mm / 0.D. = 6 mm
- (1.3) Chemical bottle connection PVC tubing

I.D. = 2 mm / 0.D. = 4 mm

- **1.4Connection to the water outlet (supply of instruments)**PUR tubing
  - I.D. = 4 mm / 0.D. = 6 mm

#### **11. Electrical connections**

#### 2 See illustration

- **2.1** Overflow sensor (yellow)
- **2.2** Pressure switch (red)
- (2.3) Mixing container probe (yellow/red/black)
- **2.4** Disinfectant sensor (green)
- **(2.5)** Level monitor in the pressure container (blue)
- (2.6) Air cushion valve on the pressure container (black) MV 4
- **2.7** External display
- **2.8** Chemical valve (black) MV3
- **2.9** Water safety valve 5 (brown)
- (**2.10**) Pump motor connection
- (2.11) Membrane break sensor (yellow)
- (**2.12**) Power supply plug 24 V AC (orange)



The power voltage must be supplied by a transformer which meet the specifications of IEC 601-1 /VDE 0750 Part 1 / DIN EN 60601-1 and IEC 60742 + A1 / DIN EN 60742.

- (2.13) Water dosage valve 1 (brown)
- (2.14) Compressed air valve (black) MV2
- (2.15) Main fuse MST250/T 3,15 A/UN 250 V/ ICN 35 A (replace with same type only!)

2

## **Description of the control unit**

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#### 12. Description of the control unit

- See illustration
- **3.1** Control light 1: Ready for use (green)
- **3.2** Control light 2: Error (red)
- **3.3** Control light 3: Disinfectant sensor (yellow)
- **3.4** Alarm RESET button

#### **4** Switch on/checking routine: The green control signal **3.1** flashes

After having switched on the WEK it automatically performs a test routine. During this procedure control signal 1 **3.1** is blinking fast. If an error occurs, the unit is not activated and the error is shown at the operating unit (see below). After the successful completion of the test routine, control signal 1 lights constantly and the unit is ready for operation.

# The green control signal **3.1** and the yellow signal **3.3** are illuminated, as well as sound of the alarm:

**Cause:** Disinfectant sensor indicates that the process water is not being decontaminated!

Action: Change the chemical bottle (see page 10)!

If the chemical bottle cannot be changed immediately, the RESET button must be pressed to deactivate the continuous alarm. The unit remains fully functional and does not interrupt the dentist's work. However, a short signal tone still sounds periodically. In case the error had been caused by an air bubble it will be gone at the next attempt.

# However, no decontamination takes place until the empty chemical bottle is replaced with a full one (see page 10).

# **The green control signal 3.1** is illuminated and the red signal **3.2** flashes, the alarm tone sounds:

**Cause:** Level monitor in the mixing container is contaminated, or no water supply!

**Action:** First of all, check if the main water tap and water inlet pipe are open! Clean or replace the mixing container probe (see page 11).

**Consequence:** All valves and the pump are switched off. The alarm tone can be switched off by pressing the RESET button. After resolving the problem the WEK can only be reactivated by switching the unit off and on.

# The green control signal **3.1** and the red signal **3.2** are illuminated, the alarm tone sounds:

Cause: Defect of the double membrane pump, or overflow!

**Action:** Clean the overflow sensor. Check the double membrane pump and the electronic control system (see page 11).

**Consequence:** All valves and the pump are switched off. The alarm tone can be switched off by pressing the RESET button. After resolving the problem the WEK can only be reactivated by switching the unit off and on.



3.1

3.2

3.3

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#### 13. Disinfectant

#### See illustration

GREEN&CLEAN WK, a 2% hydrogen peroxide solution with added silver, is used as the disinfectant. Due to their potent bactericidal and fungicidal action, hydrogen peroxide-based concentrates are particularly suitable for reducing microorganism levels in process water. The ratio of disinfection efficacy and potential risks of hydrogen peroxide are excellent, which means they present no risk to the patient.

During each disinfecting cycle of the METASYS water decontamination system, a designated amount of disinfectant is added to the 150 ml of water in the mixing container. This is how the 0.0235% concentration required for broad-spectrum disinfection is prepared.

Once the GREEN&CLEAN WK bottle is completely empty, an error signal appears on the external display, stating that no more disinfectant can be drawn. The empty bottle needs to be disconnected from the cannula of the water decontamination device and replaced with a full one.



Please note that only GREEN&CLEAN WK provides the concentration required for broad spectrum disinfection.

GREEN&CLEAN	WK - refill sets	Order numbers
1.1	4 x 750 ml bottles	60040100-1
1.2	6 x 1000 ml bottles	60040101

The GREEN&CLEAN WK refill set can be ordered directly from your dental depot!

Safety precautions: Keep out of the reach of children. In case of contact with eyes, rinse immediately with plenty of water. In case of contact with skin, wash immediately with plenty of water. Store GREEN&CLEAN WK at room temperature (or 5°C - max. 30°C) and protected from light!

Composition: water, hydrogen peroxide, silver and less than 0.1% stabilisers

Please refer to the safety data sheet for further information!

#### 14. Changing the chemical bottle

#### 2 See illustration

Remove the empty bottle from the device. Pull gently on the closure and the attached tube reaching into the bottle to remove the bottle **2.1**.

After having removed the screw cap of the new bottle insert the tube into the bottle and press the closure onto it **2.1**.

Afterwards place bottle back into the device. Ensure that tube is connected to the chemical port **2.2**.

2

## **Maintenance and cleaning**

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#### 15. Maintenance and cleaning

#### Additional programs

**Automatic emptying:** To empty the unit during operation keep the RESET button **3.4** pressed for approx. 8 sec. (control signal 1 **3.1** flashes) until a second acoustic signal is activated. Then the green control signal 1 flashes slowly. Reservoir and pressure container are empty as soon as no more water comes out at instruments or water glass filler. The WEK can now either be switched off, or the normal operation can be activated by keeping the RESET button pressed for another 8 sec.

**Intensive decontamination:** If required, the concentration of the chemical may be increased. The intensive decontamination can be activated by holding down the RESET button **3.4** (control signal 1 **3.1** flashes) for approx. 4 sec. until the first acoustic signal is activated. While this procedure is taking place control signal 1 **3.1** flashes and signal 3 **3.3** is illuminated. With the next chemical dosing operation, 3 doses of concentrate will be delivered, followed by 2 doses each in the next 4 dosing operations. No chemical will be added to the final dosing to ensure normal concentration after the intensive decontamination. Control signal 3 stops after the intensive decontamination and a short acoustic signal is activated. The WEK returns into normal operation.

# **4** Remove water level probe from the mixing container and clean or replace (see illustration)

- Switch off main switch.
- Remove bottle.
- Remove retaining plate by lifting.
- Carefully pull probe up and out.
- Clean or replace probe. Check the electronic control system.
- Afterwards place the probe back into the mixing container 4.1
- Snap in retaining plate.
- Place chemical bottle into unit.
- Switch on main switch.

#### **USE** Check overflow sensor at the mixing container (see illustration)

- Switch off main switch.
- Clean/dry overflow sensor 5.1. Check electrical connectors of the electronic control system (see page 8)
- Check double membrane pump and the electronic control system.
- Switch on main switch.

#### 6 Servicing

Annual service inspection for the METASYS WEK with service kit (service intervals are also dependent on water hardness!). This service contains a complete function control of the device, test (replacement, as necessary) of the water dosing valve **6.1** and magnetic valves **6.2**, the water non-return valve **6.3** as well as the tubes **6.4**. Additionally, also an inspection (and cleaning, as necessary) of the mixing container **6.5** and its probes needs to be carried out, see point 4 and 5.









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