

**Installation Instructions  
and  
Operating Manual  
for  
Ultraviolet Water Treatment System**

Series:

**BX, LBX**

**BX-EW, LBX-EW**  
with automatic wiping system  
(optional equipment)

XLR 20  
XLR 30

-SEC-



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**Remark:** Custom made projectspecific design of the delivered UV system and/or additionally integrated components may result in non-conformity of the system to some instructions given in this manual. If this occurs, follow instruction only if they are clearly correct. If there are any questions regarding the conformity of your UV system to any instruction in this manual, contact us for clarification.

The numbers within this manual (marked: > ... <) are identical with those of the figure in chapter Vb) "Replacement of UV Lamps" and enclosed drawings.

## **I. TECHNICAL DATA, THRESHOLD VALUES**

The individual technical data of your UV system are listed on a special datasheet which is provided with each unit.

insert datasheet here

Keep noted values for flow rate and UV transmission of the water otherwise the corresponding UV dose is not ensured by the setted alarm threshold value.

If settings do not fulfil your requirements, please contact us.

## II. INSTALLATION

### a) Before Mounting

**CAUTION TAKE CARE NOT TO DAMAGE FRAGILE COMPONENTS (UV SENSOR, QUARTZ JACKET, UV LAMP) DURING HANDLING OR INSTALLATION !**

- Ensure that the operational conditions (power supply, pressure, water quality, room climate, space, etc.) match the requirements.
- Check the UV system (especially its fragile components) for any damage.
- Insert datasheet (received together with the UV system) on page 3.

### b) Mounting of UV Reactor

To avoid **crashes** the UV reactor must be isolated from **pressure surges ! ! !**  
All piping must be fitted without mechanical tension, freezing must be prevented as well.

Pressure drop:                    about 0.05-0.3bar at nominal flow rate → see datasheet on page 3.

Mounting:                            → see attached INSTALLATION DRAWING,  
please stick to given minimum distances for maintenance purposes. Observe correct position of cleaning/sampling valves >9a+19< regarding handling and/or draining/bleeding  
→ see also chapter Va) "Cleaning Procedure".  
If brackets are required, they have to be provided by the customer.

Flow direction:                    preferably upward (mandatory at gravity flow).  
→ see attached INSTALLATION DRAWING

The chemical cleaning procedure of reactor chamber (generally not necessary within DI-water systems) requires shut-off valves at reactor in- and outlet. The arrangement of these valves must ensure total drainage of the cleaning agent/rinsing water. It is recommended to install the valves **directly** at reactor's flanges to minimize volume of cleaning agent  
→ see INSTALLATION DRAWING and chapter Va) "Cleaning Procedure".

**IMORTANT: The outlet shut-off valve must always be closed at first!**

Operating periods  $\geq 30$  minutes **without flow** can cause inadmissible heat accumulation within the UV reactor. To avoid this the UV System **must be switches off** or/and appropriate precautions have to be taken during installation, for example:

- A "dropping tap"
- A thermocontrolled valve to "bleed" the heated water.

If combining an automatically operated shut-off valve with the UV system and/or other flow control devices, they also must not cause heat accumulation.

Remove any dirt/debris (which may be present due to installation activities) from the reactor chamber by rinsing with pure water. If necessary, the complete pipe system or the complete new installation has to be included.

Deaerate thoroughly and check piping (incl. reactor) for leaks under operating pressure.

**c) Electrical Installation**

**AVOID "DRY RUNNING" OF UV REACTOR DURING FUNCTION CHECKS, RESPECTIVELY LIMIT IT TO A MAXIMUM OF 5 MINUTES. DEPOSITS ON THE QUARTZ JACKETS SHOULD BE REMOVED BEFORE TESTING IN ORDER TO AVOID A "BAKING" EFFECT.**

The electrical cabinet (IP54) should be installed in a place as **dry and cool** as possible ( $\leq 30\text{ }^{\circ}\text{C}$ ). Provide for sufficient heat transfer (prevent heat accumulation), do not block air in-and outlet.

The electrical installation has to be carried out according to the relevant local standards and regulations. Make sure that appropriate **protective safety measures** are installed and **functionable** (e.g. ground fault circuit breaker).

UV reactor and electrical cabinet usually will be delivered ready for connection incl. module cables and sensor cable ( $\approx 5\text{-}25\text{m}$  length).

**Do not modify these cables otherwise problems for UV lamp ignition and UV Intensity Monitoring are possible.**

**A PE-cable ( $\geq 4.0\text{mm}^2$ ) is necessary between reactor and cabinet, it has to be provided by customer.**

Lampholders >5<, plug connectors >3< as well as the electrical cabinet always must be tightly closed. They should be opened only for maintenance purposes with **mains OFF**.

Generally, the UV system must be switched off when the flow is interrupted >30 minutes. If the UV system is combined with a pump or automatically operated shut-off valves, short delay is necessary to ensure pump stopped/valve closed. Please note, that the outlet shut-off valve must always be closed at first!

The electrical cabinet has terminals for:

- A. Remote ON/OFF by a no volt-free -contact or 230VAC signal.  
**Note:** - To protect the UV lamps against high frequencies of switching it may be useful to install an additional off-delay timer (< 30 minutes) for the UV system.  
**terminals :** → see wiring diagram
- B. Signalling "NORMAL ON"  
**Note** - This contact leaves rest position when the system is switched on with selector switch in position "NORMAL". It may be combined with other contacts to avoid alarm signalling when the UV system is switched OFF.  
**terminals :** X11/13;X11/14
- C. Signalling "system running"  
**Note:** - If all UV lamps are in operation, this contact leaves rest position ~ 6 minutes after switching ON, this means ~ 3 minutes after the UV intensity is higher than the alarm threshold value\*.  
**terminals :** X11/15;X11/16
- D. Signalling "prealert"  
**Note:** - This contact leaves rest position when the UV intensity is lower than the prealert threshold value but higher than the alarm threshold value\*.  
**terminals :** X11/17;X11/18
- E. Signalling "system failure"  
**Note:** - This contact is in rest position when a UV lamp fails or when the UV intensity is lower than the alarm threshold value\*. It is recommended to combine this contact with terminals "NORMAL ON".  
**terminals :** X11/11;X11/12
- F. Interlocking the control circuit of a pump or valve  
**Note:** - By this contact the control circuit of a pump or shut-off valve can be interlocked. This contact is closed ~ 6 minutes after switching ON, this means after all UV lamps are in operation and the UV intensity is higher than the alarm threshold value\* (the delay time allows "stabilization" of UV intensity) → see also chapter IV. "OPERATION".  
**terminals :** X11/7;X11/8
- G. Signalling "Cabinet Overtemperature"  
**Note:** - This contact leaves rest position when the internal temperature is lower than 50°C.  
 - With "high temperature" the UV lamps will be not allowed to start switching on.  
**terminals :** X11/9;X11/10
- H. "Analogue output 0/4-20 mA"  
**Note:** - This signal at this terminal corresponds with the displayed UV Intensity. The load for external signal processing must not exceed 500 Ohm.  
 Factory setting = 0-20mA, to change setting → see chapter IIIc) "Settings".  
**terminals :** X11/5;X11/6
- I. Signaling "WIPER FAILURE" (OPTIONAL EQUIPMENT BX-EW / LBX-EW)  
**Note:** The contact leaves rest position when the wiper has a malfunction.  
 → see also chapter VI. "TROUBLE SHOOTING".  
**terminals :** X11/23;X11/24

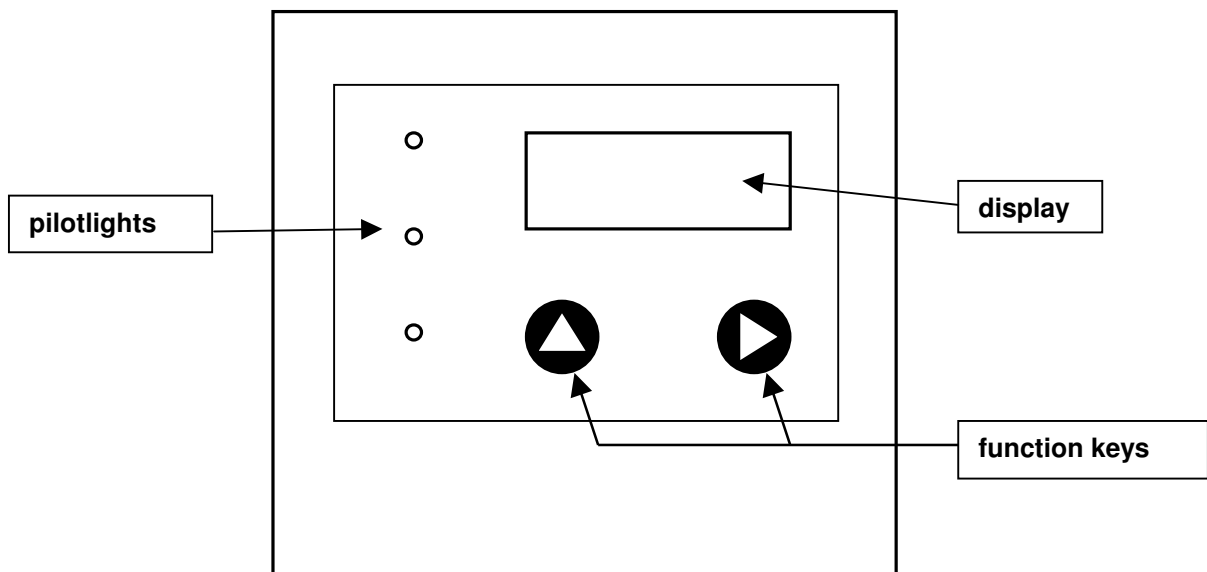
### III. START- UP

#### a) Controler SEC

This system contains all functions to control and supervise the UV system: operator panel, lamp start sequencer, UV lamp supervision, UV intensity monitoring, flow control interlock, etc.

The status of the UV system is permanently displayed at the operator panel. Furthermore several menus can be influenced here by means of function keys

→ see also chapter IIIc) "Settings".



**b) Switching on**

**CAUTION WATER HAMMER MAY DAMAGE THE REACTOR IF THE COMPLETE SYSTEM (REACTOR + PIPING) HAS NOT BEEN THOROUGHLY DE-AERATED. ALSO PROBLEMS WITH THE UV INTENSITY MONITORING SYSTEM MAY OCCURE !**

- Insert the separately packed UV lamps, if applicable.  
**IMPORTANT** → see chapter Vb) “Replacement of UV Lamps”.
- Insert and connect the separately packed electrical ballasts and lamp cables if applicable. (refer to the data sheetes “lamp cable arrangement and "wiring instruction lamp connector" in the electrical cabinet)
- Avoid “dry running“, then switch on (main switch!):  
→ see chapter IV) “OPERATION”.  
Now the controler SEC is in operation and the following messages will be displayed one by one. If this does not occur or if you have other questions/problems, please contact us.
- As soon as >New Defaults?< is displayed the following settings may be done (→ see also chapter IIIc):
  - selection of display language
  - reset of counter operational hours >UV lamps<
  - selection of analog output signal >UV intensity< (0-20mA or 4-20mA)

displayed message	description
<b>WEDECO AG SEC CONTROL SYSTEM UV MEASUREMENT</b>	When switching on the controler always will be checked automatically.
<b>New Defaults ?</b>  <b>yes</b>	Now switch over to menu >New Defaults< is possible by <b>function key ▶</b> . → see also chapter IIc.  If no settings are to be done the start-up phase will be continued automatically after ~ 10 seconds.
<b>Wait for Startup</b>	This message appears if the selector switch is in position „0“ or „NORMAL“ (with activated remote control) and the remote command ON is missing. To continue the ON command is necessary (when switch in NORMAL position) or the selector switch has to be set to „TEST“.
<b>Cabinet Overtemperature Restart?</b>  <b>yes</b>	This message is only displayed if the temperature inside electrical cabinet is higher than 50°C during the start up phase. In this case the start-up phase will be stopped. The system resart must be initialised by the <b>function key ▶</b> . <b>NOTE:</b> The message will still be displayed although the cabinet temperature decreases below 50 °C and no resart was initialised. <b>A restart must be initialised in any case!</b>

displayed message	description
<div style="border: 1px solid black; padding: 10px; width: fit-content;"> <pre>preheat .....300</pre> </div>	<p>The UV lamps are activated and ignited now            Afterwards the UV lamps are in operation and the intensity will increase continuously. The preheating time last 360 seconds (factory setting).            After the time run out, the display switches over to the normal operation mode</p>
<div style="border: 1px solid black; padding: 10px; width: fit-content;"> <pre>UV: 103,5 W/m^2 h: 000001      II: 00002 Normal Operation</pre> </div>	<p><u>Status Messages (Normal operation)</u></p> <ul style="list-style-type: none"> <li>- UV intensity W/m<sup>2</sup></li> <li>- Hours of Operation (UV lamps)</li> <li>- ON/OFF cycles</li> <li>- "Normal Operation" is displayed</li> </ul> <p>The UV system is ready for operation (no interlock of flow control anymore) after the actual UV intensity exceed the minimum UV intensity level (alarm value).(no real numbers within beside „display“, just for demonstration)</p>
<div style="border: 1px solid black; padding: 10px; width: fit-content;"> <pre>UV: 103,5 W/m^2 h: 000001      II: 00002 Total Hours h:000006</pre> </div>	<p>By <b>function key</b> ► "Total Hours of Operation (UV system)" will be displayed as long as the fuction key is pressed.</p>
<div style="border: 1px solid black; padding: 10px; width: fit-content;"> <pre>UV: 103,5 W/m^2 h: 000001      II: 00002  Halt           Menu</pre> </div>	<p>By pressing both <b>function key's</b> at the same time the submenu items <b>&gt;Halt&lt;</b> and <b>&gt;Menu&lt;</b> appears in the display.</p> <p><b>&gt;Halt&lt;</b> → see also chapter Ve) "Check of UV Sensor during Operation"  <b>&gt;Menu&lt;</b> → see also chapter IIIc) "Settings"</p>

\*) Total duration of start-up phase: ~ 6 minutes (factory setting)

**c) Settings**

By means of the function keys the following settings may be done:

- selection of display language
- selection of analog output signal >UV intensity< (0-20mA or 4-20mA)
- reset of counter operational hours >UV lamps<

The settings can be modified during the start up phase of the UV system, or during normal operation by pressing both function key's at the same time and select >menu<.

displayed message	description
<div style="border: 1px solid black; padding: 5px;"> <p><b>New Defaults ?</b></p> <p style="text-align: right;"><b>yes</b></p> </div>	<p>Press <b>function key ►</b> ~ 1 second.</p>
<div style="border: 1px solid black; padding: 5px;"> <p><b>PASSWORD: 0</b></p> <p style="text-align: center;">* * * *</p> <p style="text-align: center;">^</p> <p><b>+1 Cont.</b></p> </div>	<p>Set password <b>0 0 0 0*</b> by pressing fourtimes <b>function key ►</b> .</p> <p>After setting the password it has to be confirmed by pressing <b>function key ▲</b> .</p> <p>Press <b>function key ►</b> for corrections and set password again, if necessary.</p>
<div style="border: 1px solid black; padding: 5px;"> <p><b>&gt; Language</b></p> <p><b>0 or 4-20 mA</b></p> <p><b>Reset Hours</b></p> <p><b>Cont. Select</b></p> </div>	<p>Press <b>function key ▲</b> to scroll between the menu items (Cont.).</p> <p>Press <b>function key ►</b> to select one menu item (Select)</p> <p>After all modifications are done, select the menu item <b>&lt;Start&gt;</b> to go on with the start up phase or return to the normal operation display (if settings have been modified during normal operation).</p>
<div style="border: 1px solid black; padding: 5px;"> <p><b>&gt; German</b></p> <p><b>English</b></p> <p><b>Spanish</b></p> <p><b>Cont. Select</b></p> </div>	<p><u>Display language:</u></p> <p>Press <b>function key ▲</b> to scroll between the languages (Cont.).</p> <p>Press <b>function key ►</b> to select one language (Select).</p> <p>Six different languages can be selected (German, English, Spanish, French, Italian and Portuguese)</p>
<div style="border: 1px solid black; padding: 5px;"> <p><b>&gt; 0-20 mA</b></p> <p><b>4-20 mA</b></p> <p><b>Cont. Select</b></p> </div>	<p><u>Selection of analog output signal</u></p> <p>Press <b>function key ▲</b> to scroll between the menu items (Cont.).</p> <p>Press <b>function key ►</b> to select one menu item (Select)</p>
<div style="border: 1px solid black; padding: 5px;"> <p><b>&gt; No</b></p> <p><b>Yes</b></p> <p><b>Cont. Select</b></p> </div>	<p><u>„Counter Operational Hours &gt; UV lamps&lt;:</u></p> <p>Press <b>function key ▲</b> to scroll between “No” and “Yes” (Cont.).</p> <p>Press <b>function key ►</b> to select one menu item (Select)</p> <p>After this step the menu is closed.</p>

## IV. OPERATION

### a) General

**CAUTION THE UV SENSOR IS HEAT-PROOF UP TO 70 °C PERMANENTLY. HIGHER TEMPERATURES MAY OCCUR WITHIN A FEW MINUTES IF THE UV LAMPS ARE SWITCHED ON WHILST THE REACTOR CHAMBER IS EMPTY !**

The UV system normally is designed for water temperatures 0-60 °C  
 → see datasheet on page 3 or order confirmation/invoice/type plate.

The UV reactor may be included into hot CIP-cleaning or steam sterilization procedures up to 30 minutes (max. 130 °C). During this procedure **the UV system must be switched off !!!**

Make sure that the flow is interrupted (pump stopped/valve closed) before switching off the UV system. Please note, that the outlet shut-off valve must always be closed at first! After power supply failure the UV system re-starts automatically when mains returns. Avoid excessive on/off-switching (> 5/24h) as well as "dry running" as it will cause premature failure of the UV lamps (no claim for warranty).

The selector switch "**TEST-0-NORMAL**" usually is in position **NORMAL** (especially if the UV system is operated automatically in combination with an valve or pump).

Function of this switch:

Position	Function
<b>TEST</b>	The UV system switches on without delay independent from remote control, the contact "interlock flow" opens/stays open ( <b>flow interruption</b> ). Ventilation starts operation after lamp ignition. (Test function of the UV system after cleaning or lamp replacement → see also chapter Va and Vb)
<b>0</b>	The UV lamps are off/ switches off with a <b>time delay of 180 sec.</b> independent from remote control. The contact "interlock flow" opens/stays open ( <b>flow interruption</b> ). Ventilation switches off / is off. With mains on the system is in standby mode (relais and contacts in start up mode)
<b>NORMAL</b>	Normal operation mode. Without activated remote control the UV system switches on without delay. With activated remote control and remote "ON" the UV system will be switched on without delay, the interlock contact switches on after UV intensity is higher than the threshold value for 3 minutes. With remote "OFF" the UV system will be off without delay, the interlock contact switches off also without delay ( <b>flow interruption</b> ). Ventilation starts operation after lamp ignition:

**Note:** If the flow is interrupted, the UV system must be switched off (eventual manually) within 30 minutes → see chapter IIb) "Mounting ...".

>**Cabinet Overtemperature**< will be signalled in the display as soon as the cabinet's internal temperature is higher than 50 °C. After cooling down the cabinet <50 °C the message won't be signalled anymore. If necessary the UV system must be switched of manually to cool down the cabinet. → see also chapter VI. "TROUBLE SHOOTING".

**b) UV lamp Monitoring System**

This system consists of UV sensor, electronics (amplifier/limit value relays), UV lamp supervision as well as operator panel with pilot lights and text display.

The intensity (254nm) within the reactor chamber is measured continuously by the UV sensor.

After signal processing the intensity [ $W/m^2$ ] is displayed, furthermore it is available as a standard analog output signal (0-20 or 4-20mA) for external signal processing.

The efficiency of the UV system substantially depends on the UV intensity being available in the reactor. During operation aging of the UV lamps reduces the UV intensity, as does scale formation on the lamp's quartz jackets. The intensity also may be influenced by supply voltage and/or UV absorption (water quality). Furthermore alteration in water temperature or flow rate may be responsible for this

→ see also chapter V. "MAINTENANCE".

By permanent measurement of UV intensity in combination with electronic supervision of each single UV lamp highest degree of safety is guaranteed. Every failure will be displayed at the operator panel as well alarm signalling is caused without delay.

During operation the following messages\* may be displayed:

displayed message	description
<b>UV: 103,5 W/m<sup>2</sup></b> <b>h: 000001    Π: 00002</b> <b>Normal Operation</b>	<b>Normal operation:</b> - The green pilotlight lights up. - The UV intensity is higher than the prealert threshold value*. - "Normal Operation" is displayed
<b>UV: 80,5 W/m<sup>2</sup></b> <b>h: 000001    Π: 00002</b> <b>LOW UV. Please clean quartz tubes!</b>	<b>Warning:</b> - The yellow pilotlight signals low UV intensity. - The UV intensity is lower than the prealert threshold value but higher than the alarm threshold value*. <b>&gt;LOW UV. Please clean quartz tubes!&lt;</b> scrolls in the display. <b>Within next future maintenance is required!</b> <b>→ see also chapter Va) "Cleaning ....."</b>
<b>UV: 50,5 W/m<sup>2</sup></b> <b>h: 000001    Π: 00002</b> <b>VERY LOW UV. Please replace lamps!</b>	<b>Alarm:</b> <b>&gt;VERY LOW UV. Please replace lamps!&lt;</b> is signalled because the UV intensity is lower than the alarm threshold value*. Now the efficiency of the UV system is not guaranteed anymore, maintenance is necessary immediately. <b>→ see also chapters Va) "Cleaning ....." and Vb) "Replacement of UV lamps".</b> - The contact "interlock flow" opens (flow interruption!). <b>The UV lamps are always in operation and must probably switched of manually !</b> <b>→ see also chapters IVa) OPERATION</b>
<b>UV: 50,5 W/m<sup>2</sup></b> <b>h: 000001    Π: 00002</b> <b>LAMP FAILURE</b>	<b>&gt;LAMP FAILURE&lt;</b> is signalled because one or several UV lamp(s) are out of operation. The contact "interlock flow" opens (flow interruption!). <b>The other UV lamps are always in operation and must probably switched of manually → see also chapters IVa).</b> The efficiency of the UV system is not guaranteed anymore, maintenance is necessary immediately! <b>→ see also chapter Vb) "Replacement of UV lamps".</b> Press <b>function key ▲</b> for further informations
<b>UV: 50,5 W/m<sup>2</sup></b> <b>01 OF 08 OFF</b> <b>LAMP NO. 01 OFF</b> <b>NEXT</b>	The total number of failed UV lamps is displayed. By <b>function key ►</b> the position of each failed lamp will be displayed. After the last one <b>&gt;LAMP FAILURE&lt;</b> appears again.

\*) The values in the tables are only for demonstration → see chapter I. ".....THRESHOLD VALUES"

**Note:** As it may last some minutes until the intensity is higher than the threshold value, **>ALARM<** will be displayed/signalled after switching on and the flow may be interrupted as long.

**c) Electronic Wiping System EWS** (Optional equipment, only series BX-EW and LBX-EW)

The UV reactor is equipped with an electronic wiping system to avoid coating on the quartz sleeves (UV lamps). The wiping system operates automatically as long as the UV system is switched on (selector switch in position >TEST< or >NORMAL<).

The wiper assembly is actuated by a geared motor. Wiping interval and number of wiping procedures are preset. The wiping default is 2 intervals per hour (1 interval = twice forward and backward).

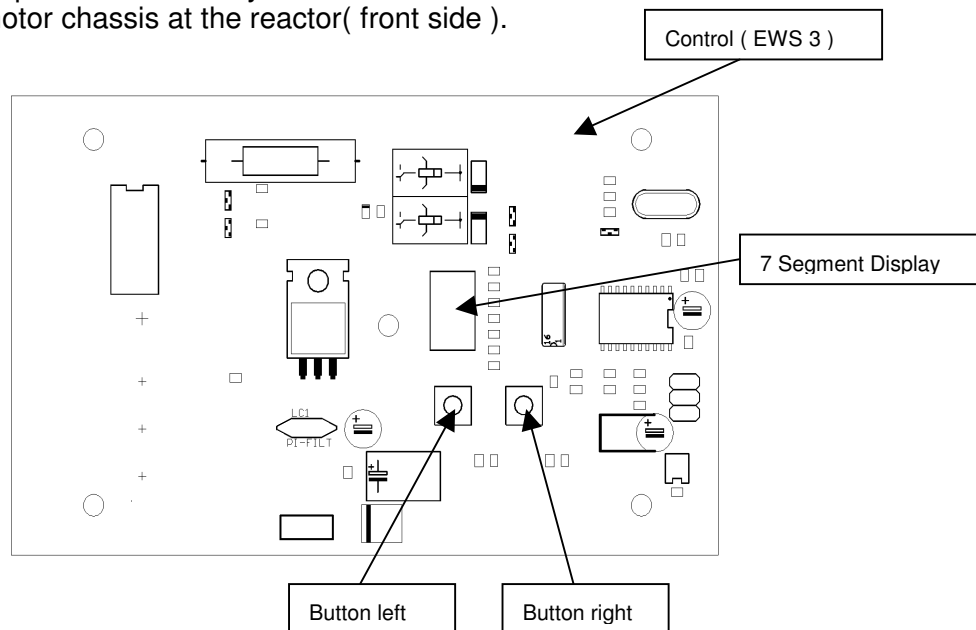
During the wiper is in action – **wiping** – is indicated in the display.

Malfunction of the wiper will be indicated in the display “WIPER FAILURE” and signalled externally via terminals → see also chapter V. “TROUBLE SHOOTING”.

**IMPORTANT:**      **During the wiper is in action, the sensor tubus will be cleaned as well. As soon as the cleaning brushes cover the sensor tubus, the UV-Intensity increases. To prevent an alarm message, the UV intensity will be fixed during the wiper operation.**

The EWS is delivered ready for connection. Only the voltage supply and the communication line are to be connected to the electrical cabinet (see wiring diagram).

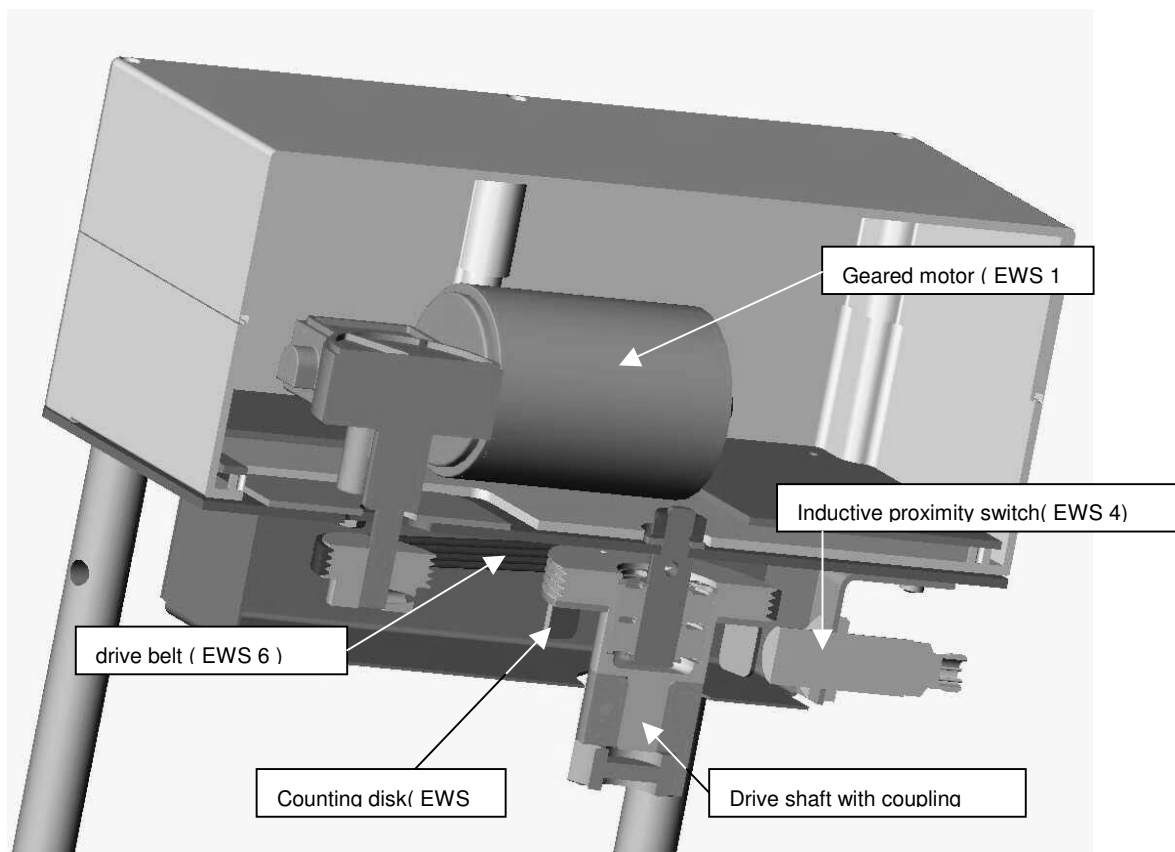
The wiper is controlled by means of a micro controller. The control is located in the motor chassis at the reactor( front side ).



By means of the two buttons (left/right) the wiping interval can be adjusted from 1x up to 7x per hour. The factory default is 2 wiping intervals per hour.

**Please note :**

**The buttons are to be actuated, from top, by pushing them with a thin screwdriver through the Plexiglas cover. Do not remove the Plexiglas cover!**



The drive is equipped with an overcurrent- and voltage monitoring device. If the preset limit values are exceeded, the wiping procedure is interrupted automatically.

The first triggering of the overcurrent monitoring causes the wiper to return to the basic position and to restart.

If the overcurrent monitoring is triggered a second time, the control changes to an "emergency program" which stops the wiper motor immediately and closes the fault contact.

If a fault is triggered, the motor can only be operated manually by means of the two buttons (left/right). In case of a wiper fault, the operation of the UV system is not primarily affected unless the fault signal is used for turning off the UV system.

**The customer terminal : X11/23;X11/24 can be used for an external alarm contact.**

After removing the wiper fault, the wiper can be reset to the rating by pushing the RESET button (min. 10 sec.) located at the motor box.

**Please note:**  
**When working at rotating parts, make sure that the wiper control is free of voltage and immobilised in open position!**

The wiper rings should be replaced after ~30.000 wiping intervals.

## V. MAINTENANCE

### a) Cleaning Procedure (normally not required within deionised water systems)

A cleaning procedure should be carried out as often as scale cause a decrease in UV intensity of ~ 20%, it is necessary latest when **>LOW UV. Please clean quartz tubes!<** is displayed.

As such a decrease also may be caused by ageing of the UV lamp or changes in water quality (UV transmission), a visual inspection of the sensortubus or a UV module is helpful before starting the cleaning procedure. Proceeding in this way leads to cleaning intervals which are adapted to the individual operating conditions (water quality).

#### Inspection of sensortubus:

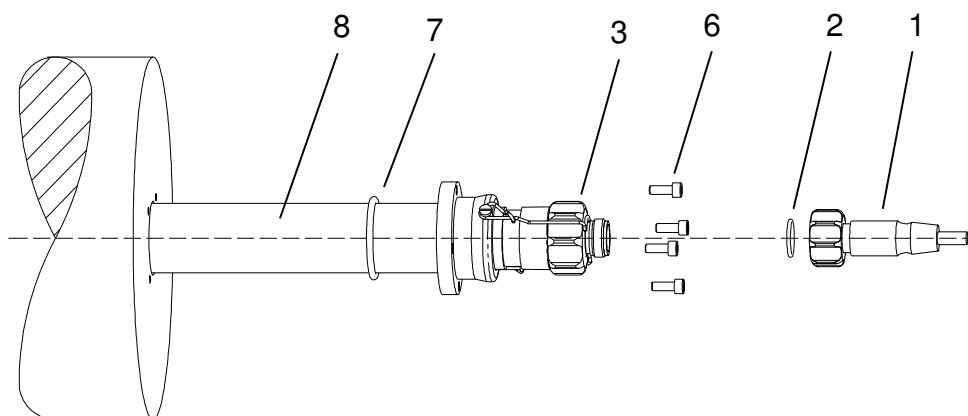
- Slowly close shut-off valves (**always close outlet at first, afterwards inlet**), then switch off mains isolator.
- Discharge reactor or release pressure.
- Dismount the sensortubus incl. UV sensor (wrench 23mm).
- Wipe off its quartz window with a wet soft cloth (white cloth shows scale residue best).  
**Never dismount the quartz window!**
- When re-installing the sensortubus **screw it only by hand**, if it leaks use the wrench to twist it for about 10°.

#### Inspection of UV module

The UV module (assembly group) mainly consists of: quartz module >8<, lampholder >3< and UV lamp >4< (➔ see picture at next page"). For dismounting no special tools are required:

- Slowly close shut-off valves (**always close outlet at first, afterwards inlet**), then switch off mains isolator.
- Discharge reactor or release pressure.
- Disassemble wiper motor plate at systems with automatic wiping system (-EW)
- Disconnect module cable (plug) >1< and loosen screws >6<.
- Carefully pull off complete UV module from the reactor.
- Wipe it off with a wet soft cloth (white cloth shows scale residue best).

When re-assembling check o-rings >7< and >2< for injury and correct position



**NOTE:** **ONLY FOR SYSTEMS WITH ELECTRICAL WIPING SYSTEM (EW)-**  
**WHEN RE ASSEMBLING THE MODULE INTO THE REACTOR THE**  
**MODULE MUST BE PUSHED VERY CAREFULLY INSIDE. EACH**  
**MODULE MUST PASS THREE WIPER RINGS LOCATED IN THE**  
**BAFFLE PLATES INSIDE THE REACTOR. TO PREVENT DAMAGE AT**  
**THE WIPER RINGS THE MODULE SHOULD BE MOISTEN WITH**  
**WATER TO GLIDE WITHOUT RESISTANCE TROUGH THE WIPER**

**NOTE:** **THE MODULE IS CENTRED BY AN TEFLON SPACER WHICH IS**  
**LOCATED INSIDE THE REACTOR ABOUT 30MM FROM MODULE'S**  
**END. DUE TO THIS THERE IS SOME RESISTANCE WHEN**  
**INSTALLING/REINSTALLING THE MODULE.**

**UV modules and sensortubus always have to be cleaned together.** This normally will be done by flushing the UV reactor with a suitable cleaning agent. Alternatively cleaning of UV modules and sensortubus can be done external, this procedure is similar as described.

To remove scale caused by dissolved minerals (calcium, etc.), a cleaning agent based upon phosphoric acid or similar like citric acid is necessary. Normally the cleaning agent will be used none diluted (components within reactor are highly resistant against these chemicals).

We recommend to use the CLEANER QA32 which is based upon phosphoric acid (> 25%). For dilution of QA32 the required quantity of concentrate will be at least 20% of reactor chamber's volume, chamber volume see datasheet on page 3 or typeplate.

**CAUTION    PROTECT EYES, SKIN AND CLOTHES WHEN HANDLING CLEANING AGENT. SPLASHES MUST BE WASHED AWAY IMMEDIATELY. FURTHERMORE, THE USUAL SAFETY REGULATIONS MUST BE OBSERVED !**

Fill-up of cleaning agent will be done by means of a Cleaning Unit (optional equipment) or pump. Proceed as described beneath, then normally no cleaning agent will get into the pipe system:

- Note current UV meter display.
- Slowly close shut-off valves (**always close outlet at first, afterwards inlet**), then switch off mains isolator.
- Open “cleaning valves“ >9a< to discharge reactor.
- Connect/operate Cleaning Unit according to corresponding manual. The required retention time depends on concentration (ph-value) of the cleaning agent as well as on degree and type of scale. Generally, allow at least 15 minutes.

**CAUTION:    VENTILATE ROOM DURING CLEANING PROCEDURE, DO NOT SMOKE, DO NOT USE AN OPEN FLAME !**

- Discharge cleaning agent from reactor (eventually into Cleaning Unit’s tank for storage until next procedure).
- To avoid residue of cleaning agent thoroughly rinsing with “clean“ water (3x as a minimum) is necessary. The water can be feed by a hose at lower cleaning valve. Via upper cleaning valve it than will be conducted by a hose to the sewerage. Especially if a total discharge of the cleaning agent is impossible, the flow direction of the rinsing water should be changed for several times.
- Deaerate reactor thoroughly and re-start UV system.

**Note:** A repeated cleaning procedure may be required if the UV intensity do not increase sufficiently. In this case it might be helpful to use

- a fresh cleaning agent (ph-value  $\leq 4$  required for QA32) or
- a different type of cleaning agent and/or
- longer retention time.

**b) Replacement of UV Lamps**

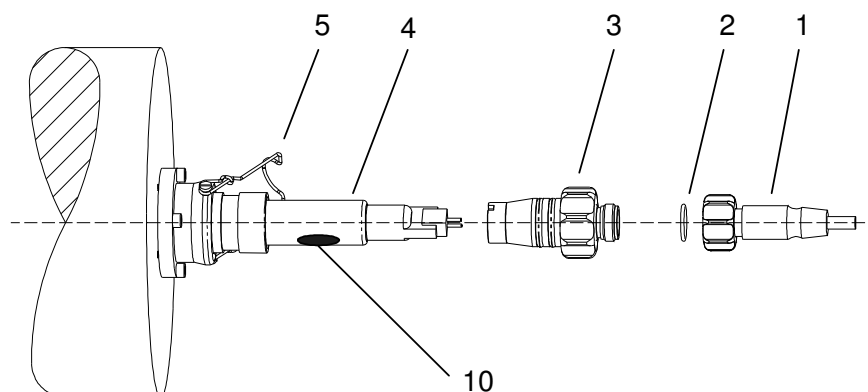
The effective life of the UV lamps depends on the required minimum UV dose [ $\text{J}/\text{m}^2$ ] which is resulting from the existing UV intensity [ $\text{W}/\text{m}^2$ ] as well as the individual operating parameters (flow rate, UV transmission).

The lamps have to be replaced latest, when **>VERY LOW UV. Please replace lamps<** or **>LOW UV. Please clean quartz tubes!<** is indicated although a cleaning procedure just has been carried out (earlier if the UV transmission of the water alters).

Generally, the UV lamps have to be replaced when the required water quality is not obtained with the available UV intensity. This may be earlier or later than signalled by the UV Lamp Monitoring System.

- Notes:**
- At a regular procedure always the complete set of lamps has to be replaced. If one or more lamp(s) has/have been replaced before earlier, it/they can be used again as a spare lamp (note operational hours).
  - If a UV lamp near to the UV sensor fails, it must be replaced by a "working" lamp of the same reactor. By this, wrong UV intensity monitoring is avoided as a brand new lamp in this position will generate too high intensity values.

<b>CAUTION DO NOT EXPOSE EYES AND SKIN TO ULTRAVIOLET LIGHT!</b>
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#### Replacement procedure:

- Slowly close shut-off valves (**always close outlet at first, afterwards inlet**), then switch off mains isolator.
- Disassemble wiper motor plate at systems with automatic wiping system (-EW)
- Disconnect module cable (plug) >1< .
- Remove clamp >5<
- Turn lamp connector >3< carefully counter-clockwise until resistance is noticeable.
- **Carefully** pull off the complete "lamp assembly" and **straight** out of the reactor (quartz module).

The "lamp assembly" consists of UV lamp >4<, lampholder >3<.,

**CAUTION      THE UV LAMP MAY BE HOT !  
HOLD IT AT BOTH ENDS WHEN HANDLING,  
OTHERWISE RISK OF BREAKING !**

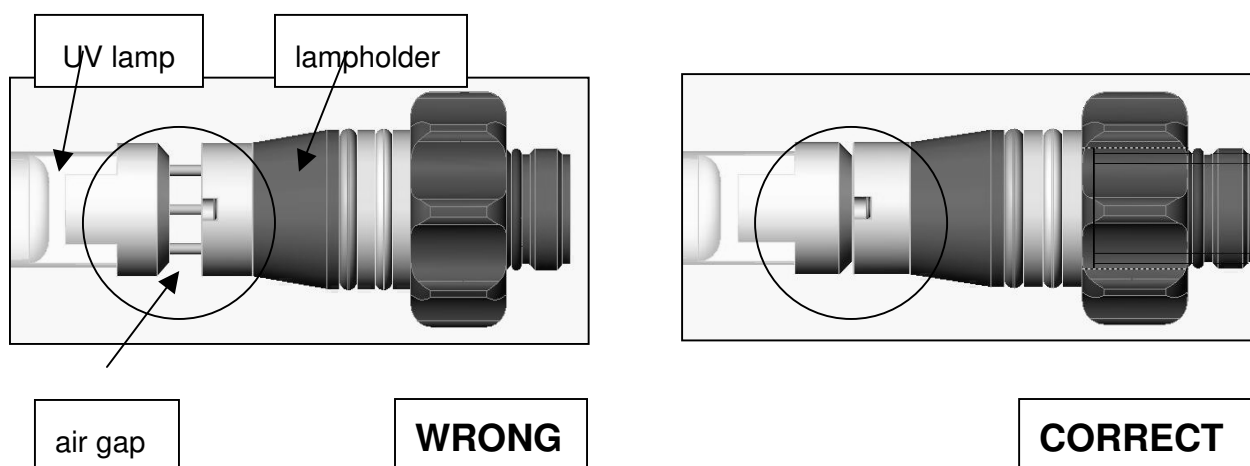
- Put "lamp assembly" on a table and pull UV lamp >4< carefully from lampholder >3< (by means of a pair of pointed pliers - **RISK OF BREAKING!**).
- Inspect quartz module insides and clean it, if necessary (e.g. soft cloth wetted with denaturated alcohol). Therefore dismantling of the quartz module is helpful  
→ see also chapter Va) "Cleaning Procedure".
- Before re-assembly the quartz module, check O-ring >7< for injury/correct position. If necessary, lubricate O-ring with a thin film of Vaseline to improve sealing effect .

**CAUTION**      **DE-PRESSURIZE REACTOR BEFORE DISMOUNTING  
A QUARTZ MODULE !  
A CRACKED QUARTZ MODULE MUST BE REPLACED IMMEDIATELY TO  
AVOID BREAKAGE (LEAKAGE) !  
WHEN INSERTING A NEW UV LAMP, TAKE CARE THAT NO  
FINGERPRINTS ARE LEFT ON LAMP, CLEAN IT WITH DENATURATED  
ALCOHOL. IF NECESSARY !**

- Carefully insert new UV lamps by applying above instructions in reverse order but do not tighten lampholder.

**IMPORTANT:**

**When attaching the lampholder >3< to the UV lamp >4<, please necessarily attend to fix both components without any air gap or spacing between them!**



- Push the lamp module carefully back in the quartz sleeve and turn lamp connector>3< carefully clockwise until resistance is noticeable.

**IMPORTANT:**

**THE AMALGAM SPOT >10< IN THE UV LAMP MUST SHOW TO THE BOTTOM WHEN THE UV LAMP IS INSTALLED IN THE REACTOR!**

- Connect module cable (plug) >1<
- Deaerate reactor thoroughly and re-start UV system to check the function of the UV lamps and the UV intensity (selector switch in Position “TEST”).
- Finally restart system with selector switch in position “**NORMAL**” reset hours counter.  
→ see chapter IVa) “OPERATION“.

**c) Disposal of used UV Lamps / Cleaning Agent QA32**

UV lamps must be disposed of in the same way as traditional fluorescent lamps, as they contain small quantities of mercury (amalgam). They are special waste and must be returned unbroken to the respective collecting depot.

CLEANER QA32 is non-toxic and biologically degradable, there is no need for special disposal.

**d) Replacement of Cooling Fan, Cleaning of Filter Mats**

- The fan in the electrical cabinet should be replaced after max. 30,000 hours of operation.
- The filter mats of the fan (air in- and outlet) should be washed/replaced latest when "cabinet high temperature" is signalled.

**e) Check of UV sensor during Operation**

Before carrying out this procedure the UV system has to be switched over to operation modus „stand-by“ because otherwise flow may be interrupted due to "low UV intensity":

displayed message	description
<div style="border: 1px solid black; padding: 5px;"> <p><b>UV: 50,5 W/m<sup>2</sup></b>  <b>h: 000001      II: 00002</b></p> <p><b>Halt                      Menu</b></p> </div>	<p>Press both <b>function keys</b> at the same time and &gt;Halt&lt; as well as &gt;Menu&lt; are Indicated in the display.            Press <b>function key ▲</b>.</p>
<div style="border: 1px solid black; padding: 5px;"> <p><b>UV: 50,5 W/m<sup>2</sup></b>  <b>h: 000001      II: 00002</b>  <b>SENSOR STOP 250</b></p> </div>	<p>When &gt;<b>SENSOR STOP 250</b>&lt; is displayed the sensor is in stand-by modus for 250 seconds. Now disconnection of the sensor cable does not lead to alarm signalling or flow interruption.            The remaining time for checking is displayed. If the check has not been finished in time ALARM will be signalled and the flow may be interrupted also.</p>

**f) Ordering of Spare Parts**

It is recommended to keep at least UV lamps and cleaning agent in stock.

- Use only original spare parts, ID code → see attached PARTS LIST.

**Note: The guarantee period of stored UV lamps expires 24 months after delivery !**

- All orders must include the serial number of the UV system  
 → see datasheet on page 3 or typeplate/invoice.

**VI. TROUBLE SHOOTING****SWITCH OFF MAINS BEFORE WORKING AT ELECTRICAL EQUIPMENT !**

<b>problem</b>	<b>possible reason</b>
<i>No function whilst selector switch in position <b>TEST</b> or <b>NORMAL</b></i>	<ul style="list-style-type: none"> <li>• No mains (supply) voltage.</li> <li>• Circuit breaker off.</li> </ul>
<i>Yellow or red pilotlight lights up</i>	<ul style="list-style-type: none"> <li>• UV sensor cable (plug) interrupted/defective.</li> <li>• UV sensor defective.</li> <li>• UV lamp(s) not inserted or not ignited.</li> </ul>
<i>UV lamp(s) do(es) not ignite</i>	<ul style="list-style-type: none"> <li>• UV lamp defective (quartz broken, electrodes interrupted, etc.) or overaged or too high on/off frequency.</li> <li>• Faulty contact (plug connector, socket, etc.).</li> <li>• Lamp devices (ballast, ignitor, transformer, etc.) defective.</li> <li>• Mains (supply) voltage less than 200 volts.</li> <li>• Water temperature too low.</li> </ul>
<i>UV intensity too low</i>	<ul style="list-style-type: none"> <li>• UV absorption too high (bad water quality).</li> <li>• UV lamps reached "end of life".</li> <li>• Cleaning procedure necessary.</li> <li>• Moisture or dust inside quartz module.</li> <li>• UV sensor or sensortubus faulty.</li> </ul>
<i>UV intensity display reacts "confused"</i>	<ul style="list-style-type: none"> <li>• Air bubbles within water.</li> <li>• Analog output signal overloaded.</li> <li>• Mains voltage or water quality (UV absorption) permanently altering.</li> <li>• Sensor signal or electronics influenced by a strong external source of interference (frequency converter "oldtimer", devices with pulse current, etc.).</li> </ul>
<b>&gt;Cabinet Overtemperature&lt;</b> <i>is displayed</i>	<ul style="list-style-type: none"> <li>• Room temperature more than 30 °C.</li> <li>• Filter mats have to be cleaned.</li> <li>• Fan or thermoswitch defective.</li> </ul>
<b>Only systems with electronic wiping system (EWS):</b> <b>customer terminal</b> <b>X11/23;X11/24</b> <b>&gt;WIPER FAILURE&lt;</b> is displayed	<ul style="list-style-type: none"> <li>• Wiper motor overloaded/defective.</li> <li>• Wiper stopped before reaching the proximity initiator &gt;44&lt; (can be moved manually by rotating the coupling &gt;42&lt; counter-clockwise).</li> <li>• Wiper proximity initiator &gt;44&lt; defective</li> </ul>

If there are any questions or problems you can not solve, please contact us.

**VII. ERSATZTEILLISTE / PARTS LIST**

Typenreihen / Series BX, LBX, BX-EW (optional) LBX-EW (optional)

Revision - 07.01.2005

<b>Benennung / Item</b>	<b>Type</b>	<b>ID Code</b>
Elektronisches Vorschaltgerät ( EVG Fix Power V1.0 )	EVG 269036k-EL EVG 55-II HP	39593 40258
Filterlüfter	SK 3150	14355
Ballast Interface Board ( Aqua ) ( nur BX 30 )	BIB Aqa	39450
Ballast Interface Board BX	BIB BX	39719
VERSTÄRKER + AUSWERTEELEKTRONIK / ELECTRONICS	KOME	40715
TASTATURDISPLAY / OPERATOR PANEL	TADI	35171
Ausfall Kontrolleinheit	AUKO	35169
HAUPTSCHALTER / MAINS SWITCH 25A	P1-25	17541
THERMOSCHALTER / THERMO SWITCH Ö-50°		14579
RELAIS / RELAY 230VAC	RM730L 40.51	25730 35750
RELAISOCKEL / RELAY SOCKET	94.84.1	41524
RC-MODUL	RC-DIL Finder	29888 35452
WAHLSCHALTER / SELECTOR SWITCH	WRK 3	35843

