

Royal Exclusiv

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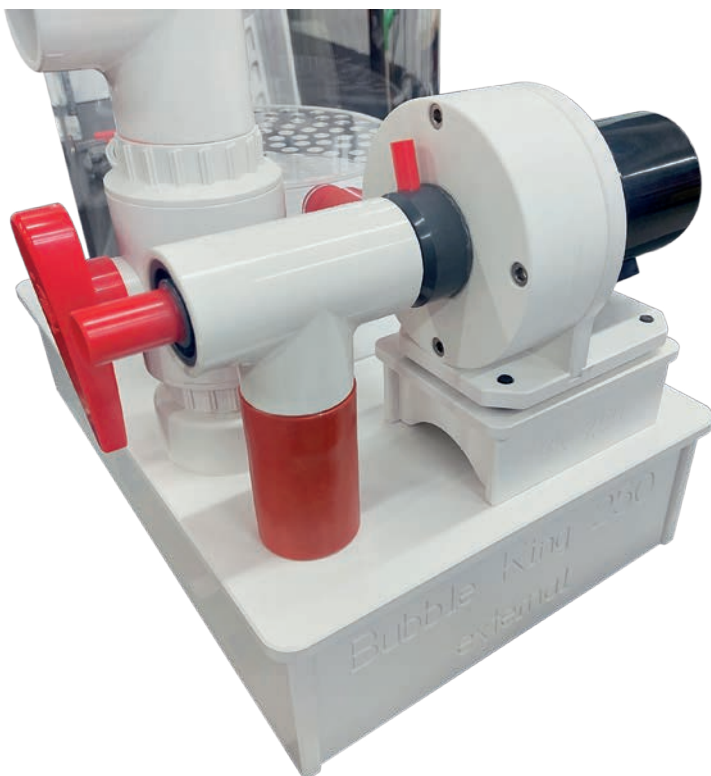


Operating- and maintenance manual Bubble King® DC 24V pumps

For all Red Dragon® Bubble King® DC 24V skimmer-, filter- and flow pumps with controller

v1.0

ENG



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Since 1986



The overview of the Red Dragon® Bubble King® DC 24V pump - family



**Bubble King® DC 24V internal
skimmer-pump with air - and ozone - connection**



**Bubble King® DC 24V external
skimmer-pump with air - connection**



**Bubble King® DC 24V
with control unit
max. 67W, with RPM and wattage display**



For more information, please visit: www.royal-exclusiv.de.

Simply enter the part number or name into the search box or email: info@royal-exclusiv.de.

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Operating- and maintenance manual for Bubble King® DC 24V pumps

For all Bubble King® DC 24 V skimmer-, filter- and flow pumps with and without controller

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Important Notice

Please read this manual carefully before you install the device. We recommend not to proceed the installation of the device until you read the manual. This prevents any questions and problems that might occur in installation process. As soon as you power-on the pump for the first time, you agree that you read and understood this manual. In doubt or if anything is unclear please contact your supplier/vendor or dealer before you start-up the pump.

1. Defects and claims for compensation, disclaimer

1.10. Defects and claims for compensation

1.11. Barring any further claims we are only liable that the supplied goods are free of defects until the initial transfer of perils. Insignificant variations of the contracted appearance and workmanship or marginal limitation of the usability or suitability of the product are unremarkable.

The warranted condition, endurance and usability the product is solely subject to the specification agreed in writing, in the product specification and / or in this manual. Further oral agreements, especially from preliminary talks, advertising and / or in related industrial standards will be only valid as integral part of a written contract. Only conditions and specifications assured specifically by us are valid. We do not accept conditions or specifications made by third parties. Specifically the specification assured in this manual are valid. If the customer wants to use the product for other than the intended purpose, he is obliged to thoroughly check the suitability of the product for the other purposes. We give no warranty and no liability accrues for any applications that are not agreed on by us explicitly and in written form.

Any manipulation of the pump, the impeller or the electronic as well as any attempt to modify the software, to influence the software or to read out or re-engineer the software of the driver unit immediately causes a loss of warranty and all claims and rights expire. We point out that the controller software is protected by security mechanism. Any attempt to read out the software will instantly result in the execution of a data-erasing program. The software of the pump then is deleted and has to be recovered by the manufacturer.

Every user is held responsible for the appropriate usage of his **Red Dragon® Bubble King® DC 24V (BKDC24V)** pump. The user manual does not discharge you from your liability for a safe, appropriate and secure application, installation, operation and maintenance.

By using this manual you agree that in no circumstances the manufacturer can or will be held liable for any personal injuries or property damages which possibly occur due to the usage of the device. This applies specifically for any damages that are due to inappropriate piping or plumbing. Insufficient or missing cleaning- or maintenance intervals and damages that might result due to these are not covered by warranty. This applies especially for calcinations (salt water usage) and accumulated foreign particles (pond usage) such as sand or gravel, which lead to damages on rotors, bearings, rotor housing or motor housing, that are not covered by warranty.

1.12. Our warranty for defects is strictly limited to supplementary performance. This is upon our choice either removal of defects or replacement delivery free from defects. In the case of challenge, impossibility or failure of the supplementary performance the customer has the right for impairment or the right to withdraw from the contract.

Additional expenses which arise because the customer has brought the sales item to another place than his subsidiary. The manufacturer explicitly limits the warranty to the pump itself. We are not liable for consequential damages, or damages that are caused by a malfunction or failure of the pump, such as a loss of animals. It is in the responsibility of the customer to provide back-up devices for the case of a potential malfunction or failure of the pump.

1.13. The customer has to check the goods immediately thoroughly, also for product safety. Apparent damages have to be reported in written form immediately. Hidden damages have to be reported immediately after their discovery. The customer is liable to report transport damages within 24 hours to the carrier and/or the delivery service. Disregarding the rules for checking and reporting results in a loss of warranty.

1.14. Furthermore we are not liable for the consequences of inappropriate application, usage, maintenance and handling of the product by the customer or his subsidiaries, neither for normal abrasion. This applies specifically to the consequences of thermal, chemical, electrochemical or electrical influences as well as for infringements against our uses- and maintenance manuals. The same applies to damages which are the result of changes or adjustments by the customer which have not been approved by us in beforehand.

1.15. Our liability for wanton negligence is limited to claims of injury of life, body and health, to claims based upon the law on product liability and to claims from culpable fundamental breach of the contract which peril contractual obligations. For the rest our liabilities for wantonly negligent breach of contractual obligations, which are foreseeable at the time of the conclusion of the contract, are barred.

Damages, which are unambiguously attributed to inappropriate usage of the product, are in general to be accounted for by the customer. In the case of returns of the product the customer has to use break-proof packaging for the product. The customer is liable for any damages that can be accounted to an inappropriate packaging.

1.16. Claims against us become time-barred within a year after the initial delivery of the goods to the customer. The same applies to claims for damages regardless of their juridical cause. The limitation period does not apply to claims based on the malicious concealment of damages from the injury of life, health or body and for other damages that result out of intention or wanton negligence.

1.17. If it becomes apparent during our examination of damages reported by the customer or in the course of our removal of defects, that the reported damages or claims were made wantonly negligent or unwarranted, we may charge an adequate consideration for our examination and for the removal of defects. The customer has the right to neglect a necessary repairing and to demand the return of the pump. In general every examination of damages is bound to lump-sum compensation if it occurs that the customer has to be accounted for the damages.

1.20. Spare parts

Our liability to deliver and hold spare parts available is limited to the period of 5 years after initial shipment of the product. Our respective list prices apply for spare parts.

1.30. Disposal

We offer our customers to take back products that fall under the restriction of hazardous substances directive (ElektroG) within Germany free of charge, for products, which were brought into circulation after the 13th of August 2005. We will take care for the disposal. If a customer chooses not to let us take care for the disposal, he takes the responsibility of a disposal according to legal regulations and discharges us from our liabilities according to §10 sect. 2 ElektroG and any associated liabilities of others.

1.40. Subject to alterations

The manufacture has the right for changes in hardware and software of the product at any time without preliminary notice, as long as these changes advance reliability or quality of the pump. No claims can be made if for instance design, functionality or performance of the pump changes elementary. The assured specification of the pump is always guaranteed.

2. CE Manufacturer's declaration

The manufacturer assures, that the products of the **Red Dragon® Bubble King® DC 24V (BKDC24V)** pump series comply with the following EWG-directives, when installed and uses according to this manual:

Machinery Directive (98/37/EG)

Electromagnetic compatibility (89/336/EEC)/(73/23/EWG (95)

EN ISO 12100

Safety of machinery

EN 61000-6-2

Electromagnetic compatibility

EN 61000-6-3

Electromagnetic compatibility (EMC)

EN 60335-1:2002

Specification for safety of household and similar electrical appliances.

EN 60335-2-41:2003

Household and similar electrical appliances. Particular requirements for pumps.

EN 60335-2-55:2003

Specification for safety of household and similar electrical appliances. Particular requirements for appliances for use with aquariums and garden ponds. Household and similar electrical appliances. Electromagnetic fields. Methods for evaluation and measurement.

EN 50366:2003

Household and similar electrical appliances. Electromagnetic fields. Methods for evaluation and measurement.

EN 55014-1:2006

Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Emission.

EN 55014-2:1997

Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Immunity. Product family standard.

2.1. Manufacturer

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Made in Germany

Royal-Exclusiv® EAR-Nummer: WEE.Reg.Nr. 83082352

2.2. Formal obligation

Titanium parts are made out of saltwater resistant pure titanium, grade 2. All plastic parts are made from ozone and UV resistant material. The wiring is saltwater resistant. The stator casing, the raw mantle and the bearing rings are made from saltwater resistant material. The parabolic rubber feet are made from 30 shore soft, saltwater resistant natural rubber.

3. Scope of delivery / Before installation

Pump model and specifications:

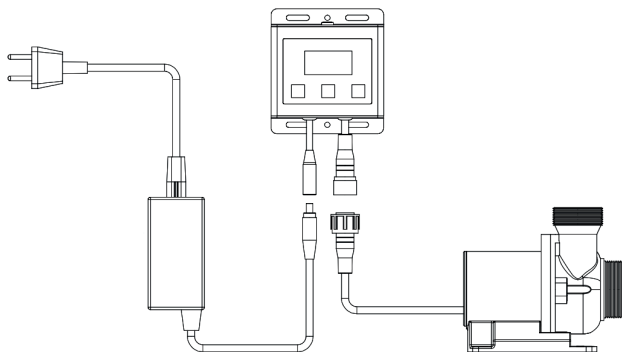
Model BKDC24V	Water intake (L/h) max. 7.500	Air intake (L/h) max. 2.500
Voltage(VDC) 24V	Watt(W) max. 67	Ampere(A) max. 2,8
Current 100 - 240V AC		Frequency 45-65Hz

Included in delivery (Please check!):

- 1× Power supply
- 1× Pump Controller / Control unit
- 1× Pump motor block with rotor
- 1x Nozzle 1500 or 2500 L/h Air-intake
- 1× Fittings (25mm/32mm Outtake, depends on Model)
- 1× Manual

When unpacking the pump, check that all parts are complete and undamaged. Any damage found must be reported to your supplier within 24 hours of purchase.

Schematic of the connection of the Red Dragon® BKDC24V



3.1. Before installation

Attentions: Before installing the pump, you must read this guide carefully. Damage caused by non-compliance with the instructions is not covered by the warranty.

This will prevent questions and problems. As soon as you turn on this pump, you confirm that you have read and understood this guide. If you do not understand something, please contact your supplier/dealer before commissioning.

4. Quick installation Red Dragon® Bubble King® DC 24V with speed control

The pump has a DC motor and therefore is equipped with a driver unit. Die **Red Dragon® Bubble King® DC 24V (BKDC24V)** pumps may only be operated with an ELCB (earth leakage circuit breaker)!!

Electrical grounding of the wiring of the **Red Dragon® Bubble King® DC 24V (BKDC24V)** pumps is **absolutely mandatory!** Bridge circuits or grounding over neutral conductor are not permitted and might cause inductive fault current up to 50 Volt!

Setting-up operation has to take place in the following order:

1. Thoroughly purge the pump, to remove the disinfectant.
2. Place the pump below the water level. (The pump is not regenerative).
3. Insert power plug. Caution: The electrical socket needs to be grounded.
4. Keep hole of the pump during the test run. Danger of blowback!
5. The pump starts immediatly (softstart).
6. Use the buttons (red arrows) to adjust the revolutions per minute.



Note: The pump controller / controller has a key lock, which activates after some time when not pressed. After starting/turning on the power, the hours of operation are displayed. This is followed by the jump to the regular display. Current set watts, amps, revolutions. The "Up" and "Down" buttons control the power in different wattage increments.

For more information, please visit: www.royal-exclusiv.de.

Simply enter the part number or name into the search box or email: info@royal-exclusiv.de.

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Watt / Ampere /
rotation speed
indicator

Speed-
regulation



Setting the watts up to max. 40W is sufficient for
skimmer models 180 + 200. Max. 67W only possible/
necessary for larger models from 250 on

5. Functions of the Red Dragon® Bubble King® DC 24V

Memory:

In the event of a power failure or shutdown of the pump,
the last set values will be restored.

Dry run:

If the pump runs dry, the controller shuts down after 15
seconds to prevent engine damage.

Speed:

The pump can be adjusted in 2 watt increments.

LCD Screen:

The large LCD display shows the revolutions per minute,
power and power consumption and possible errors.

On/Off:

The pump can be switched on or off via the speed buttons.

Installation:

We recommend using the pump submerged.

Protective devices:

In case of overheating, overvoltage, undervoltage and
blockage.

0-10V:

Monitoring and setting of the speed via external computer /
control unit, e.g. GHL ProfiLux or Apex possible.

6. Operation Red Dragon® Bubble King® DC 24V

Never: disconnect the pump and controller of the
Red Dragon® Red Bubble King® DC 24V (BKDC24V)
plug in or unplug under voltage (during operation).
In this case, the pump can be permanently damaged,
the warranty expires immediately!

Controller can be adjusted in 2 watt increments. The large
LCD display shows the operating hours, instantaneous
power, power consumption, speed, possible faults, etc.

The controller has 3 push buttons, TOUCH

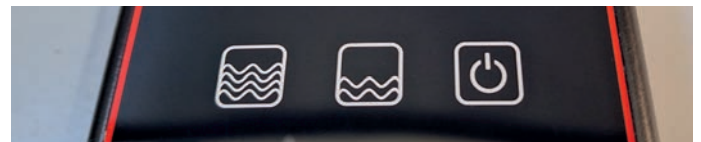
S1 (Wave symbol large): Speed up/start;
S2 (Wave symbol small): Speed down/stop
S3 (On/Off): Pause/switch on/off switch

Plug in the plug from the power adapter, LCD display
starts and displays the operating hours of the pump.

The display turns off after a 3-second pause in input.
Tastensperre // Key Lock

Link to the Video: Key lock on/off

<https://www.youtube.com/watch?v=aB2U0PZNys0>



Set key lock,

Press and hold the power button and the wave icon small

Release the key lock,

Press and hold the power button and the wave icon large

then the power can be adjusted

Start: When S1 is pressed, the pump starts at the last set
speed within 10 seconds.

Speed Up: Press S1 to increase the speed, the LCD will
display the power, power consumption and revolutions. By
pressing S1 for a long time, the pump starts up until the
maximum power is reached.

Speed Down: Press S2 to lower the speed, the LCD will
show the power, power consumption and revolutions. By
pressing S2 for a long time, the pump shuts down and
shuts down.

Switch off:

During operation, press the S3 button 2x to turn off the controller. 1x actuation of S3 while the pump pauses, shuts down the controller.

Pause:

1x actuation of S3 stops the pump for 30 minutes, after which the last set value is approached.

Soft Start:

The pump needs 10 seconds to reach maximum performance.

Dry run protection:

The controller automatically detects whether the pump is running with water or without water. If the pump is running without water, the pump will automatically switch off after 15 seconds to prevent damage.

Reboot:

1x actuation of S1 restarts the pump after an error.

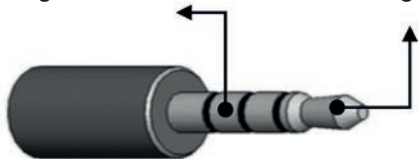
Memory:

If the pump is switched off, the last set value is saved.

0-10V Interface:

When the controller is connected to a computer/control unit with 0.5-10V, the buttons are disabled.

Negative - segment 3; Postive - segment 1 ;



6.1. Field of applications / uses

The most common use case for the **Red Dragon® pumps** are in the context of filtration systems (aquariums, ponds or swimming pools) and/or to supply a beck/creek or waterfall. The pump is not self-supplying and therefore can be used above the water surface and only in combination with a backpressure valve on the inlet pipe. In this case the pump has to be filled with water before it is set into operation.

Temperature of the liquid : +2 to +40°C.
Environment temperature : 0 °C to max. +50 °C
Max. working pressure : 2bar
(20m head of water)

6.2. Installation

Caution:

Before you install the pump you have to read the manual thoroughly. Damages, which are caused because the manual was not read thoroughly, do not fall under warranty.

When unpacking the pump, check whether all parts were delivered completely and undamaged. Detected damages have to be reported within 8 days after the purchase of the pump at your retail location. When unpacking the pump, it is possible that the inside of the pump is wet. The pump is tested before it leaves the factory.

Prior to its packaging the pump is treated with a biodegradable disinfectant in order to neutralize possibly present bacteria. The pump therefore has to be purged with water thoroughly before usage.

Please check the pump for damages before you set it into operation. Should the pump have damages it may not be set into operation. Please inform your retailer immediately if the pump is set into operation even though it is damaged, any warranty and liability is void.

Pull the plug electrical socket and make sure that the pump cannot be switch on. During the course of the installation the pump may not be connected to the power supply. To avoid injuries take care to not reach into opening of the pump with your hands or fingers, when the pump is connected to the power supply.

6.3. Control unit / Controller

The controller may not be used outdoors. It is only approved for indoor usage. Furthermore the controller may not be opposed to direct sunlight or direct heat sources (powerful lamps, central heating etc.). Adequate air ventilation has to be assured. Therefore a minimal distance of 10cm to each side from the next cabinet/shelve has to be assured. An adequate air ventilation of the room has to be assured.



6.4. Error code display

Red Dragon® Bubble King® DC 24V (BKDC24V)

Protective devices:

In case of overheating, overvoltage, undervoltage and blockage.

Error code LCD:

Er 1: Dry run ////

Er 2: Undervoltage ////

Er 3: Overvoltage ////

Er 4: Blockade ////

Er 5: Overload / Over current ////

The safety shutdown occurs when foreign objects obstruct or block the pump operation.

The power supply is interrupted while the pump is running. (This is safe and not a problem for the pump electronics)

Er 1 : Dry running detected. Becomes active at higher speeds in operation without sufficient water flow. The dry-running protection ensures that the bearings are not damaged. A restart takes place after a short pause (approx. 10 seconds). In case of

continuous dry running, the pump stops after 5 attempts.

The LCD display shows existing faults with the diagnosed error code. If the problem is solved, please restart the pump by pressing S1. If the pump cannot be restarted, please unplug the power supply completely and wait until the display of the controller goes off, plug it back in and restart.

- *Er1 at Display:* Check the pump, test the free movement of the rotor, pump is in water and has not run dry?
- *Er2 at Display:* Check power supply and voltage
- *Er3 at Display:* Please contact customer service/support

The pump should be used in pre-cleaned water, otherwise please use suction protection or slotted pipe to avoid the suction of foreign objects. Please clean and check the pump at regular intervals. To do this, loosen the 4 screws on the pump head with a suitable tool. We recommend pulling out and cleaning the runner / wheel unit every 6 months.

7. Maintenance + cleaning of Red Dragon® Bubble King® DC 24V pumps

Disconnect the pump from the power supply prior to each maintenance work. **Red Dragon®** supply- and flow pumps are essentially to be classified as low-maintenance. Usually the necessary maintenance work is limited to a check of the impellor for obstruction. Remove obstacles from the impellor with a slim and spiky tool.

A decreasing supply rate is often the result of dirt. Possible calcinations (especially in saltwater applications) has to be removed with a very soft acid as for instance vinegar. Avoid applying pressure to the sides of the impellor or the rotor. The pump can be disassembled nearly completely for cleaning.

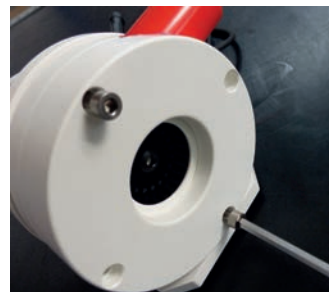
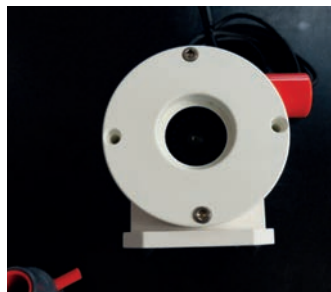
In freshwater- and saltwater applications calcification only appears in very hard water and after a complete re-filling of the pond. After this the largest amount of carbonate will be omitted within 2-3 days.

To dismount the pumps head from the engine, unscrew the M5 hexagon socket titanium screws with a matching spanner. When this is done the whole pumps head can be removed. If necessary the impeller unit can be removed, by

cautiously pulling on the rotor with. When you pull on the rotor, be very careful, as the impellor is held in its position by the magnet. If you release the rotor while trying to pull it out, the bearing can get a serious damage.



Use fitting hexagon key to loosen the 4 screws from the case.



Do not underestimate the power of the magnet.
If you slightly lose the grip and the axis hits the rear bearing, the risk to damage the bearing is very high.
A damage bearing causes high reparation costs.

Grab rotor and and cautiously pull out completely.
Check parts for calcification.

The nozzle must also be checked for calcification / dirt deposits, deposits can reduce the air intake / performance



After maintenance you can assemble the pump in reversed order. Please pay attention to first only loosely fix the in crossed over order and then fix them semi-solid (hand tight).

For the usage of a cordless screwdriver see the picture. The O-seals of the pump are made from silicone or EPDM/ Viton, depending on the application.

Please use only fresh and original O-seals with the correct thickness and hardness as replacement. When O-seals are aging, the hardness slightly changes. When you re-assemble the pump, the O-seals should always be replaced by new ones. This will increase the lifespan of the pump. Silicone and EPDM / Viton O-seals are resistant against acids and bases.

7.1. Decalcification, cleaning and assembly of the Red Dragon® Bubble King® DC 24V pumps

Decalcify the pump completely. Please **do not use** hydrochloric acid, **not even in extenuated form**. This may damage the pump beyond repair. Suitable substances are: formic acetic phosphoric acid or common deliming agents for water purification appliances like coffee makers. Insert

several hours depending on the concentrate/dilution. The containment shell of the motor must also be delimed. After the decalcification purge the pump with clear water. Re-assemble the pump.

Very important: Tighten the screws loosely crossed over and the fix them semi-solidly (hand tight).

7.2 Improper use of the Red Dragon® Bubble King® DC 24V pumps

Connect the pump **only** to the supplied power supply.

Do not operate the pump in flammable liquids. Can only be used in fresh, brackish, salt water, **not** above 40°C.

Do not operate the pump below a water depth of 1.5m.

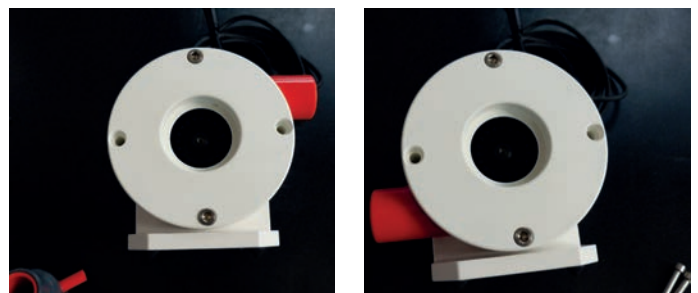
Children are **not** allowed to use or play with this pump without supervision.

The controller or connector must **not** be wet or even submerged.

Please **do not** put fingers or other objects in the pump openings.

Please **do not** pull on the connection cables of the pump, controller or power supply.

7.3. Turning of the pump head of the Red Dragon® Bubble King® DC 24V pumps



The pump head of **Red Dragon® Bubble King® DC 24V (BKDC24V)**, can be rotated in three directions.

7.4. Power outages and emergency power supply

After a blackout the pump will start automatically and the controller will set up the last chosen speed.

The pump can used on a commercial emergency power supply or a commercial UPS, which is fitted with a rectifier package.

8. Improper usage

This manual is indented to inform you correctly und exhaustively, i.e. also over potential risks caused by the pump. The user, fitter and maintenance technician is responsible to check the compliance with the procedures and advises in this manual. The **Bubble King® DC 24V (BKDC24V)** are built with state-of-the Art technology and to comply with existing safety regulations. Nevertheless this device may cause risks for individuals and for property, if it is used improperly or not regarding to its designated use, or if safety advises are ignored.

If the pump is used improperly, the liability of the manufacturer and the operating permit are void. For safety reasons children and juveniles younger than 16 years as well as people who do not recognize possible risks or who are not familiar with this manual may not use the device. **Please preserve this manual carefully. In the case of a disposal please hand over the complete manual.**

The combination of water and electricity can be a serious threat to life and limb, when not installed according to directions or when used improperly.

Only use the device when no body parts have contact to the water! Before you reach into the water always disconnect the pump from the power supply. Compare the electrical specification on the type label of the device with the specification of the power supply. Make sure that the device is connected to an ELCB (earth leakage circuit breaker) with an assigned leakage rating of max. 30 mA (DIN VDE 0100T739). Only operate the device on a correctly installed power plug.

Keep the power plug and the wiring dry! Install the wiring protected in order to avoid damages.

IT IS NOT ALLOWD TO CUT THE WIRING OR THE POWER PLUG. DOING SO WILL IMMEDIATELY VOID ALL WARRANTY AND LIABILITY OF THE MANUFACTURER.

Only use wiring, installations, adapters, extension cables and connection cables with grounding-type plugs, which are approved for outdoor usage (DIN VDE 0620) with sufficient cable diameter. Do **not** pull on the wiring of the device and to not use the wiring to carry the device! If the wiring is **damaged or broken** the device may **no** longer be used! Repairation is not possible as the wiring is perma-

nently grouted in the engine housing. Take care that the power plug never falls into water or gets wet. If the plug gets wet in any kind, it has to be opened by a professional and cleaned by purging with demineralised water. Protect the plug and the wiring against heat, oil, UV light and sharp corners. The manufacturer is not liable in any way for any damages, which are made by improper installation or by the carelessness of the user or installer. **In general, when put out of service, the pump has to be cleaned extremely thoroughly. Before it newly brought into service the ease-of-movement of the impellor has to be checked by hand. If the impellor cannot be moved round by hand, the pump needs to be disassembled and cleaned completely. It is forbidden to disconnect the plug from the controller / pump while the device is in use.**

This can result in serious damages to the electronic components and to dangerous situations due to grounding problems. The controller may exclusively be connected and operated on an ELBC protected wiring (30 mA rating) and into a grounding receptacle.

The wiring may not be modified or replaced. Electrical installations always have to be compliant and according to national and international directives and requirements. Never open the case of the device or of the appending parts if this is not explicitly suggested in the user manual. Never apply technical modifications the device. Only use original spare parts and accessories. Let only authorized customer service facilities conduct reparations. Never use the pump with other liquids than water. If you have any questions or problems consult an electrician, your dealer or the manufacturer **Royal-Exclusiv®**.

Always disconnect the pump from the power supply before working on it.

Never use the device without water throughput. The pump will automatically start when the power connection is established, unless you press the "Stop" button. Then you can only start the pump by pressing the "Start" button. The pump will then automatically accelerate to the last chosen power setting.

And now we wish you much pleasure with your **Red Dragon® Bubble King® DC 24V (BKDC24V)** pump. A regular maintenance guarantees a long running and thus life.