



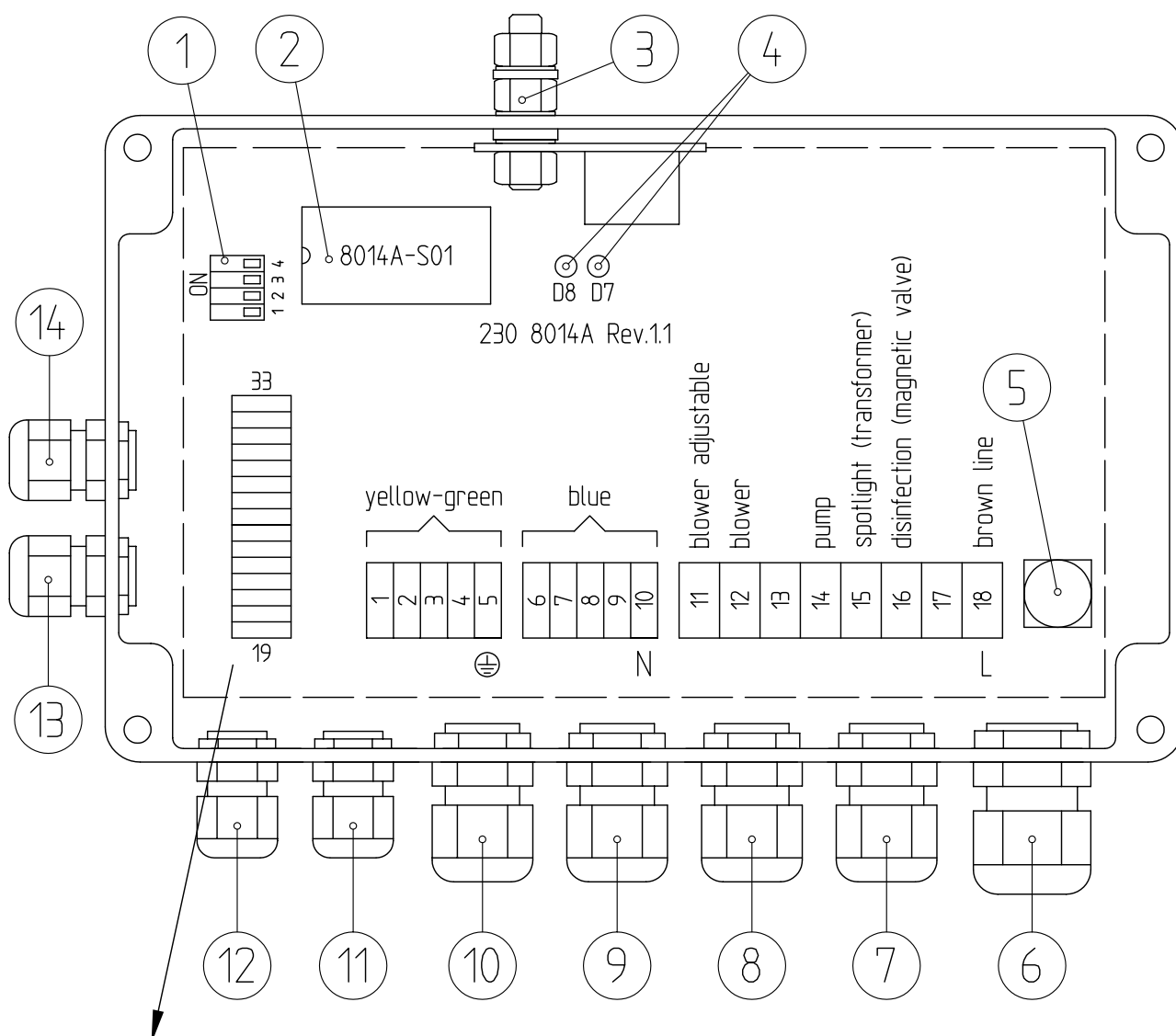
# Whirlpool Control Mechanism

Type 230 8014A-S01

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Type 230 8014A-S01  
0422 Rev.1  
Ing. Aigner A.

# WHIRLPOOLCONTROL TYPE 230 8014A-S01



TLS-dis.	TLS	switch	whirlpool
33			common
32			air
31			plus
30			minus
29			water
28			light
27			disinfection
26			bottle empty
25			common
24			blue
23			brown
22			+12V black
21			blue
20			brown
19			+12V black

- |                               |                                   |
|-------------------------------|-----------------------------------|
| 1 DIP-switches for settings   | 8 spotlight                       |
| 2 micro-controller            | 9 pump                            |
| 3 potential equalisation lead | 10 blower                         |
| 4 LED for control             | 11 switch whirlpool               |
| 5 fuse holder (T16A)          | 12 TLS whirlpool                  |
| 6 mains voltage supply        | 13 TLS disinfection liquid bottle |
| 7 disinfection                | 14 switch disinfection            |

## Technical data

Nominal voltage	230V AC 50 Hz
Total connected load	max. 3600W
Switching current	
each channel (relay)	max. 8A
channel adjustable (triac)	max. 6A
System of protection	IP55
Housing dimensions	200x120x60 mm

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## 1 General Information

This control mechanism has 4 outputs. The output for disinfection (16) is provided for the magnetic valve of disinfection, the output for the spotlight (15) is provided for the transformer of the spotlight and the output for the pump (14) is provided for the pump. The output for the blower (12) is planned for connecting up a blower that is only switched on and off. It is not possible to regulate this output. The output (11) can be regulated by the phase control mechanism and can be loaded with a maximum of 1.3 kW. It is designed for regulating the speed of the air blower. Only the inverse-speed motors, transformers and consumers drawing resistance (such as light bulbs) can be connected to the adjustable output. It is not possible to control condensator motors and alternating current motors with accelerating coil with this control mechanism. Operating elements and sensors are connected to the 5 V or 12 V control voltage (safety extra-low voltage, SELV). You may operate the whirlpool by means of the push-button on the edge of pool. All of times listed in this description are reference values. Should any modifications be made on the equipment, the warranty claim will expire.

( ).....terminal designations

### 1.1 DIP switch description

S1	minimum speed for the blower
S2	minimum speed for the blower
S3	quantity of disinfectant
S4	interval ON/OFF

## 2 Description of the Status Display(LED) on the Push-Button

Is the control mechanism connected to the power supply, the status display (LED - Light Emitting Diode) from the pump or blower symbol flashes on every 8 seconds for the time of 0,5 seconds → „supply voltage existing“. If the pool is filled with water (TLS height), the flash-rhythm from the status display changes to a steady flashing of 0,5 seconds → „pool ready“. After the „pool ready“ signal appears all functions could be used. Is a function active the LED from this function lights. If a function is active after the pool is empty (depends on the variant for instance the dry out with the blower), the speed of the flashing from the status display on the push-button changes to a double flashing with a break of 0,5 seconds. When all of the functions have ended, the status display shows the flashing function of → „supply voltage existing“

## 3 Description from the Limiting of the Running Time

This function is also called the OFF-TIMER. Automatic switch-off is a function that protects the whirlpool against functioning without supervision.

When the status display shows the „pool ready“ signal and the control mechanism registers that a button has been pressed for the first time, the switch activates the 20 minutes running time limit. You may use any of the whirlpool functions during this time as much as you desire. All of the aggregates are switched off when the running time limit is reached regardless what function is activated. If all of the functions are switched off during this time, the running time limit will also be set back. Pressing a button again starts this time again. Then the aggregates can be switched on again immediately after automatic stop. When the button is pressed for the first time, the running time limit is started again. Automatic functions such as the dry out or disinfection (depending on the design) are not included in the running time limit.

## 4 The Dry Running Protection System TLS

This system consists of the capacitive proximity switch (dry running protection sensor - TLS) whose maximum switching distance (pool wall thickness) is 20 mm. The TLS is mounted on the outside of the pool with a suitable bonder such as silicone.

The TLS has to be connected because the whirlpool must not be put into operation without water. Otherwise, the pump shaft seal or the spotlight could be damaged as a result of too little cooling. Furthermore, the pool surface could be deformed.

The switching status of the TLS is displayed directly on the TLS and in the control mechanism in each case by a LED. If there is a lack of water, the LED (D8) in the control mechanism lights. The LED of the dry running protection sensor works inverted. If the water comes under the required waterlevel the aggregate will be switched off automatically after approximately 5 seconds and they can not be switched on again. If there is no TLS connected, the control mechanism operates normal like the pool is full. The LED (D8) does not light.

### designations for connections:

black	+12 V <sub>DC</sub> max. 50mA
blue	GND
brown	signal output L-level → water existing H-level → water away

H-level → High-level, L-level → Low-level

## 5 Settings

### 5.1 Adjusting Minimum Speed

It is necessary to adjust the proper minimum speed because the air flowing into the whirlpool is simultaneously the cooling air for the blower. If the speed is too low, i.e. if the blower motor rotates so slowly that there no air is flowing into the whirlpool, it may happen that the motor windings burn off as a result of too little cooling. The minimum speed of the blower can be adapted to the pool by the DIP switches S1 and S2 (refer to Figure of Position 1).

How to adjust it: Fill the pool to the maximum, switch on the blower, push the „minus“ push-button for approximately 10 seconds. Afterwards, the air has to flow out of approximately 50 % of the built in air nozzles. If this would not be the case, switch off the blower and change the switch position in accordance with Table 1. Restart the blower and check the minimum speed. Should the desired value has not been reached, repeat the process again as described above.

table 1

S1	S2	Minimum Speed
OFF	OFF	1. Stage (Minimum)
ON	OFF	2. Stage
OFF	ON	3. Stage
ON	ON	4. Stage (Maximum)

### 5.2 Adjusting the Interval



You may adjust the interval using the DIP switch S4 (refer to figure position 1).

In the interval mode the aggregates switch „ON“ and „OFF“ in a 2 seconds rhythm. For the regulated output (pump or blower) it will be varied in the rhythm minimum – maximum – minimum and so on. A period is passed through in 8 seconds.


The function of the aggregates if a push-button is pressed (valid for the symbols air, water, light) works as follows.

pressing the button	S4 in the „ON“ position	S4 in the „OFF“ position
pressing the button for the first time	aggregate - ON	aggregate - ON
pressing the button for the second time	aggregate - interval	aggregate - OFF
pressing the button for the third time	aggregate - OFF	refer to first time
pressing the button for the fourth time	refer to first time	

## 6 A Description of the Disinfection Unit

The pool has to be filled with water for starting up the disinfection unit (at least 5 cm above the side nozzles - refer to section Status Display). Furthermore, it is possible to use the water from the previous bath. Beyond this, it should be checked whether disinfectant is in the storage tank. If the storage tank is empty, the LED control lamp lights up on the push-button with the symbol  (in the control mechanism D7). This goes off again when it is filled with a bottle of disinfectant (1 litre) (only use original KOLLER disinfectant, order number 212D-3). As long as the LED with the symbol  lights up on the push-button, the disinfection unit cannot be switched on. Should there be excessive foam formation with the disinfection so that foam escapes over the edge of the pool, close the air regulator.

### 6.1 Starting Disinfection

Keep the  button pressed until the flashing control display (LED) switches over to steady burning light (protection against incorrect usage – child protection). When the waterlevel is high enough, the disinfection process begins. If there should be an error, the LED begins to flash quickly (error signal). In this case, refer to correcting errors.


### 6.2 The Disinfection Process

The pump(s) (also the blower if available) starts up and the magnetic valve opens. One pump suctions disinfectant from the storage tank as long as the magnetic valve is opened. You can adjust the valve's opening time (refer to table 2 for the dosing time) by means of DIP switch S3 (refer to figure position 1). As soon as the dosing time is reached, the aggregates switch off automatically. After 7 minutes the aggregates start again for 30 seconds, however at this time without adding disinfectant. This process repeats itself a couple of times to ensure that the pool is reliably disinfected. The disinfection cycle is finished when the LED on the button goes out. However we recommend to leave the water in the pool for a couple of hours or overnight. Furthermore we recommend to clean it again by hand. Rinse out the pool with the showerhead and fill it with cold water afterwards. Now switch the aggregates on and off shortly. Open the drain and leave it in this position until the next time the pool is used.

table 2


S3	Dosing Period
OFF	30 seconds
ON	60 seconds

### 6.3 Correcting Errors

- |  |  |
|--|--|
| the LED on the button with the  symbol lights up. | there is no or too little disinfectant in the storage tank.<br>refill the Koller disinfectant. |
| the system cannot be started.  | the water level in the pool is not sufficient.   |
| the pump does not suction any disinfectant into the pool   | please call customer service.  |

The error signal can be cancelled by pressing the  button.

### 6.4 Ending Disinfection Ahead of Time

If you want to stop the disinfection process, you can do this by pressing the  button once more.

## 6.5 Application Information

This disinfection unit should only operate with KOLLER disinfectant (order number 212D-3). If you use a different disinfectant, there is the danger that the plastic components will be damaged, furthermore, all warranty claims expire.

We recommend:

1. normal use up to max. 7 applications per week → weekly 1 time
2. more frequent applications require shorter disinfection intervals
3. if the pool was not used longer than 3 weeks, then the pool before next application have to be disinfected

If the bath control shall be used in other, e.g. medical-technology areas (hospital institutions, out-patient department, health cure and rehabilitation institutions etc.), the additional requirements have to be taken into account for the construction of such plants (previous contacting with the manufacturer recommended).

For disinfection it is possible to use the last bath water (however without foam bath additive).  
The drain and overflow fitting must remain open every time the pool is drained.

**Note: It is only possible to disinfect if the pool is filled!!!**

## 7 Connection and electrical installation

Connection, electrical component installation and adjusting operations must only be performed by a qualified electrician or under the supervision and responsibility of such a person (by an electrical installation company authorised for this purpose).

**Note:** If work is carried out on the water installation, the complete control must be switched off and reliably disconnected from the electric power system.

To connect the control to the mains supply, use only a line of type H05VV-F3G1 (medium PVC hosepipe, YMM-J 3x1 mm<sup>2</sup>) or H05VV-F3G2,5 (YMM-J 3x2,5 mm<sup>2</sup>).

Please note when making the connection:

- Work only in the de-energised condition!
- Insulation stripping length at the ends of the conductors: 6mm
- With fine-wire conductors it is possible to use wire end ferrules.
- Keep the earthed conductor extra long so that it is pulled from the terminal after the mains conductors should the pull relief fail.
- Connect the conductors only at the connection points provided for this purpose according to the connection diagram.
- Ensure sound contact to the means of connection (introduce stripped conductor ends fully into the terminals, pull test), especially with the earthed conductor connection.
- Do not accommodate any "conductor reserves" (loops; individual cores where the insulation stripping length is excessive etc.) in the control box.
- Then check the correct connection of the entire device. Faulty connections can result in the equipment being destroyed or impair the intended safety measures!

To maintain the type of protection **IP 55**

- completely introduce the outer sheathing of the lines (jacket) in the attachment screw connection,
- properly secure the acorn nuts of attachment screw connections (open-end wrench),
- unused introduction openings closed or blanked off with insulating material,
- line introduction openings arranged downwards or laterally and
- housing covers reinstalled properly.

Cut all lines leading to the control to size such that all electrical parts are easily accessible and can be removed for repairs. Upon installation and attachment ensure that the insulation cannot be damaged or squashed by sharp edges or burrs, heated-up or moving parts.

Strictly adhere to the connection requirements of the local power supply companies and the additional requirements in terms of establishing power systems, especially such for "bathrooms" (protection area, potential equalisation etc.).

DE: DIN VDE 0100-701 (VDE 0100 Part 701)

AT: ÖVE-EN 1, Part 4 § 49/1980 and 1996

Attach all electrical components so that only parts are accessible to persons in the bath, which are supplied with 12V low safety voltage. Also ensure that electrical equipment is installed, attached and secured so that it cannot fall into the pool.

Furthermore in the case of the connection of the whirlpool have to be provided:

- A separator which makes possible switching the electrical circuit all-pole off, space-pole with at least 3 mm of contact opening distance to disconnected from the electric power system.
- Supply over a fault current circuit breaker with at least 25A 230/400 V ~ and maximum rated breaking current  $I_{\Delta N} = 30\text{mA}$ .
- Production of the additional potential equalisation (minimum cross section 4mm<sup>2</sup> copper)

After completion the electrical installation must be inspected and tested (function test) by a qualified electrician. In addition, the effectiveness of the performed protective measures, earth connection and earthed conductor connections, potential equalisation, insulation condition etc. of the newly established system component must be checked and documented.

If the bath control shall be used in other, e.g. medical-technology areas (hospital institutions, out-patient department, health cure and rehabilitation institutions etc.), the additional requirements have to be taken into account for the construction of such plants (previous contacting with the manufacturer recommended).

## 8 Water installation

The connection must only be performed by an officially licensed installation company or under the supervision and responsibility of such a person (by an installation company authorised for this purpose). The installation regulations of the local water supply companies and the provisions of DIN 1988 must be strictly adhered to. A sink trap must be provided for the water connection. In the case of pools with integrated filling a flexible connection hose (armoured hose) must also be provided for the water connection.

**Note:** No rigid pipe connection between whirlpool and water line – breaking hazard!