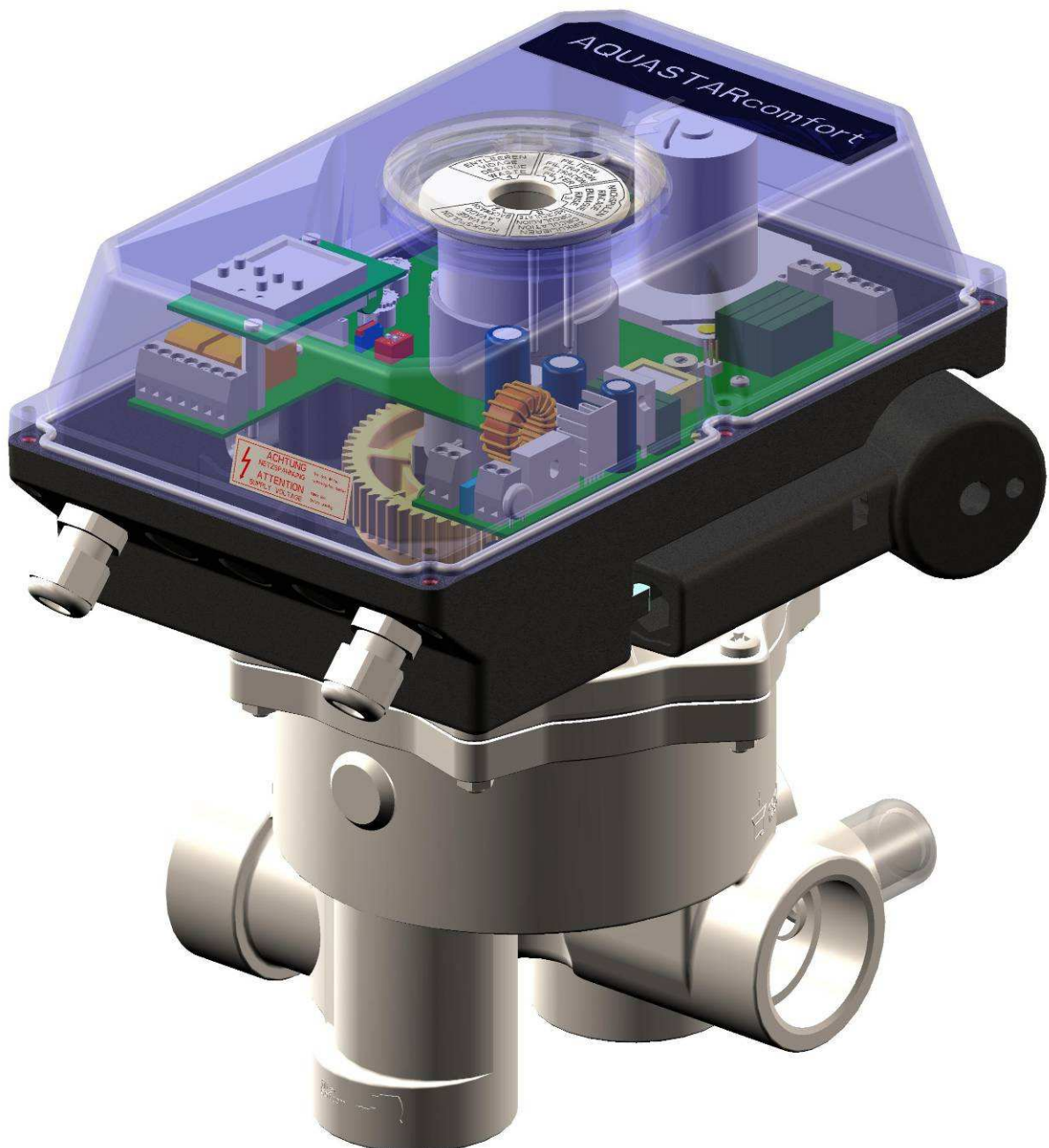


Aquastar Comfort

3000 4000 6000



Zertifiziert nach
certified acc. to
EN ISO 9001:2000





Praher

Aquastar Comfort 3000 4000 6000

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1. Copyrights

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Knowledge of the instructions contained in this operation manual is indispensable for preventing failure and ensuring faultless operation of the Aquastar. Therefore, it is essential, that the person in charge of operating the equipment is familiar with the present documentation.

2. Introduction to operation manual

This operation manual is intended to facilitate familiarization with the Aquastar and utilization of the same for the intended purpose.

This operation manual contains important information for safe, proper and economical operation of the Aquastar. Compliance with these instructions will contribute to

- preventing danger
- reducing repair costs and equipment failure, and
- increasing the liability and service life of the Aquastar

This operation manual supplements the instructions provided by existing accident prevention and environmental protection regulations. It must be available at the place of utilization of the equipment at any time and must be read by each person intending to use the Aquastar. This means

- operation, including
- correction measures in case of faulty operation and
- maintenance

In addition to the operation manual and the compulsory accident prevention regulations applicable at the place of utilization of the equipment, the generally subject specific technical rules must be taken into account.

Service- Center:

Austria	++43 / (0) 7262 / 61 178-0	office.at@praher.com
Germany	++49 / (0) 9171 / 96 77-0	office.de@praher.com
Spain	++34 / 93 / 774 / 16 / 19	office.es@praher.com
Canada	++1 7 705 / 725-1100	office.ca@praher.com
Czech Republic	++42 / 0 / 204 / 637 673	office.cz@praher.com
Benelux	++31 / 184 / 697289	office.nl@praher.com

3. Warranty and liability

Warranty and liability claims in the context of damage to person or property shall be excluded where such damage results from one or several of the causes listed below:

- Improper use of the Aquastar
- Improper installation, putting into operation, operation and maintenance of the Aquastar
- Operation of the Aquastar with defective or improper safety devices
- Non-compliance with the instructions contained in the operation manual for installation, putting into operation, operation and maintenance of the Aquastar
- Unauthorized modification of the Aquastar
- Insufficient monitoring of components subject to wear and tear
- Inadequately performed repair of the Aquastar
- Damage of the Aquastar resulting from foreign matter or Force Majeure

Enduring damage due to neglect of the operation manual or due to damaging sealed parts lead to a lapse of the warranty. We do not take any liability for resulting damages thereof! Please read the operation manual carefully before starting operation.

4. Instructions for safety at work

- Each person, involved in the user's facility, in the installation, dismantling, putting into operation, operation or maintenance of the Aquastar must have read and understood the entire operation manual and, in particular, the chapter 'Safety Instructions'.
- The instruction and warning signs calling attention to dangers must be taken into account!



Dangerous voltage!
This is for your own safety!

5. Safety instructions

- This equipment has been built and examined according to safety precaution for electronic devices and has left the plant in a perfect safety-related condition
- To keep this status and to guarantee a safe operation, the user must observe the safety instructions, which are included in these instructions
- This installation work may only be undertaken by an authorized and licensed installer or electrical business
- This equipment is not intended for it by persons (including children) with reduced physical, sensory or mental abilities or for lack of experience and/or for lack of knowledge to be used it is, it by a person responsible for their security is supervised or received from it instructions, how the equipment is to be used. Children should be supervised, in order to guarantee that they do not play with the equipment.
- The electrical installations must be carried out according to the respective local and regional regulations (e.g. OEVE, VDE,...) and possible official regulations

-
- the electrical connection must have separating device built into the permanently installed electrical installation, which enables the disconnection of all electrical contacts with a contact space of min. 3 mm from the mains. Pay attention that the supply voltage is correctly protected and an earth-leakage circuit breaker ≤ 30 mA is installed.
 - Only use the equipment in dry rooms, in which no combustible gasses and vapors are present.
 - Do not put the equipment into operation immediately if it has been taken from a cold to a warm area. The thereby developing condensation water could destroy your equipment
 - If the equipment has visible damages, does not work anymore or has been stored under adverse conditions for longer periods, then it is to be expected that a safe operation is no more possible. In this case the equipment is to be secured against unintentional start-up and if necessary to be decommissioned.
 - Live parts can be uncovered when opening the cover or removing parts. Before an alignment, maintenance, a repair or change of parts or devices, the equipment must be separated from all voltage supplies, if opening the equipment is necessary. If after that an alignment, maintenance or a repair on the opened equipment under voltage is inevitable, it may only be done by experienced, skilled staff, which has knowledge of the associated dangers and/or the relevant regulations.
 - Capacitors in the equipment can still be charged, even if the equipment is separated from all voltage supplies.
 - Assembly and/or disassembly of the valve only in a pressure-free status (i.e. empty piping beforehand)
 - Valve flow and/or direction of flow must be considered.

Each person involved in the operation and maintenance of the equipment must have read and understood the present operation manual!
This is for your own safety!

6. Residual Risk

6.1 Hazard generated by current



Manipulation of the Aquastar by operating staff is strictly prohibited and may only be performed by duly authorized staff, qualified for electrical work. Compliance with the corresponding instruction and prohibition signs is required.

6.2 Hazard generated by human error



The operating staff must be instructed in regard to the residual danger resulting from electricity and familiarized with correct operation. Efficiency of the safety training must be verified.

6.3 Hazard generated by current during cleaning work



Cleaning of the Aquastar may only be performed after disconnection from power supply (lever switch).

7. General

PRAHER Aquastar controls are significant technical products, which are manufactured with high accuracy to the most modern technical production methods. Entitled complaints will naturally be rectified as fast as possible if they occur. The equipment has a warranty after valid European law. The warranty begins with the purchase date.

Attention! For relief of the sealing system the valve is shipped on intermediate position and is not sealed! Prior to operation it has to be electrically set to position "Filter"!

8. Directions for use

This is a control unit for a multiport valve with 6 positions for fully automatic filter backwashing according to need, i.e. pressure and/or time. A filter pump connection is activated about 20 sec after the respective position is reached. The dry running design guarantees safe operation.

Additional electrical connections are available:

Backwash position; backwash and rinse position; for series connection of several valves installed in series; for interruption of a heater or a heat exchanger before cycle start; for a ball valve during the cycle.

9. Montage

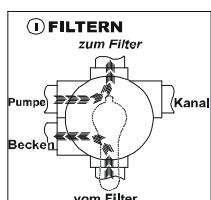
Device installation – installation of the valve:

Install the valve in the conduit according to the labeling and the sketch below. Use adapter unions. Threaded connections should be sealed only with Teflon strip. Although the device works in any position, it should not be mounted actuator down, if possible. If the difference in level between system and tank exceeds 3 meters, stop valves or non-return valves should be installed to prevent severe damage to the actuator and the valve due to excessive pressure and flow.

As filter medium can be washed out during backwashing and rinsing, we recommend fitting the drain with a throttle. Otherwise a stuck valve disk can adversely affect the flawless functioning of the Aquastar. Polluted or grainy filtering media require the use of adequate pre filters.

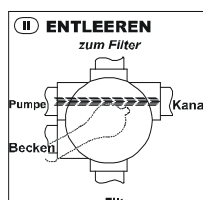
Important! During a cycle the filter pump motor must be shut off!

9.1 Function- and Installation Diagram



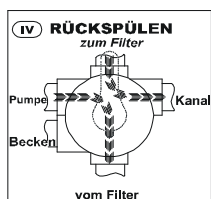
Filtering the medium (i.e. water)

Pool → Pump → Valve (towards filter) → Filter → Valve (away from filter) → Pool



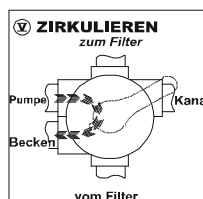
Draining of the pool with the pump

Pool → Pump → Valve → Sewer



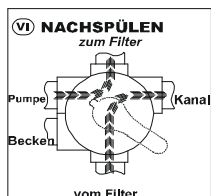
Cleaning filter medium (i.e. sand) in counter flow (reversed flow direction in filter)

Pool → Pump → Valve (away from filter) → Filter → Valve (towards filter) → sewer



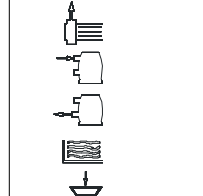
Circulating the medium without Filter (Filter is bypassed)

Pool → Pump → Valve → Pool



Cleaning filter medium (i.e. sand) after backwash cycle

Pool → Pump → Valve (towards filter) → Filter → Valve (away from filter) → sewer



Pump → away from pump
 Top → towards filter
 Bottom → away from filter
 Return → towards pool
 Waste → towards sewer

6-way valve type: 1 1/2", 2" and 3"

Connections: Thread or solvent socket (all connections open)

Max. operation pressure: ABS 1 1/2", 2", 3" → 3,5 bar

GFK 1 1/2", 2" → 6 bar / GFK 3" → 5 bar

10. Sequence of cycle

Starting position FILTER – device ON

- Start of backwash cycle by pressing the test key on the keyboard
- Control lamp ‘test key’ for backwash cycle activated is illuminated
- Output ‘heating’ clamp [22]-[21] switches off
- Set time of potentiometer ① (time delay) elapses (cooling down time for heat exchanger)
- Output ‘pump’ clamp [13]-[14] switches off (no continuity)
- Output ‘serial connection’ switches from clamp [19]-[20] to [18]-[19]
- Output ball valve switches from clamp [G]-[3] to [G]-[4]

Valve goes to backwash position

- Pump time delay of approx. 20 sec. elapses
- Output ‘pump’ clamp [13]-[14] closes
- Output ‘backwash’ switches to clamp [26]-[27]
- Set time of potentiometer ② elapses (rinsing period)
- Output ‘pump’ clamp [13]-[14] switches off

Valve goes to rinsing position

- Output ‘rinsing’ switches to clamp [24]-[25]
- Pump time delay of approx. 20 sec. elapses
- Output ‘pump’ clamp [13]-[14] closes
- Set time of potentiometer ③ elapses (rinsing period)
- Output ‘pump’ clamp [13]-[14] switches off

Valve goes to filter position

- Output ‘ball valve’ switches from clamp [G]-[4] to [G]-[3]
- Pump time delay of approx. 20 sec. elapses
- Output ‘pump’ clamp [13]-[14] closes
- Output ‘heating’ switches to clamp [21]-[22]
- Output ‘serial connection’ switches to clamp [19]-[20]

11. Flushing and changeover times

Time delay ①	20 sec. - 23 min.
Changeover Filter - Backwash	ca. 45 sec.
Backwash ②	50 sec. - 9 min.
Changeover Backwash time – Rinsing	ca.35 sec
Rinsing ③	25 sec. – 200 sec.
Changeover Rinsing – Filter	ca.25 sec
Cycle time	3 min – 40 min.

12. Function of membrane keyboard

① OFF

Pressing this key switches off the equipment, regardless of the valve position

② ON

Pressing this key (yellow control lamp is illuminated) switches on the equipment, valves goes to basic position - FILTER

③ TEST BUTTON

Pressing this key (green control lamp is illuminated) triggers the backwash cycle for the length of a backwash procedure

④ WASTE

Pressing this key (red control lamp is illuminated) sets the valve to position "Waste" Water is being drained into the sewer system

Only with Comfort 3500, 4500 and 6500 by additional filter pump control

⑤ HAND

Pressing the HAND key makes the filter pump change from automatic to manual operation. Filter pump switches on (independent from clock program)

⑥ AUTOMATIC

Pressing this key makes the filter pump change to automatic operation and only at the set filter times the filter pump switches on (independent from clock program)



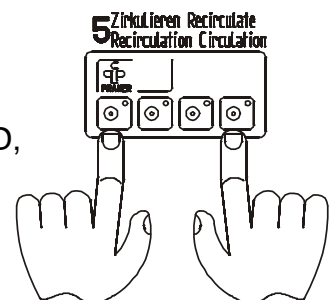
This product corresponds to the following EEC-Guidelines

- Electromagnetic compatibility 89/336/EWG
- Low voltage directive 73/23/EWG

12.1 CIRCULATE

In order to set the automatic 6- way backwash valve to position "CIRCULATE" and afterwards again to position "FILTER", following steps have to be made:

- Go to basic position ②
- Press keys "TESTBUTTON" and "Waste" at the same time, (min. 4sec.) until the LED of the "TESTBUTTON" is illuminated. ATTENTION! After simultaneous pressing of the keys first the LED of "TESTBUTTON" is illuminated and then the 'WASTE' LED, briefly. Only then the LED of the "TESTBUTTON" starts blinking and the Aquastar goes to position ,circulate'
- After "CIRCULATE" is finished, press OFF
- Go to basic position ②



13. Setting of the times

13.1 Setting the time delay (20sec – 23min)

Set the time with the potentiometer (knob ①)

- Turn the potentiometer clockwise → longer time,
counter clockwise → shorter time
- Trigger backwash procedure with the TESTBUTTON

13.2 Setting the backwash time (50sec – 9min)

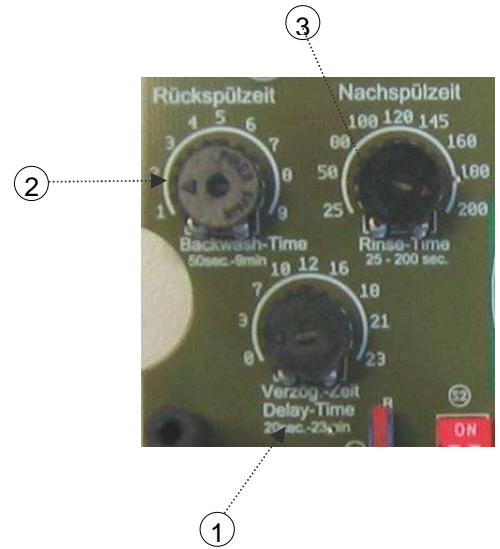
Set the time with the potentiometer. (knob ②)

- Turn the potentiometer clockwise → longer time,
counter clockwise → shorter time
- Trigger backwash procedure with the TESTBUTTON

13.3 Setting the rinsing time (25sec – 200sec)

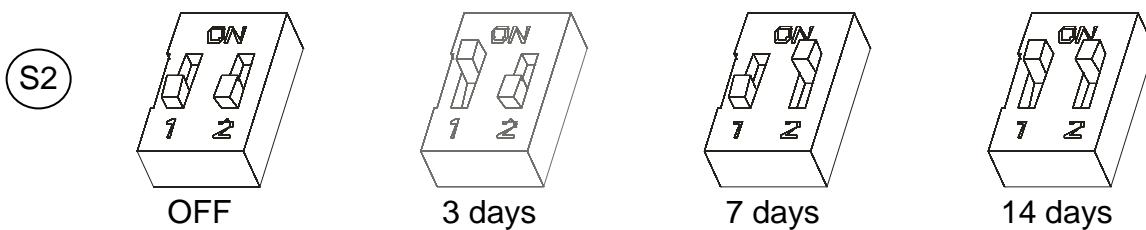
Set the time with the potentiometer. (knob ③)

- Turn the potentiometer clockwise → longer time,
counter clockwise → shorter time
- Trigger backwash procedure with the TESTBUTTON



14. Setting switch points backwash time

The switch points for backwash time are set with switch S2 on the circuit board. 4 switch points for backwashing are available



ATTENTION! Prior to setting/adjusting the switch points backwashing the valve needs to be on position "FILTER" and the Aquastar has to be turned off. (see page 10)

14.1 Time of activation of backwash cycle

Example: Backwash every Monday 09:15

- Set switch S2 to switch point 7 days and turn on the Aquastar at 09:15 (press "ON" button on the keyboard)

In order to alter the time of activation, just press the "TEST BUTTON" on the keyboard at the wanted activation time.

Example: Change activation from Monday 09:15 to Friday 08:00

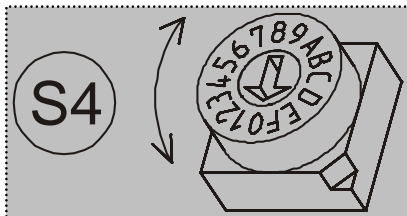
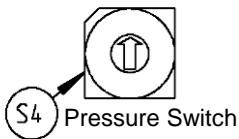
- "TEST BUTTON" at the keyboard on Friday 08:00

15. Setting of the electric pressure switch

The operating pressure in the valve is measured by an electronic pressure switch. The triggering by pressure is set with the switch S3, S4 at the control board. In order to change the triggering pressure, turn the arrow (by using a screwdriver) clockwise or anti-clockwise until the arrow points to the requested figure (see chart).



- Changeover 01 from 0,4 – 1,9 bar
- Changeover 02 from 2 – 5,75 bar

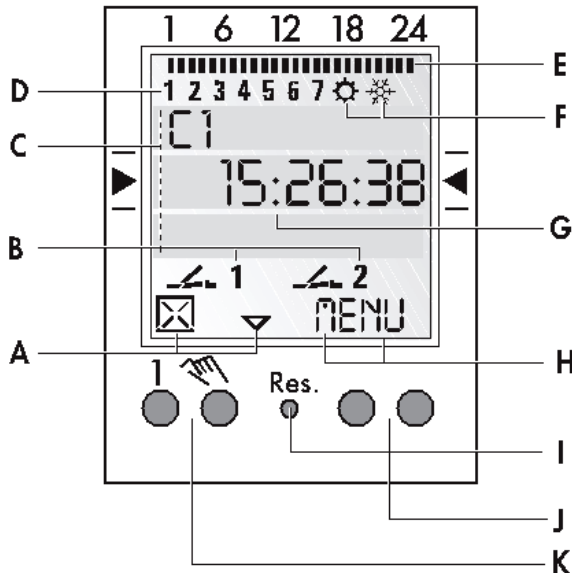


Raster	pressure (bar)	
	Changeover 01	Changeover 02
0	0,4	2,0
1	0,5	2,25
2	0,6	2,5
3	0,7	2,75
4	0,8	3,0
5	0,9	3,25
6	1,0	3,5
7	1,1	3,75
8	1,2	4
9	1,3	4,25
A	1,4	4,5
B	1,5	4,75
C	1,6	5
D	1,7	5,25
E	1,8	5,5
F	1,9	5,75

The pressure values are tested and set but can slightly vary due to manometer tolerances!

16. Programming the digital clock for the Aquastar Comfort

16.1 Clock description



Display

- A Function display of both left keys
- B Channel displays
 - 1 = Channel 1 EIN
 - 1 = Channel 1 AUS
- Channel 1 = C1, Channel 2 = C2
- C Display for time, menu, prompt,...
- D Display of day of the week
- E Overview day- and switching program
- F Display summer/winter time
- G Power supply (permanent dots)
- Battery supply (blinking dots)
- H Function display of both right keys

General

- The line in the middle shows the menu item that can be chosen. If this is confirmed with OK this item is being activated.
- Blinking texts or symbols need an input.
- If no input is being made within 2 minutes the clock sets back to Auto- Mode

Keys

- I Reset
With reset the programs stay as they are. Date and clock have to be set again. Press Reset key with a blunt object (i.e. ball point)
- J Right key
- K Left key with manual switch function

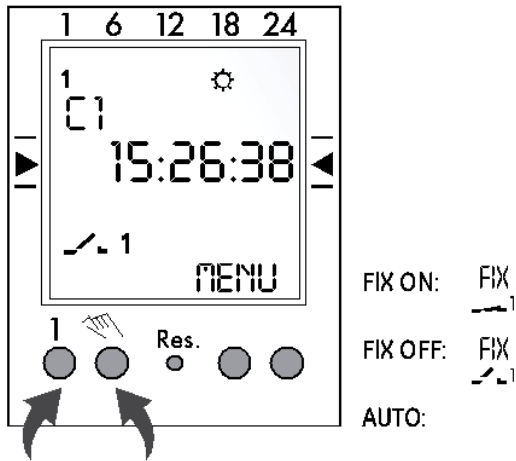
Function display of both left keys:

- △ Scroll upwards in the menu
- ▽ Scroll downwards in the menu
- ☒ Delete chosen item
- ✓ Confirm chosen item
- + Press short = +1
Press long (~ 2 sec) = +5
- Press short = -1
Press long (~ 2 sec) = -5

Function display of both right keys:

- MENU Exit auto mode and enter programming mode
- ESC press short = one step back
press long (~ 2 sec) = back to auto mode
- OK Make choice and confirm
- EDT Change request in Read-mode
- N Do not execute command
- J Execute command
- DEL Delete

16.2 Operation Mode



Info

Left key = Channel 1

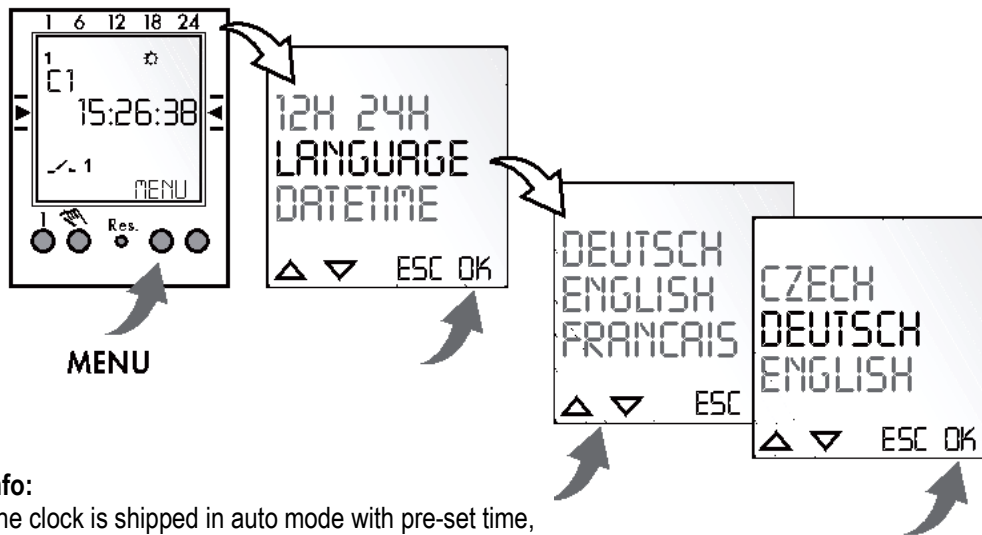
Right key = Channel 2 (only with 2-channel version)

Press 1x = FIX ON

Press 2x = FIX OFF

Press 3x = back to Auto mode

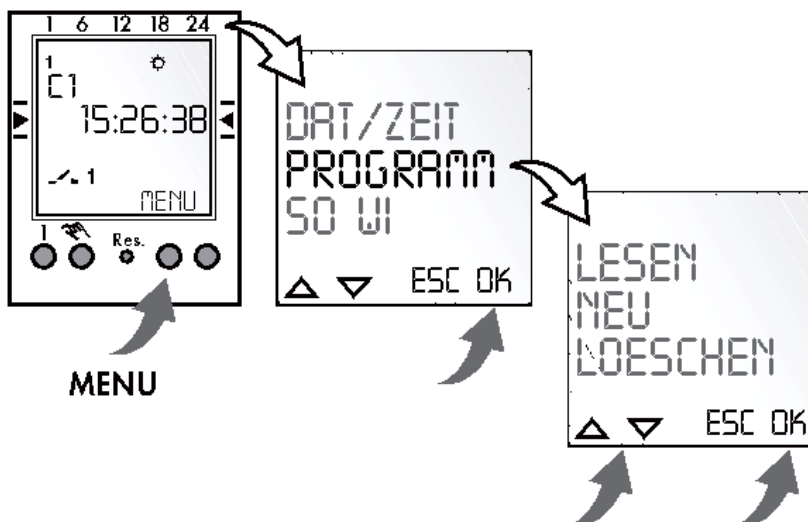
16.3 First operation – Choose menu language

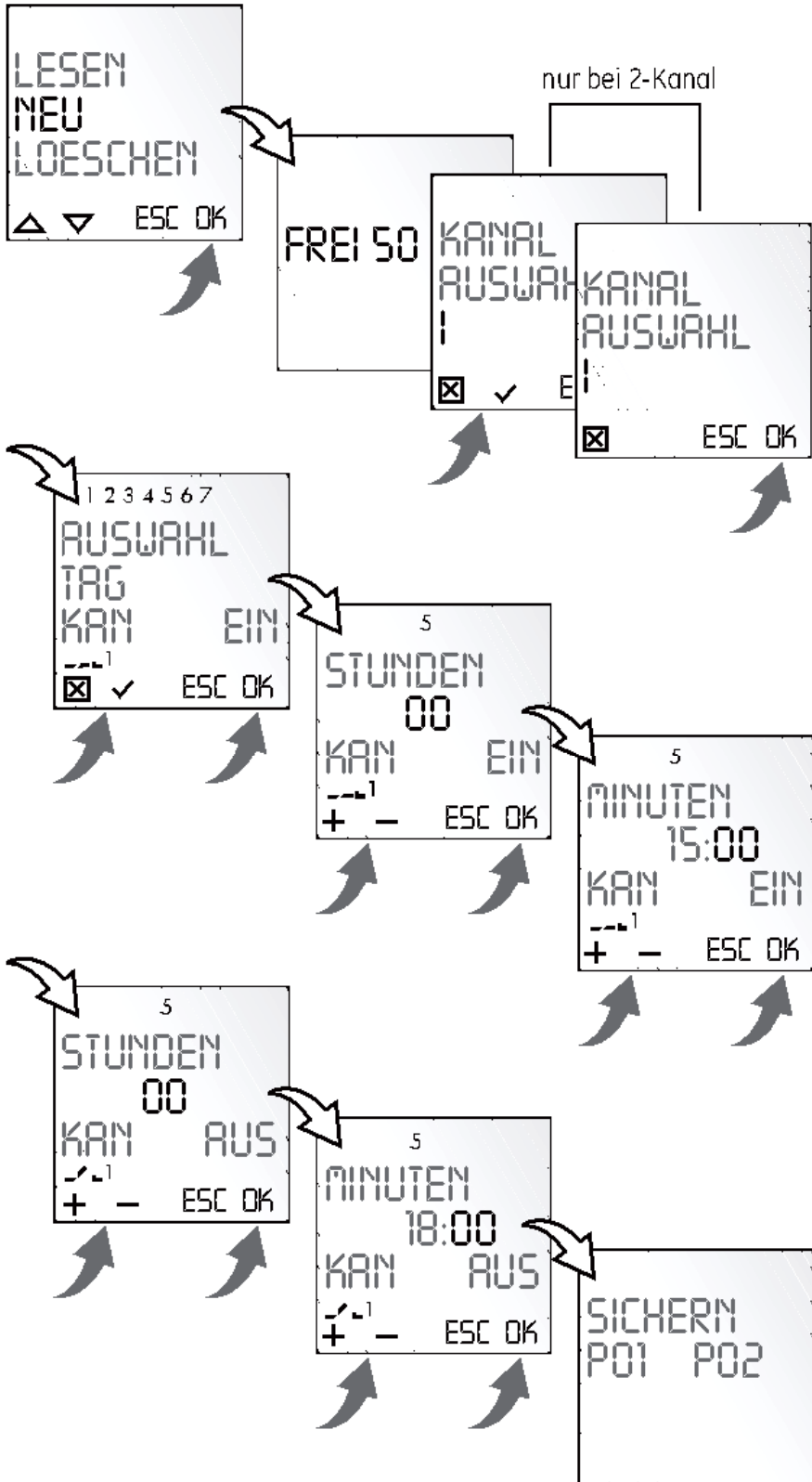


Info:

The clock is shipped in auto mode with pre-set time, date and menu language English.

16.4 Create a new program



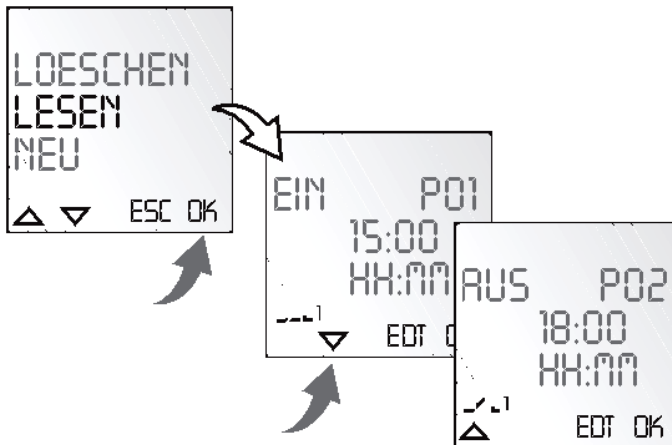


Info:
The clock has 50 store spaces.

Example:
ON command for channel 1 at 15.00 hrs. OFF command at 18.00 hrs.

- Choose program NEW and confirm with **OK**
- The available storage spaces are displayed
- Choose channel and confirm with **OK**
- Choose daily block or single day (free block building) and confirm with **OK**
- Input hour for **ON** command (+/-) and confirm with **OK**
- Input minute for **ON** command (+/-) and confirm with **OK**
- Input hour for **OFF** command (+/-) and confirm with **OK**
- Input minute for **OFF** command (+/-) and confirm with **OK**
- Program is stored
- Program goes to **READ, NEW, DEL.** More programs can now be created.

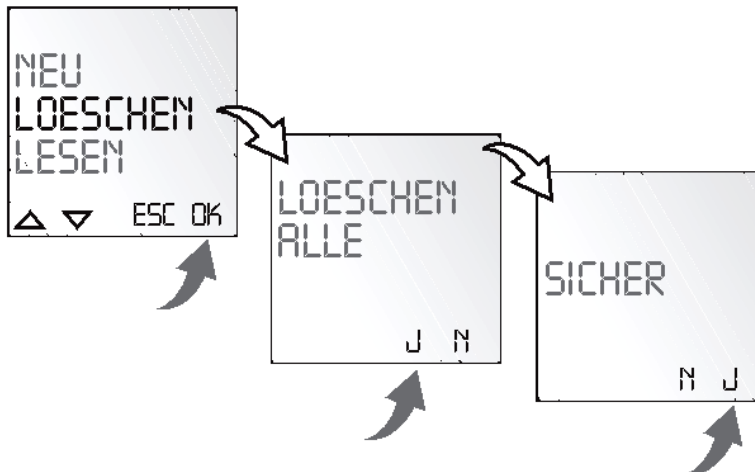
16.5 Viewing and adapting a program



Info:

- With ▲ ▼ scroll up and down
- By pressing **EDT** the program can be edited. The steps are the same as for creating a new program.

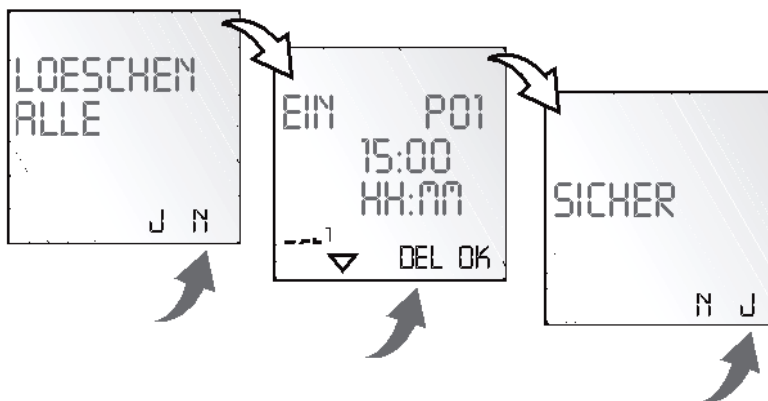
16.6 Delete all programs



Info:

- It is possible to delete all programs by pressing Y
- By pressing N single programs can be deleted

16.7 Delete single programs



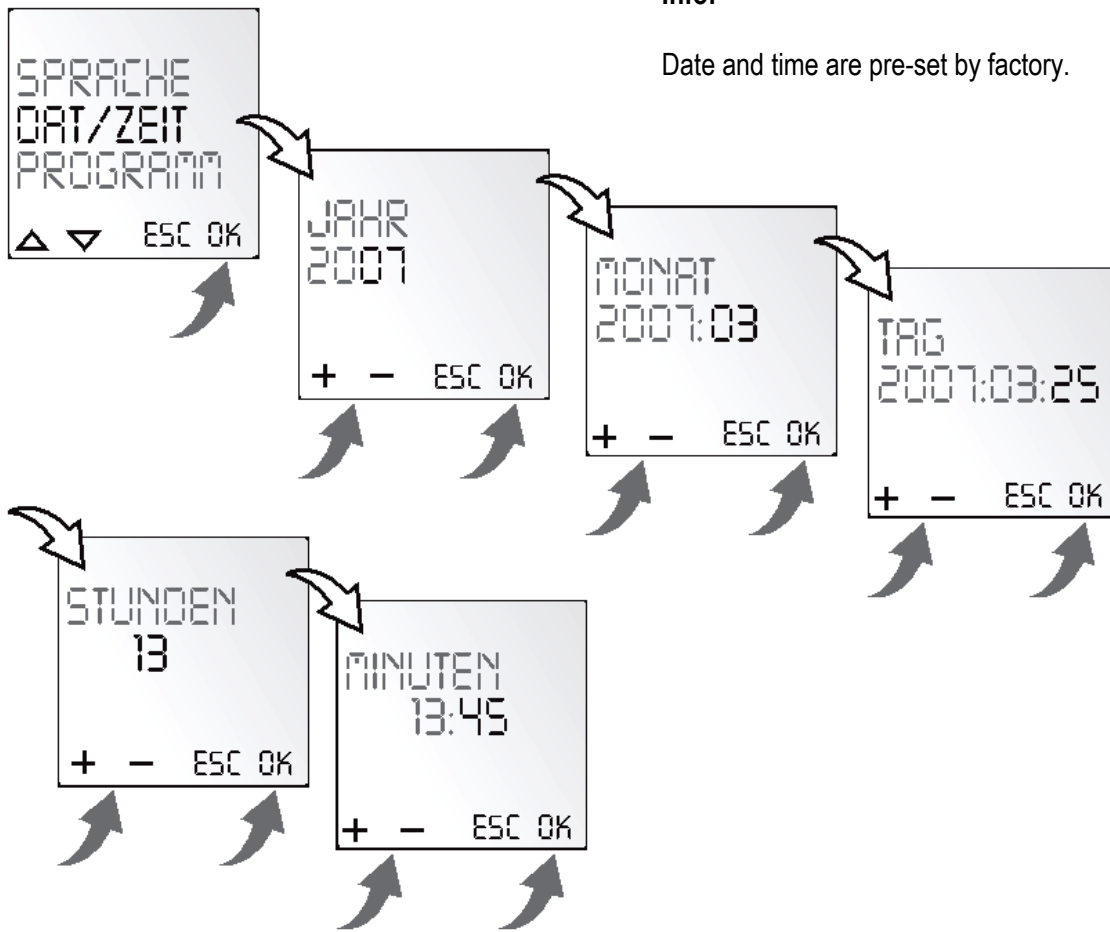
Info:

When deleting single programs all subsequent program steps are deleted (i.e. PO1 ON and PO2 OFF).

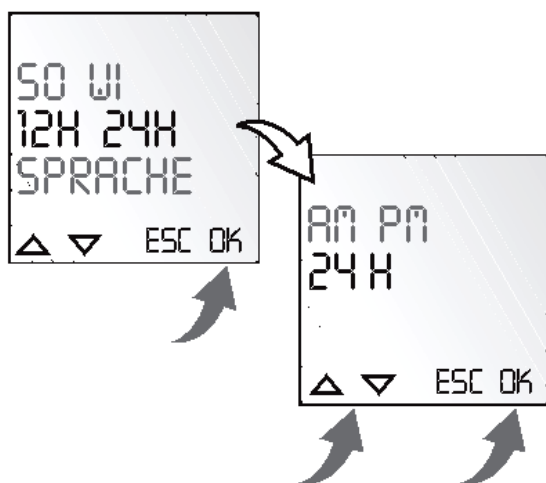
16.8 Setting of date and time

Info:

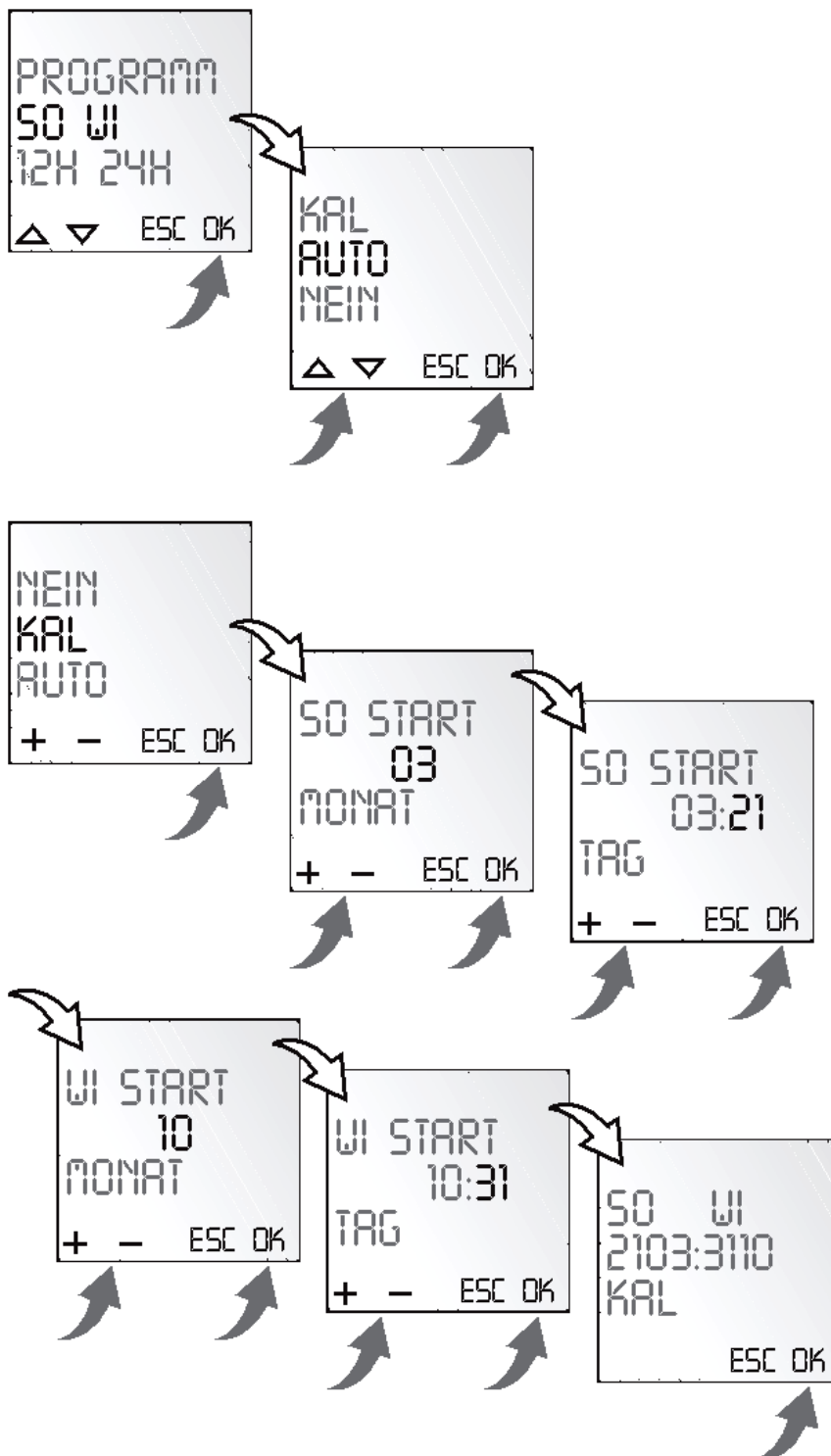
Date and time are pre-set by factory.



Setting of AM/PM 12 hours/24 hours display



16.9 Changeover Summer/Winter Time



Info:

Following settings are possible:

AUTO:

Pre-set setting by factory. This is automatically recalculated for every new year.

NO

No changeover

KAL

Program. Therefore the start date of both summer and winter time has to be input. The pre-set factory settings are deleted. The programmed summer and winter time are automatically recalculated for every new year. The changeover is done at the same set weekday in the same week of the month.

Example:

21.03. Start Summer Time
31.10. Start Winter Time

Attention:


During changeover procedure no changes at the clock must be done!

17. Electric Connection


a) Connection to the supply voltage

 MVO ~ 12-230V (AC), ---12-34V (DC), 50-60 Hz

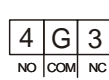
b) Trigger backwash procedure external

 Activation of clamp [11/12] with potential free contact
Attention! Do not connect to voltage!


c) Connection for pump:

Potential free: I max. 8 A
 On position FILTER, RINSE, CIRCULATE and WASTE and after approx. 20 sec. the clamps [13 →14] are interconnected.


d) Connection for ball valve

Potential free: I max. 8 A
 With switched off actuator, on position FILTER and CIRCULATE, the clamps [G→3] are interconnected. On position WASTE and during the whole backwash cycle the clamps [G→4] are interconnected.


e) Connection for 2nd rinse pump

Potential free: I max. 4 A
 On position RINSE the clamps [26→27] are interconnected.
Only switches on if pump [13, 14] switches on.


f) Connection for signal on position RINSE

Potential free: I max. 4 A
 On position RINSE the clamps [24→25] are interconnected.


g) Connection for signal on position CIRCULATE

Potential free: I max. 4 A
 On position CIRCULATE the clamps [29→30] are interconnected

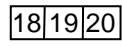
h) Connection for signal on position WASTE

Potential free: I max. 4 A
 On position WASTE the clamps [31→32] are interconnected.

i) Connection for signal for heating / heat exchanger:

Potential free: I max. 4 A
 After triggering the backwash cycle the clamps [21→22] are opened.
Filter pump stays on for the duration of the set time delay (knob ①)
Heat exchanger cools down and then pump switches off.

j) Connection for signal for serial connection:

Potential free: I max. 4 A
 During the whole cycle [18→19] is interconnected, otherwise [19→20].
Connection of more valves.

Technical data.

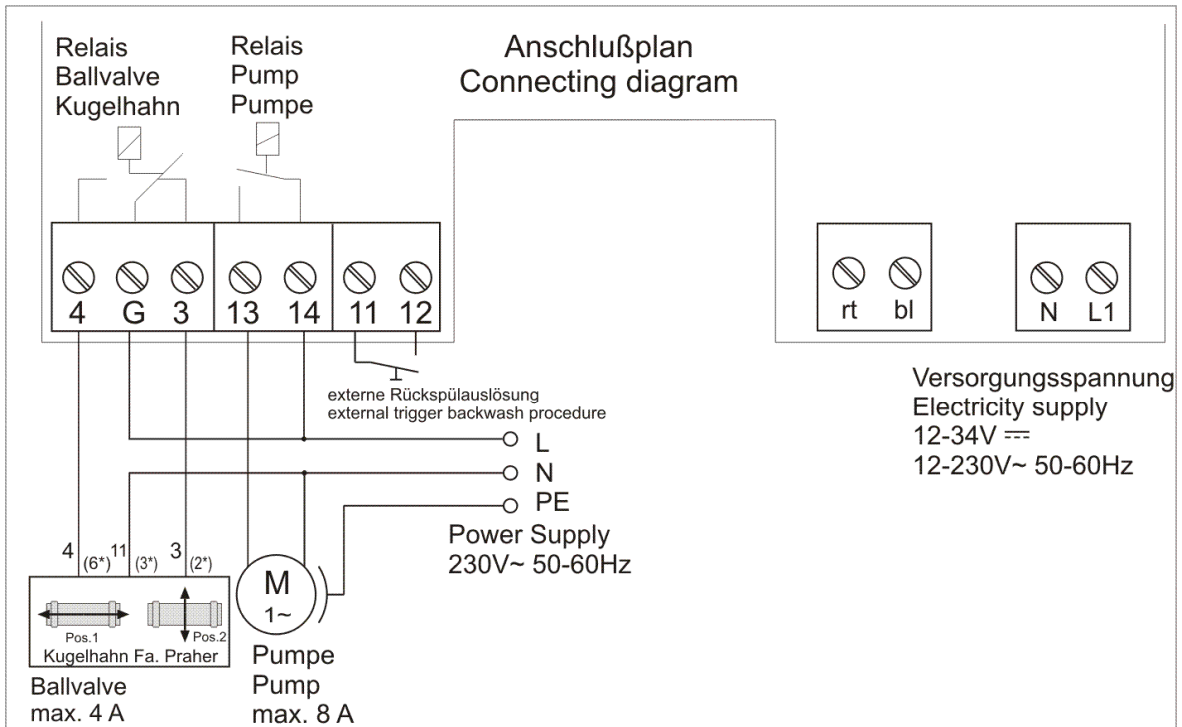
Voltage: MVO ~ 12-230V (AC), --- 12-34V (DC)

Protection rate: IP 65

Frequency: 50-60 HZ

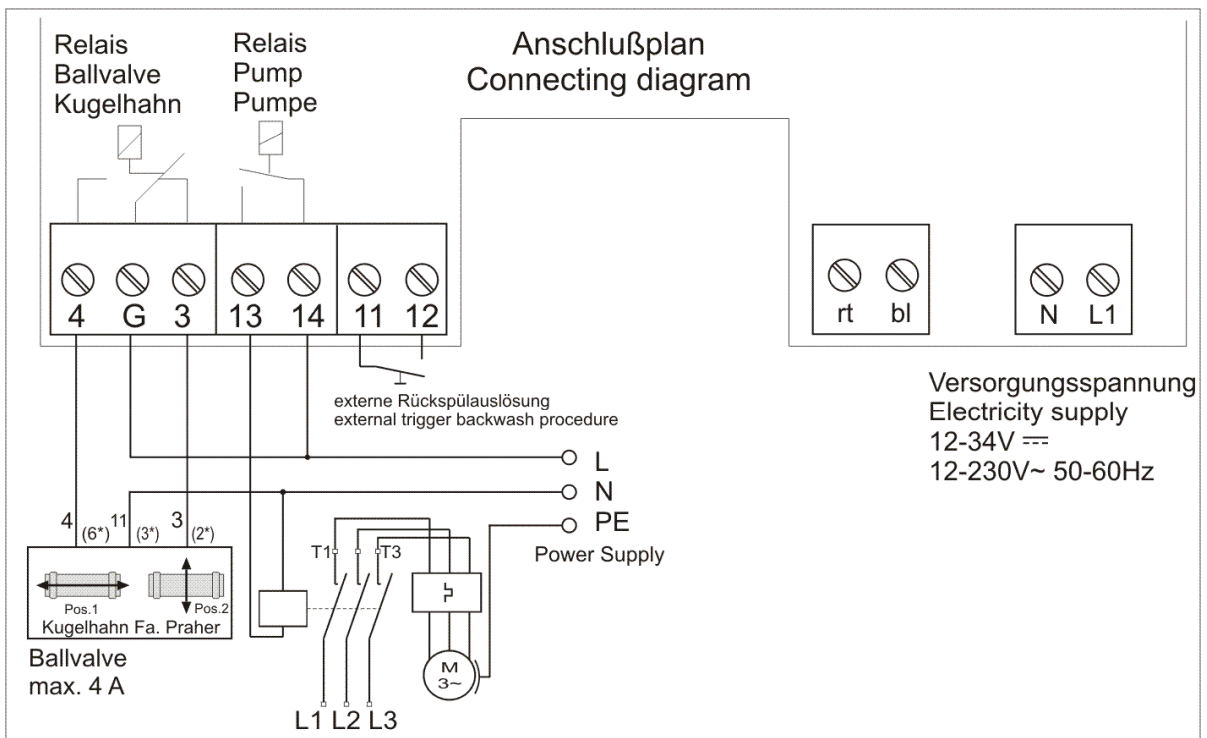
Max. own consumption: ~ 4 Watt / 12 Watt 11/2", 2", ~ 4Watt / 20 Watt 3"

18. Connecting diagram for pump



(*...alte Klemmenbezeichnung)

(*...old Terminals)



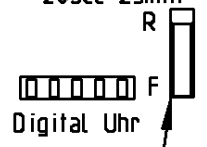
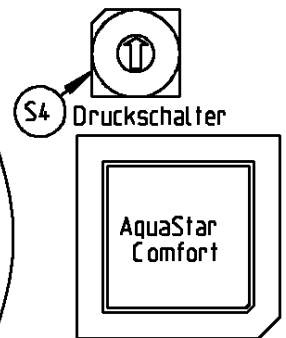
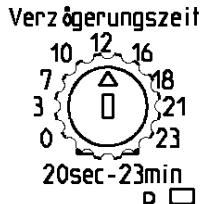
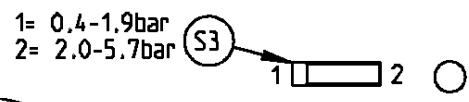
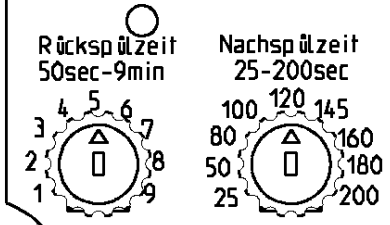
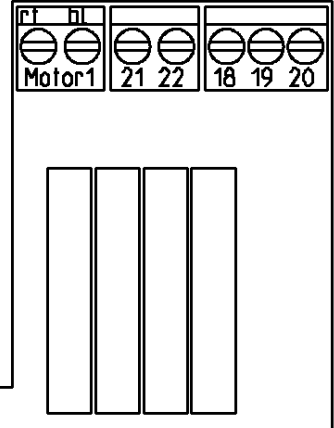
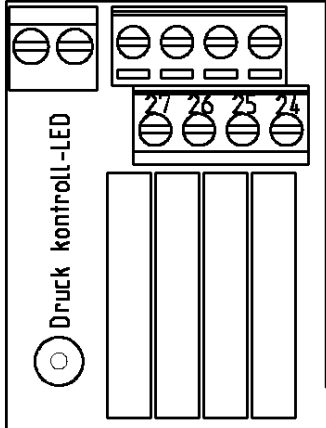
(*...alte Klemmenbezeichnung)

(*...old Terminals)

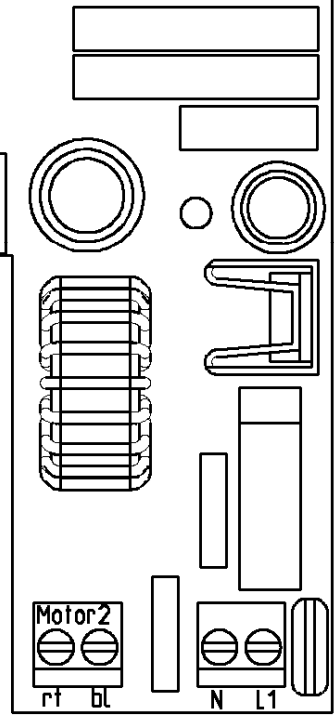
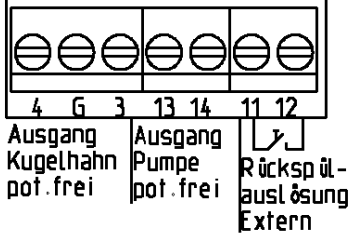
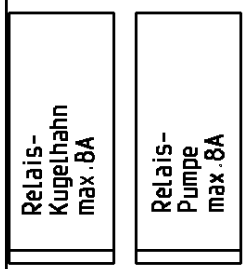
19. Control Board

Pumpen
schalter 32 31 30 29

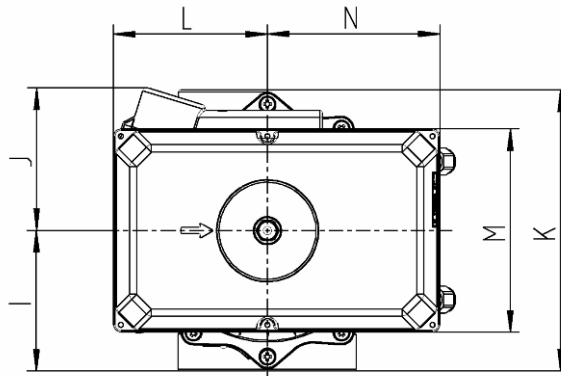
Schaltschema für
Comfort 3000/4000/6000
1 1/2" / 2" / 3"



S1 R=Rückspüluhr F=Filter Uhr S2 Schaltpunkte: Rückspülen

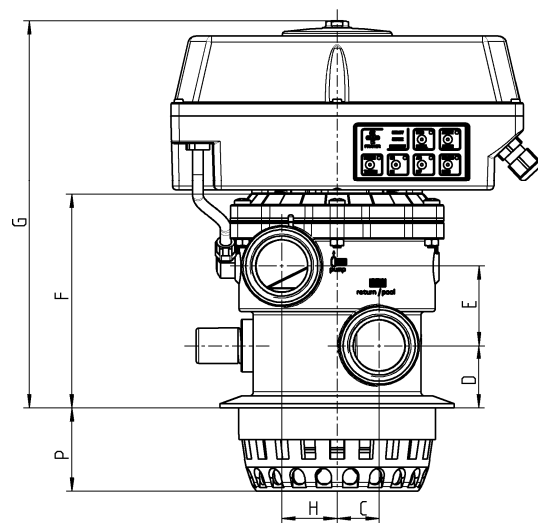
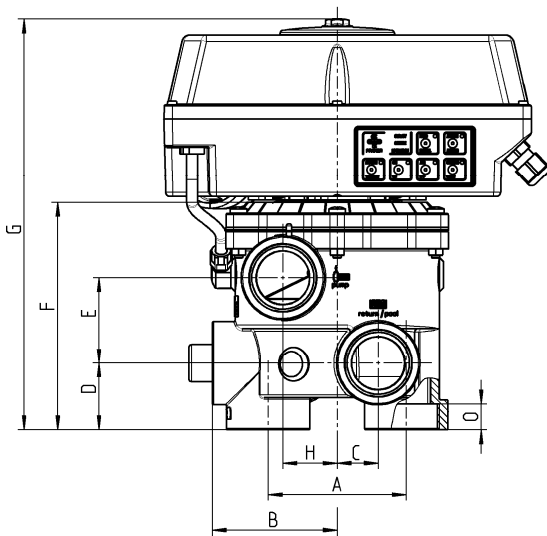


20. Dimensions



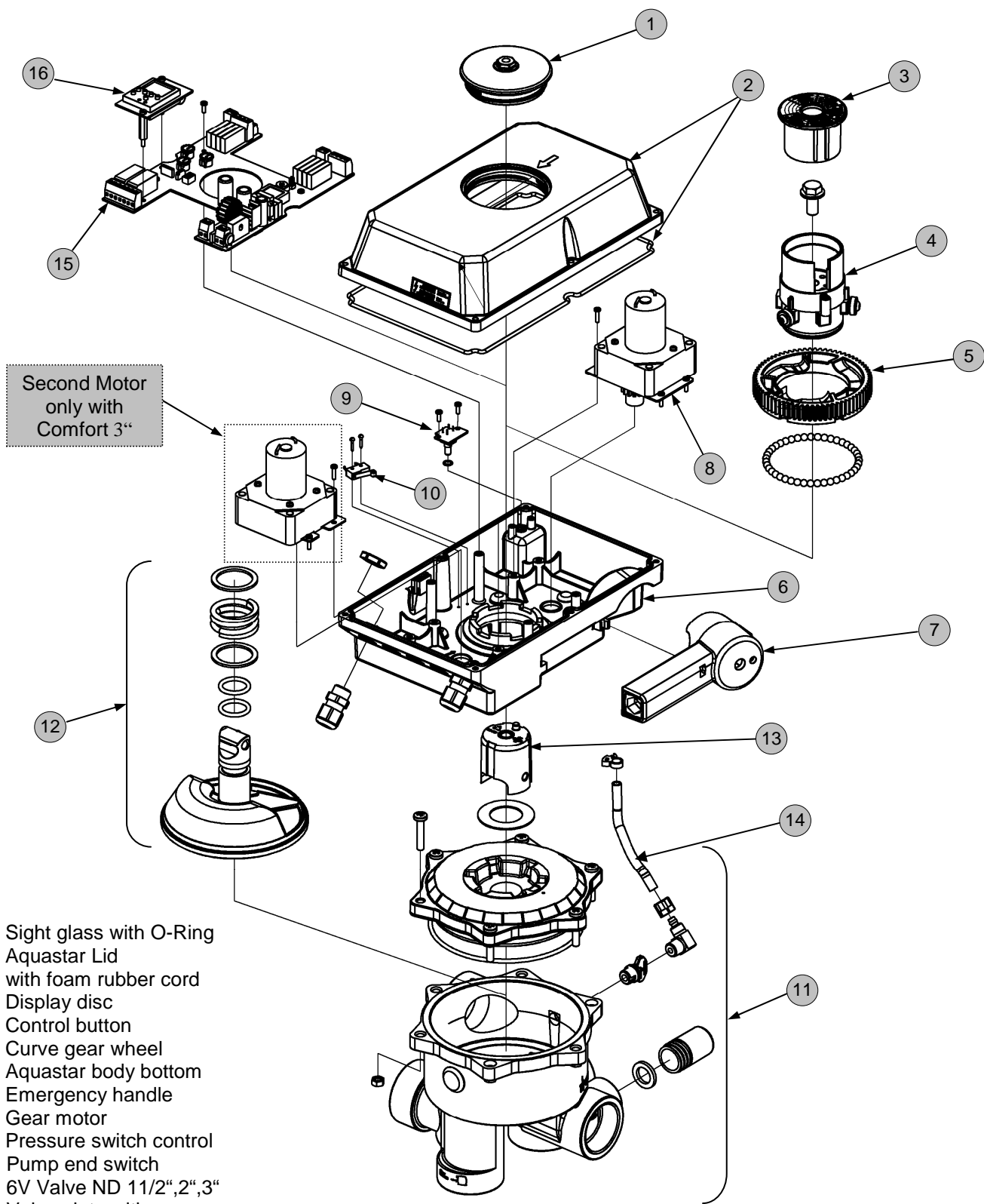
Side Mount

Top Mount



	1 1/2" SM	1 1/2" TM	2" SM	3" SM
	mm	mm	mm	mm
A	99,5	X	110	170
B	90	X	114	165
C	29,5	31,5	38	50
D	48	47	60	85,5
R	61,5	59,5	81	110
F	163,5	160	210	306
G	295	291	339	436
H	39	41,5	36	50
I	87,5	90	114	165
J	117	117	117	117
K	175	180	228	117
L	125	125	125	330
M	165	165	165	125
N	140	140	140	165
O	18,5	18,5	26	35
P	X	62,5	X	X

21. Exploded view drawing Aquastar Comfort



- 1. Sight glass with O-Ring
- 2. Aquastar Lid with foam rubber cord
- 3. Display disc
- 4. Control button
- 5. Curve gear wheel
- 6. Aquastar body bottom
- 7. Emergency handle
- 8. Gear motor
- 9. Pressure switch control
- 10. Pump end switch
- 11. 6V Valve ND 11/2", 2", 3"
- 12. Valve plate with O-rings and spring
- 13. Valve coupling
- 14. Pressure hose with union
- 15. Control board
- 16. Digital clock

22. Emergency handle

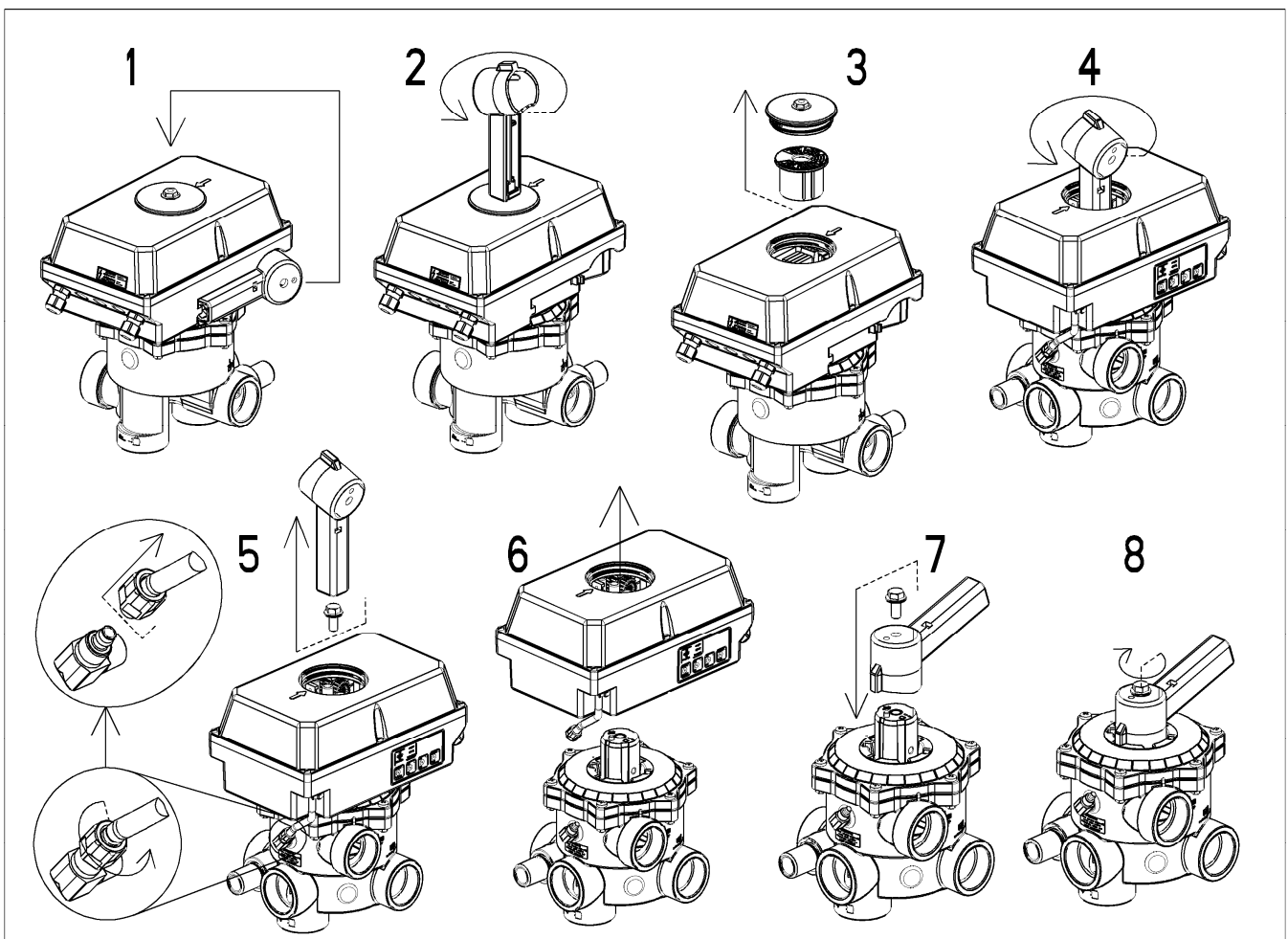
In case of power loss or control problems:

1. Prior to using the emergency handle disconnect the valve from the power supply. Interrupt the control cables to the valve.
2. Lower the system pressure (switch off pump, close ball valves, mind possible water columns)
3. Use the emergency handle according to the below chart.

Attention
Lower the system pressure prior to using
the emergency handle

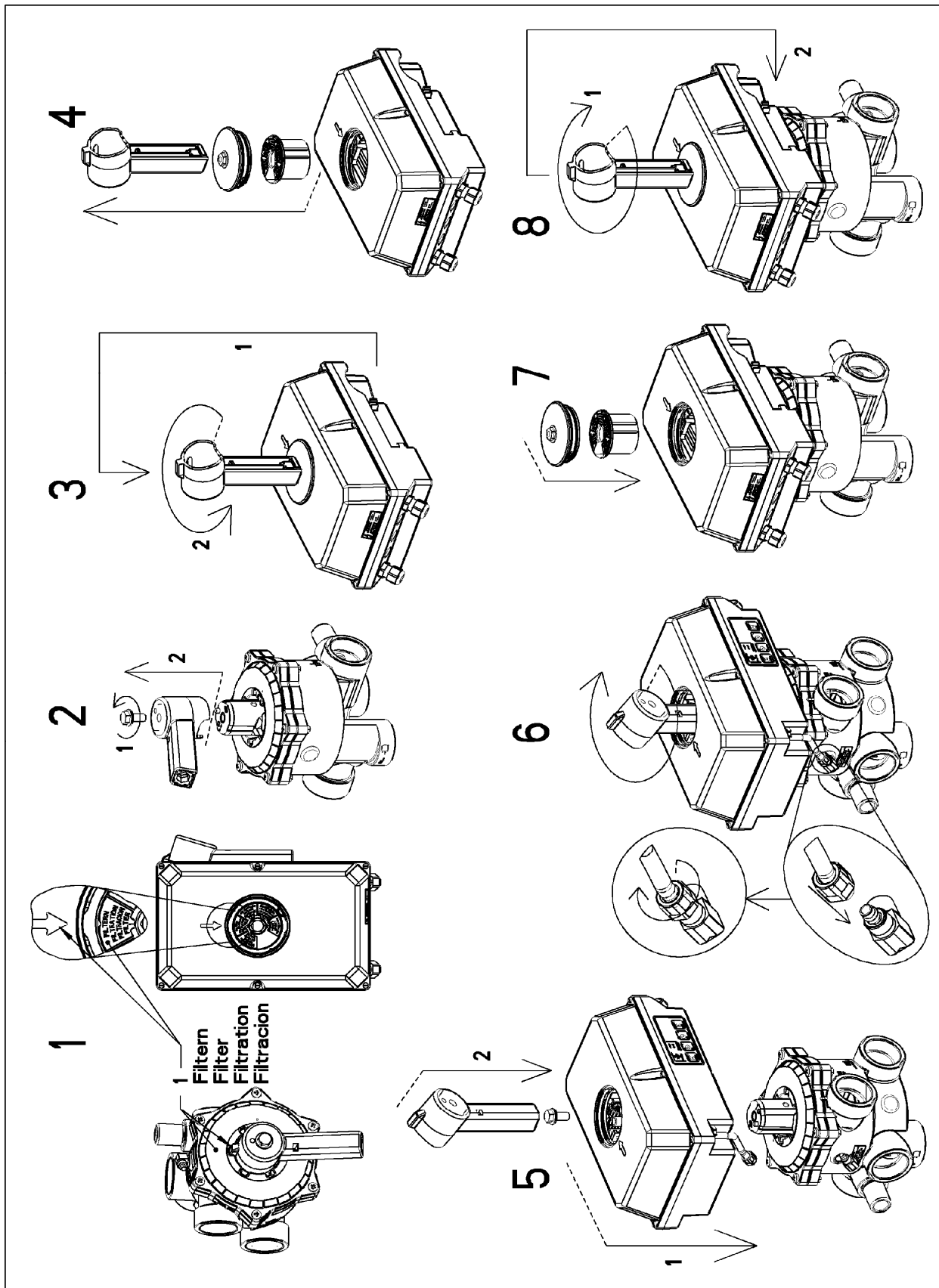
**The emergency handle is not designed to replace the electric drive.
In order to secure proper function of the emergency handle it should
not be used permanently!**

23. Dismantling



24. Installation

Attention: During installation screw tight the sight glass in the lid (pict. 8) in order to secure tightness of the Aquastar Comfort



25. Special models Aquastar Comfort

3500 4500 6500

25.1 Aquastar Comfort 3500

The Aquastar Comfort 3500 consists of the Comfort 3000, (time controlled) plus a 2 channel clock for additional filter control.

The programming of the 2 channel clock is explained in chapter **15. Programming of the digital clock.**

25.2 Aquastar Comfort 4500

The Aquastar Comfort 4500 consists of the Comfort 4000, (pressure switch and time switch on the control board) plus a 1 channel clock for additional filter control.

The programming of the 1 channel clock is explained in chapter **15. Programming of the digital clock.**

25.3 Aquastar Comfort 6500

The Aquastar Comfort 6500 consists of the Comfort 6000, (pressure switch on the control board and triggering the backwash cycle by clock) plus a 2 channel clock for additional filter control.

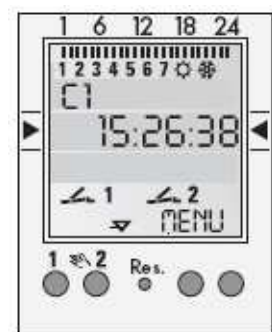
The programming of the 2 channel clock is explained in chapter **15. Programming of the digital clock.**

Integrated clock for triggering backwash cycle (channel 1)

Settings: each day the same, Mo-Fr same and Sa-Sun same or each day different times.

Integrated clock for filter control (channel 2)

Settings: each day the same, Mo-Fr same and Sa-Sun same or each day different times.



Picture: 2-channel clock

Notes

A series of horizontal dashed lines for writing notes.



OCEAN - Made by Praher, für individuelle Anwendungen:
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und Steuerungen mit dazugehörigen Armaturen.

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