

---

# INSTRUKTION

---

## *BUDGET RO*



# AQUA EXPERT

*"Välbefinnande baserad på omtanke!"*

Mårdvägen 7, 352 45 Växjö, 0470 – 700 600, E-mail:

# GARANTIVILLKOR

Ni har just installerat ett filter från Aqua Expert AB, ett ledande företag i branschen med 20 års erfarenhet av vattenrening.

För att ni skall känna Er extra trygg med Ert val av Aqua Expert AB som filterleverantör, ger vi följande återköpsgaranti.

## 2 års återköpsgaranti

Villkor för återköpsgaranti:

- \* Att livsmedelsverkets normer SLV FS1993:35 för enskild vattentäkt inte uppfylls av filtret för det filtret är avsett för.
- \* Att komplett offererad anläggning är installerad.
- \* Att den i offert uppgivna pumpkapaciteten uppfylls.
- \* Att råvattenkvalitén inte har ändrats.
- \* Att filtret har skötts enligt givna instruktioner.

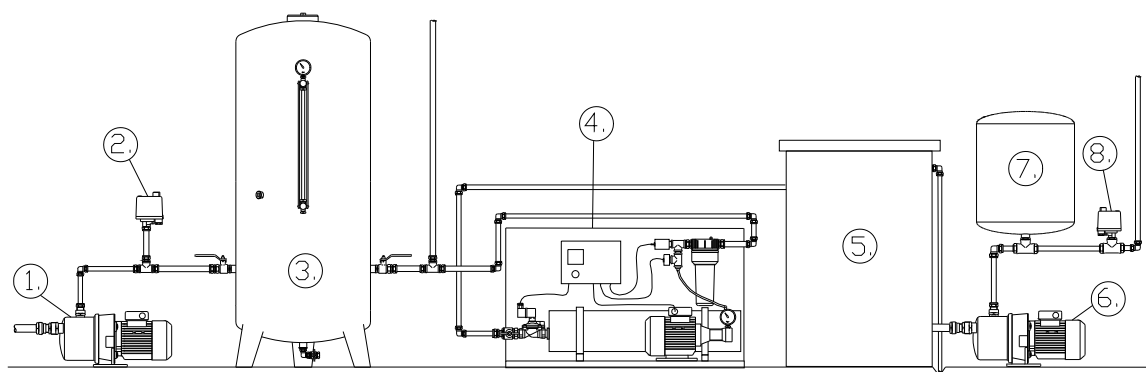
Installation, demontering och frakter kostnadsersätts ej.

Aqua Expert AB

## VIKTIGT!

- \* **WARNING!** Detta är en utrustning som jobbar under tryck. Instruktionen måste följas.
- \* Inkommande tryck får vara max 4 bar.
- \* Vid tveksamheter om installation och funktion kontakta er installatör.
- \* "Drain"-ventilen = avloppsventilen får aldrig stängas.
- \* 3:e medföljande vipa skall anslutas till renvattenpumpen och stoppa pumpen om nivån i råvattentunnan blir för låg. Vippan skall alltså monteras vid lägre nivå än lägsta nivå. Denna vippan är helt fristående från Budget filtret och skall EJ kopplas in i automatiksskåpet.

# INSTALLATION



1. Råvattenpump
2. Tryckströmbrytare
3. Hydrofor/hydropress
4. Budget RO
5. Renvattentank
6. Renvattenpump
7. Hydrofor/hydropress
8. Tryckströmbrytare

## FILTRETS PLACERING

Placera filtret så att det är lätt att komma åt för underhåll och skötsel. Där filtret placeras skall det vara mellan +5 och +30 grader.

Vi rekommenderar att det monteras en kulventil före filtret, så att det kan stängas av för underhåll.

När filtret arbetar produceras rent vatten och spillvatten. I avloppet rinnder det mellan 2-5 liter/minut när det produceras vatten.

## MONTERING

Från hydroforen koppla till "IN" på osmos filtret. Från "UT(OUT)" monteras en slang till renvattentanken. Från "DRAIN"-uttagen kopplas slangar till ett avlopp. Montera bomullspatronen i avsedd behållare.

Anslut elen. Nivåvippor för högsta och lägsta nivå monteras. Anslut en nivåvipa till renvattentanken på plintar HLEV (denna vippan är för maxnivån) och anslut en vipa till LLEV (denna är för lägsta nivån), se sid 6.

Montera en slang till avlopp från bräddavlopp på renvattentanken.

Vi rekommenderar att det monteras ett torrkorningsskydd för renvattenpumpen ifall det förbrukas mer vatten än vad Budget RO hinner producera, denna vippan skall bryta pumpautomaten vid en lägre vattennivå än vippan för lägsta nivå, dock måste den bryta ovanför utgående ledning. OBS! Vippan medföljer. Denna vippan kopplas oberoende av Budget RO och skall alltså inte in i elskåpet på filtret.

## BLOCKERING

**OM det kopplas ett järnfilter eller annat mjukvattenfilter än vårt Duplex före Budget RO skall det kopplas så att strömmen till Budget RO bryts när backspolning sker av järn och/eller mjukvattenfilter. Detta för att undvika att Budget RO kallar på vatten under backspolning av förfilter.**

## IGÅNGKÖRNING

För att starta filtret, tryck in ON/OFF-knappen. En grön lysdiod tänds. För att stänga av filtret, tryck in ON/OFF-knappen igen.

Den gröna lampan "PUMP ON" lyser när renvattentanken kallar på vatten samt när filtret rensas.

# Underhåll

Underhållsintervallen är en rekommendation från tillverkaren.

## 1. Förfilter

Är till för att ta bort smuts och klor från råvattnet.

Byt filterpatronen var 3:e månad eller oftare om det är igensatt/smutsigt.

## 2. Torrkörningsskydd

Ser till att pumpen ej går torr.

Kolla varje månad om detektorn stoppar pumpen när inkommande vatten vatten stängs av. Denna reservdel bör bytas varje år.

## 3. Tryckstegringspump

Ökar trycket på vattnet.

Byt pumpen vid behov.

## 4. Membranet

Tar bort salter.

Byt membranet var 18:e månad eller upp till var 48:e månad om vattnet är rent och mjukt.

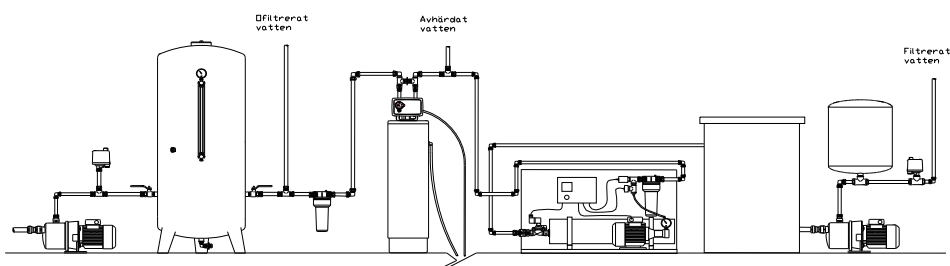
## 5. Elboxen

Styr filtret.

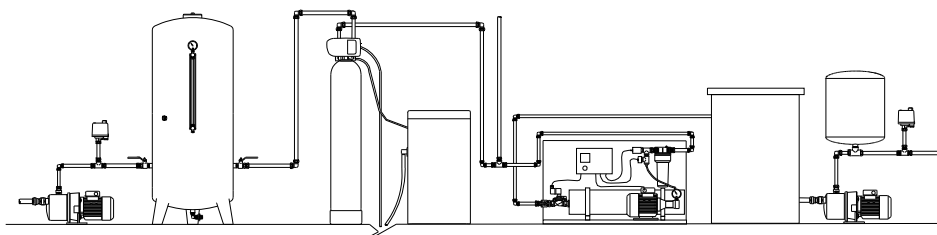
Byt pumprelä vid behov.

---

Midi och Budget RO:



Crystal Right och Budget



Elektrisk inkoppling:

PLINT	BESKRIVNING
25 o 25 HLEV	Maxnivå
22 o 23 LLEV	Minnivå

Koppla in vippan för maxnivå och minnivå.

OBS! När vippan sluter är det en fördröjning på ca 10 sekunder innan filtret startar.

Vid inkoppling av EN vippan(EJ att



Koppla in Vippan på HLEV. OBS! Vippan skall vara sluten i nedre läget. Bygga sedan mellan den vänstra plinten på HLEV och den vänstra plinten på LLEV samt mellan den högra plinten på HLEV och den högra plinten på LLEV.

# **Operating instructions**

---

## **RO 500 control system**

### **1. Description of functions**

- normal operation**
- regeneration (emergency shut-down)**
- hard water ( Limitron )**
- disinfection**
- intermittent flushing**
- calibration**
- emergency shut-down**

### **2. Operating parameters**

- description of parameters**
- status and malfunction signals**

### **3. Terminal allocation**

# 1. Description of functions

## Normal operation

e

Following "**power-on**", the control system starts an initialization cycle with a duration of about two seconds.

During initialization, "88" is displayed and the LEDs are off.

The control system then switches over to normal operation, the display switches to operation "b0" and the green LED lights up.

If it is necessary to fill the tank because of the low level, i.e. both level switches are closed (the unit may also be only be equipped with one level switch: in this case, a jumper must be installed on the low level switch), the solenoid valve V1 will open.

The water pressure is then checked by the pressure switch. If the pressure signal is not available after a preset time (**time\_pressure\_available**), an automatic shut down is initiated and "**E5**" is displayed.

If the pressure signal is received, the pump is started up after a preset time (**time\_pressure\_start-up**) and the water conductivity measured is indicated.

This operational status is changed if the upper level switch closes, indicating that the tank is full. In this case, the pump is shut down and the solenoid valve V3 is open, "b0" is displayed and the solenoid valve V1 is closed again after a preset time (**time\_displacement**), also the solenoid valve V3 is close afer a preset time (**time\_valves\_delay**).

If the pressure switch signals low pressure to the control unit with the pump running, the green LED flashes and "**E3**" is displayed until the pressure switch again signals the pressure required.

The control system then switches over to normal operation with the exception that the two signals "normal operation" and "**E3**" are displayed in succession.

If the conductivity exceeds the warning value for five minutes with the pump running, the green LED flashes and the conductivity is displayed alternately with "**E6**" until the conductivity falls below this value. Normal operation then continues.

If the conductivity exceeds the conductivity alarm limit for five minutes with the pump running, a collective malfunction signal is initiated, the green LED flashes and the conductivity is displayed alternately with "**E7**".

If the alarm limit is exceeded for a further preset time (**time\_cond**), the unit is automatically shut down and "**E7**" is displayed.

If the conductivity measurement is deactivated, there is a lower case o displayed, the limit values will be not monitored.

Malfunction signals are reset by switching the unit **ON** and **OFF**. The flashing green LED is then lit continuously.

## **Regeneration (emergency stop)**

The unit can be set to "**regeneration**" or "**emergency stop**" by operating (opening) the appropriate switch. The pump is then shut down immediately and the solenoid valve V1 is closed after a time delay of two seconds. The green LED continues to be lit and (**b1**) is displayed.

If the switch is closed, the control unit is switched back to normal operation.

This is the case if an individual water softening unit is installed upstream from the unit.

## **Hard water (Limitron)**

If the "**hard water**" or "**Limitron**" switch is operated (opened), an emergency shut-down is initiated and "**E2**" is displayed

## **Disinfection**            *(to be carried out only by specialist personnel)*

To switch to the "disinfection" operating mode, press the button before switching the power on and keep the button pressed during initialization, while "**88**" is displayed. After five seconds, "**b3**" is displayed, the solenoid valve V1 is switched on, a collective malfunction signal is initiated and the red LED starts to flash slowly. If you have released the button in the meantime, the pump will be started up after a further time delay of five seconds and the conductivity value will be displayed alternately with "**b3**".

To switch back to normal operation, press the push button again. The pump will be shut down immediately. The solenoid valve V3 will be opened and the solenoid V1 valve will be closed after two seconds, if applicable. The solenoid valve V3 will be closed after a preset time (**time\_valve\_delay**).

**Caution:** in this mode of operation, no safety functions are in operation. The unit must only be operated under close supervision. Make sure that the water pressure is correct in order to prevent damage to the pump.

## **Intermittent flushing**

If the solenoid valve is switched off for a preset time in normal operation (**time\_int\_flush\_start**), in other words if the tank is still full, the control system will switch to "intermittent flushing". This is similar to normal operation except that the level switches have no effect and the objective is to fill the tank. "**b2**" is displayed and, after the pump has been started up. The solenoid valve V3 will be open and after a preset time (**time\_valve\_delay**) the solenoid valve V1 will be open. The conductivity value is displayed alternately with "**b2**". Intermittent flushing continues for a preset time (**time\_int\_flush\_run**). When this time has elapsed, the pump is shut down immediately, the solenoid valves V1 and V3 are switched off after a preset time (**time\_valve\_delay**) and the control system switches back to normal operation.

The intermittent flashing function can be deactivated by setting the preset time (**time\_int\_flush\_start**) to 0.

If the pressure switch signals low pressure to the control unit, the green LED flashes and "**E3**" is displayed and a collective malfunction signal is initiated until the pressure switch again signals the pressure required.



## **Calibration** *(to be carried out only by specialist personnel)*

To switch to the "calibration" mode, press the push button before switching the power on and keep the button pressed during initialization while "88" is displayed. After five seconds, "b3" is displayed a collective malfunction signal is initiated and the red LED starts to flash slowly. The unit is switched to disinfection. If you keep the push button pressed for a further period of five seconds, the pump is switched on and the conductivity value is displayed alternately with "C". The green LED is also lit.

Each time you press the button, the conductivity offset value is increased by 2%. When you reach the maximum offset, the conductivity measurement will be switched off and "OF" will be displayed. The offset will be switched to minimum the next time you press the push button. Each time you press the button, the current conductivity value is displayed immediately and the current offset is saved. The offset is saved irrespective of whether mains power is available.

You can only end calibration operation by switching the power off.

It is only necessary to use the calibration function if the conductivity measuring cell is replaced.

## **Emergency shut-down**

Emergency shut-down means that the pump is shut down immediately and the solenoid valve V3 is switched on. The corresponding malfunction signal "E" is displayed, the green LED flashes rapidly and a collective malfunction signal is initiated. After a preset time (**time\_displacement**) the solenoid valve V1 will be closed and after a preset delay (**time\_valve\_delay**) the solenoid valve V3 will be closed.

An emergency shut down can only be reset by switching the power off.

## 2. Operating parameters

Operating parameters can only be programmed by the manufacturer!

Parameter	Resolution	Limits		Settings set by manufacturer
		min.	max.	
TIME_PRESSURE_AVAILABLE	0.05 sec.	0.1 sec.	9.9 sec.	<b>9.9 sec.</b>
TIME_PRESSURE_STARTUP	0.05 sec.	0.1 sec.	9.9 sec.	<b>9.9 sec.</b>
TIME_DISPLACEMENT	1.0 min.	0 min.	99 min.	<b>3 min.</b>
CONDLIM	0.5 µS/cm	1 µS/cm	99 µS/cm	<b>50 µS/cm</b>
CONDWARN	0.5 µS/cm	1 µS/cm	99 µS/cm	<b>40 µS/cm</b>
TIME_COND	1.0 min.	1.0 min.	250 min.	<b>5 min.</b>
TIME_PRESSURELOW	0.05 sec.	0.1 sec.	9.9 sec.	<b>1.0 sec.</b>
TIME_INT_FLUSH_START	1.0 h	1.0 h	250 h.	<b>24 h</b>
TIME_VALVE_DELAY	0.05 sec.	0 sec.	60 sec.	<b>10 sec.</b>
COND_OFFSET	0.5	-30	+30	<b>-20</b>

Parameters which are set to 0 are disabled.

### Description of parameters

**TIME\_PRESSURE\_AVAILABLE** Time from switching on valve V1 to malfunction signal "E5".

**TIME\_PRESSURE\_STARTUP** Time from pressure detection (pressure switch ON) to pump start-up.

**TIME\_DISPLACEMENT** Time from pump shut-down (open solenoid valve V3) to switching off solenoid valve V1.

**CONDLIM** Conductivity limit at which malfunction signal "E7" is displayed after a delay of 5 min., alternately with the conductivity value.

**CONDWARN** Conductivity limit at which warning "E6" is displayed after a delay of 5 min., alternately with the conductivity value.

**TIME\_COND** Time between exceeding conductivity limit and shut-down of unit with continuous "E7" signal.

**TIME\_PRESSURELOW** Time during pump operation before malfunction "E3" (low pressure) is signalled with the pressure switch off.

**TIME\_INT\_FLUSH\_START** Time before intermittent flushing is started with the solenoid valve V1 off (tank full).

TIME\_VALVE\_DELAY

Time to avoid simultaneous valve activation.

COND\_OFFSET

Offset, if the conductivity measuring cell is replaced.

## 2. Status and malfunction signals

Anzeige	Beschreibung
<b>88</b>	Signal during initialization.
<b>b0</b>	Normal operation, „ <b>tank full</b> “ if the pump is no switched on (normally when the tank is full)
<b>b1</b>	„ <b>emergency stopp/regeneration</b> “
<b>b2</b>	„ <b>intermittent flushing</b> “ displayed alternately with the conductivity when the pump is running
<b>b3</b>	„ <b>disinfection</b> “ displayed alternately with the conductivity value when pump is running
<b>C</b>	„ <b>calibration</b> “ displayed alternately with the conductivity value
<b>OF</b>	Displayed in „ <b>calibration</b> “, if conductivity measurement is switched off
□	Displayed, if the conductivity measurement is deactivated
<b>E2</b>	„ <b>hard water</b> “ or Limitron emergency shut down, if the appropriate switch is opened.
<b>E3</b>	Malfunction signal if no pressure is measured for a certain time with the pump running. „ <b>low pressure</b> “
<b>E5</b>	„ <b>low pressure</b> “ signal if no pressure is measured for a preset time after switching on the solenoid valve V1
<b>E6</b>	„ <b>conductivity warning</b> “ signal if the conductivity warning limit is exceeded for 5 minutes; displayed alternately with other operating signals
<b>E7</b>	„ <b>conductivity alarm</b> “ signal if the conductivity alarm limit is eceeded for 5 minutes; displayed alternately with other operating signals After a further time delay, the unit is shut down and this signal is displayed continuously.

### 3. Terminal allocation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
L	N	N	L	N	L1	PE	PE	PE	PE	PE	PE	W	S	Ö																	
mains 230V		Soft. 230V		pump 230V								STO			Valve V1 24VDC		Valve V3 24VDC		PS		LLEV		HLEV		REG		MOT		Cond. Sensor		

x 1	L	230V AC power supply, phase conductor 1
x 2	N	230V AC power supply, neutral
x 3	N	230V AC power supply for softener, neutral
x 4	L	230V AC power supply, phase conductor 1 max 5A
x 5	N	pump motor P1, neutral
x 6	L1	pump motor P1, normally open contact max. 3.8A
x 7	PE	230V AC power supply, earth
x 8	PE	earth
x 9	PE	earth
x 10	PE	earth
x 11	PE	earth
x 12	PE	earth
x 13	STO C	collective malfunction signal contact ZLT, 250V AC, 6A, changeover contact – floating
x 14	STO NO	collective malfunction signal contact ZLT, 250V AC, 6A, normally open – floating
x 15	STO NC	collective malfunction signal contact ZLT, 250V AC, 6A, normally closed, floating
x 16	V1 earth	solenoid valve V1, earth
x 17	V1	solenoid valve V1 normally open contact, 24VDC, 0.5A
x 18	V3 earth	solenoid valve V3, earth
x 19	V3	solenoid valve V3 normally open contact, 24VDC, 0.5A
x 20	PS earth	pressure switch -earth
x 21	PS	pressure switch input 24V DC, 10mA
x 22	LLEV earth	low level switch - earth
x 23	LLEV	low level switch input 24V DC, 10mA
x 24	HLEV earth	high level switch - earth
x 25	HLEV	high level switch input 24V DC, 10mA
x 26	REG earth	regeneration (emergency stop) – earth
x 27	REG	regeneration (emergency stop) - input 24V DC, 10mA
x 28	MOT earth	motor circuit breaker (hard water, Limitron)- input
x 29	MOT	motor circuit breaker (hard water, Limitron)- input 24V DC, 10mA
x 30	COND sensor earth	conductivity sensor earth
x 31	COND sensor	conductivity sensor input