Condair AX

Reverse Osmosis

Assembly and Operating Manual

Table of Contents

1. Safety Information

1.1 General Information

This technical documentation contains basic instructions that must be followed during setup, operation, and maintenance. Therefore it is essential that it is read before assembly and commissioning by the installer as well as by the responsible technical personnel/operators. It must always be available in the location where the system is in use.

The general safety instructions listed in the "Safety Instructions" section must be followed, as must the special safety instructions and warnings that appear in other sections.

Moreover, the special rules and guidelines for accident prevention that apply to the location of use must also be followed.

Note

These instructions provide important information on how to handle the system correctly. Failure to observe these instructions can lead to faults in the system or problems in the surrounding environment.

Risk of injury

Warning — informs the operator of hazardous situations. These situations must be avoided, otherwise you or other persons could suffer severe injury or even death.

Instructions and warnings affixed directly to the system, such as arrows indicating the direction of rotation or labels for fluid connections, must always be followed and kept in a completely legible condition.

1.2 Qualification and Training of Personnel

The personnel carrying out operation, maintenance, inspection, and assembly work must have appropriate qualifications. The responsibility, competence, and supervision of personnel must be regulated in detail by the operator. If personnel do not have the required skills, they must be trained and instructed. If necessary, this may be provided by the manufacturer/supplier at the request of the system operator. Furthermore, the operator must ensure that the content of the technical documentation is completely understood by personnel.

1.3 Hazards Due to Failure to Follow Safety Instructions

Failure to follow the safety instructions can lead to hazards to personnel as well as to the environment and the system. Failure to follow the safety instructions can result in any damage compensation claim being void.

Specifically, failure to follow the safety instructions can result in the following hazards, for example:

- Failure of important system functions
- Failure of specified maintenance and repair methods
- Hazards to personnel due to electrical and mechanical effects

1.4 Safe Working Practices

The safety instructions listed in this technical documentation, applicable national guidelines for accident prevention, and any workplace, operating, and safety guidelines provided by the operator must all be followed.

1.5 Safety Instructions for the Operator/User

- Any existing contact guard for moving parts may not be removed from a system in operation.
- Hazards due to electrical energy must be ruled out (for details, please see for example the guidelines of the German Electrotechnology Federation (GEF) and local power companies).

1.6 Safety Instructions for Maintenance, Inspection, and Assembly Work

The operator must ensure that all maintenance, inspection, and assembly work is carried out by authorized, qualified technicians who are sufficiently informed as the result of comprehensive study of the technical documentation.
Work on the system may only be carried out when it is switched off. The procedures for shutting down the system described in the technical documentation must always be observed.
Immediately after completion of work, all safety and protective systems must be reattached and/or reactivated.
Before recommissioning the machine, the points listed in the section "Commissioning and Decommissioning" must be followed.

1.7 Unauthorized Modification and Replacement Parts

Modification of or changes to the system are only permitted after discussion with the manufacturer. Original replacement parts and manufacturer-authorized accessories are important for your safety. The use of other parts can void liability for any resulting consequences.

1.8 Unauthorized Operation

The operational safety of the system provided can only be guaranteed if it is used as intended. The limit values specified in the technical data may not be exceeded under any circumstances.

1.9 Safety Instructions for Storage

 Important:

The reverse osmosis system is protected by a preservative against microbial contamination and against risk of frost down to -20°C.
At room temperature (< 25°C), this preservative must be purged and replaced within 6 months at the latest. At higher temperatures, the protection period is correspondingly shorter (3 months at 30°C). The maximum allowable ambient temperature for transport and storage in any case is 40°C. When decommissioning the system for 30 days or more, more preservative must be added to the system to prevent microbial contamination.
The system must always be protected from direct sunlight during transport, storage, and operation.

2. Functional Description

When saline solution and pure water are separated by a semipermeable membrane, this system strives to achieve a concentration equilibrium. The water penetrates the membrane without the action of external force, diluting the solution until balance is achieved. This process is called osmosis. In equilibrium, the static pressure in the solution is equivalent to the osmotic pressure. The process is reversible if pressure is exerted on the saline solution to overcome the osmotic pressure. In this process, called “osmotic pressure,” only water is transported through the membrane, while the saline solution becomes concentrated. In the technical process of reverse osmosis, which runs continuously, the concentrated solution is called the “concentrate” and the desalinated water produced “permeate”; when describing performance, the term “permeate output” is often used.

Reverse osmosis systems are used for the cost-effective production of desalinated water. Applications include the production of boiler water, the preparation of supplementary water for humidifiers and cooling towers, and the generation of rinsing water for industry, commerce, and gastronomy.

Due to the extensive separation of microorganisms and toxins, reverse osmosis is also a particularly well-suited water preparation process for clinics, the pharmaceutical and cosmetics industry, and the food and drink industry.

When used in air conditioning systems, particularly for humidification, the salt content in water must be as low as possible.

This requirement is met in a highly cost-effective manner by a Condair AX reverse osmosis system. It is designed for the direct supply of modern humidifiers and provides permeate to the humidifier in the pressure range from 4 to 7 bar.

Softened water or hard water may be used to feed the Condair AX reverse osmosis system.

Operating parameters may change according to experience in ongoing operation, changes to the composition and concentration of materials, the water used, ambient conditions, legal requirements, and the conditions of use.

The degree of desalination, depending on the content and composition of the water contents, is 94% to 99%. Gases pass through the reverse osmosis membrane unhindered, including CO_2 which increases conductivity.

Please inform us of any changes in the behavior of the system. Changes in system behavior can be detected by careful logging of operation, together with any warranty claims. Preprinted forms for this purpose can be found in Chapter 8. This will allow you to operate your system in a safe and cost-effective manner.

3. Technical Data

Type		Condair AX 02	Condair AX 05 W	Condair AX 05 H	Condair AX 12 W	Condair AX 12 H	Condair AX 20 W	Condair AX 20 H	Condair AX 30	Condair AX 50
Water quality of the untreated water		Hard/ soft water opera-tion 20° dH	Soft water opera-tion 0° dH	Hard* water opera-tion 15° dH	Soft water opera-tion 0° dH	Hard* water opera-tion 15° dH	Soft water opera-tion 0°dH	Hard* water opera-tion 15°dH	Soft water operation 0°dH	
Performance specifications										
Permeate output at 3 bar	l/h	20	50	50	120	120	200	200	300	500
Permeate output at 1 bar	l/h	23	70	70	140	140	230	230	300	500
Permeate output at 0 bar	l/h	30	80	80	150	150	250	250	400	600
Permeate volume/day (max.)	m³	0.48	1.1	1.1	2.76	2.76	4.6	4.6	6.9	11.5
Yield	%	40**	70	35–40	70	35–40	70	35–40	70	70
Untreated water pressure (min./max.)	bar	2/6								
Water temperature (min./max.)	°C	5/30								
Desalination rate	%	95/98								
Working pressure	bar	10	10	10	10	10	10	10	10	10
Hydraulic connection										
Untreated water	R”	¾								
Permeate	DN	15								
Concentrate	mm	16 (hose sleeve)								
Electrical connection	V/Hz	230/50								
Power consumption	kW	0.15	0.55							
Dimensions (block)										
Height	mm	400	670						1500	
Width	mm	620	1400						1900	
Depth	mm	330	430						430	

Performance specifications for:

Water temperature	°C	15
Salt content max.	mg/l	1,000
Daily operating time	h	23
Ambient temperature	°C	5–30

Limit values of input water (among others):

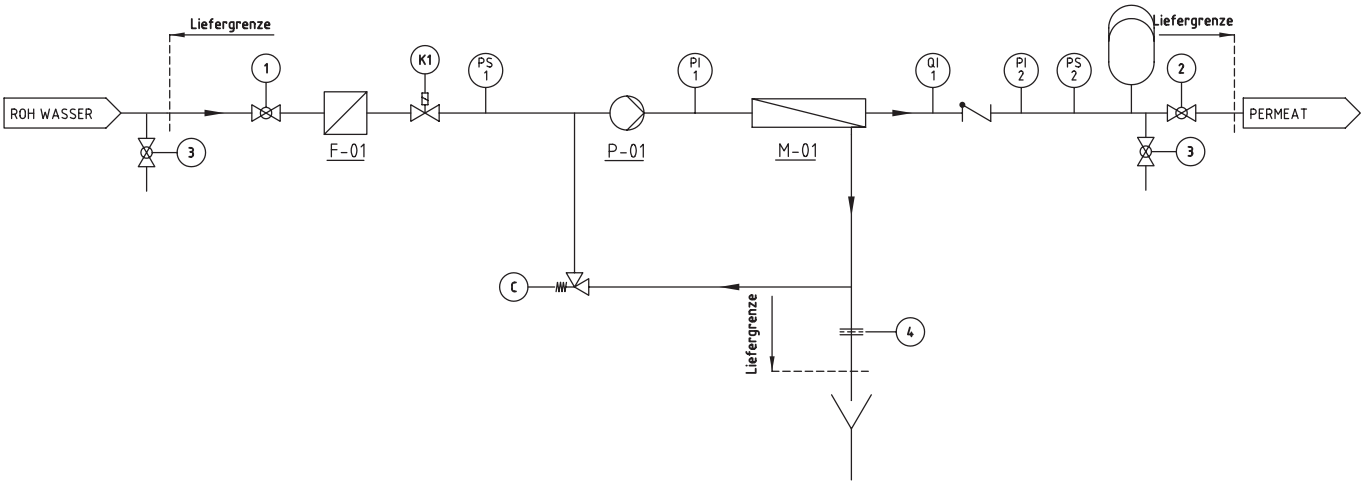
Salt content max.	mg/l	1,000***
pH value		3–11
Silt density index	SDI	< 3.0
Free chlorine	mg/l	< 0.1
Total Fe, Zn, Mn	mg/l	< 0.2

*Operation with hard water is only designed for systems with limited lifetime. An upstream water softening system must be used in most cases. Please contact us if you are using hard water

**Yield may be adjusted during commissioning by checking the actual water quality. Up to a maximum 70%

***For other limit values, the performance data will change accordingly. In case of doubt, please contact Customer Services.

3.1 P&I Diagram



MSR units and actuators

MSR point list

PI 1	Local display of pump pressure and working pressure
PI 2	Local display of permeate pressure
PS 1	Pressure switch to signal pressure loss in intake
PS 2	Pressure switch to signal lack of pressure in permeate
QI 1	Conductivity measurement/signalling

Actuators

1	Shutoff valve for untreated water, manually actuated
2	Shutoff valve for permeate, manually actuated
3	Sampling valve for untreated water, manually actuated
K 1	Automatic valve on intake, controlled by RO controller
3	Sampling valve for permeate, manually actuated
4	Concentrate screen, factory setting (determines the volume of concentrate drained)
C	Pressure regulation valve, overflow valve (sets the circulation volume)

3.2 Dimensions

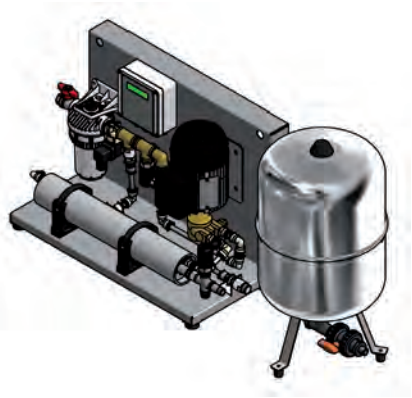
AX 02

Connections:

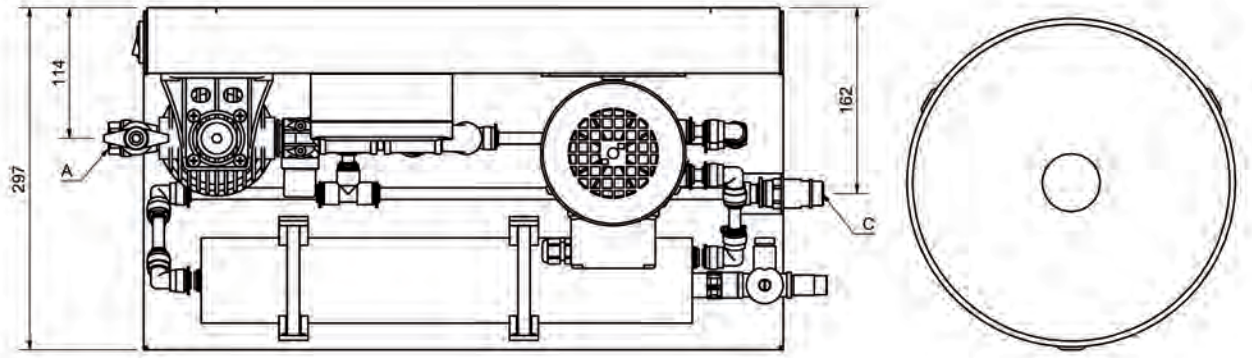
A = untreated water (PVC Ø 25 mm)
B = permeate (PVC Ø 20 mm)
C = drain water (hose sleeve Ø 16 mm)

Electrical connection:
230V/50Hz

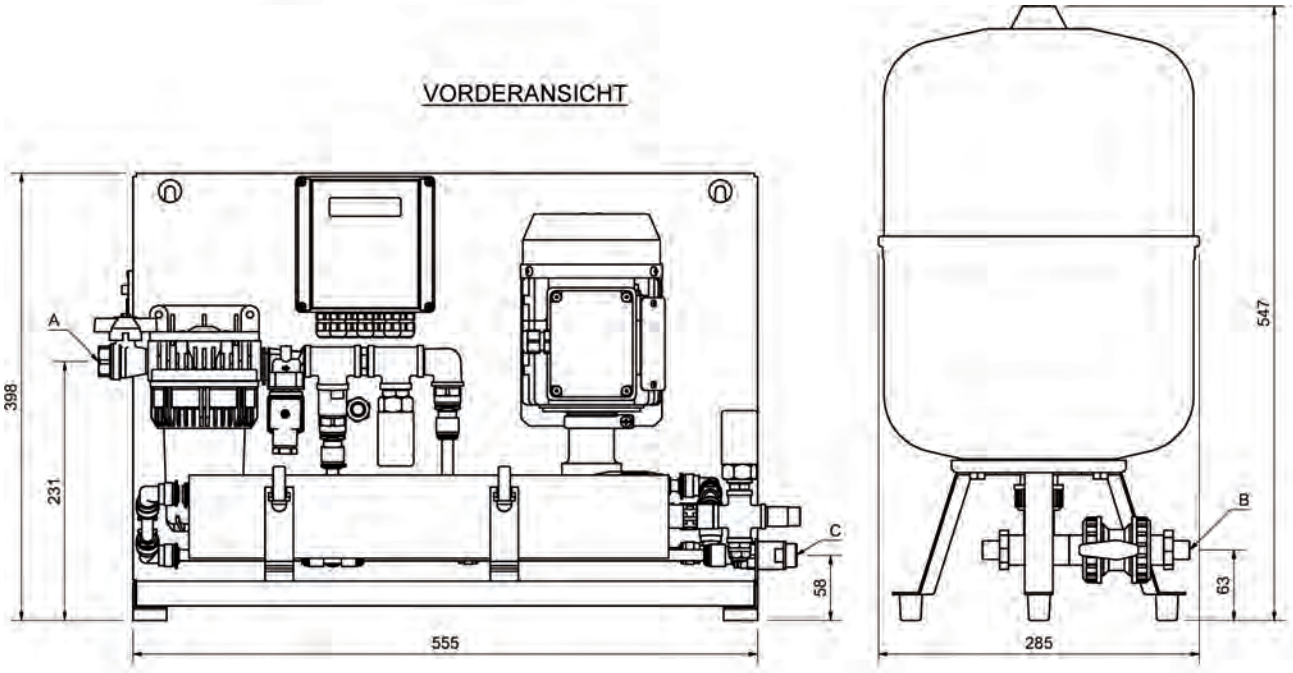
Side view



DRAUFSICHT



VORDERANSICHT



3.2 Dimensions

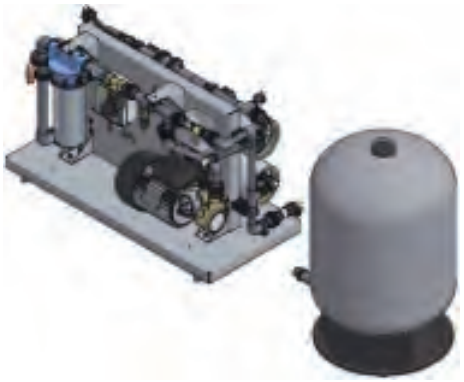
AX 05, 12, and 20

Connections:

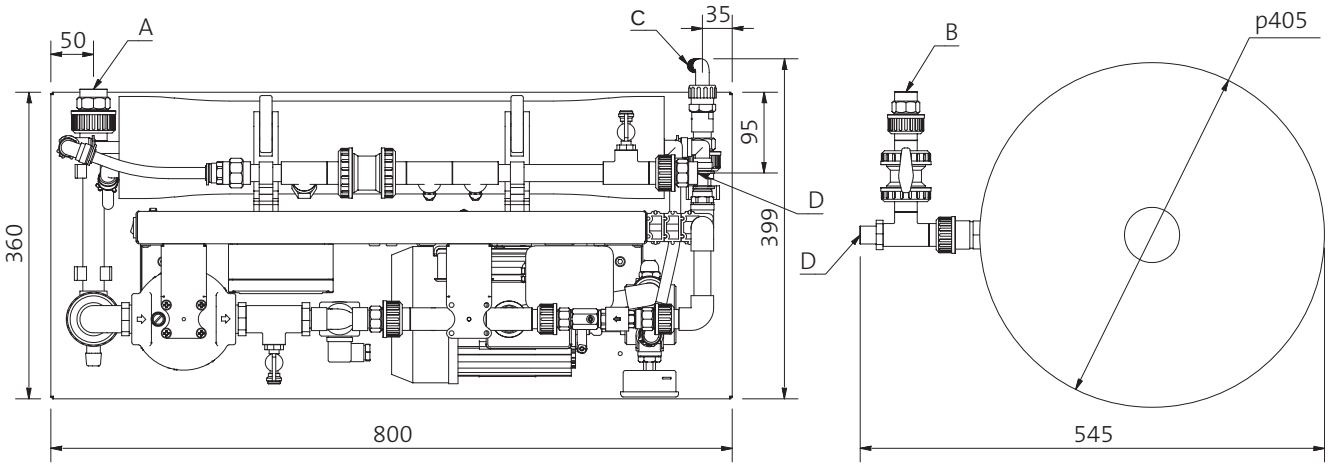
A = untreated water (PVC Ø 25 mm)
B = permeate (PVC Ø 20 mm)
C = drain water (hose sleeve Ø 16 mm)
D = drain (flexible hose)

Electrical connection:
230V/50Hz

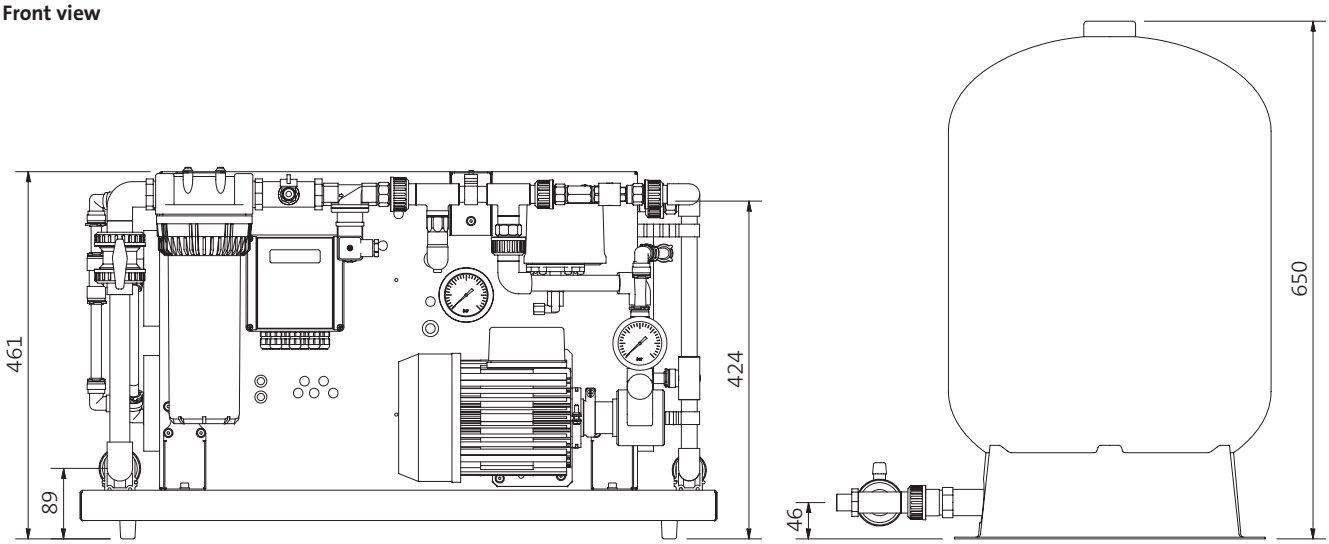
Side view



Top view



Front view



3.2 Dimensions

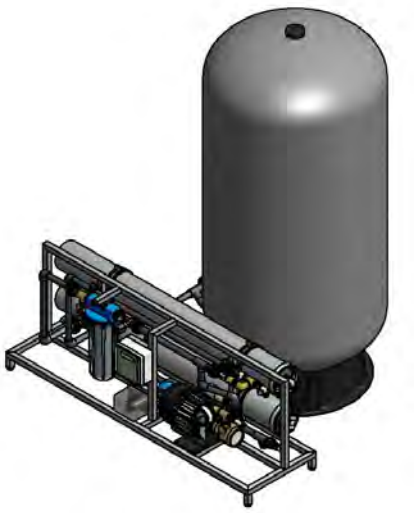
AX 30 and 50

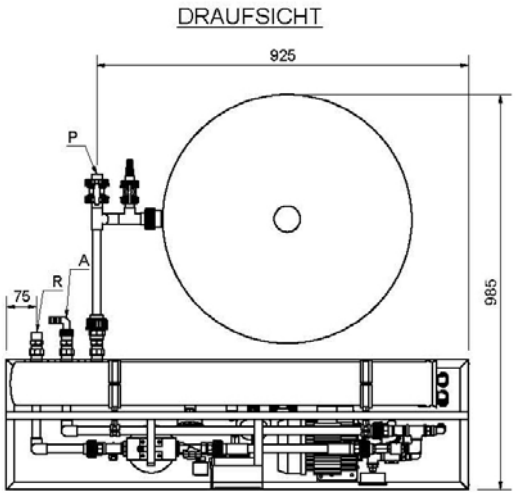
Connections:

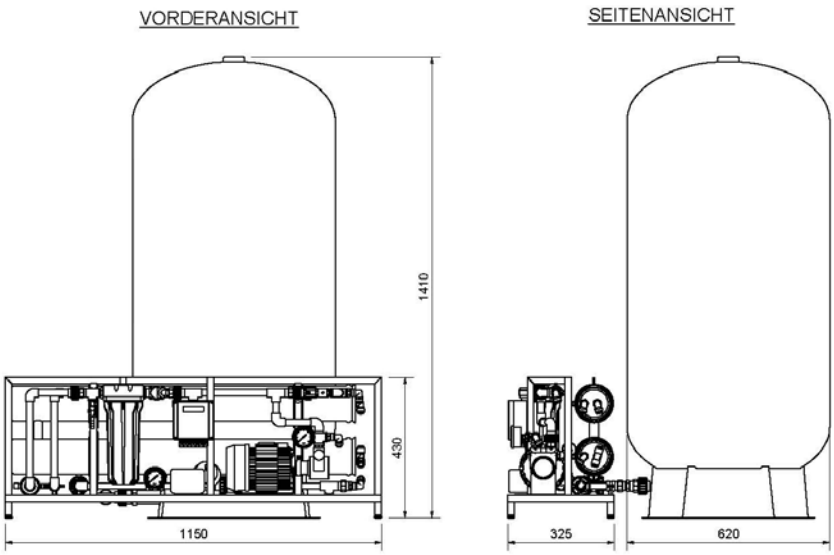
R = untreated water (PVC Ø 25 mm)
P = permeate (PVC Ø 20 mm)
A = drain water (hose sleeve Ø 16 mm)

Electrical connection:
230V/50Hz

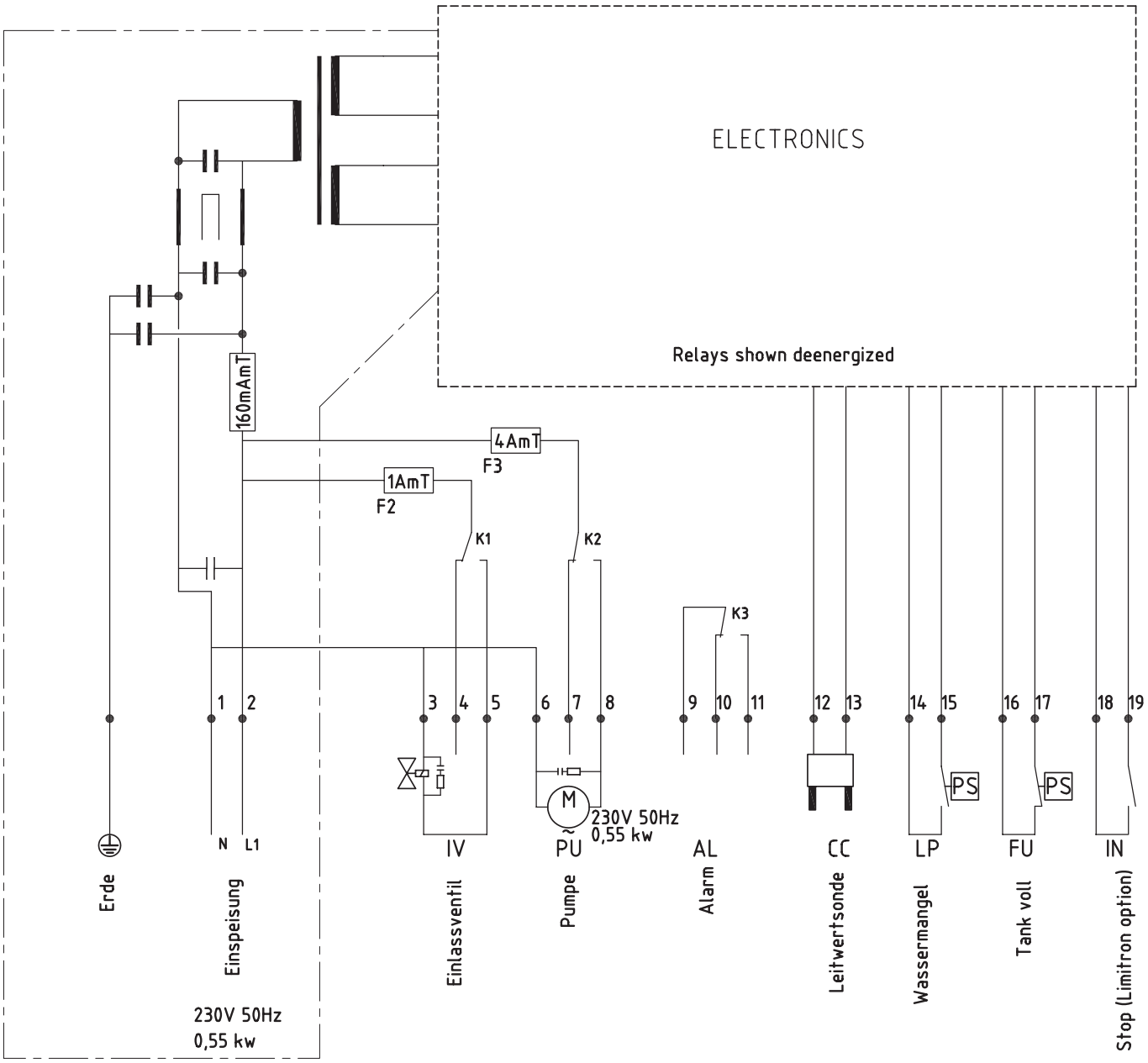
Side view







3.3 Electrical Connection



4. Installation and Assembly

4.1 Inspecting the Delivery

Before assembly starts, check the delivery for completeness and transport damage.
In case of any discrepancies, please contact the supplier immediately.

4.2 Installation

- Installation area:
  The installation area must be frost-free, sufficiently ventilated, and clean.

- Installation surface:
  Floor and wall surfaces must be smooth and horizontal/vertical.

- Connections:
  Connections of the media required for this process (e.g., water, power, control air, chemicals, etc.) and for the disposal of rinse water and concentrates must be installed and usable in the required cross-section.

4.3 Assembly

Setting up the system
Set up the system and check that the system points are horizontal, supplemented with appropriate, corrosion-resistant documentation if necessary.

Hydraulic connections
All plumbing connections must be connected without pressure.
Do not crush or kink hoses; connect hose connections securely.
Concentrate and drainage lines must be routed to the drain intake along the shortest path possible and with a drop.
Drain water must flow out without any backwater forming.

- Connecting the intake water:
  Connect the intake water to the intake water connection through a shutoff valve. Remove the sealing disk from the screw connector (keep it!).

- Connecting the permeate:
  Remove the sealing disk from the screw connector (keep it!). Connect the permeate outlet to the permeate intake of the consumer (the humidifier) using the permeate line.

- Connecting the concentrate:
  Remove the sealing disk from the screw connector (keep it!). Route the concentrate outlet to the water drain with a free-flowing drop using the concentrate drain line.

Electrical connections
The electrical installation must be carried out by an electrician in compliance with the installation guidelines of the GEF, utility suppliers, factory standards, etc. (see “Electrical wiring diagram”).

- Electrical connection:
  If a standard controller is used, the internal system components are already prewired with the controller.
  Depending on the equipment of the entire water preparation system, the connections for the level switch, outputs from pretreatment, additional quality monitoring of the intake water or permeate quality must still be connected to the controller according to the wiring diagram.
  For all types, existing central control system outputs can be connected.

- Electrical power connection:
  Within reach of the power cord of the Condair AX reverse osmosis system, a CEE AC terminal outlet must be mounted that corresponds to the system power requirements (see “Technical data”).

This connection must be fused by the building power system and may not be turned off by other parts of the system.

5. Commissioning, Decommissioning, and Controller

5.1 Commissioning and Controller

5.1.1 Chemical analysis of the untreated water

Before commissioning, a detailed analysis of the available untreated water is required.
This analysis must include physical, chemical, and biological parameters:

Physical parameters:
Pressure, temperature, conductivity, turbidity, and colloidal index, also called the SDI = silt density index.

Chemical parameters:
An overall analysis (anions, cations, pH value) including: ammonia, iron, manganese, barium, strontium, chromium, nickel, lead, copper, aluminum, silicate, and chlorine.

Biological parameters:
The CFU (number of colony-forming units) should be determined, since germs can change the behavior of membranes by forming biofilms.

Obtaining this analysis requires the involvement of a professional laboratory. If necessary, please send your water samples to our service, specifying the order number.

Some of the parameters can only be determined in untreated water under line pressure, such as the colloidal index. This should always be done before commissioning, so that a pretreatment stage (e.g., 0.2 µm absolute filter) can be included upstream of the system in case of heavy colloidal burden. Even if a professional analysis is carried out before commissioning, we recommend determining some parameters on location and repeating and logging these measurements on a weekly basis (see "Operations Log").

- Working pressure bar
- Temperature of untreated water °C
- Conductivity of untreated water µS/cm
- Total hardness °dH

- pH value
- Free chlorine content mg/l
- Iron content mg/l
- Colloidal index

The relevant devices can be ordered from our service if necessary:

- Manometer
- Thermometer
- Conductivity meter
- Hardness test kit
- pH meter
- Chlorine meter/test kit
- Iron test kit
- Colloidal index meter

5.1.2 Commissioning of Pretreatment

A reverse osmosis system essentially consists of three parts:

1. Pretreatment (depending on the design)
2. Reverse osmosis system
3. Permeate container

To produce a high-quality permeate, the following situations should be avoided:

- Allowing water to stand in the system for longer periods of time
- Operation without a water softener or with a poorly generated water softener as pretreatment
- Poor quality conditioning products or incorrect usage (overdosing, underdosing)
- Contamination of the permeate container (dust, microbes)
- Contamination of the permeate distribution system

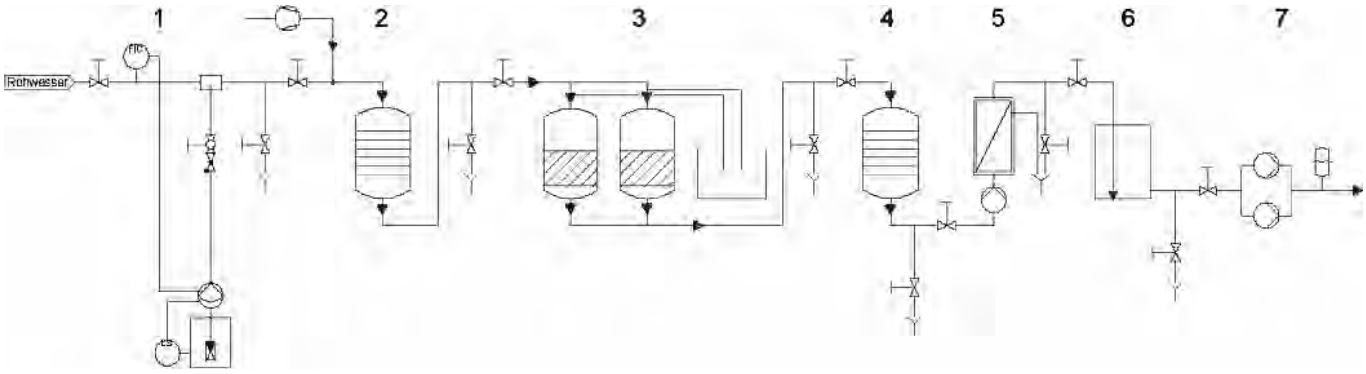
Only pretreatment with different control, cleaning, and disinfectant operations in combination with a reverse osmosis system leads quickly to production of a permeate of the expected quality and safe operation.

These operating instructions do not include a detailed description of this pretreatment. For better understanding of the RO system, only the principles of a possible pretreatment system are described here. Pretreatment is designed to provide the RO system with intake water that meets the requirements listed in the "Technical data" in Section 3. The following diagram shows the principles of the pretreatment system, including the RO system, permeate storage, and pressure increase. In the pretreatment system that is actually implemented, some of these stages may be missing or additional stages may be added. The pretreatment measures that are most frequently required are listed here:

1. Dispensing system (chemical conditioner such as chlorine dosing)
2. Iron removal (only if the iron content in the soft water is > 0.2 mg/l)
3. Softening (always required)
4. Activated charcoal filter (if chlorine dosing is used and/or in case of organic contamination)

See figure on the next page.

Possible water treatment design:



1 Dispensing system
2 Iron removal
3 Water softener
4 Activated charcoal filter
5 Reverse osmosis
6 Permeate container
7 Pressure increase system

Pretreatment must be put into operation before the RO system. This means that the different stages of pretreatment can be flushed in the flow direction and put into operation, so that no contamination or microbes are pulled in.

For the separate flushing of the individual treatment stages, bypasses from the main line to the sewer (with free run) must be included in the overall system design (planning!) before the first stage and after each stage. Downstream of each bypass, a shutoff valve must be provided in the main line. Before commissioning, all sewer bypasses and the shut-off valves must be closed in the main line.

Commissioning:

- Open the sewer bypass before the first treatment stage — water is forced into the intake line. The intake line may contain higher concentrations of germs and dissolved metallic ions due to water being there for longer periods of time or due to replumbing of the pipes.

  Rinse for long enough for the line volume to be replaced with fresh water at least three times over.

- Open the sewer bypass after the first pretreatment stage if this stage does not have its own sewer bypass. Flush and perform the operational testing for the first pretreatment stage according to the commissioning guidelines for that stage (see operating manual for this part of the system).

- Once the first pretreatment stage is operationally ready, the next pretreatment stage can be made operationally ready in the manner described above.

- All pretreatment stages in the main line, from the first to the last stage before the RO system, must be flushed and made operationally ready in the same manner.

- The dispensing system is not located in the main flow, but is connected from the side instead. It cannot be flushed in the manner described. However, a functional test must be carried out to ensure operational readiness and the chemicals must be stocked and filled.

5.1.3 Commissioning of the Reverse Osmosis System

5.1.3.1 Flushing out the Preservative

On delivery, the membrane elements are protected against microbial contamination and against freezing down to -20°C by a preservative that lasts about 6 months (depending on temperature and humidity).

Before commissioning the RO system, the preservative must be flushed out as follows:

1. Disconnect the permeate line from the permeate outlet (screw connector) and temporarily guide the permeate through a hose to the drain connector.

2. Completely open the concentrate drain valve (4).

3. Open the sampling valve (1) for the untreated water

4. Slowly open the shutoff valve (2) in the intake line to the RO system.

5. Drain the intake water through the untreated water sampling valve (1) for 10 minutes.

6. Close the untreated water sampling valve (1).

7. Turn on the main switch and controller (rocker switch)

The system is completely preprogrammed and tested at the factory. During initial commissioning, the system may show a fault due to temporary lack of water. This can be cleared by pressing the alarm button.

8. Flush the RO system for about 1 hour. This forces the preservative into the drain.

9. Permeate formed is also drained through the sampling valve.

10. After the flushing is complete, turn the power off again at the main switch.

11. Reconnect the permeate connection.

5.1.3.2 Making Operationally Ready

After turning on the controller at the rocker switch, the system automatically goes into an operational state.

5.1.3.3 Adjustment

Among other things, the permeate output is also temperature-dependent.
The permeate output listed in the Technical Data is based on an intake water temperature of 15°C. If the temperature rises or falls, then the permeate output will also rise or fall by about 3% per °C respectively.

The permeate and concentrate outputs are regulated by a concentrate screen in accordance with the technical data. The maximum permissible working pressure, the maximum permissible permeate output, and the maximum yield may not be exceeded.

Note

If the intake water temperature is less than 15°C, the permeate output will have a lower value in accordance with that temperature. If the intake water temperature is greater than 15°C, the permeate output will have a higher value in accordance with that temperature.

Adjusting the pressure switch:

Set point for the shutoff pressure of the RO system. Fine adjustment should take place with the humidifier operating. Switching point adjustment: Turn clockwise = shutoff pressure is lower.

Set point for the switch-on pressure of the RO system. As the permeate pressure falls, the RO goes back into operation. Hysteresis setting: Turn clockwise = switch-on pressure is higher.

In automatic operation, check again that the working pressure is not greater than the max. allowable working pressure.

5.2 Messages on the Controller

LCD display

First line

				E	n	t	n	a	h	m	e			
V	e	r	z	ö	g	e	r	u	n	g		1	0	s

The first line of the LCD display shows the current status (phase) of the system.
- "Entnahme" [Sampling]
- "Spülen" [Flushing]
- "BEREITSCHAFT" [READINESS]

If the system is shut off by an alarm situation during one of the above phases, this is displayed with the
- "Alarm"

display.

Second line

				E	n	t	n	a	h	m	e			
B	e	t	r	i	e	b	:			1	4	4	:	2	3

The second line of the LCD display switches between showing the following:
- "Betrieb" [Operation] with the hours of operation
- "Spülzeit" [Flushing time] with the remaining flushing time
- "Leitw." [Conductivity] with the conductivity in µS/cm

Alternatively, the conductivity can also be displayed with:

				E	n	t	n	a	h	m	e			
L	e	i	t	w	:		1	5	.	0	µ	S	/	c	m

For example: 15.0 µS/cm

Note

If the display "OFL" appears, the measured conductivity value is outside the measuring range.

Note

Alternating with the displays described in this section, the display of other messages may take place as needed.

5.3 Alarm Messages on the Controller

The alarm is displayed, alternating with the operational status.

G	**r**	**e**	**n**	**z**	**e**		**L**	**M**		**M**	**i**	**n**		
		u	**n**	**t**	**e**	**r**	**s**	**c**	**h**	**r**	**i**	**t**	**t**	**e**	**n**

- "Grenze LM Min unterschritten" [LM min. limit violated]
  If the limit value for minimum conductivity is violated, then an alarm message is displayed after the display period (which is displayed). The system continues to operate, but the alarm relay is activated.
- "Grenze LM Max überschritten" [Limit LM max exceeded]
  If the limit value for maximum conductivity is exceeded, then an alarm message is displayed after the display period (which is displayed). The system stops, and the alarm relay is activated. The system can be started again by turning it off and on again.
- "Signal Stop"
  If the Limitron hardness monitor signals hard water (contact closed), then after the display time (which is displayed) an alarm message appears. The system stops, and the alarm relay is activated. The system can be started again by turning it off and on again. The fault message from the Limitron must first be removed.
- "Signal Wassermangel" [Signal: no water]
  If the pressure switch in the intake signals low pressure (contact opened), then after the display time (which is displayed) an alarm message appears. The system stops, and the alarm relay is activated. The system can be started again by turning it off and on again. The flow pressure must return to less than 1 bar for this to work.

The alarms are acknowledged by turning the controller on and off.

5.4 Functional Test of the Controller

Success of the functional test requires prior programming of the controller to match the existing system configuration. In particular, it must be determined whether the sensors (pressure switches) are normally open or normally closed when active.

1. Start "Operating":
1.1 Open shutoff valve in the intake water line and ensure that there is an operating pressure in the intake water to the RO system of at least 3 bar.
1.2 Switch controller to "Operating" mode by extracting water through the tap on the permeate
1.3 Check the pressure switch assigned to the on/off switching procedure for the RO system.

2. Functional test "Pressure loss"
2.1 Slowly close shutoff valve in the intake line
2.2 If the intake pressure (read from PL1) falls below about 1 bar, the RO system pump shuts off and the "Pressure loss" fault is displayed.
2.3 Slowly open shutoff valve in the intake line again
2.4 Once the intake water pressure rises above 1 bar, the pump in the RO system turns back on.

3. Functional test "Readiness"
3.1 Disable water request from humidifier.
3.2 System shuts off.
3.3 Reactivate water request and generate permeate extraction.
3.4 System turns on.

4. Functional test "Conductivity display"
Read off the conductivity of the permeate from the conductivity meter of the RO system. Compare the conductivity value shown with a manual measurement.

5.5 Decommissioning

Temporary decommissioning
For a temporary decommissioning, select the "OFF" mode.

Long-term decommissioning
To shut down the RO system for several days or a longer period, preservation of the modules against microbial contamination and frost is necessary.
Turn off the main switch of the RO system.
Completely empty the permeate membrane container.

5.6 Recommissioning

Recommissioning after temporary decommissioning Restore operational readiness.

Recommissioning after a longer period After a longer period, repeat the procedure described in 5.1 "Commissioning".

6. Monitoring and Maintenance

6.1 Monitoring

To ensure operation, a visual check must be carried out daily for damage, leaks, etc.

Operations Log
An operations log must also be maintained for monitoring the RO system.

Note
The validity of warranty claims depends on an operations log being kept properly.
Recording the measured values on the day of commissioning is the first priority.

Using the operations log, sudden or gradual changes leading to the degradation or destruction of modules can be detected. Furthermore, faults or changed behavior can be detected and corrected in a timely manner.

6.2 Maintenance

The work to be performed can be handled by our service department within the framework of a maintenance agreement.
The warranty can only be honored if original replacement parts are used.

Component	Measures	Interval
Protective filter	Change the filter cartridge	for a differential pressure > 0.5 bar, at least every 2 months
RO system	Total functional test of all electrical and mechanical parts (see also “Commissioning” chapter)	Monthly
Check parameters	■ Permeate conductivity (QI 1) ■ Working pressure (PI 1) ■ Total hardness of intake water ■ Temperature of intake water ■ pH value ■ Conductivity of intake water ■ Free chlorine ■ Dissolved iron ■ Silt density index SDI	Daily Daily Weekly Weekly Monthly As needed Monthly As needed As needed
Parameter setting	Check and correction of set operating parameters	As needed

7. Troubleshooting

7.1 Pressure Loss

The “Water loss” fault is displayed when the water pressure at the pressure switch (before the pump of the RO system) falls below 0.8 bar. The system shuts off.

During troubleshooting, the water must be flowing in order to check the intake water pressure.

No.	Check/inspection	Result	Measures
		Pressure ≤ 0.8 bar	Continue with No. 3.
1.	Check pressure switch connector (PS 1)	Connector not connected	Connect connector
		Connector OK	Contact customer service
2.	Check solenoid valve (K 1) “Intake”	Solenoid valve defective	Repair/replace solenoid valve
3.	Check prefilter	Filter contaminated	Replace filter insert

7.2 Conductivity of Permeate Too High

The measured or displayed permeate conductivity is too high. Depending on the controller settings, the system may or may not shut off.

Measure the conductivity of the intake water and calculate the maximum permeate conductivity (conductivity limit value in permeate about 8% of the value in the intake water).

No.	Check/inspection	Result	Measures
1.	After about 10 minutes of operation, measure the permeate conductivity directly from the permeate line, before the permeate container, with a manual meter, and compare with the display	Measured value OK, but displayed value too high	Turn off RO system, remove conductivity measurement cell (QI 1). Check, clean, or replace. Then install, turn on system, restore operation, and carry out calibration.
		Displayed and measured value are the same, but permeate conductivity is too high.	Continue with No. 2.
2.	If the conductivity doesn't fall to the set point even after a few minutes of operation of the RO system, contact customer service.		

Module cleaning should only be carried out after corresponding diagnostics by the service department. The costs of cleaning must be weighed against the costs of a membrane replacement in case of failure.

No guarantee can be made that cleaning will be successful!

7.3 RO System Does Not Engage Although Request From Moistener is Activated

No.	Check/inspection	Result	Measures
1.	Check whether an alarm or stop has occurred	Alarm or stop did occur	See “Alarm messages”
		None of the faults listed	Contact customer service

7.4 Pump Pressure Too High

The pump pressure is higher than the limit value specified in the technical data.

Measure the temperature of the intake water and calculate the permeate output (see “Commissioning”).

No.	Check/inspection	Result	Measures
1.		Pressure does not correspond to set value	The pump pressure has presumably been readjusted due to increasing blocking of the module. Clean or replace module, request customer service

8. Operations Log

System type:_____ Object:_____

Measured/calculated value	Unit	Date					
		Commis-sioning					
Measured values							
Total hardness before softening	°d						
Total hardness after softening	°d						
Conductivity	µS/cm						
Temperature	°C						
Permeate conductivity	µS/cm						
Pump pressure	bar						
Switch play							
Switching pressure on	bar						
Switching pressure off	bar						
Production time without extraction, operation to flushing	sec.						
Pressure before membrane vessel	bar						
Consumption data							
Operating hours	h						
Counter value on untreated intake water	m³						
Counter value on permeate	m³						
Filter change							
Hardness sensor regenerated							

Operations Log

System type:_____ Object:_____

Measured/calculated value	Unit	Date					
Measured values							
Total hardness before softening	°d						
Total hardness after softening	°d						
Conductivity	µS/cm						
Temperature	°C						
Permeate conductivity	µS/cm						
Pump pressure	bar						
Switch play							
Switching pressure on	bar						
Switching pressure off	bar						
Production time without extraction, operation to flushing	sec.						
Pressure before membrane vessel	bar						
Consumption data							
Operating hours	h						
Counter value on untreated intake water	m³						
Counter value on permeate	m³						
Filter change							
Hardness sensor regenerated							

9. Declaration of Conformity

This product bears the CE label because it meets the requirements of the following directives:

- Conformity Assessment Procedures Directive 93/465/EEC
- Low Voltage Directive 73/23/EEC
- Electromagnetic Compatibility EMC 89/336/EEC, amended 92/31/EEC
- Machinery Directive 98/37/EC, 89/392/EEC, 93/44/EEC
- Pressurized Equipment Directive 97/23/EC

This declaration loses its validity in case of usage deviating from that specified by the manufacturer and/or in case of disregard — including partial disregard — of the installation manual and/or operating manual.

Notes

Device model: _____

Serial number: _____

Dealer: _____

Date of purchase: _____

Installation date: _____

Notes

Device model: _____

Serial number: _____

Dealer: _____

Date of purchase: _____

Installation date: _____

Notes

Device model: _____

Serial number: _____

Dealer: _____

Date of purchase: _____

Installation date: _____

Condair GmbH
Parkring3, 85748 Garching-Hochbrück
Tel. (0) 89 207 008 -0, Fax (0) 89 207 008 -140, www.condair.de