

**IMPORTANT! Read and save these instructions.
This manual to be left with the equipment.**

INSTALLATION AND OPERATION MANUAL

Pure Water System
Condair **RO-A**

Thank you for choosing Condair

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Site:

Model:

Serial number:

Contact

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1 Introduction

1.1 Read me first!

Thank you for choosing the **Condair RO-A reverse osmosis water system**.

The Condair RO-A reverse osmosis water system incorporates the latest technical advances and meets all recognized safety standards. Nevertheless, improper use of the Condair RO-A reverse osmosis water system may result in danger to the user or third parties and/or damage to property.

To ensure a safe, proper, and economical operation of the Condair RO-A reverse osmosis water system, please observe and comply with all information and safety instructions contained in the present documentation as well as in the separate documentations of the components used together with the Condair RO-A reverse osmosis water system.

If you have questions after reading this documentation, please contact your Condair representative. They will be glad to assist you.

1.2 About this installation and operation manual

Scope

The subject of this operation manual is the Condair RO-A reverse osmosis water system. Additional facility components are described only as is necessary for proper installation and operation of the system.

Since the system offers a wealth of expansion options, this documentation focuses on the standard system only. Additional facility components can be supplied for a variety of applications and performance requirements. Increased humidification output will affect a range of facility components. While some accessories are not essential, others form part of the standard system configuration. For further information on accessory parts or individual custom solutions, please consult your customer-specific schematic diagram or get in touch with your Condair representative.

Details provided in this installation and operation manual are limited to the **installation, commissioning, operation** and **maintenance** of the Condair RO-A reverse osmosis water system.

This manual is supplemented by various other documents (brochures, purchase order forms, schematic diagrams, etc.). Where required, you will find the relevant cross-references to these publications in this documentation.

Conventions



NOTE

This symbol highlights important information. This is also clearly indicated with the word "**NOTE**".



CAUTION!

The catchword "**CAUTION**" used in conjunction with the caution symbol in the circle designates notes in this manual that, if neglected, may cause **damage and/or malfunction of the unit or damage to property**.



WARNING!

The catchword "**WARNING**" used in conjunction with the general caution symbol designates safety and danger notes in this manual that, if neglected, may cause **injury to persons**.



DANGER!

The catchword "**DANGER**" used in conjunction with the general caution symbol designates safety and danger notes in this manual that, if neglected, may lead to **severe injury or even death of persons**.

Definitions

– Raw water:

The term raw water refers to (untreated) drinking or mains water without any specific additives like chlorine, H₂O₂, ozone, etc.

– Soft water:

Soft water is the term applied to water produced by the water softener unit. The water softening process replaces hard ions from calcium and magnesium with sodium.

– Pure water (RO water):

The term pure water or reverse osmosis water (RO water) refers to water partially demineralised by the Condair RO-A reverse osmosis water unit.

Safekeeping

Please safeguard this manual in a safe place, where it can be immediately accessed. If the equipment changes hands, the documentation must be passed on to the new operator.

If the documentation gets misplaced, please contact your Condair representative.

Language versions

This manual is available in other languages. Please contact your Condair representative for information.

2 For your safety

2.1 Intended use

The Condair RO-A reverse osmosis water system is intended **to be used exclusively for industrial reverse osmosis water production** within the operating conditions as specified and must not be installed/used in explosion hazard areas. Any other use without the written consent of Condair, is considered as not conforming with the intended purpose and may lead to the Condair RO-A reverse osmosis water system becoming dangerous and will void any warranty.

Operation of the equipment in the intended manner requires **that all the information contained in this manual are observed (in particular the safety instructions)**.

2.2 General safety guidelines

General

Every person working with the Condair RO-A reverse osmosis water system must have read and understood the Condair RO-A reverse osmosis water system installation and operation manual before carrying out any work.

Knowing and understanding the contents of this manual is a basic requirement for protecting personnel against any kind of danger, to prevent faulty operation, and to operate the Condair RO-A reverse osmosis water system safely and correctly.

All icons, signs and markings applied to the components of the Condair RO-A reverse osmosis water system must be observed and kept in readable state.

Qualification of personnel

The Condair RO-A reverse osmosis water system must be installed and operated only by **persons who are well trained, and adequately qualified for the respective task and are authorized by the customer**.

For safety and warranty reasons any action beyond the scope of this manual must be carried out only by service personnel authorised by Condair.

It is assumed that all persons working with the Condair RO-A are familiar and comply with the appropriate regulations on work safety and the prevention of accidents.

The Condair RO-A reverse osmosis water system may not be used by persons (including children) with reduced physical, sensory or mental abilities or persons with lacking experience and/or knowledge, unless they are supervised by a person responsible for their safety or they received instructions on how to operate the system.

Children must be supervised to make sure that they do not play with the Condair RO-A reverse osmosis water system.

Danger that may arise from the Condair RO-A reverse osmosis water system



DANGER!
Danger of electric hazard!

The Condair RO-A is mains powered. Live parts may be exposed when the unit is open. Touching live parts may cause severe injury or danger to life.

Prevention: Before carrying out any work set the Condair RO-A out of operation as described in (switch off the unit, unplug mains cable, shut off the water supply and depressurise the system) and secure the unit against inadvertent power-up.



DANGER!
Health risk because of inadequate hygiene!

Inadequately operated and/or poorly maintained reverse osmosis water systems may endanger health.

Prevention: the Condair RO-A reverse osmosis water system must strictly be operated and maintained in accordance with this manual.



CAUTION!

Do not use oil, grease, glue, Teflon, silicone, O-ring lubrication, etc. when assembling pipes or hose connections. All of these products can lead to the growth of bacteria and thus pose health risks.

Only approved lubricant is: **Dishwashing liquid.**

Always wash your hands and wear clean disposable gloves while assembling parts in direct contact with water.

Do not remove dust protection caps on pipe and hose ends until just before assembly.

When fitting water filters, RO membranes, hoses and other components in direct contact with water, wash your hands and wear sterile disposable gloves or touch only the packing foil to keep the filter and RO membranes bacteria-free.

Observe all local safety standards

Observe all local safety standards regarding the handling of **mains-powered electrical and electronic devices**, and the design and handling of **low-pressure water systems**.

Preventing unsafe operation

If it is suspected that **safe operation is no longer possible**, the Condair RO-A reverse osmosis water system should immediately **be shut down and secured against accidental power-up according to [chapter 5.5](#)**. This can be the case under the following circumstances:

- if the Condair RO-A reverse osmosis water system or other system components are damaged
- if the electrical installations are damaged
- if the Condair RO-A reverse osmosis water system is no longer operating correctly
- if connections and/or piping are not sealed

All persons working with the Condair RO-A reverse osmosis water system must report any alterations to the system that may affect safety to the owner without delay.

Prohibited modifications to the unit

No modifications must be undertaken on the Condair RO-A without the express written consent of Condair.

For the replacement of defective components use exclusively **original accessories and spare parts** available from your Condair representative.

Recommended fire extinguisher system:

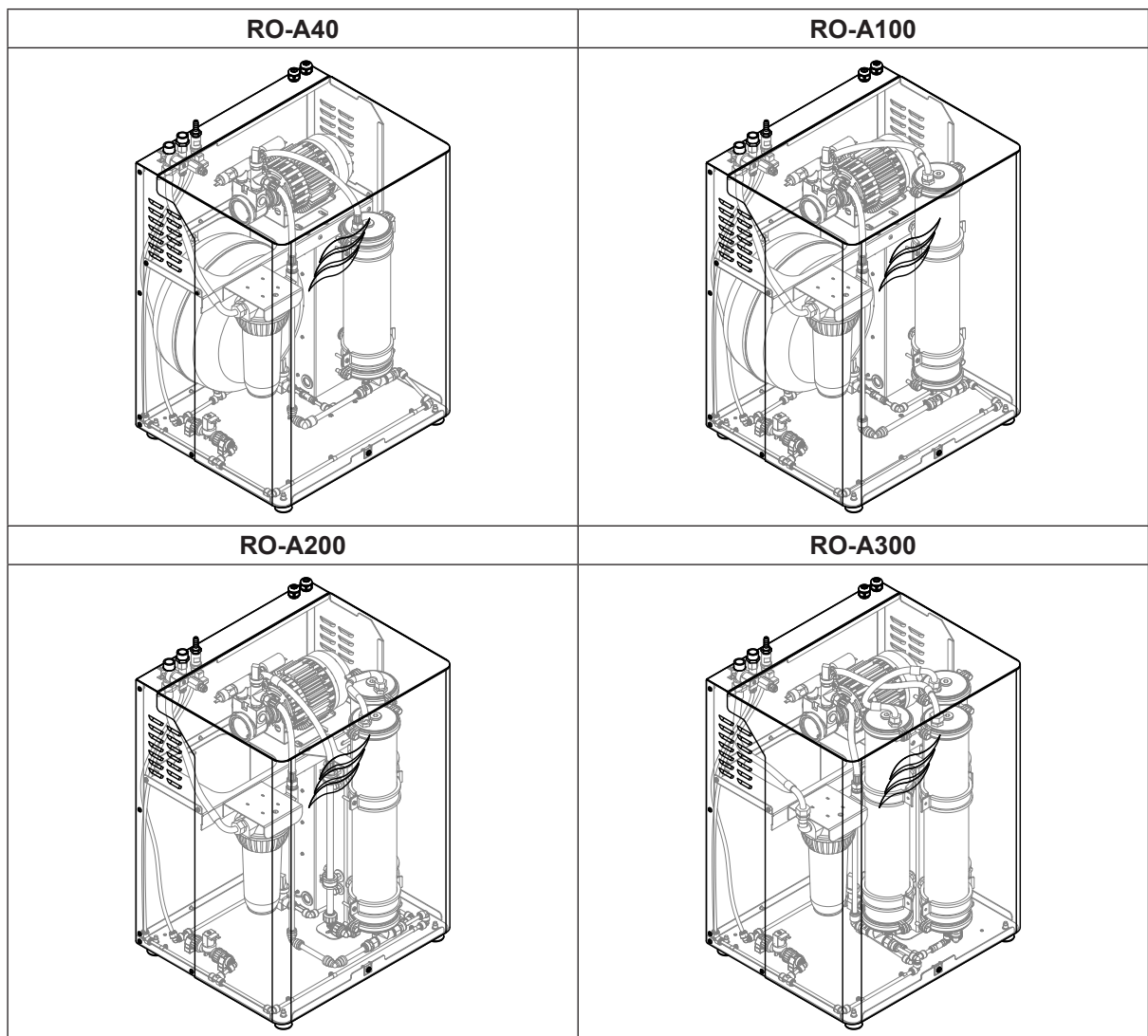
Fire extinguishers must be suitable for tackling fires in electrical installations to 1000 V. Extinguishing agents can be foam, water, powder or CO₂.

3 Product Overview

3.1 Model overview

The Condair RO-A reverse osmosis water system is available in **4 models** with different maximum reverse osmosis water output. All four RO-A models have the same housing and the same electrical parts. All systems can be operated as **stand-alone systems** controlled via the optional Condair RO-A reverse osmosis water system control unit or as **Nortec RS integrated systems** controlled via the Nortec RS control unit.

	Model			
	RO-A40	RO-A100	RO-A200	RO-A300
Pure water output at 5°C (41°F)	40 l/h (255 gpd)	100 l/h (635 gpd)	200 l/h (1270 gpd)	300 l/h (1900 gpd)
Pure water output at 15°C (59°F)	70 l/h (445 gpd)	140 l/h (890 gpd)	300 l/h (1900 gpd)	400 l/h (2535 gpd)
RO membrane type	1x 14" NSR 99.4% Spare part: 50001	1x 21" NSR 99.4% Spare part: 50039	2x 21" NSR 99.4% Spare part: 50040	3x 21" NSR 99.4% Spare part: 50041
Pure water tank	internal 18 l (4.75 gal)	internal 18 l (4.75 gal)	external 120 l (31.7 gal) (accessory)	external 120 l (31.7 gal) (accessory)

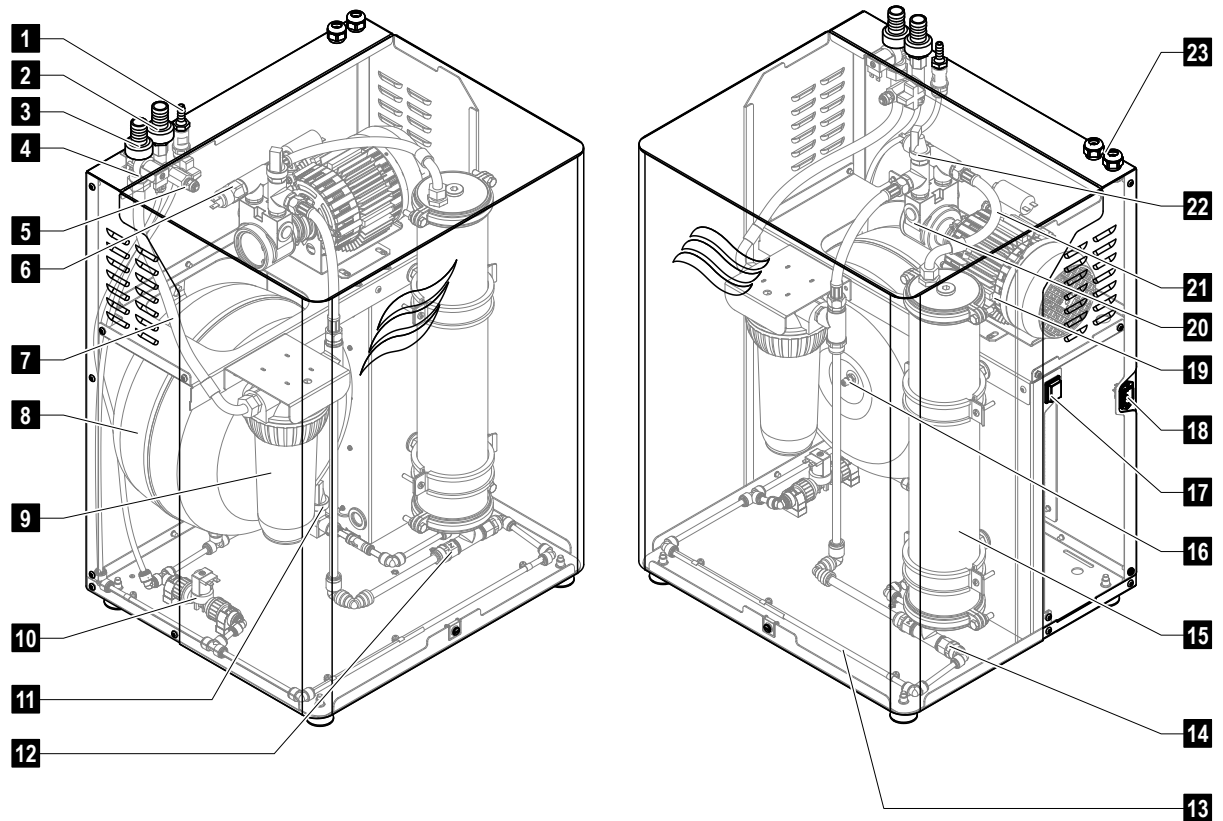


3.2 Which RO-A pure water system for which Condair device

Device	Nominal capacity in lb/hr	RO-A Type	Type pure water tank ¹⁾	
			internal	external
Nortec RS				
10 (Single unit "S")	10	RO-A40	4.75 gal (18 l)	—
15 (Single unit "S")	15	RO-A40		
20 (Single unit "S")	20	RO-A40		
30 (Single unit "M")	30	RO-A40		
45 (Single unit "M")	45	RO-A40		
65 (Single unit "M")	65	RO-A40		
90 (Single unit "M")	90	RO-A40		
90 (Double unit "L")	90	RO-A100		
130 (Double unit "L")	130	RO-A100		
180 (Double unit "L")	180	RO-A100		
Condair GS				
050	50	RO-A40	4.75 gal (18 l)	1 x 31.7 gal (1 x 120 l)
100	100	RO-A100	4.75 gal (18 l)	1 x 31.7 gal (1 x 120 l)
150	150	RO-A100		
200	200	RO-A100	—	2 x 31.7 gal (2 x 120 l)
300	300	RO-A200	—	2 x 31.7 gal (2 x 120 l)
Recommendation: Instead of the Condair RO-A, a Condair ML RO 500 with an internal 52.8 gal (200 l) water tank should be used for the following Condair GS devices.				
450	450	ML RO 500	1 x 52.8 gal (1 x 200 l)	—
600	600	ML RO 500		—

¹⁾ Design water conditions 41°F (5°C)

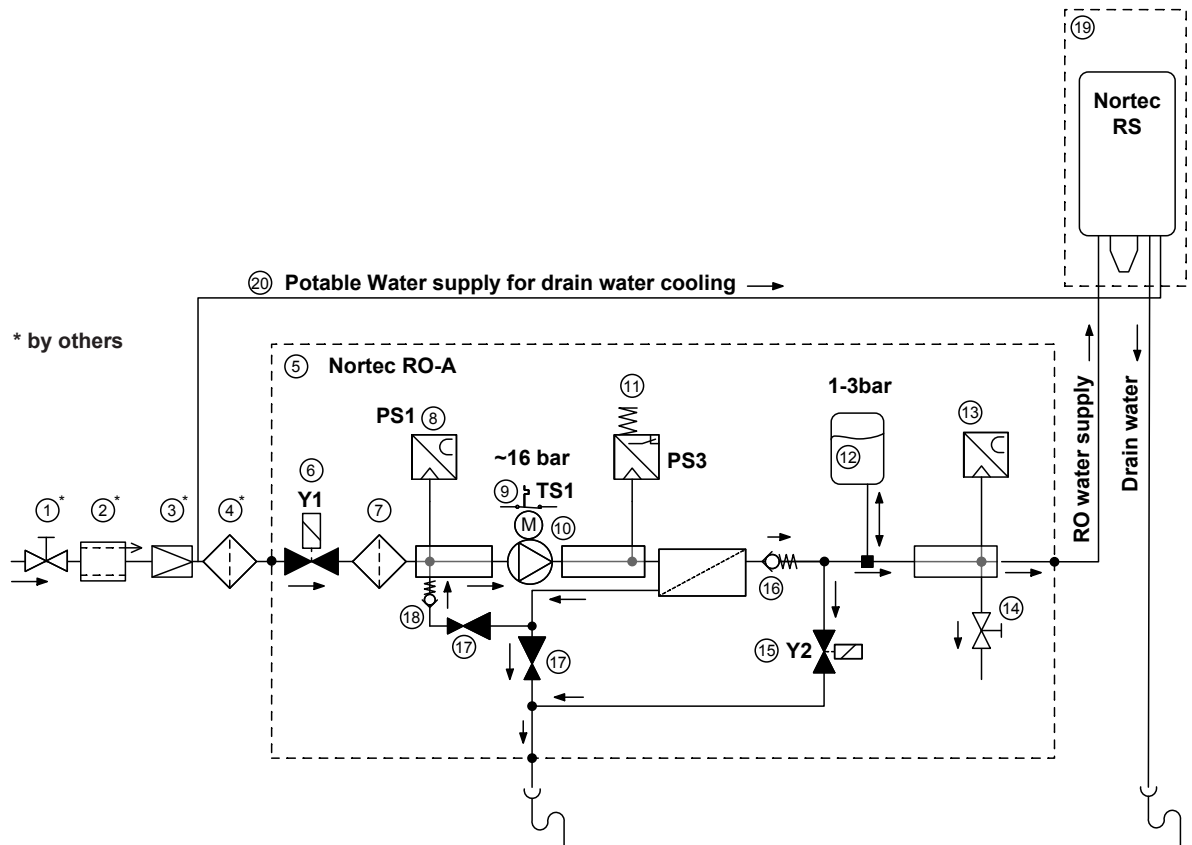
3.3 Condair RO-A construction



- | | | | |
|----|--|----|---|
| 1 | Outlet connector concentrate | 12 | Throttle circulation line |
| 2 | Outlet connector RO water
(Hose adapter G 3/4" / ø0.79" (ø20 mm), supplied) | 13 | Circulation line |
| 3 | Water inlet connector
(Hose adapter G 3/4" / ø0.79" (ø20 mm), supplied) | 14 | Throttle concentrate line |
| 4 | Inlet solenoid valve Y1 (NC) | 15 | Membrane housing |
| 5 | Probe and reverse osmosis water test valve | 16 | Valve air pressure internal RO water tank |
| 6 | Pressure switch input membrane PS3 (NC) | 17 | Unit switch |
| 7 | Supply line | 18 | Mains supply socket |
| 8 | Internal pure water tank (RO-A40 and RO-A100 only)
Note: For the RO-A200 and RO-A300 an external 120 l pure water tank is available as accessory. | 19 | Pump motor |
| 9 | Filter 10", 5 µm | 20 | Pump |
| 10 | Drain solenoid valve Y2 | 21 | Pressure hose to membrane |
| 11 | Pressure transmitter PS2 (pressure internal RO water tank) | 22 | Pressure transmitter pump inlet PS1 |
| | | 23 | Cable glands |

Fig. 1: Construction Condair RO-A (figure shows Condair RO-A100)

3.4 Hydraulic diagram Condair RO-A / Nortec RS



- | | |
|--|---|
| 1 Shut-off valve | 11 Pressure switch input membrane PS3 (NC) |
| 2 Pipe disconnect (where mandatory by local regulations) | 12 Internal RO water tank |
| 3 Pressure reducer (for supply pressures >6 bar (>87 psi)) | 13 Pressure transmitter PS2 (pressure internal RO water tank) |
| 4 Dual filter (option, recommended, mandatory for occasionally chlorinated supply water) | 14 Probe and relieve valve |
| 5 Condair RO-A | 15 Drain solenoid valve Y2 |
| 6 Inlet solenoid valve Y1 (NC) | 16 Check valve to protect membrane |
| 7 Internal filter 10", 5 µm | 17 Throttles |
| 8 Pressure transmitter pump inlet PS1 | 18 Check valve to protect throttle |
| 9 Motor over temperature switch TS1 | 19 Consumer steam humidifier "Nortec RS" |
| 10 Motor and pump | 20 Potable water supply for drain water cooling |

Fig. 2: Hydraulic diagram Condair RO-A (without optional water softener and prefilter)

3.5 Functional description Condair RO-A

A reverse osmosis system demineralises the supplied water by filtration at a low energy consumption. The product of the system is "salt-free" water (also known as RO water, pure water or permeate) and is up to 99% free of dissolved substances in the water and microorganisms, such as minerals and germs.

Reverse osmosis systems are used in pharmaceutical and food industry, heating and power plant engineering, as well as in air humidification. They are based on the economically favourable and continuous process of water filtration by reverse osmosis. The reverse osmosis (by osmosis - diffusion through a semi-permeable membrane) is a filtration at nanoscale level. It takes place at a differential pressure in the reverse osmosis membrane.

The membrane is a wrapped filter, which is flowed alongside by supply water. Filtered water flows under pressure through various membrane layers and is separated from the additives. The product (reverse osmosis water) is collected in the center of the membrane (diaphragm). Dissolved or entrained substances of the inlet water are carried further along the filter. The product is filtered, depending on input water quality, up to 99%. In the concentrate minerals and other substances flow lengthwise through the membrane. The concentrate is passed partly into the drain and partly mixed with the supply water to reduce water consumption.

The reverse osmosis water quality is usually controlled by a conductivity measurement of the product water. The lower the conductivity, the higher the electrical resistance and the purer the product water. Filtration quality depends on the particle size: gases due to their small molecular size pass through the membrane layers and increase the conductivity of the product. For sensitive applications the quality of the feedwater and the product water must be checked and optionally be periodically monitored.

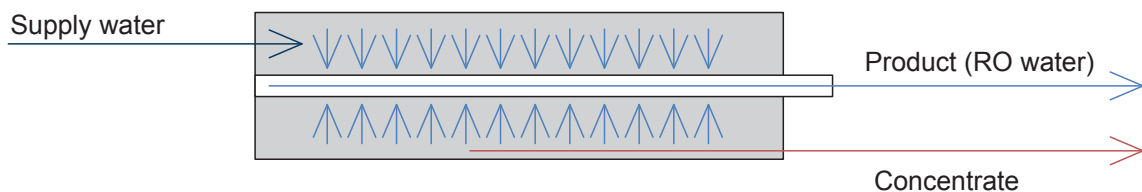
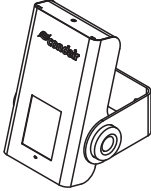


Fig. 3: Functional diagram of the reverse osmosis membrane

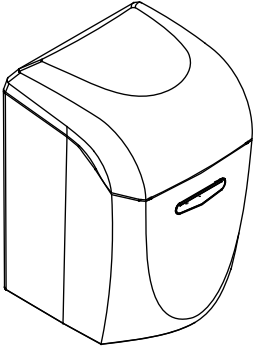
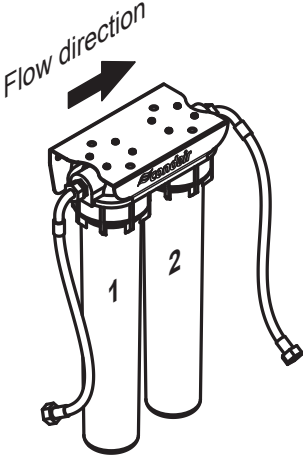
The Condair RO-A reverse osmosis water system is designed for demineralised water production. The system uses special "low-energy" reverse osmosis membranes that are especially efficient: the membranes permit under the listed supply water demands a particularly energy-saving water filtration at a desalination up to 99%.

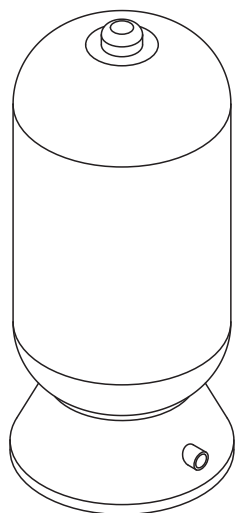
The Condair RO-A reverse osmosis water system has a compact design and is characterized by an integrated pre-filter, an internal 18 l (4.75 gal) RO water tank (RO-A40 and RO-A100) or an external 120 l (31.7 gal) RO water tank (RO-A200 and RO-A300) and a control sampling point for the product. It is intended for rapid "movable" installations and is bound only by hoses. The digital controller interface enables an accurate and simple control as well as various setting and monitoring functions.

3.6 Available options

<p>Condair RO-A control unit or Condair RO-A control unit with RFI</p> 	<p>The RO-A Control unit is used for Condair RO-A stand-alone systems only.</p> <p>The Condair RO-A control unit is equipped with a touch panel to operate the control software, a operation status LED which indicates normal operation (LED lights green), warning (LED lights yellow) and error status (LED lights red).</p> <p>Additionally the control unit features a USB interface for data logging, exporting service and error histories and updating the control and the driver board software.</p> <p>The version of the control unit with RFI is additionally equipped with a remote operation and fault indication board (RFI), via whose relay the following operating states can be signaled: "Unit on", "Operation", "Error" and "Service".</p>
<p>Protective cover</p>	<p>Protective cover for RO-A.</p> <p>Note: The protective cover is supplied as standard in some countries.</p>
<p>Leakage monitoring</p>	<p>The leakage monitoring option consist of the leakage monitoring control board and 1 to 3 floor sensors. The leakage monitoring control board is connected to driver board inside the Condair RO-A reverse osmosis water unit and the sensor(s) are connected to the leakage monitoring control board.</p> <p>Important: the leakage monitoring does not override the direction that the Condair RO-A system must be installed in a room with a floor drain or in a tub equipped with a drain connected to the building drain system.</p>
<p>Orifice</p>	<p>Orifice for operation with softened water.</p>

3.7 Available accessories

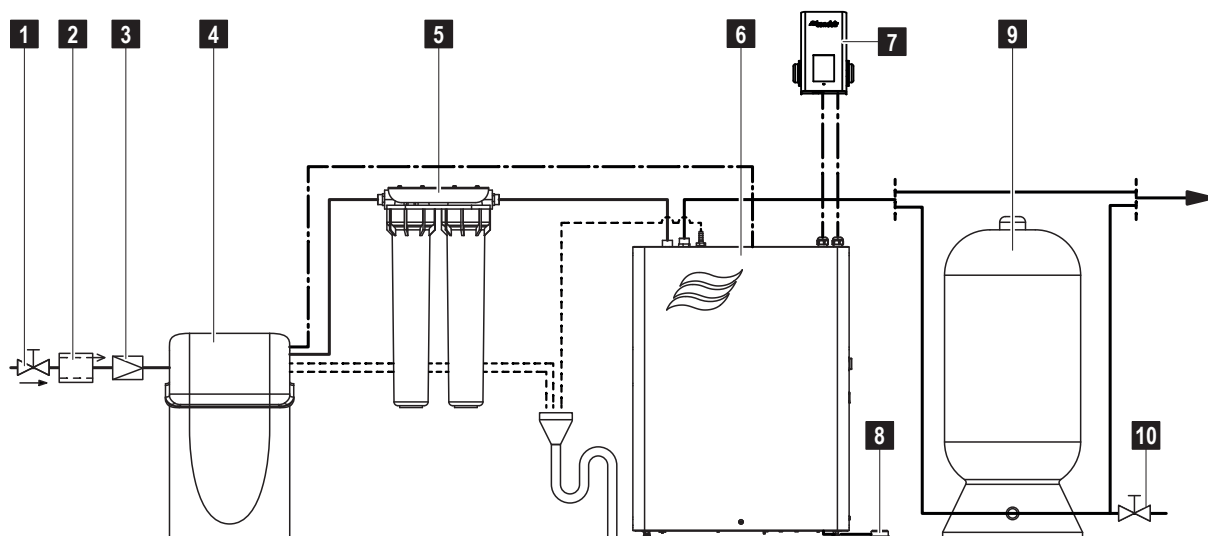
<p>Water softener</p> 	<p>The water softener constitutes the first stage in water treatment and should be installed, if the values of the incoming water exceed the limits specified in chapter 4.6.2 – Supply water specification. The water softener reduces the water hardness to 0 - 1 °dh (0 - 1.8°Fh, 0 - 18 ppm).</p> <p>The water softener works on the ion exchange principle. The resin balls inside the water softener bind the magnesium and calcium ions of the supply water and emit salt ions into the water. After processing a specific amount of supply water the resin balls are exhausted and must be regenerated. During this regeneration process the bound ions are flushed out and replaced by fresh salt ions. This process is fully automatic and takes approximately 2 hours. The regeneration process can be triggered time of day or quantity controlled.</p> <p>The water softener is supplied with a separate operation manual.</p> <p>Note: the operation of the Condair RO-A is not stopped during the regeneration process of the water softener.</p>
<p>Dual filter</p> 	<p>The dual filter serves as pre-filter and must mandatory be installed if the supply water is occasionally chlorinated. The dual filter consist of an activated charcoal filter (1) and a 5 µm filter (2). Important: the dual filter is not intended to be used for continues filtration of chlorinated water!</p> <p>The dual filter is supplied with connecting hoses and has to be installed after the water softener (if installed).</p> <p>Different types of dual filters can be used, if these meet at least the specification specified above.</p>

External RO water tank

External 120 l RO water tank for Condair RO-A200 and Condair RO-A300.

3.8 System overview

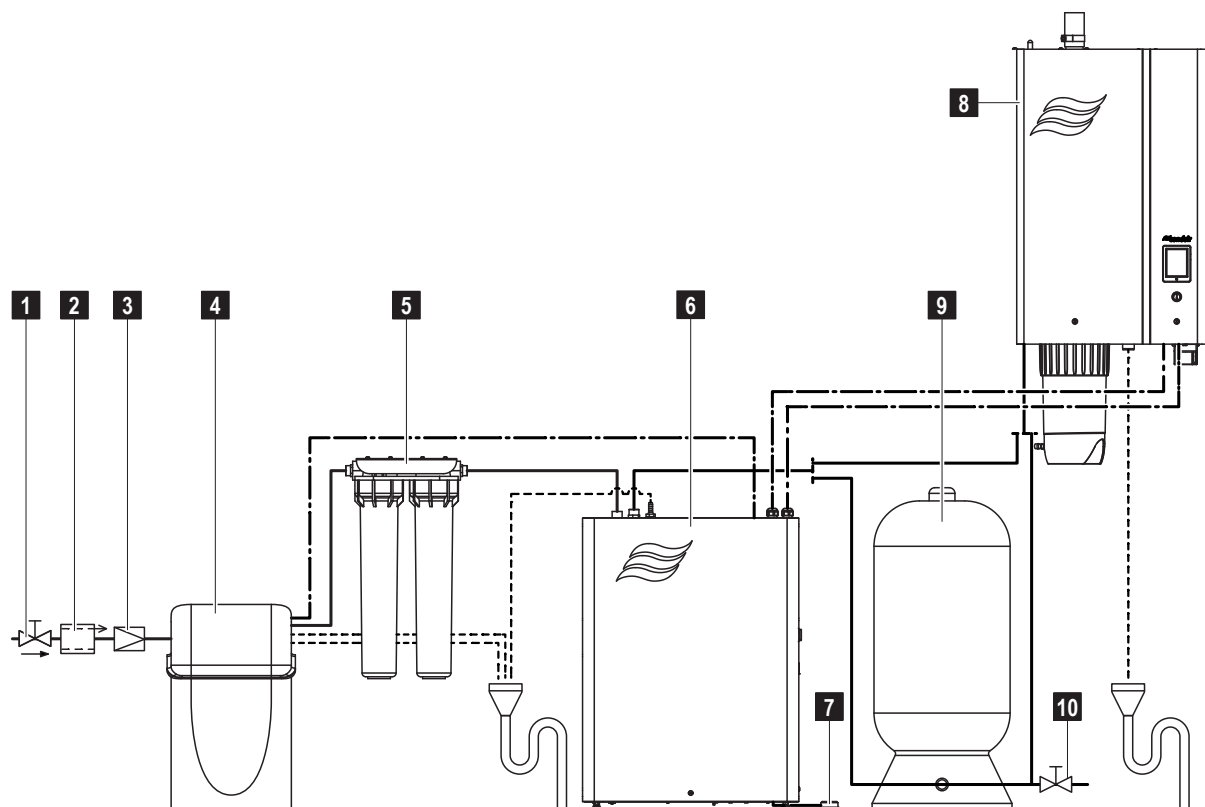
Principal system layout Condair RO-A stand-alone systems



- | | |
|--|--|
| 1 Shut-off valve (mandatory) | 6 Condair RO-A |
| 2 Pipe disconnect (where mandatory by local regulations) | 7 Condair RO-A control unit |
| 3 Pressure reducer (mandatory for water supply pressure >6 bar (>87 psi)) | 8 Leakage sensor (option leakage monitoring) |
| 4 Water softener (option, recommended if the supply water hardness exceeds the limits specified in chapter 4.6.2 – Supply water specification.) | 9 External RO water tank (accessory for Condair RO-A200 and RO-A300) |
| 5 Dual filter (option, recommended, mandatory for occasionally chlorinated supply water) | 10 Tank drain valve (recommended, by client) |

Fig. 4: Principal system layout Condair RO-A stand-alone systems

Principal system layout Condair RO-A Nortec RS integrated systems



- | | |
|--|--|
| 1 Shut-off valve (mandatory) | 6 Condair RO-A |
| 2 Pipe disconnect (where mandatory by local regulations) | 7 Leakage sensor (option leakage monitoring) |
| 3 Pressure reducer (mandatory for water supply pressure >6 bar (>87 psi)) | 8 Steam humidifier Nortec RS |
| 4 Water softener (option, recommended if the supply water hardness exceeds the limits specified in chapter 4.6.2 – Supply water specification .) | 9 External RO water tank (accessory for Condair RO-A200 and RO-A300) |
| 5 Dual filter (option, recommended, mandatory for occasionally chlorinated supply water) | 10 Tank drain valve (recommended, by client) |

Fig. 5: Principal system layout Condair RO-A Nortec RS integrated systems

4 Mounting and installation work

4.1 Safety notes on mounting and installation work

Qualification of personnel

All mounting and installation work must be carried out only by **properly instructed and well qualified personnel (e.g. certified plumbers and certified electricians) authorised by the owner**. It is the owner's responsibility to verify proper qualification of the personnel.

General notes

Strictly observe and comply with all information given in the present installation and operation manual regarding the positioning and mounting of the Condair RO-A system components and the water and electrical installations.

Observe and comply with all local regulations dealing with water and electrical installations.

Safety

Some installation work requires removal of the unit covers. Please note the following:



DANGER!
Danger of electric shock

The Condair RO-A reverse osmosis water unit as well as the Nortec RS are mains powered. Live parts may be exposed when the units are open. Touching live parts may cause severe injury or danger to life.

Prevention: The Condair RO-A reverse osmosis water unit and the Nortec RS unit must be connected to the mains only after all mounting and installation work has been completed, all installations have been checked for correct workmanship and the units are closed and properly locked.



CAUTION!

The electronic components inside the Condair RO-A reverse osmosis water unit, the RO-A control unit and the Nortec RS are very sensitive to electrostatic discharge. Before carrying out installations work inside these units, appropriate measures must be taken to protect the electronic components against damage caused by electrostatic discharge (ESD protection).

4.2 Inspection of the delivery

After receiving:

- Inspect shipping boxes for damage.
Any damages of the shipping boxes must be reported to the shipping company without delay.
- Check packing slip to ensure all parts has been delivered.
All material shortages are to be reported to your Condair supplier within 48 hours after receipt of the goods. Condair assumes no responsibility for any material shortages beyond this period.
- Unpack the parts/components and check for any damage.
If parts/components are damaged, notify the shipping company immediately.
- Check whether the components are suitable for installation on your site according to the facility documentation.

4.3 Storage and Transportation

Storing

Until installation store the Condair RO-A system components in its original packaging in a protected area meeting the following requirements:

- Room temperature: 5 ... 40°C (41 ... 104°F)
- Room humidity: 10 ... 75 %rh

Transportation

For optimum protection always transport the Condair RO-A system components in their original packaging and use appropriate lifting/transporting devices.



WARNING!

It is the customer's responsibility to ensure that operators are trained in handling heavy goods and that the operators comply with the appropriate regulations on work safety and the prevention of accidents.

Packaging

Keep the original packaging of the components for later use.

In case you wish to dispose of the packaging, observe the local regulations on waste disposal. Please recycle packaging where possible.

4.4 Requirements on siting and installation

Typically, the siting of a Condair RO-A reverse osmosis water system is determined at the planning stage and set down in the facility documentation. The following general guidance on component siting should be observed in all cases, however:

- All installation work must be performed in accordance with industry good practice and the supply (fitting) regulations from local utilities.
- All Condair RO-A system components must be installed inside a building in a room which can be locked and which is accessible only to a limited number of people. The room must meet the following requirements:

- The room temperature must be between +10°C and +30°C throughout the year.
- The room must be equipped with a **floor drain with sufficient drain capacity (min. 1,000 l/h, 4.5 gpm)**.

Note: If no floor drain is available all Condair RO-A system components must be installed in tub equipped with a drain connected to the building waste water line.

- The room must be equipped with tap water supply capable to deliver the required water flow according to the table below.

System type	Minimum water flow rate at 1.5 bar (21 PSI) flow pressure
Condair RO-A40	300 l/h (1.3 gpm)
Condair RO-A100	450 l/h (2 gpm)
Condair RO-A200	600 l/h (2.6 gpm)
Condair RO-A300	800 l/h (3.5 gpm)

- The room must be equipped with **two 120VDC/ 60 Hz (P, N and PE) mains supply wall sockets** in the vicinity of the installation site for the power supply of the Condair RO-A reverse osmosis water unit and the water softener. Both mains supply wall sockets must be placed at a **height between 0.6 to 1.3 m (2 ft to 4 ft) above the floor** and be **equipped with a UL listed, 15 amp Class A ground-fault circuit-interrupter (GFCI)**. The GFCI must meet the following requirements.

GFCI requirements	
Type:	UL listed Class A
Trip current:	0.05 A (defined by class A standard)
Pin count:	2 pole
Protection class:	IP40
Overcurrent	15 A
Fitted with test button	

- The room must be equipped with an **open funnel with siphon** connected to the building waste water system with **sufficient drain capacity (min. 1,000 l/h, 4.5 gpm)**.
- The installation site should be chosen so that all system components are shielded from thermal and solar radiation.
- Ensure that structures (walls, stanchions, ceilings, etc.) to which the equipment/system components is/are to be mounted have a sufficient load-bearing capacity and are suitable for installing the devices.
- Install the Condair RO-A system components in such a manner that they are **freely accessible** with sufficient space available for operation and maintenance purposes.
- To avoid bacterial contamination, the drain pipework must not come into contact with the drain water funnel. Maintain an air gap of at least 2x drain hose diameter or 1" (25.4 mm), whichever is larger, between the drain hose and the building sanitary waste system.

- **No modifications must be undertaken** on the Condair RO-A reverse osmosis water system without the express written consent of Condair.
- The installation of any additional fittings (e.g. valves, etc.) not indicated on the installation schematic is prohibited within the entire Condair system.
- Comply with material specifications at all times.

The manufacturer supplies individual plant schematics for customer facilities. Guidance on installation work is also provided. Installation instructions, schematics and guidance are binding for the given layout.

4.5 Positioning/mounting the Condair RO-A system components

The Condair RO-A system components must be positioned in the order as shown in the figure below.

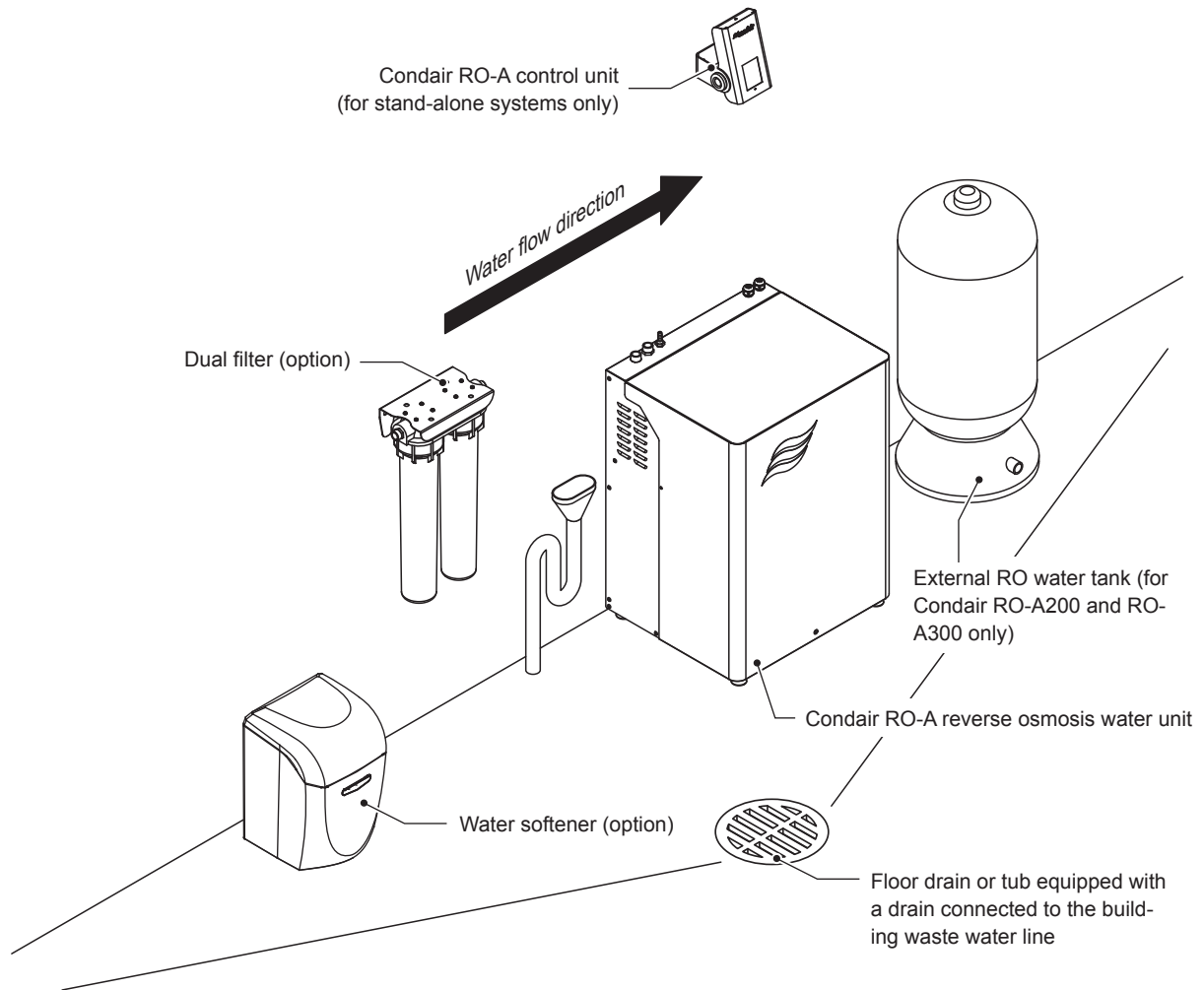


Fig. 6: Positioning order of the Condair RO-A system components in water flow direction

General

Whenever possible place the system components on the same level in the order as shown above. Make sure the distances between the components are as short as possible (max. 3 m (max. 10 ft)) between each component).

Make sure the drain line is as short as possible and the drain funnel is located below the drain connector of the RO-A reverse osmosis water unit.

Make sure the RO water line from the outlet of the RO-A reverse osmosis water unit (RO-A40 and RO-A100) or the outlet of the external RO water tank (if applicable) to the connector of the consumer is as short as possible (max. 30 m (max. 100 ft)) and the vertical height between the outlet of the RO-A reverse osmosis water unit and the consumer does not exceed 9 m (30 ft). However the installer should ensure pressure drops from RO water line do not exceed 14.5 psi (1 bar).

Positioning the optional water softener (if applicable)

Place the water softener at the desired position on the floor.

Mounting the optional dual filter (if applicable)

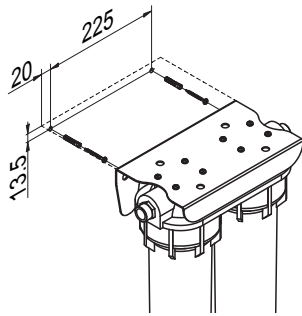


Fig. 7: Mounting the optional dual filter (dimensions in mm/inch)

Fix the dual filter at the desired position (max. 3 m, 10 ft) away from the RO-A unit) to the wall with two appropriate dowels and screws.

Note: ensure a minimum free space of 50 cm (20") underneath the dual filter to be able to change the filter cartridges.

Note: the normal flow direction of the dual filter is from left to right (indicated on the filter housing). If for any reason the flow direction must be from right to left, remove the screws on top of the support, turn filter assembly 180° and remount.

Positioning the Condair RO-A reverse osmosis water unit

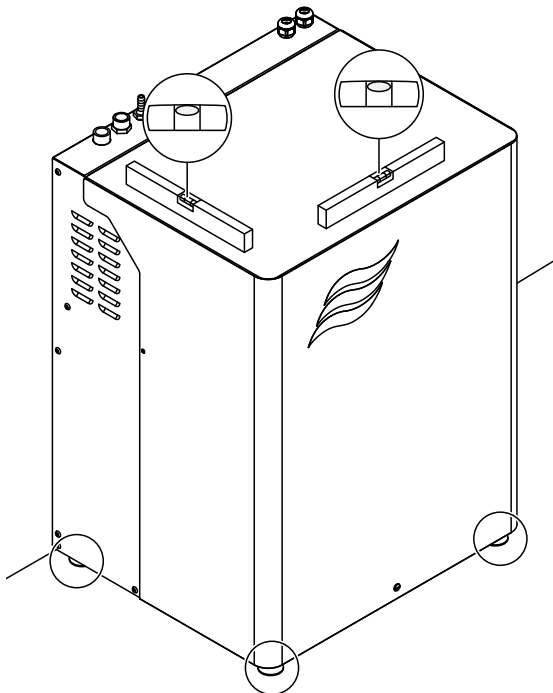


Fig. 8: Positioning the Condair RO-A reverse osmosis water unit

Place the Condair RO-A reverse osmosis water unit at the desired position and align unit with the four screw feet exactly horizontal using a level.



DANGER!
Danger of electric hazard!

Do not connect Condair RO-A reverse osmosis water unit to the mains yet.

Mounting the Condair RO-A control unit (for stand alone systems only)

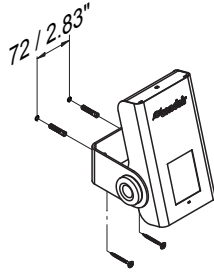


Fig. 9: Positioning the Condair RO-A control unit (dimensions in mm/inch)

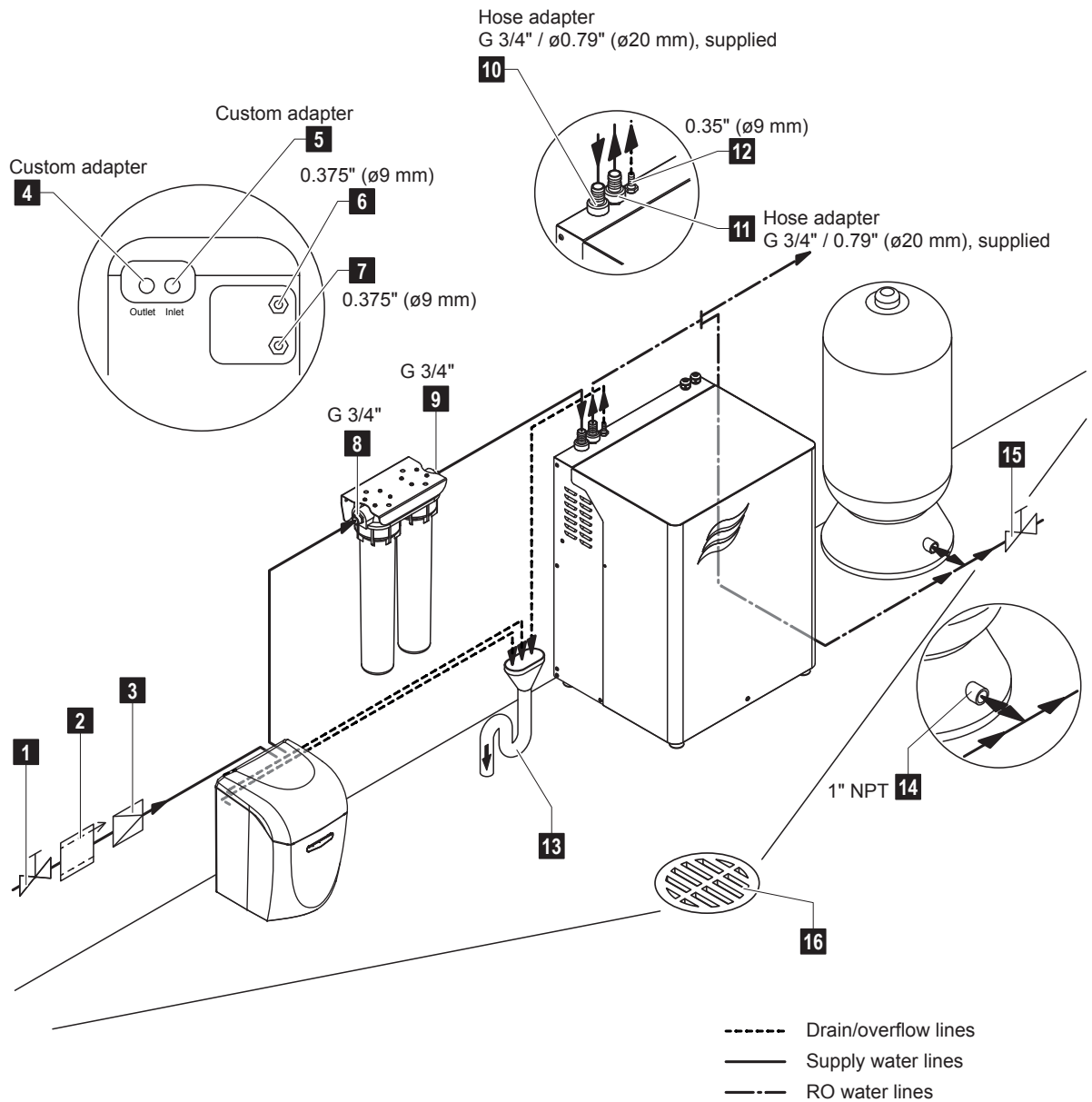
Fix the Condair RO-A control unit at the desired position at a convenient height to the wall with two appropriate dowels and screws.

Positioning the external RO water tank for Condair RO-A200 and RO-A300

Place the external RO water tank (available as accessory) as near as possible to the Condair RO-A reverse osmosis water unit on the floor. Turn external RO water tank in such a way that the water connector shows in the desired direction. Secure external RO water tank against tilting with an appropriate securing.

4.6 Water installation

4.6.1 Principal system layout water installation



- | | |
|--|--|
| 1 Shut-off valve (mandatory) | 10 Inlet connector Condair RO-A reverse osmosis water unit (hose adapter G 3/4" / ø0.79" (ø20 mm), supplied) |
| 2 Pipe disconnect (where mandatory by local regulations) | 11 RO water outlet connector Condair RO-A reverse osmosis water unit (hose adapter G 3/4" / ø0.79" (ø20 mm), supplied) |
| 3 Pressure reducer (mandatory for water supply pressure >6 bar (87 psi)) | 12 Concentrate outlet connector Condair RO-A reverse osmosis water unit (hose connector 0.35" (ø9 mm)) |
| 4 Outlet connector water softener (custom adapter) | 13 Funnel with siphon connected to building waste water line |
| 5 Inlet connector water softener (custom adapter) | 14 Connector external RO water tank 1" NPT (only applicable for Condair RO-A200 and RO-A300) |
| 6 Drain connector water softener (hose connector 0.375" (ø9 mm)) | 15 Drain valve external tank |
| 7 Overflow connector water softener (hose connector 0.375" (ø9 mm)) | 16 Floor drain |
| 8 Inlet connector dual filter (outside thread G 3/4") | |
| 9 Outlet connector dual filter (outside thread G 3/4") | |

Fig. 10: Principal system layout water installation

4.6.2 Supply water specification

The supply water must meet the following specifications:

Water supply quality	Drinking water quality
Water supply pressure	1.5 - 6 bar (21.8 - 87.0 PSI)
Max. water temperature	20°C (68°F)
Max. pH level without softener	8 (see also table below)
Free chlorine	up to 0.1 mg/l
Silt index (SDI)	max. 3
KMnO ₄	max. 10 mg/l
Fe	max. 0.2 mg/l
Mn	max. 0.05 mg/l
NTU	max. 1.0

Common preconditions for water treatment			
pH level of incoming water	6.5 - 7.0	>7.0 - 7.5	>7.5 - 8.0
Max. water hardness	356 ppm ¹⁾ (20 °dH)	303 ppm ¹⁾ (17 °dH)	178 ppm ¹⁾ (10 °dH)
Max. conductivity	1300 µS/cm ¹⁾	750 µS/cm ¹⁾	400 µS/cm ¹⁾
Max. TDS	800 mg/l ¹⁾	500 mg/l ¹⁾	250 mg/l ¹⁾

¹⁾ If any of these values of the incoming water are higher at related ppm or pH value, a water softener should be installed before the RO-A unit

4.6.3 Material specifications water installation



WARNING!

The material specifications provided below must be complied with at all times. They form an integral part of the product warranty. **Always** use the installation materials supplied by Condair.

Material for **raw water** supply lines:

Designation:	According loacal regulations
Specifications:	According loacal regulations
Connection:	G 3/4" outside thread (hose adapter G 3/4" / ø0.79" (ø20 mm), supplied)
Operating pressure	10 bar (145 PSI)
Operating temperature:	6 - 40°C (42 - 104°F)
Medium:	Raw water

Material for **RO water** pipework and fittings:

Designation:	Hose or piping: PP, aisi 304/316, POM, PVC, PA, PTFE
Specifications:	Food grade, impermeable to UV, inner diameter min. 13 mm, 1/2")
Connection:	G 3/4" outside thread (hose adapter G 3/4" / ø0.79" (ø20 mm), supplied)
Operating pressure	10 bar (145 PSI)
Operating temperature:	6 - 40°C (42 - 104°F)
Medium:	Pure water
Adhesive:	TANGIT

4.6.4 Installation notes on tap water supply

Note: The water supply must be capable to deliver the flow rates as indicated in [chapter 4.4](#):

Depending on the system layout and options used, the tap water supply (minimum inner diameter 1/2" (13 mm)) has to be connected to the inlet connector of the water softener (custom adapter), the dual filter (G 3/4" outside thread connector) or the Condair RO-A reverse osmosis water unit (G 3/4" outside thread connector (hose adapter G 3/4" / ø0.79" (ø20 mm), supplied)).

In the water supply line, before the Condair RO-A system, a shut-off valve, a pipe disconnecter (where mandatory by local regulations) and a pressure reducer (mandatory for water supply pressure >6 bar (>87 PSI)) must be installed.

4.6.5 Installation notes on drain lines



IMPORTANT NOTE

The waste connection or drain outlet of the appliance shall maintain an air gap of 2 pipe diameters or 1" (25.4 mm), whichever is larger, between the drain hose and sanitary waste system.

Drain and overflow line water softener

The drain line and the overflow line (inner diameter 0.375" (9 mm)) has to be connected to the drain outlet and the overflow connector of the water softener (0.375" (9 mm) hose connector) and led down to the funnel of the room drain with constant downslope (max. length of drain line 5 m, 16 ft). Before the funnel the drain and overflow lines must be fixed in such a way, that the end of the hoses/pipes do not touch the funnel (maintain an air gap of 2 pipe/hose diameters or 1" (25.4 mm), whichever is larger, between the drain and overflow hoses/pipes and the building sanitary waste system) and can not slip out of the funnel. The funnel must be positioned below the drain and overflow connector of the water softener.

Concentrate drain line Condair RO-A reverse osmosis water unit

The concentrate drain line (inner diameter 0.35" (9 mm)) has to be connected to the drain outlet connector (hose connector outside diameter 0.35" (9 mm)) and led down to the funnel of the room drain with constant downslope (max. length of drain line 5 m, 16 ft). Just before the funnel the drain line must be fixed in such a way, that the end of the hose/pipe does not touch the funnel (maintain an air gap of 2 pipe/hose diameters or 1" (25.4 mm), whichever is larger, between the drain hose/pipe and the building sanitary waste system) and can not slip out of the funnel. The funnel must be positioned below the drain connector of the RO-A drain connector.

4.7 Electrical installation

4.7.1 Notes on electrical installation



DANGER! **Danger of electric shock**

GROUNDING INSTRUCTIONS - The Condair RO-A must be grounded. In the event of a malfunction or breakdown, grounding will reduce the risk of electric shock by providing a path of least resistance for electric current. The Condair RO-A is equipped with a mains cable having an appliance-grounding conductor and a grounding plug. The mains plug must be plugged into an appropriate mains socket that is installed and grounded in accordance with all local codes and ordinances.

WARNING - Improper connection of the appliance-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service representative if you are in doubt whether the appliance is properly grounded. Do not modify the plug provided with the appliance; if it will not fit the mains socket, have a proper mains socket installed by a qualified technician.



DANGER! **Danger of electric shock**

The Condair RO-A reverse osmosis water unit as well as the Nortec RS are mains powered. Live parts may be exposed when the units are open. Touching live parts may cause severe injury or danger to life.

Prevention: The Condair RO-A reverse osmosis water unit and the Nortec RS unit must be connected to the mains only after all mounting and installation work has been completed, all installations have been checked for correct workmanship and the units are closed and properly locked.

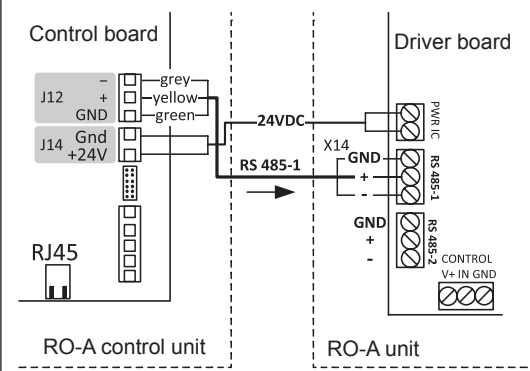


CAUTION!

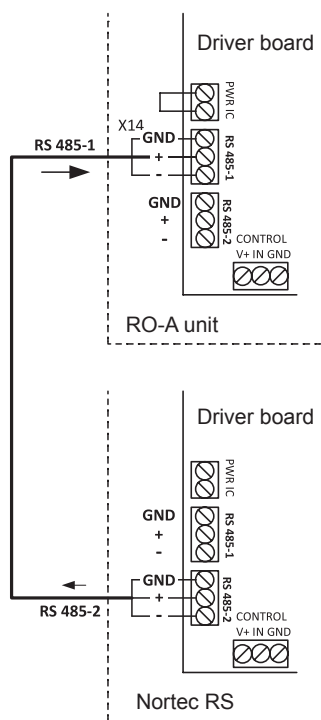
The electronic components inside the Condair RO-A reverse osmosis water unit, the RO-A control unit and the Nortec RS are very sensitive to electrostatic discharge. Before carrying out installations work inside these units, appropriate measures must be taken to protect the electronic components against damage caused by electrostatic discharge (ESD protection).

- All work concerning the electrical installation must be performed only by a **certified electrician with appropriate training, authorised by the owner**. It is the owner's responsibility to verify proper qualification of the personnel.
- The electrical installation must be carried out according to the corresponding wiring diagram (see [chapter 11.1.1](#) and [chapter 11.1.2](#)), the notes on electrical installation as well as the applicable local regulations. All information given in the wiring diagrams and notes must be followed and observed.
- All cables must be led into the devices, via appropriate cable strain relief or grommets. The cable for the optional leakage sensor can be led into the Condair RO-A reverse osmosis water unit from top via a cable grommet or from the bottom via the cable opening (fix cable with a clamp strap to the unit).
- Make sure all cables are adequately fixed over their entire length, do not rub on any components or become a tripping hazard.
- Observe and maintain maximum cable length and required cross section per wire according to local regulations.
- The mains supply voltages must match the respective voltage and fuse requirements as stated [chapter 4.4](#).

4.7.2 Electrical connections of the Condair RO-A reverse osmosis water unit

Power supply (120 VAC / 60 Hz), recommended fuse rating: 13 A	The Condair RO-A reverse osmosis water unit is connected to the mains via the supplied mains cable.
GROUNDING INSTRUCTIONS - The Condair RO-A reverse osmosis water system must be grounded. In the event of a malfunction or breakdown, grounding will reduce the risk of electric shock by providing a path of least resistance for electric current. The Condair RO-A is equipped with a mains cable having an appliance-grounding conductor and a grounding plug. The mains plug must be plugged into an appropriate mains socket that is installed and grounded in accordance with all local codes and ordinances. Improper connection of the appliance-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service representative if you are in doubt whether the appliance is properly grounded. Do not modify the plug provided with the appliance; if it will not fit the mains socket, have a proper mains socket installed by a qualified technician.	
Connecting the Condair RO-A control unit to the Condair RO-A reverse osmosis water unit (stand-alone systems)	
	<p>Connect 24 V power supply cable and the RS485 control cable to the corresponding terminals on the control board of the RO-A control unit and the driver board inside the RO-A reverse osmosis water unit according to the opposite wiring diagram.</p> <p>Note: Regarding jumper settings and rotary switch setting refer to the wiring diagram inn chapter 11.1.1.</p>

Connecting the Condair RO-A reverse osmosis water unit to the Nortec RS (Nortec RS integrated systems)



Connect RS485 control cable to terminal X14 (RS485-1) on the driver board inside the Condair RO-A reverse osmosis water unit and to the terminal X14 (RS485-1) on the driver board inside the Nortec RS steam humidifier according to the opposite wiring diagram.

Note: Regarding jumper settings and rotary switch setting refer to the wiring diagram in [chapter 11.1.2](#).

5 Operation

5.1 Prior to initial commissioning

Prior to initial commissioning the filter cartridge and the membranes must be installed in the Condair RO-A reverse osmosis water unit. In this regard please refer to [chapter 7.2.1](#) and [chapter 7.2.2](#).

If the Condair RO-A reverse osmosis water unit is purchased together with a Nortec RS as an integrated system, the operating mode of the Nortec RS is already configured to "RS+RO" in the factory level of the Nortec RS control software.

If the Condair RO-A is purchased as a retrofit for the Nortec RS, please contact your local Condair representative, for a full system integration of the Nortec RS and Condair RO-A reverse osmosis water system.

5.2 Initial commissioning

Initial commissioning, testing and configuration of the Condair RO-A reverse osmosis water system must be carried out only by Condair Customer Service or trained service personal authorised by Condair.

The Condair RO-A reverse osmosis water system may not be operated by the system owner or a person the owner has authorised unless acceptance testing for commissioning has been completed by Condair Customer Service or trained service personal authorised by Condair. The system owner must also have been instructed in operation of the unit by Condair. Once commissioning and training in the operation of the unit is complete, the system owner must ensure that the system is operated only by trained personnel. This is an integral part of the Condair product warranty conditions and non-compliance will void the product warranty.

5.3 Start-up sequence for daily operation

The following description outlines the start-up procedure after an interruption of operation (e.g. after servicing the Condair RO-A reverse osmosis water system). It is assumed that first-time commissioning has been carried out properly by Condair Customer Service and the Condair RO-A reverse osmosis water system has been configured accordingly.

1. Examine the Condair RO-A reverse osmosis water system and the installations for possible damage.



DANGER!

Systems with damaged components or installations may present danger to human life or cause severe damage to material assets.

Therefore: Systems with damaged components and/or systems with damaged or faulty installations must not be operated.

2. Ensure all covers of the different system components are closed.
3. Open all shut-off valves in the water supply line and the reverse osmosis water line.
4. Plug in the power supply cable on the Condair RO-A reverse osmosis water unit.
5. Switch on the unit switch on Condair RO-A reverse osmosis water unit and on the Nortec RS steam humidifier (if applicable).

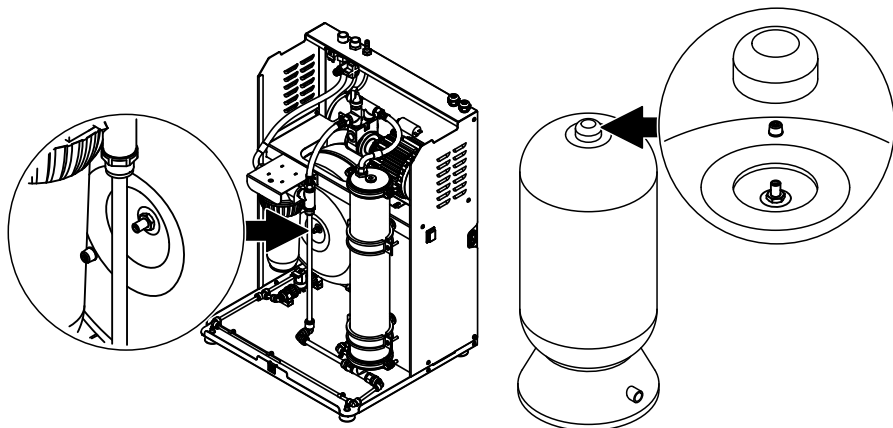
The Condair RO-A control unit (standalone systems) or the Nortec RS steam humidifier, respectively carry out an automatic system test (initializing). If a fault is detected during the system test, a corresponding fault message is shown in the maintenance and malfunction indication field (see [chapter 6.1.2](#)) of the standard operating display .

If the initialization is successful, the Condair RO-A reverse osmosis water system starts-up automatically and fills the RO water tank. As soon as the preset maximum pressure in the RO water tank is reached, the pump inside the Condair RO-A reverse osmosis water unit is stopped.

If the water pressure in the RO water tank drops 1 bar below the maximum pressure the pump starts again and refills the RO water tank to the preset maximum pressure.

5.4 Notes on operation

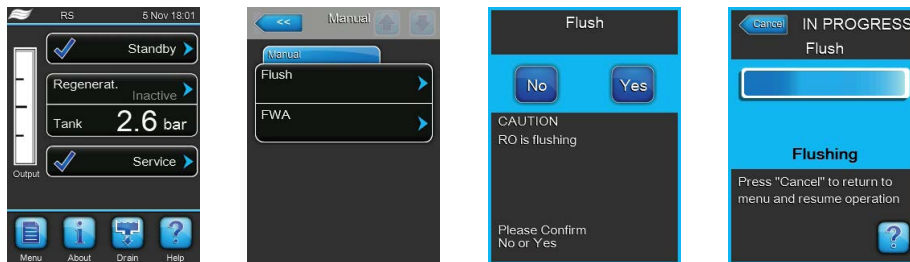
5.4.1 Inspections during operation

Interval	Work to be carried out
Every 2 days	<p>Check salt level of the water softener. Refill salt if necessary according to the instructions in the separate operating manual of the water softener.</p> <p>Always use residue-free tablet salt (not rock salt, etc.)</p> <p>If no salt is being consumed, immediately inform Condair Customer Service!</p>
Weekly	<p>During operation the following checks must be performed on the Condair RO-A reverse osmosis water system:</p> <ul style="list-style-type: none"> • check the system components and water installation for any leakage. • check the Condair RO-A reverse osmosis water system for any damage. • check the electric installation for any damage. • check the display of the Condair RO-A control unit or the Nortec RS for any warning or error indication. <p>If the inspection reveals any irregularities (e.g. leakages, error indication) or any damaged components take the Condair RO-A reverse osmosis water system out of operation as described in chapter 5.5. Then, contact your Condair representative.</p>
Monthly	<p>Check the air pressure of the bladder inside the RO water tank. Proceed as follows:</p>  <ol style="list-style-type: none"> 1. Close shut-off valve in the water supply line. Then, perform a complete system flushing as described in chapter 5.4.3. 2. Switch off unit switch of the Condair RO-A reverse osmosis water unit. 3. Applies for Condair RO-A40 and RO-A100 only: Unlock the retaining screw on the bottom of the unit cover of the Condair RO-A reverse osmosis water unit, then remove the unit cover. 4. Applies for external RO water tank only: Remove cap on top of the external RO water tank. 5. Remove screw cap on the air valve of the RO water tank. 6. Check air pressure inside the RO water tank using a tyre pressure gauge. The pressure must be between 0.5 to 0.8 bar (7 to 12 PSI). Adjust pressure if necessary. 7. Reassemble in reverse order and switch on Condair RO-A reverse osmosis water unit.

5.4.2 Flushing the water supply system

To flush the water supply system proceed as follows:

Note: the following displays show the steps to initiate a flushing of the water supply system via the control software of the Condair RO-A control unit (stand alone system). The sequence via the control software of the Nortec RS (integrated system) is identically only the content of the displays is slightly different.



1. Press on the **<Drain>** button in the standard operating display. The "Manual" submenu appears.
2. Press on the **<Flush>** button in the "Manual" submenu.
3. Press on the **<Yes>** button to start the flushing of the water supply system. The progress bar in the display shows the current status of the flush cycle. After flushing has finished the unit returns to normal operating mode.

Note: in order to stop the flush cycle press the **<Cancel>** button in the draining progress window. The flush cycle is stopped and the unit returns to normal operating mode.

5.4.3 Performing a complete flushing of the Condair RO-A system

Note: if you close the shut-off valve before performing a complete system flush you can use this function to release the pressure in the RO water tank.

To perform a complete system flush or to release the pressure in the RO water tank proceed as follows:
Note: the following displays show the steps to initiate a complete system flushing via the control software of the Condair RO-A control unit (stand alone system). The sequence via the control software of the Nortec RS is identically only the content of the displays is slightly different.



1. Close the shut-off valve in the water supply line if you want to release the pressure in the RO water tank.
2. Press on the **<Drain>** button in the standard operating display. The "Manual" submenu appears.
3. Press on the **<FWA>** button in the "Manual" submenu.
4. Press on the **<Yes>** button to start the flushing of the complete system. The progress bar in the display shows the current status of the flush cycle. After flushing has finished the unit returns to the "Manual" submenu.

Note: in order to stop the flush cycle press the **<Cancel>** button in the draining progress window. The flush cycle is stopped and the unit returns to normal operating mode.

If the shut-off valve in the water supply line was closed, then the flush cycle will be stopped after releasing the pressure in the RO water tank.

5.5 Shut-down sequence for daily operation

Important! For reasons of hygiene, we basically recommend that the Condair RO-A reverse osmosis water system should be left switched on and the water supply should be left open even if no RO water is needed at the moment. With the system switched on and the water supply left open, the water circuit is flushed at regular intervals (every 24 hours) and hence the build-up of germs is opposed due to water stagnation in the system.

If you have to shut-down the Condair RO-A reverse osmosis water system (e.g. for maintenance purpose), perform the following steps:

1. Close the shut-off valve in the water supply line.
2. Carry out a complete system flush as described in [chapter 5.4.3](#) to release the pressure in the RO water tank.
3. As soon as the LED lights up yellow switch off the Condair RO-A reverse osmosis water unit via the unit switch.
4. Disconnect the Condair RO-A reverse osmosis water unit from the mains supply by unplugging the mains supply cable.



WARNING!

If the Condair RO-A reverse osmosis water system is shut-down for more than 24 hours, there is danger of water stagnation in the system, since the automatic system flushing function (every 24 hours) is inactive. Please ALWAYS inform Condair Customer Service before recommissioning the system after a prolonged shut-down.

6 Operating the control software

Note: this chapter describes the operation of the Condair RO-A control software for standalone systems. The operation of the control software for the Nortec RS integrated systems is identical only the content of the displays is slightly different.

6.1 Standard operating display

After switching on the Condair RO-A reverse osmosis water unit the **standard operating display** is shown in the display of the Condair RO-A control unit.

Note: the appearance of the standard operating display depends on the current operating status and the configuration and can deviate from the display shown below.

The standard operating display is structured as follows:

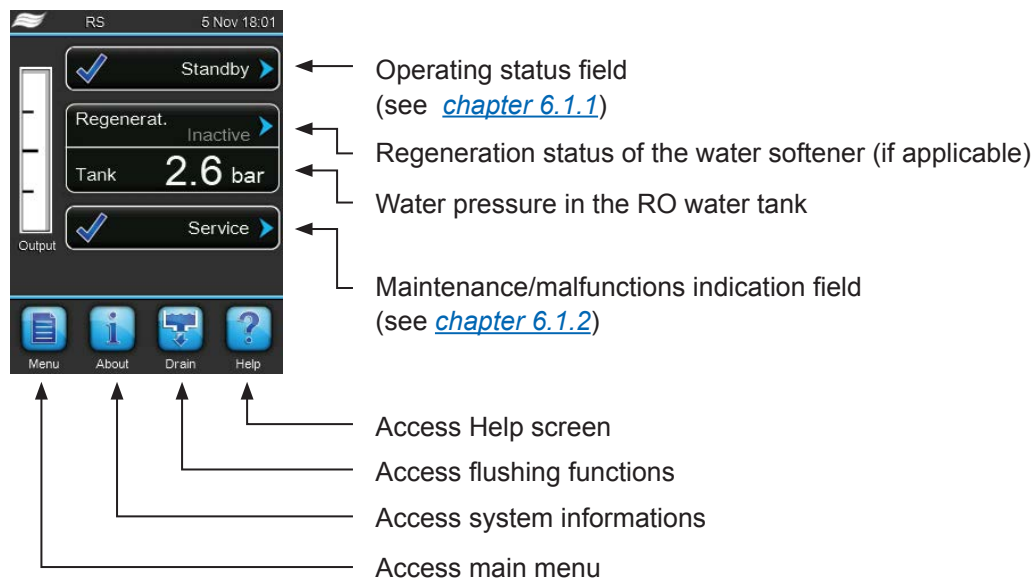














Fig. 11: Standard operating display









6.1.1 Operating status indication

The following operation status indications may appear during operation:














Operating status indications	Description
 Standby 	The Condair RO-A system is in standby mode. The pressure in the RO water tank is at the preset maximum pressure.
 Flushing 	The Condair RO-A system is flushing the water supply line.
 Producing 	The Condair RO-A system is producing RO water to fill up the RO water tank to its maximum pressure.
 FWA 	The automatic flushing of the complete system is in progress. The automatic flushing of the complete system is carried out every 24 hours.
 Refreshing 	The Condair RO-A system is doing a quality flush of the RO water tank and internal piping.
 Stopped 	The Condair RO-A system is stopped due to a malfunction which obviates further operation. Additionally "Warning" or "Fault" is displayed in the maintenance and malfunction field.

6.1.2 Maintenance and malfunction indications

The following maintenance and malfunction indications may appear during operation:

Maintenance and malfunction indications	Description
 Service info 	No malfunction present. By pressing on the indication field the service menu can be accessed.
 RO Service 	This message appears if the maintenance counter has elapsed. If the maintenance of the Condair RO-A reverse osmosis water unit is not carried out, and the maintenance counter is not reset within 7 days, a corresponding fault message appears. Carry out the maintenance Condair RO-A reverse osmosis water unit, then reset the maintenance counter in the "Service" submenu.
 Warning 	A malfunction with status "Warning" is active. Additionally the yellow LED lights. Depending on the malfunction the Nortec RS is either be stopped or stays operable for a certain period of time.
 Fault 	A malfunction with status "Fault" is active. Additionally the red LED lights. Depending on the malfunction the Nortec RS is either be stopped or stays operable for a certain period of time. Note: some fault messages require to reset the unit. Please refer to chapter 8.6 .

6.2 Navigating/Operating the control software

Navigation element	Action
	Accessing main menu
	Accessing system informations
	Performing flushing functions
	Accessing help screen
	If you press on a field with a blue arrow symbol a new screen with additional informations or settings appears.
	This symbol on the left side of the operating status field and of the maintenance/malfunctions indication field indicates, that the system is working ok.
	This symbol on the left side of the maintenance/malfunctions indication field indicates, that a Warning is present. Press on the field to get further information.
	This symbol on the left side of the operating status field and of the maintenance/malfunctions indication field indicates, that a Fault is present (additionally the LED lights red). Press on the field to get further information.
	Jumps back to previous screen (Cancel and back)
	Scroll up/down in the present window
	Increase/decrease value
	Delete shown value
	Confirm set value or selected option

6.3 Information functions

6.3.1 Accessing support informations



In the standard operating display press the **<Help>** button.

The screen with the support information appears.

6.3.2 Accessing system informations



In the standard operating display press the **<About>** button.

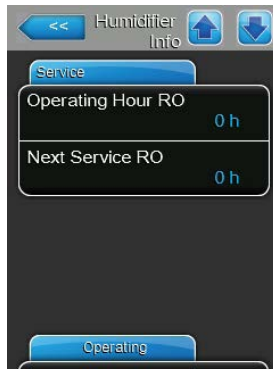
The system information screen appears. Use the arrow buttons to scroll up and down within the system information screens to access the different system information and operating data.

General Tab



- **RO Model:** Model RO-A unit.
- **Software Version:** Actual version of the control software.
- **Driver C.DB.A Version:** Actual software version of the driver board of Condair RO-A reverse osmosis water unit.
- **Serial Number:** Condair RO-A reverse osmosis water unit.

Service Tab



- **Operating Hour RO:** Total operating hours since initial commissioning of the system.
- **Next Service RO:** Remaining time in hours until the next maintenance of the RO-A unit must be performed.

Operating Tab

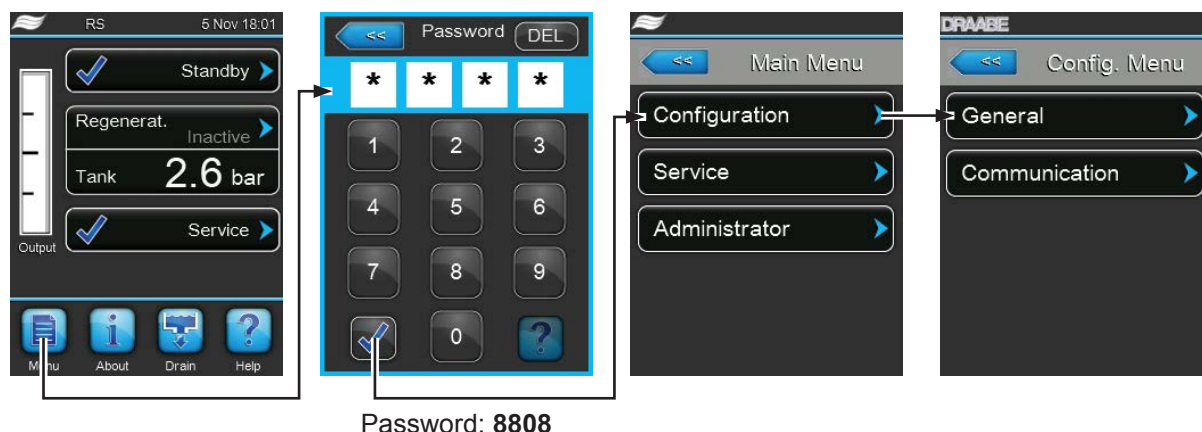
In this section you can view actual pressure values.



- **PS1:** Actual pressure at the pump inlet in bar.
Note: Pressure is shown only if pump is running.
- **PS2:** Actual RO water pressure in the RO water tank in bar.

6.4 Configuration

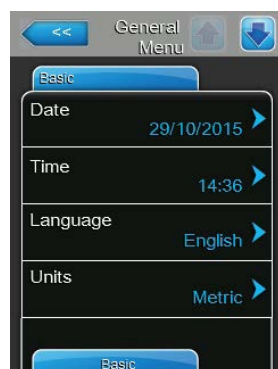
6.4.1 Accessing the "Configuration" submenu



6.4.2 Basic settings – "General" submenu

In the "General" submenu you determine the basic settings for operating the Nortec RS control software.

Basic Tab



- **Date:** with this setting you determine the current date in the set format ("MM/DD/YYYY" or "DD/MM/YYYY").
Factory setting: **00/00/0000**
- **Time:** with this setting you set the current hour of the day in the set time format ("12H" or "24H").
Factory setting: **12:00**
- **Language:** with this setting you determine the dialogue language.
Factory setting: **depending on the country**
Options: **various dialogue languages**
- **Units:** with this setting you determine the desired unit system.
Factory setting: **depending on the country**
Options: **Metric or Imperial**
- **Contrast:** with this setting you determine the desired value for the display contrast.
Factory setting: **8**
Options: **1 (weak contrast) ... 31 (strong contrast)**
- **Brightness:** with this setting you determine the desired value for the display brightness.
Factory setting: **52**
Options: **1 (dark) ... 100 (white)**
- **LED Brightness:** with this setting you determine the desired value for the brightness of the operating status LED.
Factory setting: **52**
Options: **1 (dark) ... 100 (white)**

Time/Date Tab

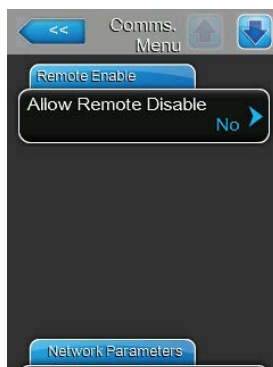


- **Date Format:** With this setting you determine the desired date format.
Factory setting: **DD/MM/YYYY**
Options: **DD/MM/YYYY** or **MM/DD/YYYY**
- **Clock Format:** With this setting you determine the desired time format.
Factory setting: **12H**
Options: **24H** (24 hours, display 13:35) or **12H** (12 hours, display: 01:35 PM)

6.4.3 Communication settings – "Communication" submenu

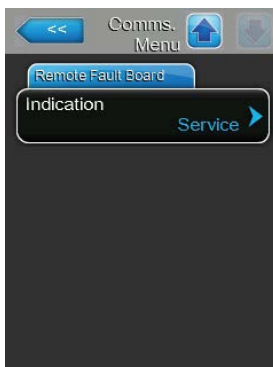
In the "Communication" submenu you determine the parameters for the communication.

Remote Enable Tab



- **Allow Remote Disable:** with this setting you can activate ("Yes") or deactivate ("No") remote blocking via the BMS.
Factory setting: **Yes**
Options: **Yes** (Remote blocking permitted)
No (Remote blocking not permitted)

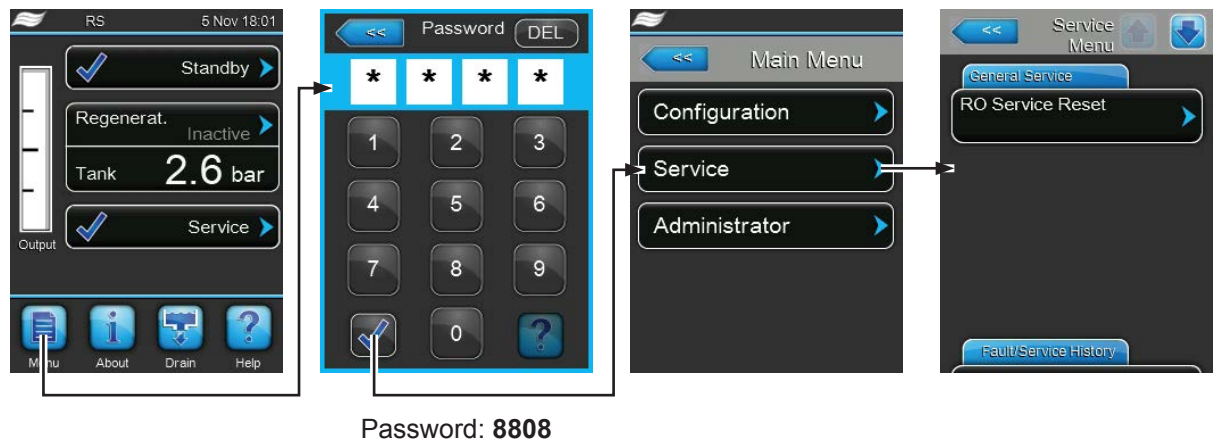
Remote Fault Board Tab



- **Indication:** with this setting you determine whether only maintenance messages ("Service") or all Warning messages ("Warning") are outputted via the service relay of the optional remote operating and fault indication board.
Factory setting: **Service**
Options: **Service** or **Warning**

6.5 Maintenance functions

6.5.1 Accessing the "Service" submenu



6.5.2 Performing maintenance functions – "Service" submenu

In the "Service" submenu you can reset the maintenance counter, access the fault and maintenance history and perform different diagnostic functions.

General Service Tab



- **RO Service Reset:** with this function you can reset the RO service message or the RO service counter, respectively of the Condair RO-A reverse osmosis water unit. After pressing on the "RO Service Reset" button a confirmation window appears where the resetting must be confirmed.

Fault/Service History Tab



Note: the fault and maintenance events stored can be correctly analysed only if the data and the time of day are correctly set.

- **Fault History:** with this function you can access the fault history list where the last 40 fault events are stored. After pressing on the "Fault History" button the fault history list appears.
- **Service History:** with this function you can access the service history list where the last 40 service events are stored. After pressing on the "Service History" button the service history list appears.
- **Export History:** with the function "Export History" you can export the fault and service history list to a USB memory stick via the USB port on the control board.

Diagnostics



- **Input Diagnostics:** with this function you can access the "Input Diagnostics" submenu where you can view different current input values the control system is using. Detailed information can be found in [chapter 6.5.2.1](#).
- **Relay Diagnostics:** with the "Relay Diagnostics" function you can access the "Relay Diagnostics" submenu where you can activate or deactivate the relays of the optional remote operating and fault indication board. Detailed information on the individual relay diagnostic functions can be found in [chapter 6.5.2.2](#).

Note: By accessing the "Relay Diagnostics" submenu the Condair RO-A system is automatically switched to standby operation.

6.5.2.1 Input diagnostic functions – "Input Diagnostics" submenu

The following input values can be viewed after accessing the "Input Diagnostics" submenu.

Note: the input values can be accessed and viewed too, via the "Service Info" selection field in the standard operating display.

RO Tab



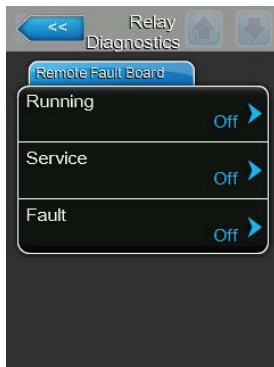
- **PS1:** Actual pump inlet pressure in bar.
- **PS2:** Actual pressure in the RO water tank in bar.
- **Guard:** Actual status of the pump motor guard switch ("Off"= switch open, "On"= switch closed).
- **PS3:** Actual pressure at the membrane inlet in bar.



- **Regeneration:** Actual status of the regeneration switch of the optional water softener ("Off"= No regeneration in progress, "On"= Regeneration in progress).
- **Leakage:** Actual status of the optional leakage monitoring switch ("Off"= No leakage present, "On"= Leakage detected).

6.5.2.2 Relay diagnostic functions – "Relay Diagnostics" submenu

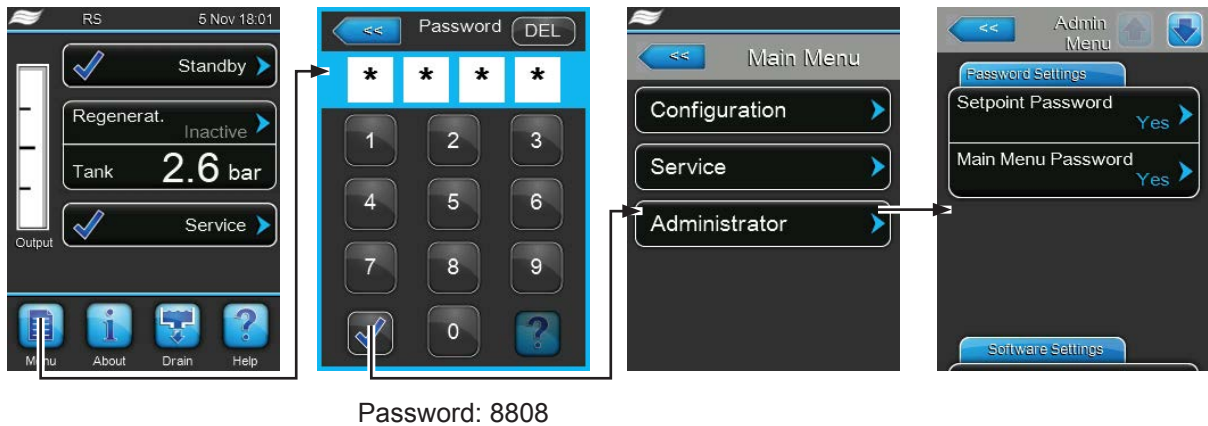
Remote Fault board Tab



- **Running:** with this function you can activate ("On") and deactivate ("Off") the relay "Running" on the optional remote operation and fault indication board.
- **Service:** with this function you can activate ("On") and deactivate ("Off") the relay "Service" on the optional remote operation and fault indication board.
- **Fault:** with this function you can activate ("On") and deactivate ("Off") the relay "Error" on the optional remote operation and fault indication board.

6.6 Administration settings

6.6.1 Accessing "Administrator" submenu



6.6.2 Switching on/off password protection and software updates function - submenu "Administrator"

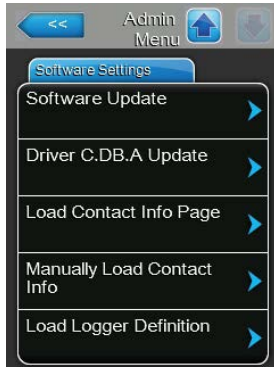
In the "Administrator" submenu you can activate and deactivate the password protection for the main menu and the setpoint, and download software updates via a USB stick connected to the USB connector.

Password settings Tab



- **Setpoint Password:** with the function "Setpoint Password" you can protect the setpoint input screen with the user password "8808" against unauthorised access ("Yes") or not ("No").
- **Main Menu Password:** with the function "Main Menu Password" you can protect the access to the main menu with the user password "8808" against unauthorised access ("Yes") or not ("No")

Software Settings Tab



- **Software Update:** with this function you can update the control software of the integrated controller. See information in [chapter 7.5](#).
- **Driver C.DB.A Update:** with the function "Driver C.DB.A Update" you can update the software of the optional reverse osmosis control board. See information in [chapter 7.5](#).
Note: this menu item appears only if your unit is equipped with the reverse osmosis system.
- **Load Contact Info Page:** this function allows you to upload new contact information data (which are displayed when pressing the <Help> button) from a USB memory stick connected to the USB port on the control board.
- **Manually Load Contact Info:** this function allows you to manually change/enter contact information data (which are displayed when pressing the <Help> button).
- **Load Logger Definition:** this function allows logging of system parameters with a FAT32 formatted USB memory stick connected to the USB port on the control board. A factory supplied access file is required to enable operation.

7 Maintenance

7.1 Important notes on maintenance

Qualification of personnel

All maintenance work must be carried out only by **well qualified and trained personnel authorised by the owner**. It is the owner's responsibility to verify proper qualification of the personnel.

General note

The instructions and details for maintenance work must be followed and upheld.

Only the maintenance work described in this documentation may be carried out.

Only use original Condair spare parts to replace faulty parts.

Safety

Some maintenance work requires removal of the unit cover. Please note the following:



DANGER!
Danger of electric hazard!

You may get in touch with live parts when the unit is open. Touching live parts may cause severe injury or even lethal violation.

Prevention: Before carrying out any maintenance work set the Condair RO-A out of operation as described in [chapter 5.5](#) and secure the unit against inadvertent power-up.



CAUTION!

The electronic components inside the Condair RO-A are very sensitive to electrostatic discharge.

Prevention: Before carrying out any maintenance work to the electrical or electronic equipment of the Condair RO-A, appropriate measures must be taken to protect the respective components against damage caused by electrostatic discharge (ESD protection).

7.2 Maintenance work to be carried out on the Condair RO-A

The control software of the Condair RO-A or the Nortec RS with RO option features a maintenance counter for the Condair RO-A maintenance. The maintenance counter is set at the initial commissioning based on the water condition on site.

Maintenance indication "RO Service"



If the maintenance counter has elapsed, a maintenance message is shown in the standard operating display indicating that the maintenance of the RO system must be carried out.

Note: If the RO system maintenance is not carried out and the maintenance counter is not reset within 7 days, the Condair RO-A is blocked and a corresponding error message is triggered.

As soon as the maintenance message appears, carry out the following maintenance work:

- Replace the filter cartridge of the integrated filter (see [chapter 7.2.1](#)).
- Replace the filter cartridges of the optional external pre-filter (if applicable, see [chapter 7.3](#)).
- Disinfect the water system incl. external RO water tank (by Condair service technician)
- Test the desalination rate of the membrane(s) and replace the membrane(s) if the desalination rate is not of satisfactory quality (Condair recommends changing the membranes at a rejection rate less than 95%) or if the membrane(s) are more than 2 years old (see [chapter 7.2.2](#)).

Important! Regardless of the maintenance counter, the maintenance work listed above must be performed at **least every 6 month**.

7.2.1 Replacing the filter cartridge inside the internal filter



WARNING!

Always wear disposable protective gloves when handling filters to prevent infection due to opportunistic pathogens!

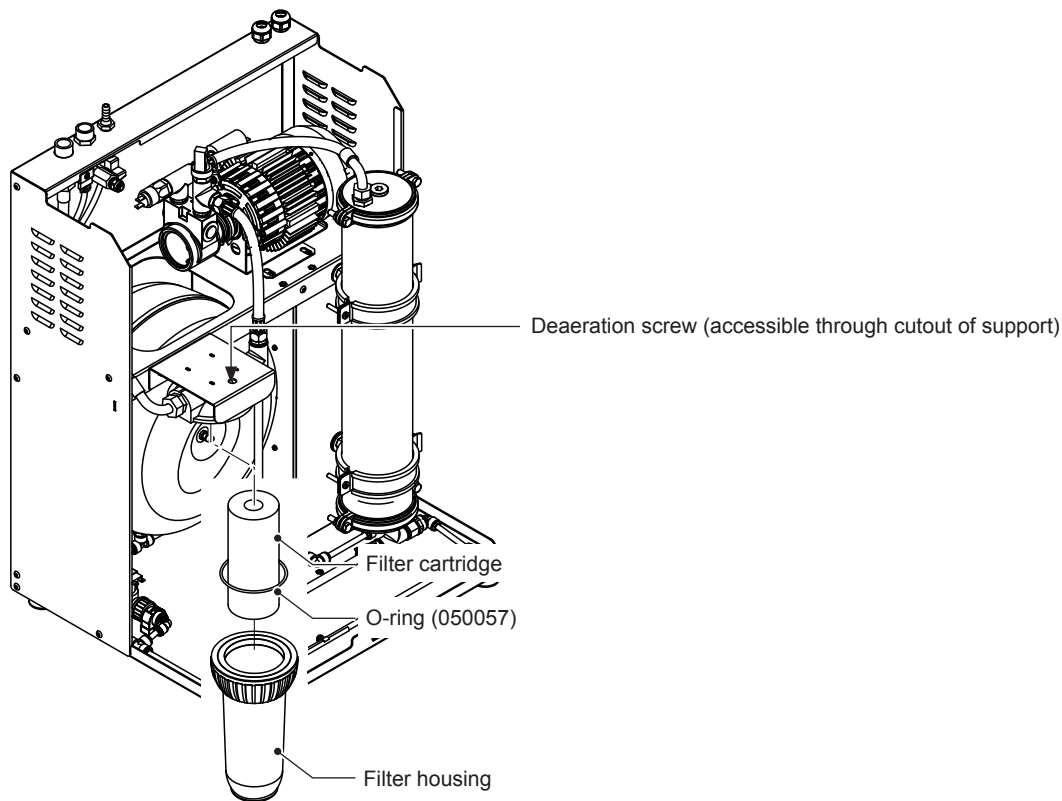


Fig. 12: Filter replacement

To replace the filter cartridge proceed as follows:

1. Set the Condair RO-A system out of operation as described in [chapter 5.5](#). Then, unplug mains supply cable to unit.
2. Unlock the retaining screw on the bottom of the unit cover, then remove the unit cover.
3. Place bucket underneath the filter.
4. Turn filter housing counterclockwise and remove filter housing.
5. Remove filter cartridge and O-ring from housing.
Note: Filter cartridge can be disposed with the household waste.
6. Wash filter housing and O-ring with a lukewarm soap solution and rinse filter housing and O-ring well with tap water before remounting.
7. Check O-ring and replace if necessary. Insert O-ring into the groove inside the filter housing.
8. Carefully take new filter cartridge out the packaging and remove plastic foil without damaging the filter cartridge.
9. Insert filter cartridge into the filter housing. Centrally align filter cartridge inside the housing and ensure the sealing of the filter cartridge is correctly placed.

10. Moisten O-ring inside the filter housing with clean tap water (do not use oil or grease), then carefully screw on the filter housing by hand until it comes to a stop.
11. Plug in mains supply cable into the socket of the unit.



DANGER!
Danger of electric hazard!

There is mains power on the terminals inside the control compartment of the Condair RO-A after plugging in the mains supply cable. Do not touch any components inside control compartment.

12. Switch on Condair RO-A or Nortec RS, respectively.
13. Carefully open water supply. Check whole system for any leaks and seal if necessary.
14. Deaerate filter by opening the deaeration screw on top of the filter with a screwdriver (>5 mm). Close deaeration screw as soon as bubble free water is purging out of the deaeration opening.
15. Relocate unit cover and secure it with the retaining screw.

7.2.2 Determination of the desalination rate / Replacing the membrane(s)

Determination of the desalination rate

1. Take a water sample from the water inlet to the Condair RO-A reverse osmosis water system and determine the conductivity value ("InCon").
2. Take a water sample via the reverse osmosis water test valve in the Condair RO-A reverse osmosis water unit and determine the conductivity value ("PerCon").
3. Calculate the desalting rate according to the following formula

$$\text{Desalination rate} = [1 - (\text{PerCon in } \mu\text{S/cm} / \text{InCon in } \mu\text{S/cm})] \times 100\%$$

If the desalination rate is **<95%** or if the membrane(s) are in use for more than **2 years**, the membrane(s) must be replaced.

7.2.3 Replacing the membrane(s)



WARNING!

Always wear disposable protective gloves when handling membranes to prevent infection due to opportunistic pathogens!

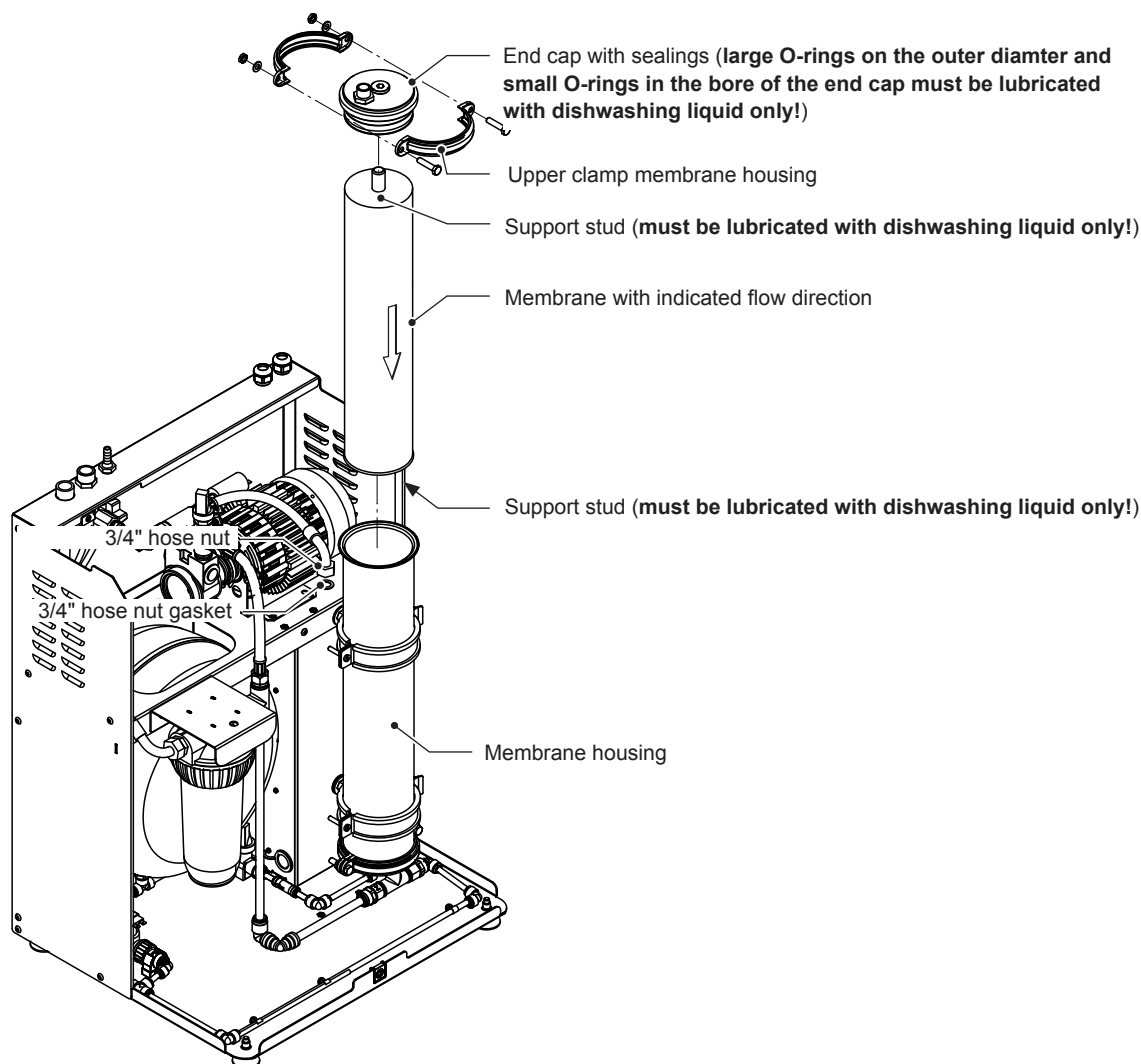


Fig. 13: Membrane replacement

To replace the membrane(s) proceed as follows:

1. Set the Condair RO-A out of operation as described in [chapter 5.5](#). Then, unplug mains supply cable to unit.
2. Unlock the retaining screw on the bottom of the unit cover, then remove the unit cover.
3. Place bucket underneath the filter. Then, remove filter to drain remaining water in the hoses and the membrane. Refit filter again.
4. Remove water hose fixed to the end cap on top of the membrane housing.
5. Undo the two screw connections on the upper clamp fixing the end cap to the membrane housing, then remove clamp and end cap (if necessary use a screw driver to remove the end cap).
6. Remove old membrane upwards out of the housing (use a pipe wrench if necessary).

7. Inspect inside of the housing for dirt and biofilm. If cleaning is required:
 - Put on clean disposable gloves.
 - Wash the membrane housing, O-rings and top and bottom caps with a lukewarm soap solution and a soft brush, disinfect parts if required.
8. Put on new sterile disposable gloves, then carefully take new membrane out the packaging and remove plastic foil without touching or damaging the membrane.
9. Carefully lubricate support studs on both ends of the new membrane and the four O-rings of the upper end cap **with dishwashing liquid**.
Important: Make sure all O-rings on the upper end cap and the studs of the new membrane are adequately lubricated. Otherwise the membrane may get stuck inside lower end cap and dismantling is not possible anymore without dismantling the complete membrane housing!
10. Insert new membrane into the membrane housing. Ensure to insert the correct membrane type and to position the membrane in the correct flow direction as shown in the figures below.

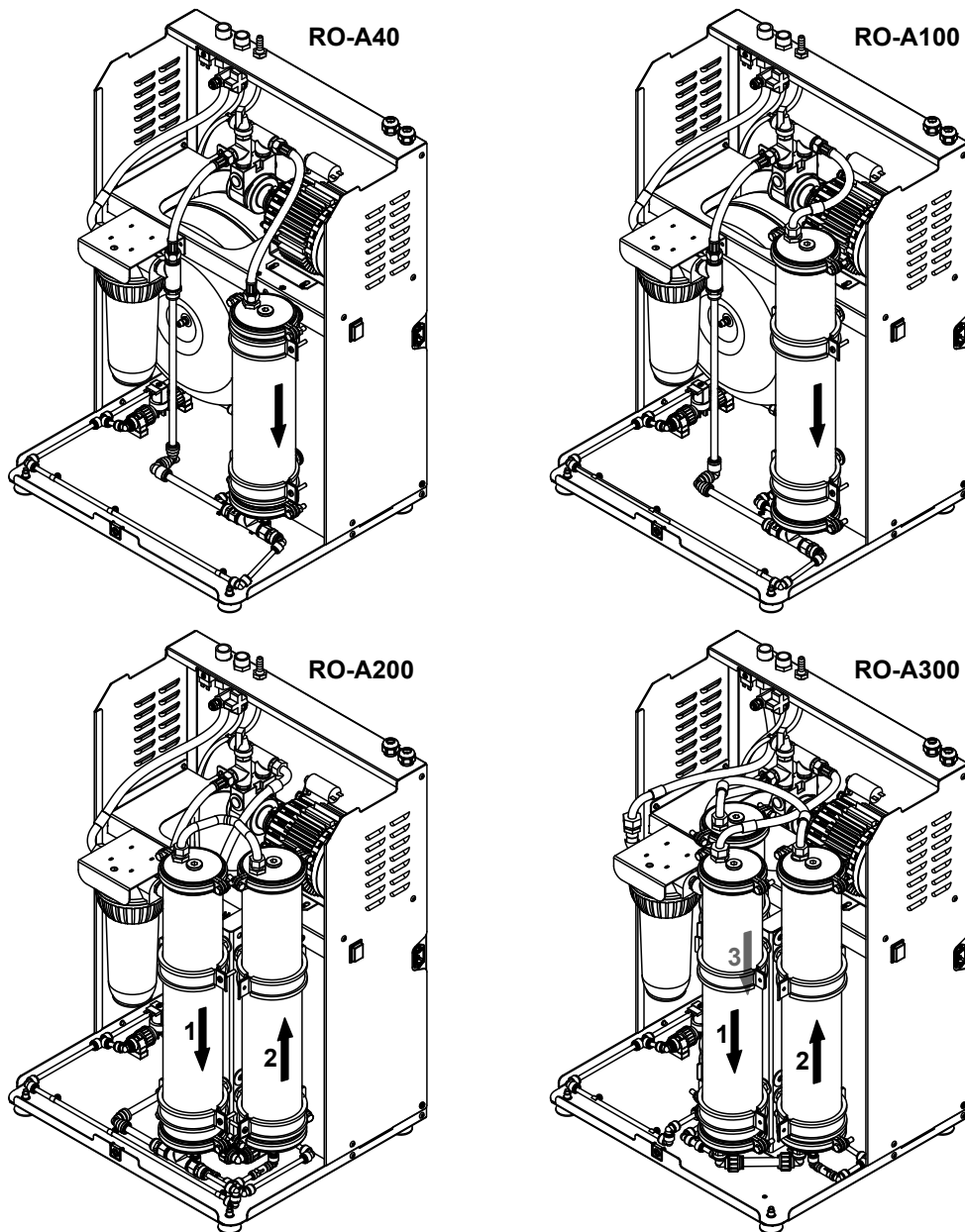


Fig. 14: Flow directions to be observed when mounting the membranes

11. Lubricate sealings on the end cap with **with dishwashing liquid**.
12. Remount end cap and fix it with the clamp, screws, washers and nuts to the membrane housing.
13. Check gasket of water hose and replace if necessary. Place gasket on the connector of the end cap and screw on the union nut of the water line. When tightening the union nut secure water line against twisting. Ensure water line is free of tension after tightening.
14. Repeat steps 3 to 11 for all other membranes (only applicable on Condair RO-A200 and Condair RO-A300)
15. Plug in mains supply cable into the socket of the unit.



DANGER!
Danger of electric hazard!

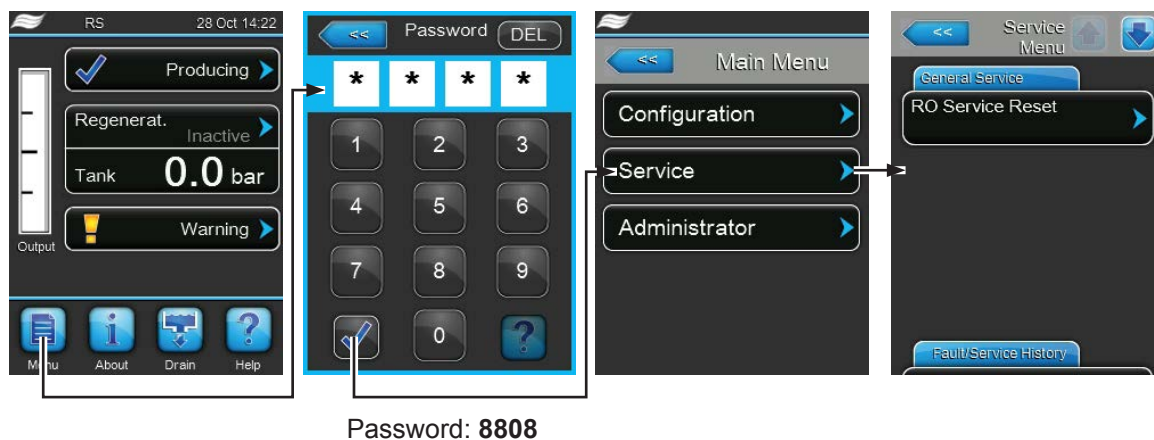
There is mains power on the terminals inside the control compartment of the Condair RO-A after plugging in the mains supply cable. Do not touch any components inside control compartment.

16. Switch on Condair RO-A or Nortec RS, respectively.
17. Carefully open water supply. Check whole system for any leaks and seal if necessary.
18. Relocate unit cover and secure it with the retaining screw.

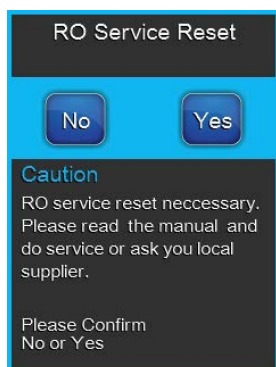
7.2.4 Resetting the RO maintenance counter

After completing the maintenance work on the Condair RO-A, the maintenance indication or maintenance counter, respectively must be reset. Proceed as follows to reset the maintenance counter:

1. Select in the "Service" submenu the "RO Service Reset" function.



2. The reset dialogue appears:



- Press the **<Yes>** button to reset the maintenance counter. The maintenance counter and the maintenance indication are reset.
- Press the **<No>** button if the maintenance work has not been completed and you want abort the reset procedure. The control unit returns to the "Service" submenu.

7.3 Maintenance work to be carried out on the optional pre-filter

The filter cartridges of the optional pre-filter must be replaced every 6 month.

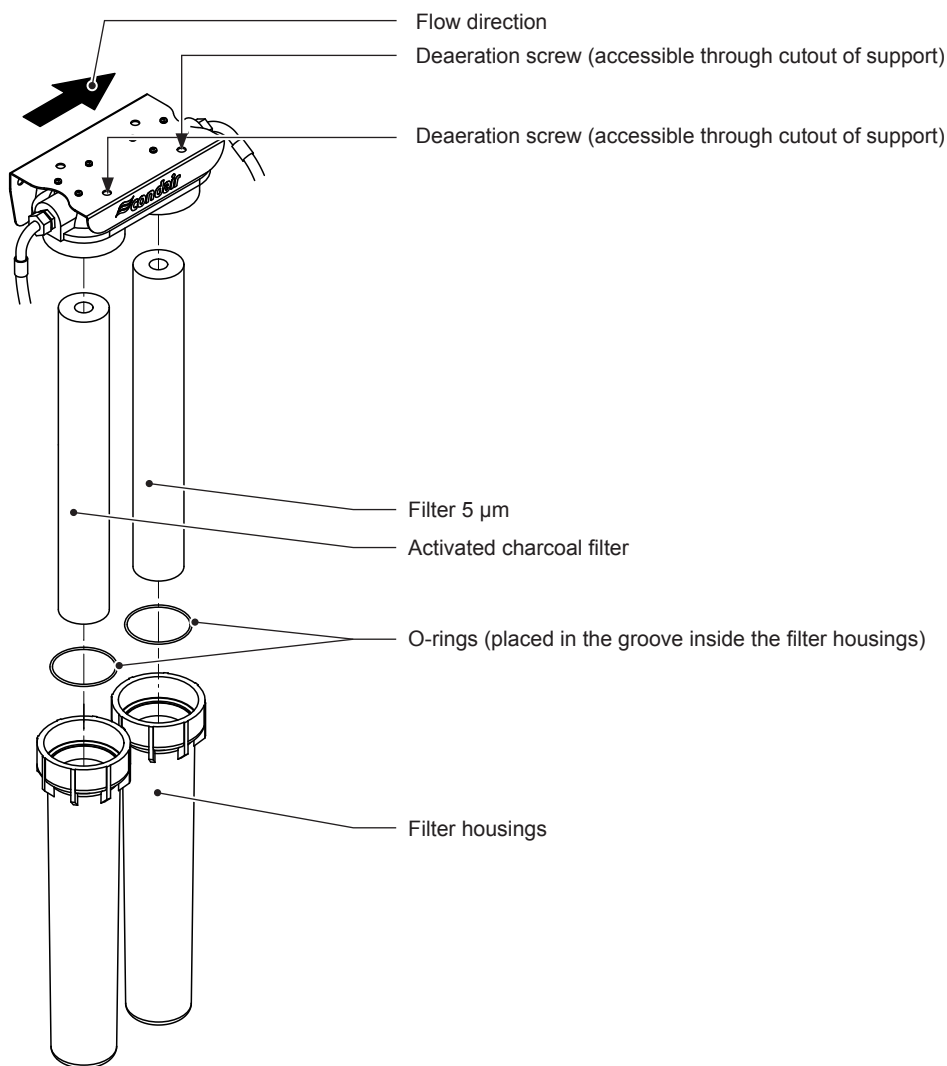


Fig. 15: Membrane replacement

Proceed as follows.

1. Close water supply to pre-filter and release pressure in the water system via the flush function of the control software of the Condair RO-A or the Nortec RS, respectively.
2. Place bucket underneath the corresponding filter.
3. Turn filter housing clockwise and remove filter housing.
4. Remove filter cartridge and O-ring from housing.
Note: Filter cartridge can be disposed with the household waste.
5. Wash filter housing and O-ring with a lukewarm soap solution and rinse filter housing and O-ring well with tap water before remounting.
6. Check O-ring and replace if necessary. Insert O-ring into the groove inside the filter housing.
7. Carefully take new filter cartridge out the packaging and remove plastic foil without damaging the filter cartridge.

8. Insert the appropriate filter cartridge (see [Fig. 15](#)) into the filter housing. Centrally align filter cartridge inside the housing and ensure the sealing of the filter cartridge is correctly placed.
9. Moisten O-ring inside the filter housing with clean tap water (do not use oil or grease), then carefully screw on the filter housing by hand until it comes to a stop.
10. Repeat steps 2 to 9 for all filters.
11. Carefully open water supply to filter. Check for any leaks and seal filter system if necessary.
12. Deaerate filter battery by opening the two deaeration screws on top of the filters one after the other with a screwdriver (>5 mm). Close deaeration screws as soon as bubble free water is purging out of the deaeration openings.

7.4 Maintenance work to be carried out on the optional water softener

The refill interval of the salt tablets inside the water softener depends on the amount of water being processed by the water softener. Please refer to the operating instructions of the water softener for the refill interval and the type of salt tablets to be used.

After refill of the salt tablets check system for any leaks and seal if necessary.

7.5 Performing software updates

To perform a software update of the control software or of the driver boards, proceed as follows:

Note: To update the control software or the software of the driver board of the Condair RO-A unit on Nortec RS intergarted systems please refer to operation manual of the Nortec RS

1. Switch off the Condair RO-A reverse osmosis water unit and unplug mains cable.
2. Connect USB memory stick holding the update software to the USB port of the Condair RO-A control unit.
3. Plug in mains cable and switch on RO-A reverse osmosis water unit.
4. Access main menu and select in the "Administrator" submenu the desired software update function (e.g. "Control Software Update"). Then, follow the instructions in the display of the control unit.
Note: in order to perform the update of the control software or of the driver board a USB stick with a valid software update (the update files must be on the highest level outside of any folder) must be connected to the USB port on the control board. Otherwise, an appropriate fault message appears when starting the software update.
5. During update a progress bar is shown in the display. If the update has completed the controller returns to the standard operating display.
6. Repeat steps 1 to 3 to remove the USB memory stick.
7. To activate the new software the Condair RO-A reverse osmosis water unit must be switched off and on again via the unit switch.

8 Fault elimination

8.1 Fault indication

Malfunctions during operation detected by the control software are indicated by a corresponding **Warning** message (operation still possible) or **Fault** message (operation not longer possible) in the maintenance and fault indication field in the standard display of the control unit.

Warning



Temporary problems (e.g. water supply interrupted for a short time) or malfunctions which cannot cause damage to the system are indicated with a warning message. **If the cause of the malfunction disappears of its own accord within a certain period of time, the alarm message will automatically switch off otherwise an fault message is triggered.**

Note: warnings can be indicated also via the service relay of the remote operating and fault indication. Therefore the warning indication via the service relay must be activated in the communication menu of the control software (see [chapter 6.4.3](#)).

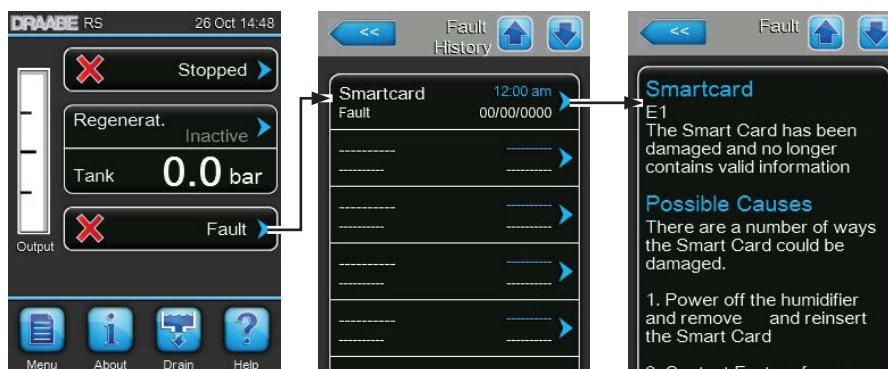
Fault



Malfunctions where further operation is not possible any longer or malfunctions which can damage the system are indicated with a fault message, additionally the red LED below the touch panel light up. If such a malfunction occurs the operation of the system is limited only or the system will be switched off automatically.

Note: some faults messages require to reset the unit. Please refer to [chapter 8.6](#).

By pressing on the maintenance and malfunction indication field in the standard operating display the error list shown with all active warning and fault messages. By pressing on the corresponding Warning or Fault entry additional information regarding the malfunction are displayed (see display on the far-right).



8.2 Malfunction list

Most operational malfunctions are not caused by faulty equipment but rather by improper installation or disregarding of planning guidelines. Therefore, a complete fault diagnosis always involves a thorough examination of the entire system.

Code		Message	Information	
Warning	Fault		Possible causes	Remedy
—	E54	Leakage	Leakage monitoring has triggered, Condair RO-A is stopped!	
			Leakage in the water system detected.	Check/seal water supply line, water drain line, hose connections in side and outside of the Condair RO-A.
			Fuse "F2" on the driver board defective.	Replace fuse "F2" on the driver board.
—	E58	Pr.Sens.Inlet	Invalid signal from inlet water pressure sensor PS1!	
			Pressure sensor PS1 not or not correctly connected.	Check/correctly connect pressure sensor PS1.
			Pressure sensor PS1 wrong configured.	Correctly configure pressure sensor PS1.
			Pressure sensor PS1 defective.	Replace pressure sensor PS1.
—	E59	Pr.Sens.Tank	Invalid signal from pressure sensor of the tank!	
			Pressure sensor PS2 not or not correctly connected.	Check/correctly connect pressure sensor PS2.
			Pressure sensor PS2 wrong configured.	Correctly configure pressure sensor PS2.
			Pressure sensor PS2 defective.	Replace pressure sensor PS2.
—	E60	Pump Guard	Pump guard (over current monitoring) has triggered.	
			Overcurrent condition occurred during operation of pump. Overcurrent relay inside the control compartment of the Condair RO-A has triggered.	Let have the overcurrent relay inside the control compartment of the Condair RO-A checked by an electrician.
—	E61	Pump Pressure	Pump pressure out of valid range!	
			Tank pressure out of valid range.	Check tank pressure.
—	E62	Tank Pressure	Tank pressure out of valid range!	
			Tank pressure out of valid range.	Check tank pressure.
—	E73	FWA Timeout	FWA has not been completed within the set time!	
			Drain blocked.	Check/clean drain.
			Valves defective.	Check/replace valves inside the Condair RO-A.
—	E74	Keep Alive	Communication between control board and driver board interrupted.	
			Driver board not connected.	Correctly connect driver board.
			Wrong driver board installed.	Install and connect correct driver board.
			Driver board defective.	Replace driver board.
—	E82	Driver Missing	Communication with driver board interrupted.	
			RS485 Bus to driver board interrupted.	Contact your Condair representative.
—	E84	Driver defective	Unknown fault on driver board	
			Driver board defective.	Replace driver board.
—	E85	Driver ID wrong	Driver board ID wrong.	
			Wrong driver board connected or SAB address wrong.	Contact your Condair representative.
—	E86	Driver Incompatible	Wrong version of driver board.	
			Wrong version of driver board.	Contact your Condair representative.

Code		Message	Information	
Warning	Fault		Possible causes	Remedy
—	E87	Local 24V Supply	Local 24V voltage on driver board out of valid range!	
			Short circuit on supply module or supply module defective.	Contact your Condair representative.
—	E88	Local 5V Supply	Local 5V voltage on driver board out of valid range!	
			Short circuit on supply module or supply module defective.	Contact your Condair representative.
—	E89	Local Ref Supply	Local reference voltage out of valid range!	
			DC supply faulty or supply line interrupted.	Contact your Condair representative.
—	E91	Pressure Instable	Water pressure instable because of missing water!	
			Shut-off valve in the water supply line not fully open.	Check/completely open shut-off valve.
			Cross section of the supply line too small.	Install water supply line with larger cross section (min. ø10/12 mm).
			Optional prefilter clogged.	Clean optional prefilter and replace filter cartridges.
W92	E92	RO Service	The maintenance interval of the RO system service has elapsed. If the system service is not performed and the maintenance message is not reset within one week after the maintenance message has appeared a fault message is triggered!	
			RO system service due.	Perform RO system service and reset maintenance counter.
—	E96	Per. 5V Supply	Peripheral 5V supply out of valid range.	
			5V supply interrupted.	Check wiring.
			Fuse "F2" on the driver board defective.	Replace fuse "F2" on the driver board.
			Overload on external connection.	Disconnect load on terminal X16.
			Overload due to defective pressure sensor.	Replace pressure sensor.
—	E97	Ext. 24V Supply	External 24 V supply faulty. Voltage too high or too low.	
			Fuse "F2" on the driver board defective.	Replace fuse "F2" on the driver board.
			Short circuit on external connection.	Remedy short circuit.
			Overload on external connection.	Disconnect load on terminal X16.
—	E98	Ext. 10V Supply	External 10 V supply faulty. Voltage too high or too low.	
			Fuse "F2" on the driver board defective.	Replace fuse "F2" on the driver board.
			Short circuit on external connection.	Remedy short circuit.
			Overload on external connection.	Disconnect load on terminal X16.
—	E122	Water Missing	The inlet valve is open, but the water pressure is not reached within the set time.	
			Water supply closed.	Check/open shut-off valve in water supply line.
			Optional Prefilter clogged.	Replace filter cartridges in the optional prefilter.
			Optional Water softener is refreshing.	Wait until refreshing (duration approx. 2 h) has finished.
—	E124	Pressure Min	The nominal tank pressure is not reached within time.	
			Water supply closed.	Check/open shut-off valve in water supply line.
			Optional Prefilter clogged.	Replace filter cartridges in the optional prefilter.
			Optional Water softener is refreshing.	Wait until refreshing (duration approx. 2 h) has finished.

Code		Message	Information	
Warning	Fault		Possible causes	Remedy
—	E200	IO Inlet Y11	Fault on inlet valve Y11.	Correctly connect valve or replace coil .
			Valve electrically not connected or coil defective.	
—	E201	IO Inlet Y12	Fault on drain valve Y12.	Correctly connect valve or replace coil .
			Valve electrically not connected or coil defective.	

8.3 Malfunctions without indication

The following table presents failures that do not trigger an fault message. The table shows the failure, together with indications on their cause and notes on how to eliminate the sources of trouble

Failure	Cause	Remedy
Water below the components of the Condair RO-A reverse osmosis water system.	System components, hose connections, etc. leaky	Check system components for leaks and seal/replace leaky components.
Pump motor not starting.	Nominal value of humidity is set too high.	Set nominal value correctly.
	Ambient humidity very low.	Wait.
	The internal controller is activated although an external controller is connected.	Deactivate the internal controller.
Pump is running with an audible grinding noise.	Pump worn.	Replace pump.
The "Refreshing" function is hanging	The air pressure of the bladder inside the RO water tank is set too high (>0.8 bar).	Adjust air pressure of the bladder inside the RO water tank in accordance with chapter 5.4.1 to the correct value (0.5 bis 0.8 bar).

8.4 Saving fault and service histories to a USB memory stick

The fault and service histories of the Condair RO-A stand-alone systems can be saved to a USB memory stick for logging and further analysis.

Note: If the Condair RO-A is controlled via the control software of the Nortec RS please refer to the corresponding chapter in the operation manual of the Nortec RS for saving the fault and service histories to a USB memory stick.

To save the fault and service histories to a USB memory stick, proceed as follows:

1. Connect USB memory stick to USB port on the bottom the side of the control unit.
2. Switch on power supply to the Condair RO-A (if disconnected).
3. Access the main menu, then select "Export History" function in the "Service" submenu. The data are saved as CSV table on the USB memory stick. The CSV table can be processed with a spread-sheet program on a PC.
4. When the data have been saved remove USB memory stick.

8.5 Notes on fault elimination

- For the elimination of faults set the Condair RO-A reverse osmosis water system out of operation as described in [chapter 5.5](#) and disconnect it from the mains (remove mains supply cable).



DANGER!

Make sure the control unit is separated from the mains (check with voltage detector) and the shut-off valve in the water supply line is closed.

- The elimination of faults must be carried out by qualified and well trained professionals only. Malfunctions relating to the electrical installation (e.g. replacement of the backup battery, replacement of fuses) must be repaired by authorized personnel.



CAUTION!

Electronic components are very sensitive to electrostatic discharge. When carrying out repairs to the electronic equipment, appropriate measures (ESD-protection) must be taken to prevent damage to electronic components.

8.6 Resetting the fault indication

To reset the fault indication (red LED light, operating status indication shows "Stopped"):

1. Disconnect the Nortec RS or the Condair RO-A from the mains via the **<Unit On/Off>** switch.
2. Wait approx. 5 seconds, then reconnect the Nortec RS or the Condair RO-A to the mains by switching on the **<Unit On/Off>** switch again.

Note: If the fault has not been eliminated, the fault indication reappears after a short while.

9 Taking out of service/Disposal

9.1 Taking out of service

If the Condair RO-A reverse osmosis water system must be replaced or if the Condair RO-A reverse osmosis water system is not needed any more, proceed as follows:

1. Take the Condair RO-A reverse osmosis water system out of operation as described in [chapter 5.5](#).
2. Have the system components unmounted by a qualified service technician.

9.2 Disposal/Recycling

Components not used any more must not be disposed of in the domestic waste. Please dispose of the individual components in accordance with local regulations at the authorised collecting point.

If you have any questions, please contact the responsible authority or your local Condair representative.

Thank you for your contribution to environmental protection.

10 Product specification

10.1 Technical data

10.1.1 Technical data RO-A reverse osmosis water system

	Model			
	RO-A40	RO-A100	RO-A200	RO-A300
Pure water output at 5°C (41°F)	40 l/h (255 gpd)	100 l/h (635 gpd)	200 l/h (1270 gpd)	300 l/h (1900 gpd)
Pure water output at 15°C (59°F)	70 l/h (445 gpd)	140 l/h (890 gpd)	300 l/h (1900 gpd)	400 l/h (2535 gpd)
Max. reverse osmosis water output per day at 15°C (59°F)	1.68 m³/day	3.36 m³/day	7.20 m³/day	9.60 m³/day
Recovery hard water	50 %			
Recovery softened water	70 %			
Admissible inlet water pressure	1.5 - 6 bar (21.8 - 87.0 PSI)			
Admissible inlet water temperature	5 - 20°C (41 - 68°F)			
Salt rejection rate	95 to 98 %			
RO membrane type	1x 14" NSR 99.4%	1x 21" NSR 99.4%	2x 21" NSR 99.4%	3x 21" NSR 99.4%
Pure water tank	internal 18 l (4.75 gal)	internal 18 l (4.75 gal)	external 120 l (31.7 gal) (accessory)	external 120 l (31.7 gal) (accessory)
Pump capacity	400 l/h (1.75 gpm)	700 l/h (3.0 gpm)	1,000 l/h (4.4 gpm)	1,000 l/h (4.4 gpm)

Hydraulic connections

Inlet water connection	G 3/4", outside thread (hose adapter G 3/4" / Ø0.79" (Ø20 mm), supplied)
Pure water connection	G 3/4", outside thread (hose adapter G 3/4" / Ø0.79" (Ø20 mm), supplied)
Drain connection	Ø9 mm (Ø0.35"), hose connection

Electric connections

Power supply	120 V / 1~ / 60 Hz
Power consumption	600 W

Housing dimensions

Height	815 mm (32.1")
Width	572 mm (22.5")
Depth	485 mm (19.1")

Weights

Netweight	54.0 kg (119 lb)	55.0 kg (121 lb)	59.5 kg (131 lb)	67.5 kg (149 lb)
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10.1.2 Technical data optional water softener CC 206c

System Components	
Media Vessel (Qty.) Size	(2) 6" X 13"
Media Vessel Construction	Fiberglass Wrapped Engineered Plastic
Empty Bed Volume	0.16 ft ³
Media Type	Standard Mesh Resin
Media Volume	0.16 ft ³
Bed Depth	Packed
Free Board	None
Riser Tube	1" CPVC
Distributor	Upper: 0.012" Slots, Engineered Plastic Basket Lower: 0.009" Slots, Stainless Steel Flat Plate
Under bedding	None
Regeneration Control	Non-electric, use Meter
Regeneration Type	Countercurrent
Meter Type	0.30 - 25.00 gpm Polypropylene Turbine
Inlet Water Quality	
Pressure Range	15 - 125 psi Dynamic Pressure
Temperature Range	35-160°F
Temperature (Continuous)	150° F
pH Range	5 -10 SU
Free Chlorine Cl ₂ (Max.)	2.0 mg/l
Hardness as CaCO ₃ (Max.)	30 gpg
Operating Specs	
Flow Range (15 / 30 psig) ..	9. 1 - 15.2 gpm
Flow Configuration	Alternating
Dimensions (Width x Depth x Height)	14" X 14" X 22"
Weight (Operating/ Shipping)	110 / 60 lbs.
Connections	
Inlet/ Outlet Connections	Custom Adapter and Bracket
Drain Connection	0.375" Tube
Brine Line Connection	0.375" Tube (internal)
Overflow Connection	0.375" Tube
Power	None
Regeneration Specifications	
Regeneration Volume	5 gallons
Regeneration Time	11 minutes
Backwash Flow Control	0.70 gpm
Brine Refill Flow Control	0.20 gpm

Brine Tank Options	
Tank Description	206 Cabinet
Tank Height	22"
Tank Footprint	14" x 14"
Material	HDPE
Salt Capacity	40 lbs.

					Disc Selection (Compensated Hardness*)							
Setting	Capacity	Efficiency	Dosining	Meter Disc	1	2	3	4	5	6	7	8
0.5 lbs.	1,746 grains	3,492 gr./lb.	2.7 lbs./ft ³		2	5	8	10	13	15	18	20
1.0 lbs.	2,527 grains	2,527 gr./lb.	5.5 lbs./ft ³		4	8	11	15	19	23	27	30
Gallons / Regeneration:					583	282	194	146	117	97	83	73
Flow during regeneration(at 15 psig):					9.1	9.1	9.1	9.1	8.4	6.6	5.4	4.4

• compensated hardness in gpg = Hardness+ (3 x Fe in mg/l)

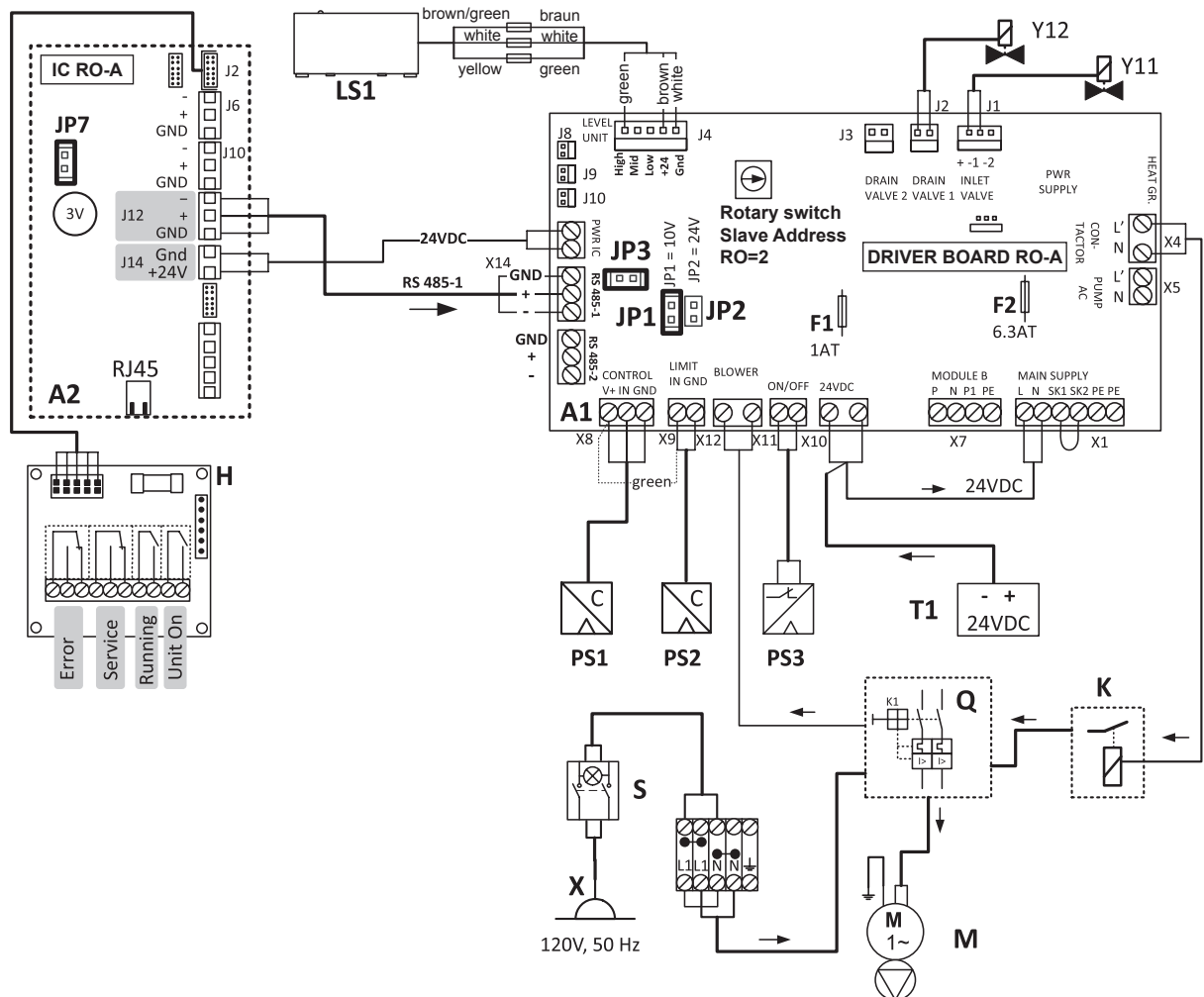
10.1.3 Free-standing RO water tank for Condair RO-A200 and RO-A300

Volume	35 gal
Drawdown	20/40: 14.1 gal 30/50: 11.9 gal 40/60: 10.3 gal
Dimensions	Ø: 16.5", H: 48.9"
Netweight	approx. 33.5 lb
Ratings water	10 bar (145 PSI)
Ratings Temperature	Max. working temperature 140°F
Threated tank connection	1" PVC MPT

11 Appendix

11.1 Wiring diagrams

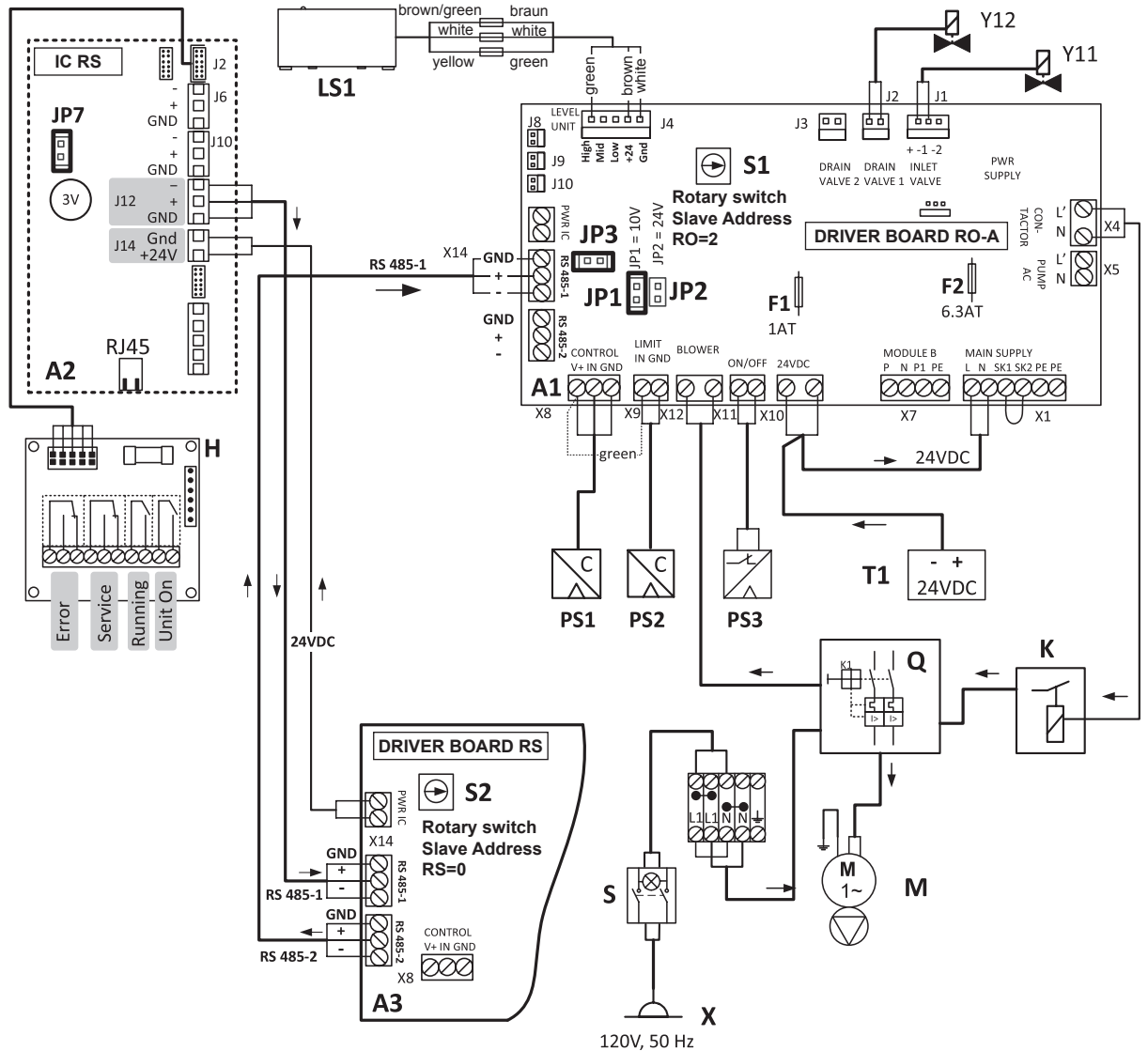
11.1.1 Wiring diagram Condair RO-A Stand-alone



A1	Driverboard Condair RO-A	M	Motor with pump
A2	Controller with display RO-A	PS1	Pressure sensor tap water (Inlet)
F1	Fuse 1 A, slow acting	PS2	Pressure sensor RO water (Vessel)
F2	Fuse 6.3 A, slow acting	PS3	Max. pressure switch pump (Outlet)
H	Remote operation and fault Indication (Option)	Q	Motor protecting switch
JP1	Jumper connected means 5V on X8	S	Main switch
JP2	Warning: Do not set this jumper, 24V!	S1	Rotary switch Condair RO-A (must be set to 2)
JP3	Bus (Jumper only for last participant)	T1	Internal power supply 24VDC
JP7	Jumper Modbus (remove for Bacnet)	X	Mains supply socket (male connector)
K	Motor relay pump	Y11	Inlet valve tap water
LS2-4	Leakage sensor (Option)	Y12	Drain valve RO water

Fig. 16: Wiring diagram Condair RO-A, Stand-alone

11.1.2 Wiring diagram Condair RO-A for Nortec RS



- | | | | |
|--------------|--|------------|---|
| A1 | Driverboard Condair RO-A | M | Motor with pump |
| A2 | Controller with display Nortec RS | PS1 | Pressure sensor tap water (Inlet) |
| A3 | Driverboard Nortec RS | PS2 | Pressure sensor RO water (Vessel) |
| F1 | Fuse 1 A, slow acting | PS3 | Max. pressure switch pump (Outlet) |
| F2 | Fuse 6.3 A, slow acting | Q | Motor protecting switch |
| H | Operation and fault Indication (Option) | S | Main switch |
| JP1 | Jumper connected means 5V on X8 | S1 | Rotary switch Condair RO-A (must be set to 2) |
| JP2 | Warning: Do not set this jumper, 24V! | S2 | Rotary switch Nortec RS (set to 0) |
| JP3 | Bus (Jumper only for last participant) | T1 | Internal power supply 24VDC |
| JP7 | Jumper Modbus (remove for Bacnet) | X | Mains supply socket (male connector) |
| K | Motor Relay Pump | Y11 | Inlet valve tap water |
| LS2-4 | Leakage sensor (Option) | Y12 | Drain valve RO water |

Fig. 17: Wiring diagram Condair RO-A for Nortec RS

11.1.3 Wiring plan Condair RO-A

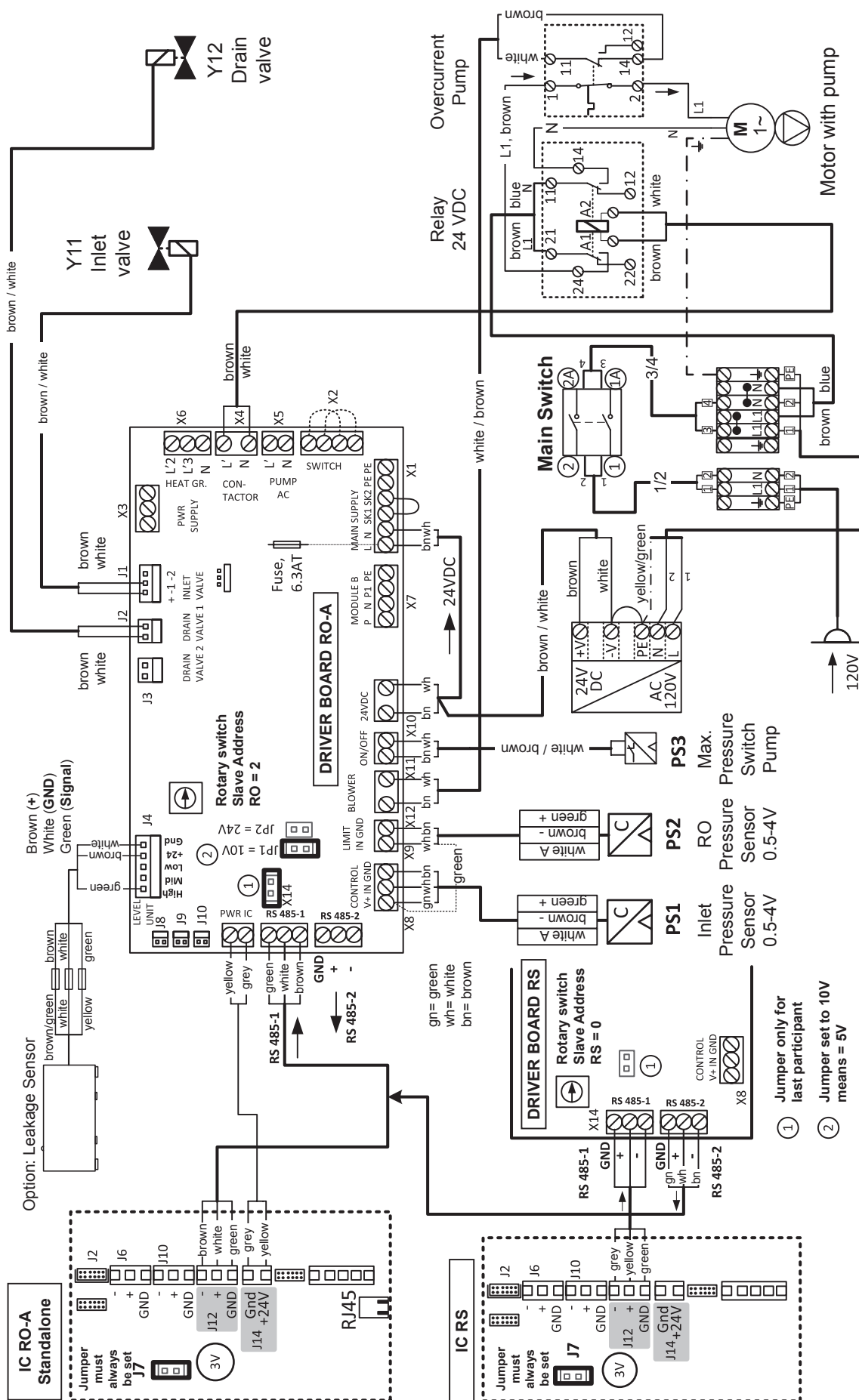


Fig. 18: Wiring Plan Condair RO-A

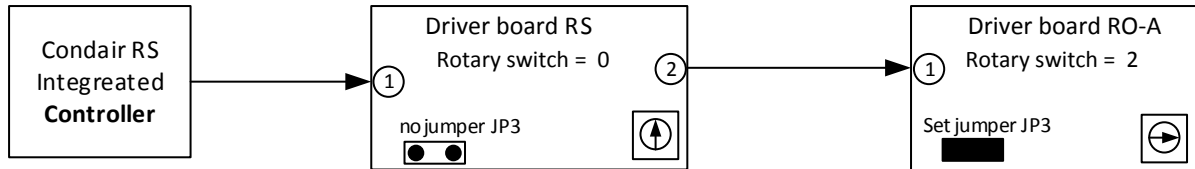
11.1.4 Connecting Nortec RS type units to the Condair RO-A

① RS485-1

② RS485-2

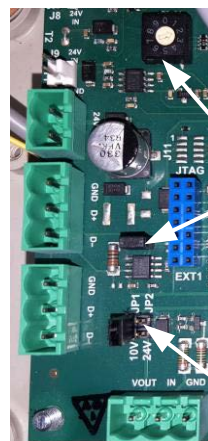
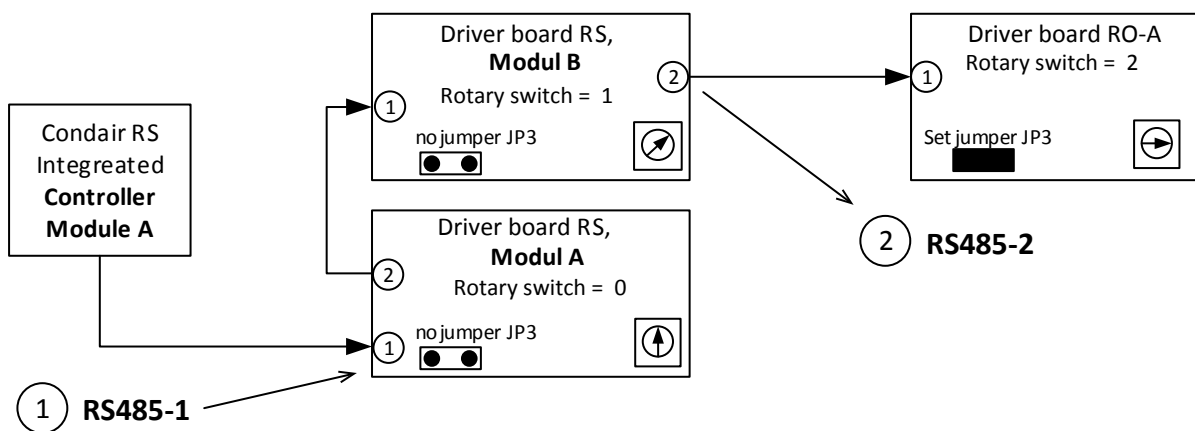
Nortec RS 10...90 – Single units "S" and "M"

Condair RO-A 40...300 l/h



Nortec RS 90...180 – Single units "L"

Condair RO-A 40...300 l/h

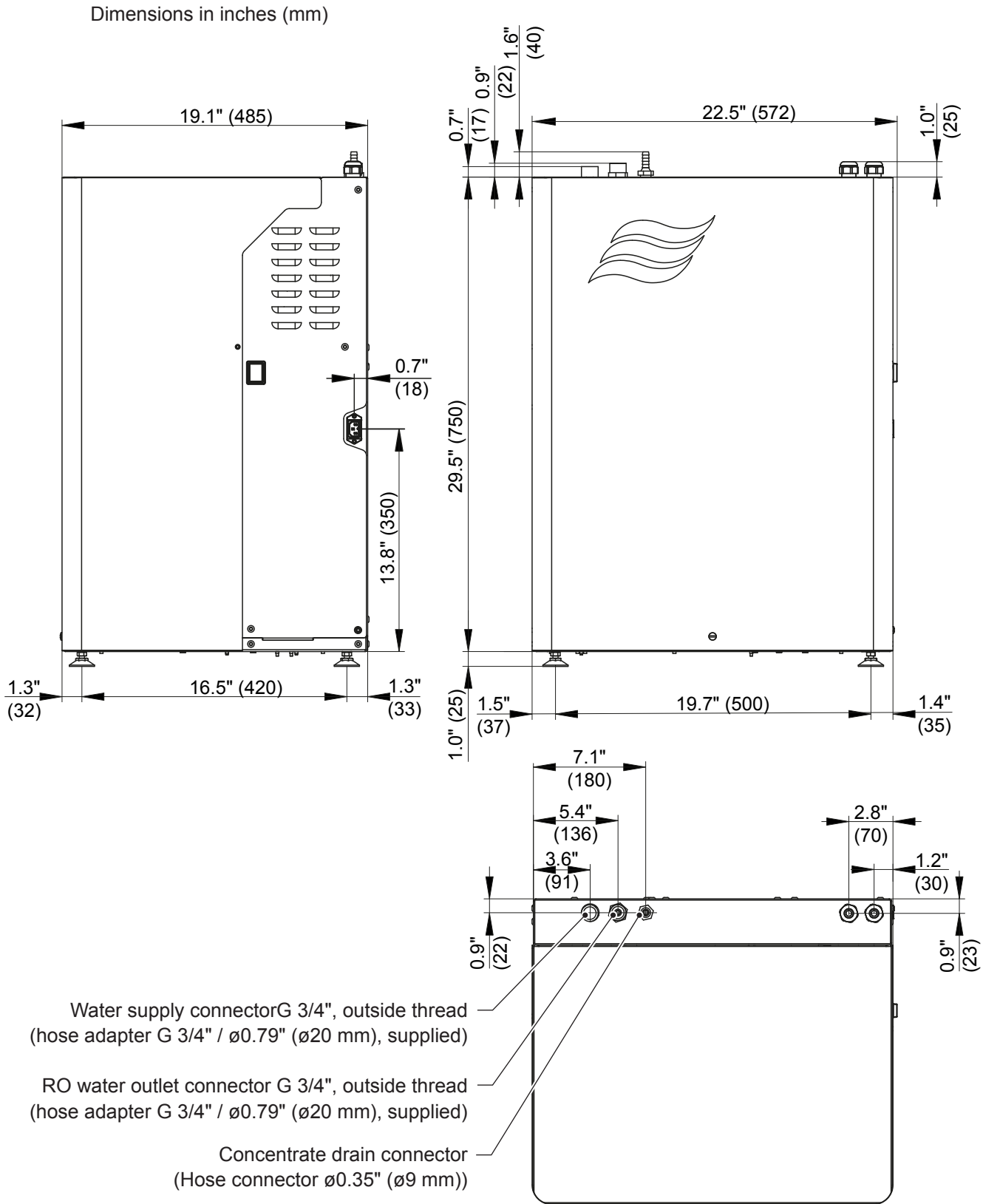


Rotary switch

Jumper JP3
(Bus termination)

Jumper JP2, JP3
(internal voltage)
see RS / RO-A Manual!

11.2 Dimensional drawing Condair RO-A40 ... RO-A300



Warranty

Condair Inc. and/or Condair Ltd. (hereinafter collectively referred to as THE COMPANY), warrant for a period of two years after installation or 30 months from manufacturer's ship date, whichever date is earlier, that THE COMPANY's manufactured and assembled products, not otherwise expressly warranted, are free from defects in material and workmanship. No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

THE COMPANY's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. THE COMPANY's factory, providing the defective part(s) is returned freight prepaid by the customer. Parts used for repairs are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer.

The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to THE COMPANY until said products have been paid for in full and then said liability shall be limited to the original purchase price for the product. Any further warranty must be in writing, signed by an officer of THE COMPANY.

THE COMPANY's parts or materials that are considered consumables, including but not limited to: cylinders, filters, nozzles, membranes, media, gaskets, O-rings, etc. are NOT covered by the warranty.

THE COMPANY makes no warranty and assumes no liability unless the equipment is installed in strict accordance with a copy of the catalog and installation manual in effect at the date of purchase and by a contractor approved by THE COMPANY to install such equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for consequential damage or damage resulting directly from misapplication, incorrect sizing or lack of proper maintenance of the equipment.

THE COMPANY makes no warranty and assumes no liability whatsoever for damage resulting from freezing of the humidifier, supply lines, drain lines, or quality of the water used.

THE COMPANY retains the right to change the design, specification and performance criteria of its products without notice or obligation.

THE COMPANY's limited warranty on accessories, not of the companies manufacture, such as controls, humidistats, pumps, etc. is limited to the warranty of the original equipment manufacturer from date of original shipment of humidifier.

Extended Warranty

Extended warranties are available to purchase under the conditions listed above.



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