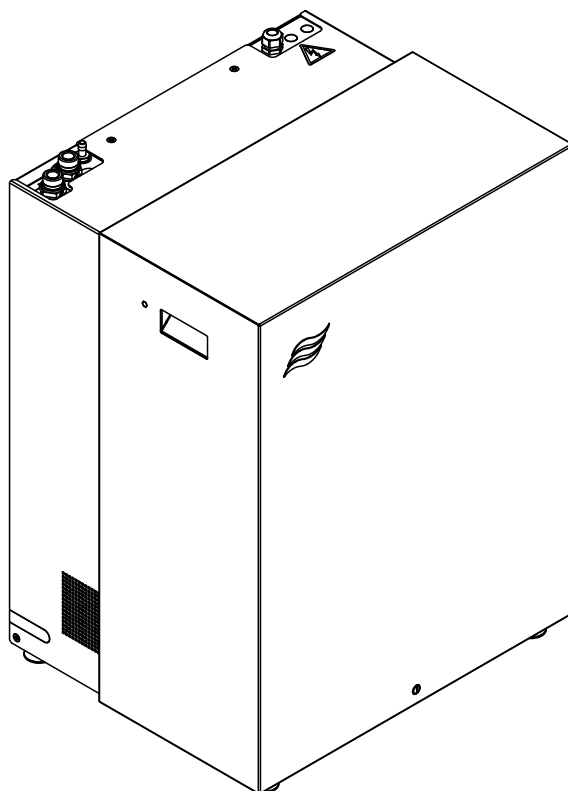




**Read and save these instructions.
This manual to be left with the equipment.**

INSTALLATION MANUAL

Pure Water System
Condair **RO-E**

Humidification, Dehumidification
and Evaporative Cooling

 **condair**

Thank you for choosing Condair

Installation date (MM/DD/YYYY):

Commissioning date (MM/DD/YYYY):

Site:

Model:

Serial number:

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1 Introduction

1.1 Read me first!

Thank you for choosing the **Condair RO-E(+) pure water system**.

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

To ensure a safe, proper and correct installation of the Condair RO-E(+) pure 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-E(+) pure water system

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

1.2 Notes on the installation manual

Scope

The subject of this installation manual is the Condair RO-E(+) pure water system in the various versions. Additional system components as well as options and accessories are only described to the extent necessary for proper installation. For more information about the options and accessories, please refer to the respective instructions.

The information provided in this installation manual is limited to the **installation** of the Condair RO-E(+) pure water system and is intended for **well-trained specialist personnel who are sufficiently qualified for the respective work**.

This installation manual is supplemented by other documents (e.g. operation manual, spare parts list, etc.). Where necessary, cross-references to these publications can be found in this installation manual.

Use of model designation

The model designations are used in this installation manual as follows:

- **RO-E:** If the model designation "RO-E" is used in texts, the corresponding instruction text **only applies to the RO-E model series**.
- **RO-E+:** If the model designation "RO-E+" is used in texts, the corresponding instruction text **only applies to the RO-E+ model series**.
- **RO-E(+):** If the model designation "RO-E(+)" is used in texts, the corresponding instruction text applies to **both model series** (RO-E and RO-E+).

Conventions



CAUTION!

The catchword "**CAUTION**" used in conjunction with the general caution symbol 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 tap water without any 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 (reverse osmosis water):

The term pure water or reverse osmosis water (RO water) refers to water partially demineralised by the Condair RO-E(+) pure water system.

Safekeeping

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

If the installation manual gets misplaced, please contact your Condair representative.

Language versions

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

2 For your safety

2.1 General safety guidelines

General

Every person carrying out installation work on the Condair RO-E(+) pure water system must have read and understood the installation manual and the operation manual of the Condair RO-E(+) pure water system before carrying out any work.

Knowing and understanding the contents of these manuals is a basic requirement for protecting the personnel against any kind of danger and to prevent faulty installation of the equipment.

All icons, signs and markings applied to the components of the Condair RO-E(+) pure water system must be observed and kept in readable state.

Qualification of personnel

All work described in this installation manual may only be carried out by trained and sufficiently qualified personnel authorized by the owner. It is the owner's responsibility to verify proper qualification of the personnel.

For safety and warranty reasons any action beyond the scope of this manual must only be carried out by a Condair service technician or trained personnel authorized by Condair.

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

2.2 Intended use

The Condair RO-E pure water system is intended exclusively for the production of pure water for feeding isothermal humidification systems and the Condair RO-E+ pure water system is intended exclusively for the production of pure water for feeding Condair adiabatic humidification systems within the specified operating conditions. 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-E(+) pure water system becoming dangerous and will void any warranty.

The intended use also includes observing **all information contained in this installation manual as well as in the operation manual of the Condair RO-E(+) pure water system (in particular the safety instructions).**

2.3 Danger that may arise from the Condair RO-E(+) pure water system



DANGER! Risk of electric shock!

The Condair RO-E(+) pure water system is mains powered. Live parts may be exposed when the control compartment or the terminal box of the pump motors/are open. Touching live parts may cause severe injury or danger to life.

Prevention: Before carrying out any work on the components of the Condair RO-E(+) pure water system make sure the system is disconnected from the mains and secured against inadvertent power-up.

Important: The frequency converter in the Condair RO-E(+) pure water system contains capacitors. These can remain charged with a potentially deadly voltage for a certain period of time after the Condair RO-E(+) pure water system has been disconnected from the power supply. Therefore, wait at least 10 minutes after disconnecting the power supply. Then make sure the appropriate contacts on the frequency converter and the terminals on the pump motor are free of voltage before starting any work on these components!



DANGER! Health risk because of inadequate hygiene!

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

Prevention: The Condair RO-E(+) pure 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.



WARNING!

Water produced from a Condair RO-E(+) pure water system is very aggressive and can cause metals to corrode quickly. The Condair RO-E(+) pure water system should always be connected to piping / equipment suitable for handling reverse osmosis water.

2.4 Ensure safe installation

Observe all local safety standards

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

Preventing dangerous situations

All persons working on the Condair RO-E(+) pure water system are obliged to immediately report any alterations to the system that may affect safety to the responsible person of the owner and to secure the Condair RO-E(+) pure water system against unintentional activation.

Prohibited modifications to the unit

No modifications must be undertaken on the Condair RO-E(+) pure water system 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.

2.5 Hygiene

Please observe the local health and safety executive's technical guidance on the control of Legionellosis in water systems.

The installer is responsible for ensuring that the water system complies with local regulations, bylaws and guidelines (such as the HSE ACoP L8, VDI 6022, ISO 22000, HACCP or equivalent).

The Condair RO-E(+) pure water system is produced according to best hygiene standards, which means that we have considered all aspects of this equipment to reduce the risk of Legionnaires' disease and other similar conditions. However, the operator is responsible for ensuring that the installation is performed in a manner, ensuring that the system stays clean!

Any risks or hazards relating to the system, including during installation, should be identified by a competent health and safety representative who is responsible for introducing effective control measures.

Observe and follow all hygiene instructions in the Condair RO-E(+) pure water system operation manual.



DANGER!

The Condair RO-E(+) pure water system must be installed in accordance with this manual. Failure to do so could result in contamination that might cause Legionnaires' disease, which can be fatal.

3 Product Overview

3.1 Product overview Condair RO-E pure water systems

3.1.1 Model overview Condair RO-E pure water systems

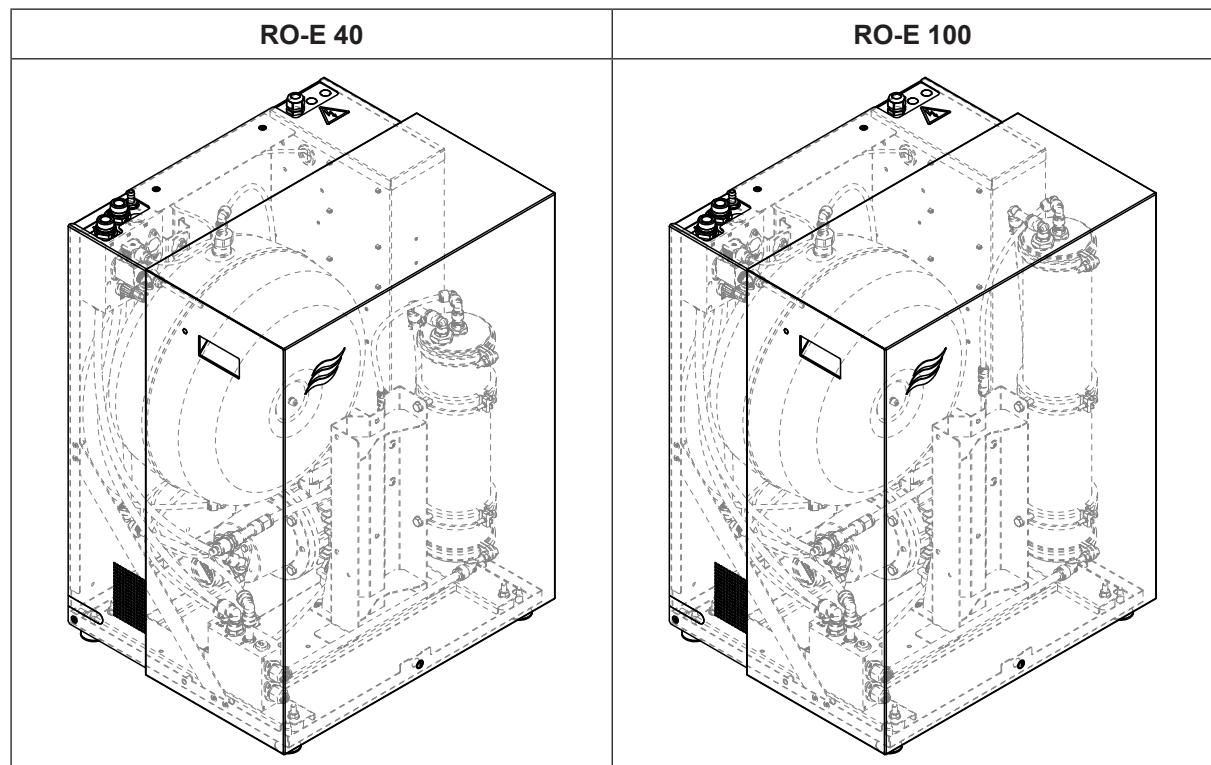
The Condair RO-E pure water system is designed for the production of **reverse osmosis water for Condair isothermal humidifiers** and is available in **4 models** with different maximum pure water output. All four models have the same housing and the same electrical parts.

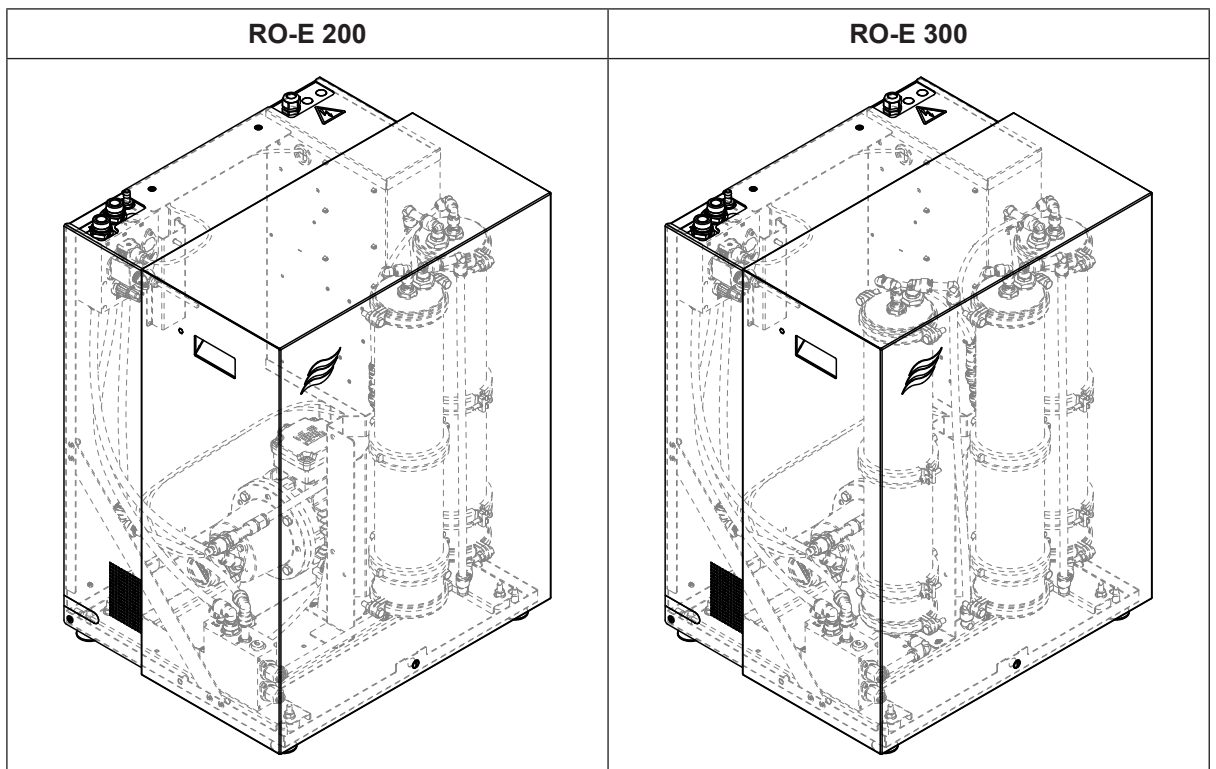
All systems can be operated as **stand-alone systems** controlled via the external Condair control unit (supplied with stand-alone systems) or as **integrated systems** controlled via the corresponding Condair humidifier control unit.

	Model			
	RO-E 40	RO-E 100	RO-E 200	RO-E 300
Pure water output at 41°F (5°C) against 14.50 psi (1 bar)	15.32 gal/hr (58 l/hr)	27.74 gal/hr (105 l/hr)	52.83 gal/hr (200 l/hr)	75.29 gal/hr (285 l/hr)
Pure water output at 59°F (15°C) against 14.50 psi (1 bar)	25.89 gal/hr (98 l/hr)	47.82 gal/hr (181 l/hr)	92.99 gal/hr (352 l/hr)	135.52 gal/hr (513 l/hr)
RO membrane type	1x 14"	1x 21"	2x 21"	3x 21"
Pressure tank	internal ¹⁾		external ²⁾	
Nominal volume	6.60 gal (25 l)			
Usable volume at 72.52 psi (5 bar)	4.76 gal (18 l)			

¹⁾ Models with internal pressure tank. Different external pressure tanks available as accessory (see [Section 3.7](#)) can be connected.

²⁾ Different external pressure tanks available as accessory can be connected (see [Section 3.7](#)).





3.2 Which RO-E pure water system for which Condair isothermal humidifier

Use the following guide to properly size a RO-E unit with a storage tank (5°C [41°F] supply water)

Isothermal Humidifier RO-E Sizing Chart					
		RO-E 40	RO-E 100	RO-E 200	RO-E 300
GS	50	85* / 119 gal	20 - 85* / 119 gal	14 - 20* / 32 - 119 gal	14 - 119 gal
GS	100	NA	85* / 119 gal	14-20* / 32 - 119 gal	14 - 119 gal
GS	150	NA	NA	14 - 85* / 119 gal	15 - 44* / 85 - 119 gal
GS	200	NA	NA	119 gal*	14 - 119 gal*
GS	300	NA	NA	NA	14 - 119 gal*
GS	450	Contact Condair for an MLRO			
GS	600	Contact Condair for an MLRO			

SETC	50	6.6 - 20* / 32 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
SETC	100	NA	32 - 85* / 119 gal	14 - 32* / 44 - 119 gal	14 - 119 gal
SETC	175	NA	NA	14 - 32* / 44 - 119 gal	14 - 119 gal
SETC	250	NA	NA	NA	14 - 119 gal*
SETC	375	Contact Condair for an MLRO			
SETC	525	Contact Condair for an MLRO			
SETC	750	Contact Condair for an MLRO			
SETC	1050	Contact Condair for an MLRO			

RS	10	6.6 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS	15	6.6 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS	20	6.6 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS	30	6.6 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS	45	6.6 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS	65	6.6 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS 440, 550-600V	90	NA	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS 208, 220-240V	90	NA	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS	130	NA	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
RS	180	NA	NA	14 - 119 gal	14 - 119 gal

Note: For GS and SETC systems, the Full Tank Blow Down (FTBD) settings must be turned off, & blowdown rate set to 15%. RS-RO drain water cooling must be installed and the reduction interval time set to drain 1 litre every 180 minutes for scale management.

* Tank sizing is possible for the chosen RO-E model size but the tank fill time parameter must be adjusted to allow for fills from empty without faulting out. Fill time may be doubled.

Example: To pair a GS100 unit with an RO-E 100. Either a 85 gallon storage tank with a fill time adjustment can be used or a 119 gallon tank can be used without any affect on fill time. 41 minutes vs 20 minutes to fill from empty, where the default settings would cause the unit to fault out after a fill time of 40 minutes.

Use the following guide to properly size a RO-E(+) unit with a storage tank (15°C [59°F] supply water)

Isothermal Humidifier ROE Sizing Chart

		RO-E 40	RO-E 100	RO-E 200	RO-E 300
GS	50	32 - 85* / 119 gal	6.6 - 32* / 44 - 119 gal	14 - 119 gal	14 - 119 gal
GS	100	32 - 85* / 119 gal	6.6 - 32* / 44 - 119 gal	14 - 119 gal	14 - 119 gal
GS	150	NA	6.6 - 119 gal*	14 - 119 gal	14 - 119 gal
GS	200	NA	NA	14 - 119 gal*	14 - 119 gal
GS	300	NA	NA	14 - 119 gal*	14 - 119 gal
GS	450	NA	NA	NA	14 - 119 gal*
GS	600	NA	NA	NA	14 - 119 gal*

SETC	50	6.6 - 119 gal	6.6 - 119 gal	14 - 119 gal	14 - 119 gal
SETC	100	44 - 85* / 119 gal	6.6 - 44* / 85 - 119 gal	14 - 119 gal	14 - 119 gal
SETC	175	NA	6.6 - 44* / 85 - 119 gal	14 - 119 gal	14 - 119 gal
SETC	250	NA	NA	14 - 44* / 85 - 119 gal	14 - 119 gal
SETC	375	NA	NA	14 - 119 gal	14 - 119 gal
SETC	525	NA	NA	NA	14 - 119 gal*
SETC	750	Contact Condair for an MLRO			
SETC	1050	Contact Condair for an MLRO			

RS	10	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS	15	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS	20	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS	30	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS	45	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS	65	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS 440, 550-600V	90	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS 208, 220-240V	90	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS	130	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal
RS	180	NA	6.6 - 119 gal	6.6 - 119 gal	6.6 - 119 gal

Note: For GS and SETC systems, the Full Tank Blow Down (FTBD) settings must be turned off, & blowdown rate set to 15%. RS-RO drain water cooling must be installed and the reduction interval time set to drain 1 litre every 180 minutes for scale management.

* Tank sizing is possible for the chosen RO-E model size but the tank fill time parameter must be adjusted to allow for fills from empty without faulting out. Fill time may be doubled.

Example: To pair a GS100 unit with an RO-E 100. Either the 6.6 gallon (internal) storage tank with a fill time adjustment can be used or a 44 gallon tank can be used without any affect on fill time. 50 minutes vs 40 minutes to fill from empty, where the default settings would cause the unit to fault out after a fill time of 40 minutes.

3.3 Product overview Condair RO-E+ pure water systems

3.3.1 Model overview Condair RO-E+ pure water systems

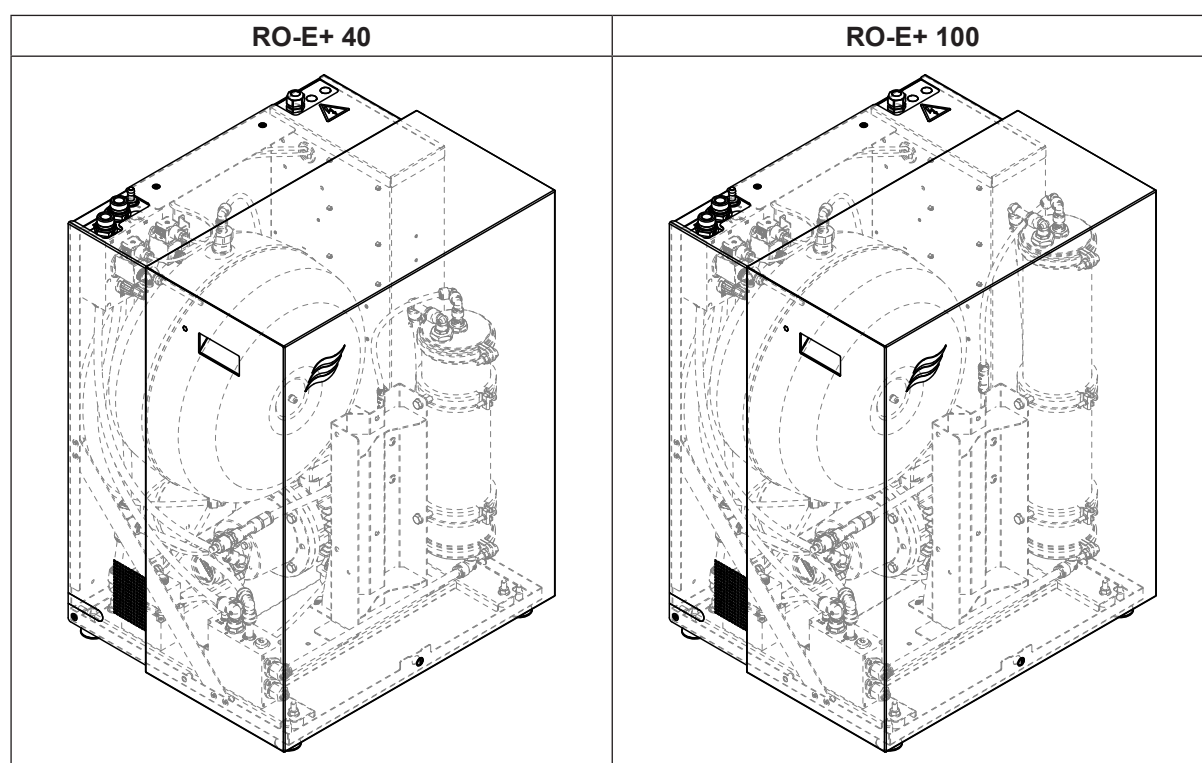
The Condair RO-E+ pure water system is designed for the production of **reverse osmosis water for Condair adiabatic humidifiers** and is available in **4 models** with different maximum pure water output. All four models have the same housing and the same electrical parts.

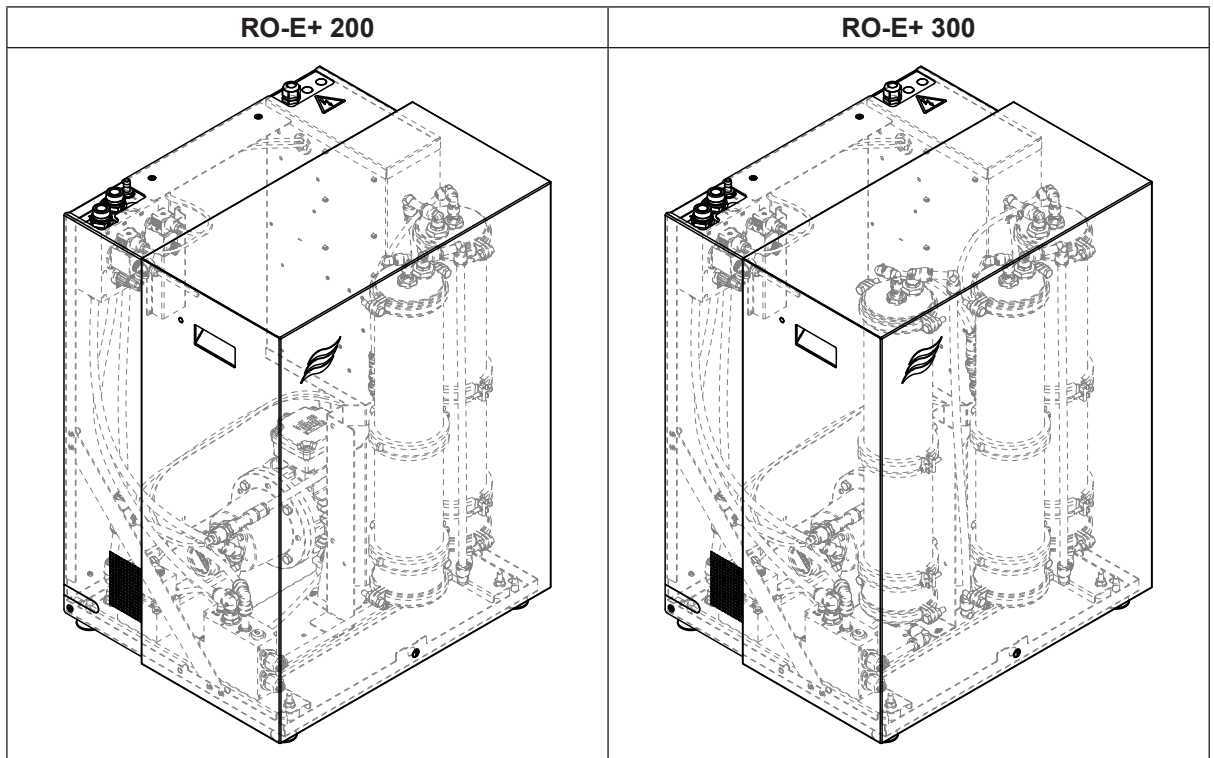
All systems can be operated as **stand-alone systems** controlled via the external Condair control unit (supplied with stand-alone systems) or as **integrated systems** controlled via the corresponding Condair humidifier control unit.

	Model			
	RO-E+ 40	RO-E+ 100	RO-E+ 200	RO-E+ 300
Pure water output at 41°F (5°C) against 14.50 psi (1 bar)	9.51 gal/hr (36 l/hr)	17.70 gal/hr (67 l/hr)	32.76 gal/hr (124 l/hr)	45.17 gal/hr (171 l/hr)
Pure water output at 59°F (15°C) against 14.50 psi (1 bar)	15.59 gal/hr (59 l/hr)	30.12 gal/hr (114 l/hr)	57.59 gal/hr (218 l/hr)	82.42 gal/hr (312 l/hr)
RO membrane type	1x 14"	1x 21"	2x 21"	3x 21"
Pressure tank Nominal volume Usable volume at 72.52 psi (5 bar)	internal ¹⁾ 6.60 gal (25 l) 4.76 gal (18 l)		external ²⁾	

¹⁾ Models with internal pressure tank. Different external pressure tanks available as accessory (see [Section 3.7](#)) can be connected.

²⁾ Different external pressure tanks available as accessory can be connected (see [Section 3.7](#)).





3.4 Which RO-E+ pure water system for Condair adiabatic humidification systems

The Condair RO-E+ pure water system for Condair adiabatic humidification systems (Condair ME, Condair DL, etc.) must be selected based on the required humidification capacity.

Adiabatic Humidifier ROE+ Sizing Chart		
ME	Any Size	Contact Condair Application Engineering for Support
DL	Any Size	$RO-E + Model\ Size = Humidifier\ Load\ in\ lb/hr \times \frac{0.454\ kg}{1\ lb} \times 1.3_{sf+drain\ cycles} = Total\ Water\ Needed\ in\ l/hr$
JetSpray	Any Size	
HP	Any Size	Consider HPRO / Contact Condair Application Engineering for Support

3.5 Product designation

The product designation and the most important unit data are found on the rating plate fixed on the top side and the back side of the Condair RO-E(+) pure water system (see example below):

Device type

Serial number

Manufacturing date month/year

Condair Group AG, Gwattstrasse 17, 8808 Pfäfers SZ, Switzerland		
Type: Condair RO-E 100	Serial-No: XXXXXXXX	05.24
Voltage: 120 VAC 1~ / 60 Hz	El. Power: 640 VA / 4.8 A	
RO Water capacity: 26.4 gal/hr	Reverse Osmosis System	
Water press.: 29-87 psi (200-600 kPa)		
 US LISTED RO SYSTEM E491728    		
Engineered in Switzerland, Made in Germany		

Supply voltage

RO production capacity

Admissible water supply pressure (yield pressure)

Certificates

Unit designation

Power consumption

3.6 Available options

Option	Description	RO-E	RO-E+
Cover (CO)	Cover for RO-E(+). Note: The cover is supplied as standard in some countries.	X	X
Insulated cover (CONI)	Insulated cover for RO-E(+).	X	X
Outlet valve permeate Y13 (OV)	Outlet valve Y13 (NO) for controlling the permeate outlet.	X	X
Drain valve Y12 (DV)	Drain valve Y12 (NO) for controlling the draining and flushing of the internal water system. Note: The drain valve Y12 is installed as standard in Condair RO-E+ pure water systems.	X	—
Volume flow measuring (VF)	Sensor for measuring the permeate volume flow. The sensor is installed in the outlet line of the membrane(s) and connected to the driver board in the control compartment.	X	X
Pressure gauge pump pressure (PPG)	Pressure gauge for displaying the pump pressure. The pressure gauge is connected to the inlet of the (first) membrane.	X	X
Conductivity measuring (CM)	The conductivity sensor is installed in the standard logic block and connected to the conductivity and temperature in the control compartment. Note: Condair RO-E+ pure water systems have the conductivity measuring installed as standard.	X	—
Conductivity and temperature measuring (CTM)	The conductivity and temperature sensor is installed in the standard logic block and connected to the conductivity and temperature measuring board in the control compartment. Note: Conductivity and temperature measuring option cannot be used together with conductivity measuring (CM option).	X	X
Concentrate valve (CV)	Concentrate valve for emptying the membrane(s). The concentrate valve is installed in the options logic block and connected to the driver board in the control compartment. Note: The concentrate valve cannot be used with the conductivity adjustment (option CA). Use the CVA option if necessary.	X	X
Conductivity adjustment (CA)	The conductivity adjustment option consists of a throttle valve and a check valve. The conductivity adjustment option is installed in the options logic block. Note: The conductivity adjustment cannot be used with the concentrate valve (CV option). Use the CVA option if necessary.	X	—
Concentrate valve and conductivity adjustment (CVA)	Concentrate valve for draining the membrane(s) and conductivity adjustment consisting of a throttle valve and a check valve. The concentrate valve and conductivity adjustment are installed in the options logic block.	X	—
Safety valve pressure tank (SV)	External safety valve set with mounting and connection material for reverses osmosis pressure tank. Note: For CE certified system the safety valve set for the reverses osmosis pressure tank is included in the delivery.	X	X

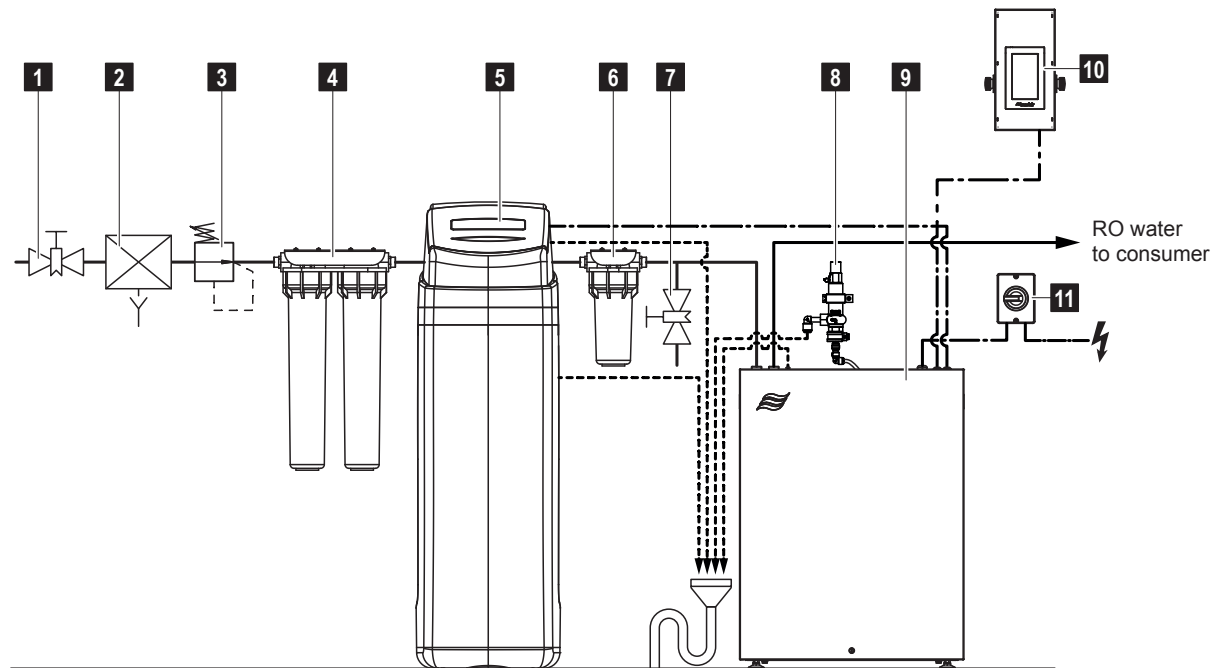
3.7 Available accessories

Condair IC2 control unit	The Condair IC2 control unit is used for Condair RO-E(+) stand-alone systems only. The Condair IC2 control unit is equipped with a touch panel to operate the control software, an operation status LED which indicates normal operation (LED lights green), warning (LED lights yellow) and error status (LED lights red). 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.
Remote operating and fault indication	The remote operating and fault indication board (RFI) has five potential-free relay contacts for remote signaling of the following operating and fault indications: Unit on, Unit producing, Maintenance due, Error present, Furnace (not supported). The remote operating and fault indication board is installed in the control compartment of the RO-E(+) pure water system and connected to the driver board.
Leakage monitoring	The leakage monitoring option consist of the leakage monitoring control board and 1 floor sensor. The leakage monitoring control board is connected to driver board inside the Condair RO-E(+) pure water system and the sensor(s) are connected to the leakage monitoring control board. Important: the leakage monitoring does not override the direction that the Condair RO-E(+) pure water 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.
Single water softener "Envirofalk 40 CK"	The Envirofalk 40 CK single water softener is used to reduce the water hardness of the inlet water to 0-1 °dH (0-1.8 °fH, 0-18 ppm) if the inlet water exceeds certain specified values (see Section 5.4.5 – Supply water requirements for the Condair RO-E(+) pure water system). Note: The Envirofalk 40 CK water softener provides a regeneration contact that can be connected to the Condair RO-E(+) pure water system to stop the operation of the Condair RO-E(+) during the regeneration process. The Envirofalk 40 CK water softener is delivered with a separate operating manual.
Double water softener "Kinetico"	The Kinetico double water softener with mechanical hardness dial disk is used to reduce the water hardness of the inlet water to 0-1 °dH (0-1.8 °fH, 0-18 ppm) if the inlet water exceeds certain specified values (see Section 5.4.5 – Supply water requirements for the Condair RO-E(+) pure water system). The Kinetico water softener is delivered with a separate operating manual.
Double water softener "Envirofalk MC-N2C/N2CT"	The Envirofalk MC-N2C/N2CT double water softener is used to reduce the water hardness of the inlet water to 0-1 °dH (0-1.8 °fH, 0-18 ppm) if the inlet water exceeds certain specified values (see Section 5.4.5 – Supply water requirements for the Condair RO-E(+) pure water system). The Envirofalk MC-N2C/N2CT water softener is delivered with a separate operating manual.
Single filter	The 5 µm single filter serves as a pre-filter. The single filter is supplied with connecting hoses on request and can be installed before and/or after the water softener (if it is installed). Other types of single filters can also be used provided they meet at least the specification specified above.

Dual filter	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 10 µm filter (2). Important: The dual filter is not intended to be used for filtration of permanently chlorinated water! The dual filter is supplied with connecting hoses on request and has to be installed before the water softener (if installed). Other types of dual filters may also be used provided they meet at least the specification specified above.																								
Triple filter	The triple filter serves as pre-filter and must mandatory be installed if the supply water is occasionally chlorinated. The triple filter consists of a 10 µm filter (1), an activated carbon filter (2) and a second 5 µm filter (3). Important: The triple filter is not intended to be used for filtration of permanently chlorinated water! The triple filter is supplied with connecting hoses on request and has to be installed before the water softener (if installed). Other types of triple filters may also be used provided they meet at least the specification specified above.																								
Pressure reducing valve	Pressure reducing valve for water inlet pressures >6 bar. The pressure reducing valve is to be installed in the supply water line after the shut-off valve.																								
Shut-off valve	Shut-off valve for installation in the supply water pipe to shut off the water supply.																								
Sampling tap	Sampling tap for installation in the supply water pipe for taking water samples.																								
Hose set	Hose set for connecting the Condair RO-E(+) pure water system and its accessories.																								
External pressure tank	6 different external pressure tanks are available: <table><tr><th colspan="6">Nominal volume of tanks</th></tr><tr><td>14 gal (53 l)</td><td>20 gal (76 l)</td><td>32 gal (121 l)</td><td>44 gal (166 l)</td><td>85 gal (321 l)</td><td>119 gal (450 l)</td></tr></table> <table><tr><th colspan="6">Usable volume of tanks at 72.52 psi (5 bar)</th></tr><tr><td>9.8 gal (37.0)</td><td>14.0 gal (53.1)</td><td>22.3 gal (84.5)</td><td>30.6 gal (115.9)</td><td>59.2 gal (224.2)</td><td>83.0 gal (314.3)</td></tr></table>	Nominal volume of tanks						14 gal (53 l)	20 gal (76 l)	32 gal (121 l)	44 gal (166 l)	85 gal (321 l)	119 gal (450 l)	Usable volume of tanks at 72.52 psi (5 bar)						9.8 gal (37.0)	14.0 gal (53.1)	22.3 gal (84.5)	30.6 gal (115.9)	59.2 gal (224.2)	83.0 gal (314.3)
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3.8 System overview

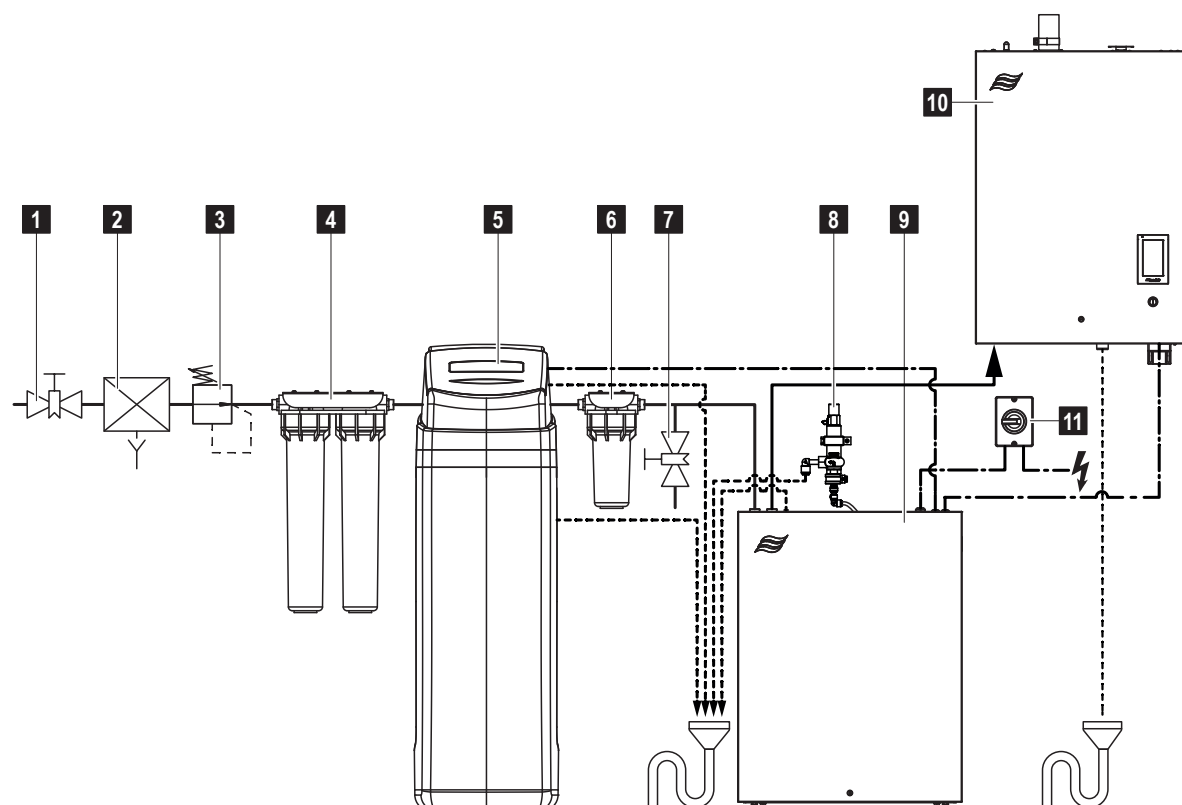
Principal system layout Condair RO-E(+) stand-alone systems



- | | |
|--|---|
| 1 Shut-off valve (mandatory, by others) | 6 Filter 5 µm (mandatory if water softener is used, available as accessory) |
| 2 System separator (where mandatory by local regulations, by others) | 7 Sampling tap (optional, recommended for taking water samples) |
| 3 Pressure reduction valve (mandatory for water supply pressure >87 psi (>6 bar), available as accessory) | 8 Safety valve pressure tank (optional, mandatory for CE certified systems) |
| 4 Single, double or tripple pre-filter (optional but recommended, double or tripple filter mandatory for occasionally chlorinated supply water, available as accessory) | 9 Condair RO-E(+) |
| 5 Water softener (optional, recommended if the supply water hardness exceeds the limits specified in Section 5.4.5 – Supply water requirements for the Condair RO-E(+) pure water system , available as accessory) | 10 Condair control unit |
| | 11 Electrical isolator (mandatory, by others) |

Fig. 1: Principal system layout Condair RO-E(+) stand-alone systems (figure shows RO-E 100 with internal pressure tank)

Principal system layout Condair RO-E(+) integrated systems with Condair humidifier



- | | |
|--|---|
| 1 Shut-off valve (mandatory, by others) | 6 Filter 5 µm (mandatory if water softener is used, available as accessory) |
| 2 System separator (where mandatory by local regulations, by others) | 7 Sampling tap (optional, recommended for taking water samples) |
| 3 Pressure reduction valve (mandatory for water supply pressure >87 psi (>6 bar), available as accessory) | 8 Safety valve pressure tank (optional, mandatory for CE certified systems) |
| 4 Single, double or tripple pre-filter (optional but recommended, double or tripple filter mandatory for occasionally chlorinated supply water, available as accessory) | 9 Condair RO-E(+) |
| 5 Water softener (optional, recommended if the supply water hardness exceeds the limits specified in Section 5.4.5 – Supply water requirements for the Condair RO-E(+) pure water system , available as accessory) | 10 Condair humidifier (e.g. Condair RS) |
| | 11 Electrical isolator (mandatory, by others) |

Fig. 2: Principal system layout Condair RO-E(+) integrated systems (figure shows RO-E 100 with internal pressure tank and Condair RS steam humidifier)

4 Important notes

4.1 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.

4.2 Storage and Transportation

Storing

Until installation store the Condair RO-E(+) pure water system components in its original packaging in a protected area meeting the following requirements:

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

Transportation

For optimum protection always transport the Condair RO-E(+) pure water system components in their original packaging and use appropriate lifting/transporting devices.



WARNING!

It is the customer's responsibility to ensure that installers and 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

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

5 Mounting and installation work

5.1 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) authorized by Condair**. 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 manual regarding the positioning and mounting of the Condair RO-E(+) pure water 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!
Risk of electric shock!

The Condair RO-E(+) pure water system is mains powered. Live parts may be exposed when the control compartment or the terminal box of the pump motors/are open. Touching live parts may cause severe injury or danger to life.

Prevention: Before carrying out any work on the components of the Condair RO-E(+) pure water system make sure the system is disconnected from the mains and secured against inadvertent power-up.

Important: The frequency converter in the Condair RO-E(+) pure water system contains capacitors. These can remain charged with a potentially deadly voltage for a certain period of time after the Condair RO-E(+) pure water system has been disconnected from the power supply. Therefore, wait at least 10 minutes after disconnecting the power supply. Then make sure the appropriate contacts on the frequency converter and the terminals on the pump motor are free of voltage before starting any work on these components!



CAUTION!

The electronic components inside the control compartment of the Condair RO-E(+) pure water system, the Condair control unit and the control compartment/control unit of the corresponding Condair humidifier are 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).

5.2 Requirements on siting and installation

Typically, the siting of a Condair RO-E(+) pure 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-E(+) pure water 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)**. Note: If no floor drain is available all Condair RO-E(+) pure water 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 21.75 si (1.5 bar) flow pressure
Condair RO-E(+) 40	79.25 gal/hr (300 l/hr)
Condair RO-E(+) 100	118.87 gal/hr (450 l/hr)
Condair RO-E(+) 200	158.50 gal/hr (600 l/hr)
Condair RO-E(+) 300	211.34 gal/hr (800 l/hr)

- Depending on the voltage of the Condair RO-E(+) pure water system (see rating plate on device) the room must be equipped either with **a 230 VAC / 50-60 Hz (P, N and PE) or a 120 VAC / 60 Hz (P, N and PE) mains supply line with electrical isolator** for the power supply of the Condair RO-E(+) pure water system.

The electrical isolator should be located in the immediate vicinity of the Condair RO-E(+) pure water system at a **height between 39.37" (1.0 m) to 59.05" (1.5 m) above the floor**.

The mains supply line should be protected **with a residual current device (RCCB) or a UL listed Class A ground-fault circuit-interrupter (GFCI)**. The RCCB and GFCI must meet the following requirements:

	RCCB requirements	GFCI requirements
Type:	A (EN 61008)	UL listed Class A
Trip current:	0.03 A or less	0.05 A (defined by class A standard)
Pin count:	2	2
Protection class:	IP40	IP40
Fitted with test button		

The mains supply line must be protected with a "F1" 10 A slow acting fuse (230 VAC / 50-60 Hz) or 15 A slow acting fuse (120 VAC / 60 Hz).

- Depending whether and which type of water softener is used a power supply wall sockets may be required in the room. Refer to the corresponding water softener manual regarding the power supply requirements.
- The room must be equipped with an **open funnel with trap** connected to the building waste water line with **sufficient drain capacity (min. 265 gal/hr (min. 1,000 l/hr))**.
- 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-E(+) pure water system components in such a manner that they are **freely accessible** with sufficient space available for operation and maintenance purposes.
- To avoid bacterial contamination, drain pipework of the Condair RO-E(+) pure water system must not come into contact with the drain water funnel (an air gap of at least 0.8" (2 cm) must be maintained).
- **No modifications must be undertaken** on the Condair RO-E(+) pure 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.

Distances to be observed

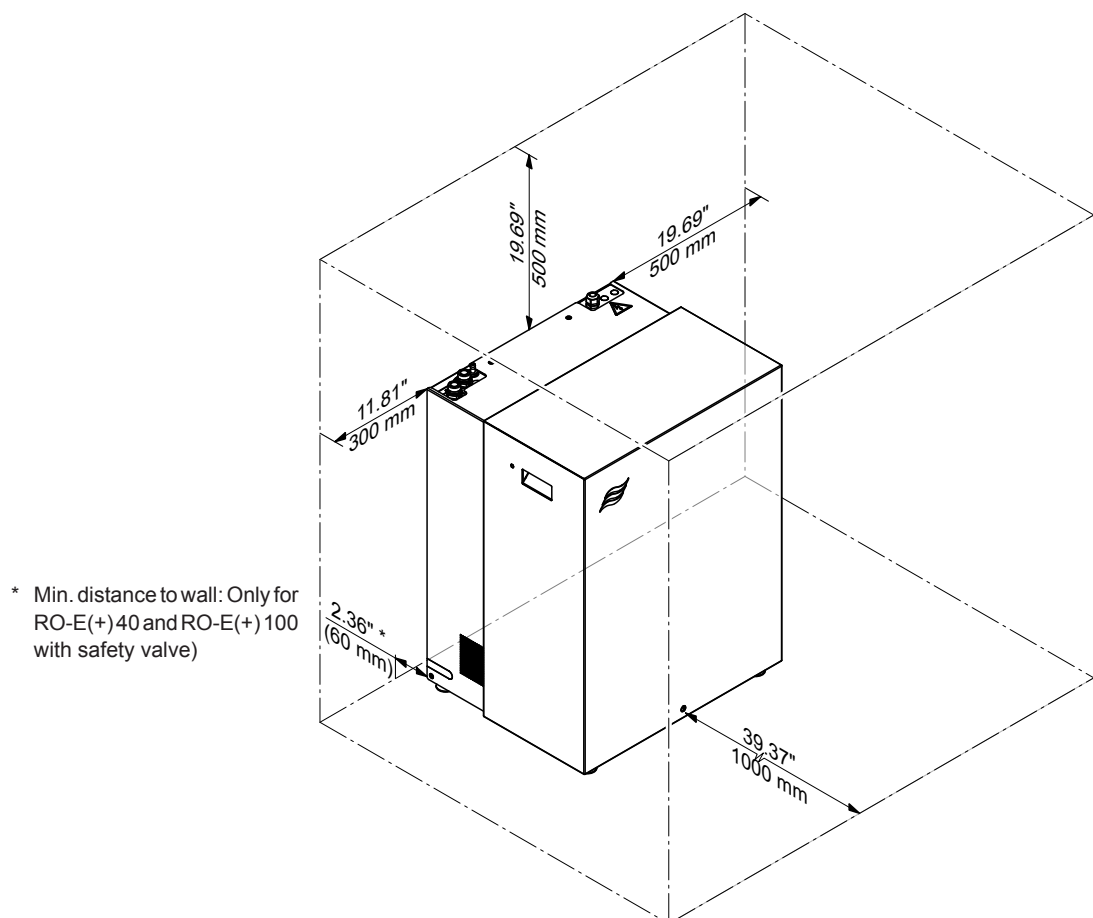


Fig. 3: Distances to be observed

5.3 Positioning the Condair RO-E(+) pure water system components

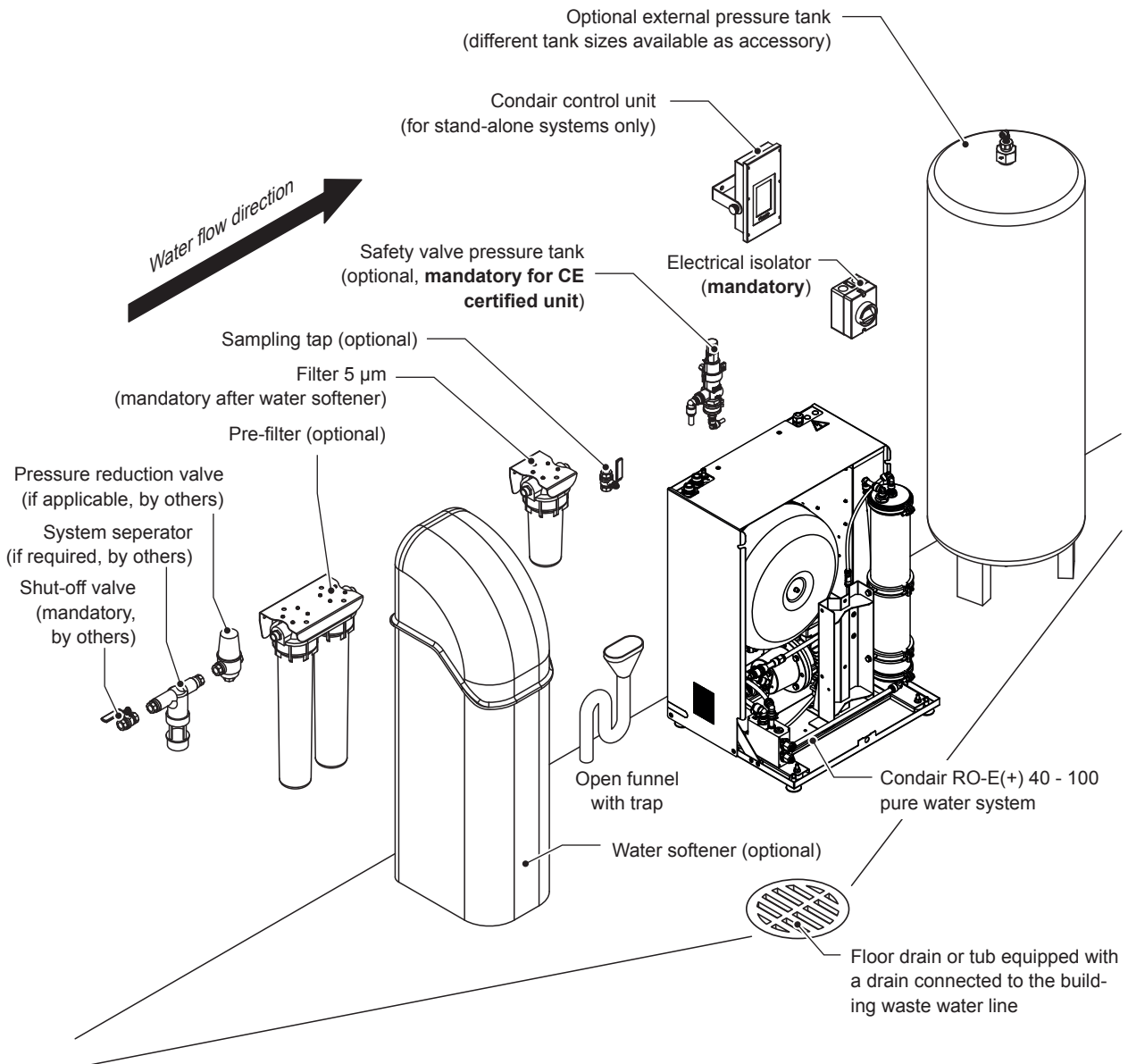


Fig. 4: Positioning of the system components for Condair RO-E(+) 40 - 100 pure water systems with or without optional external pressure tank (unit cover of Condair RO-E(+) unit removed for better visibility)

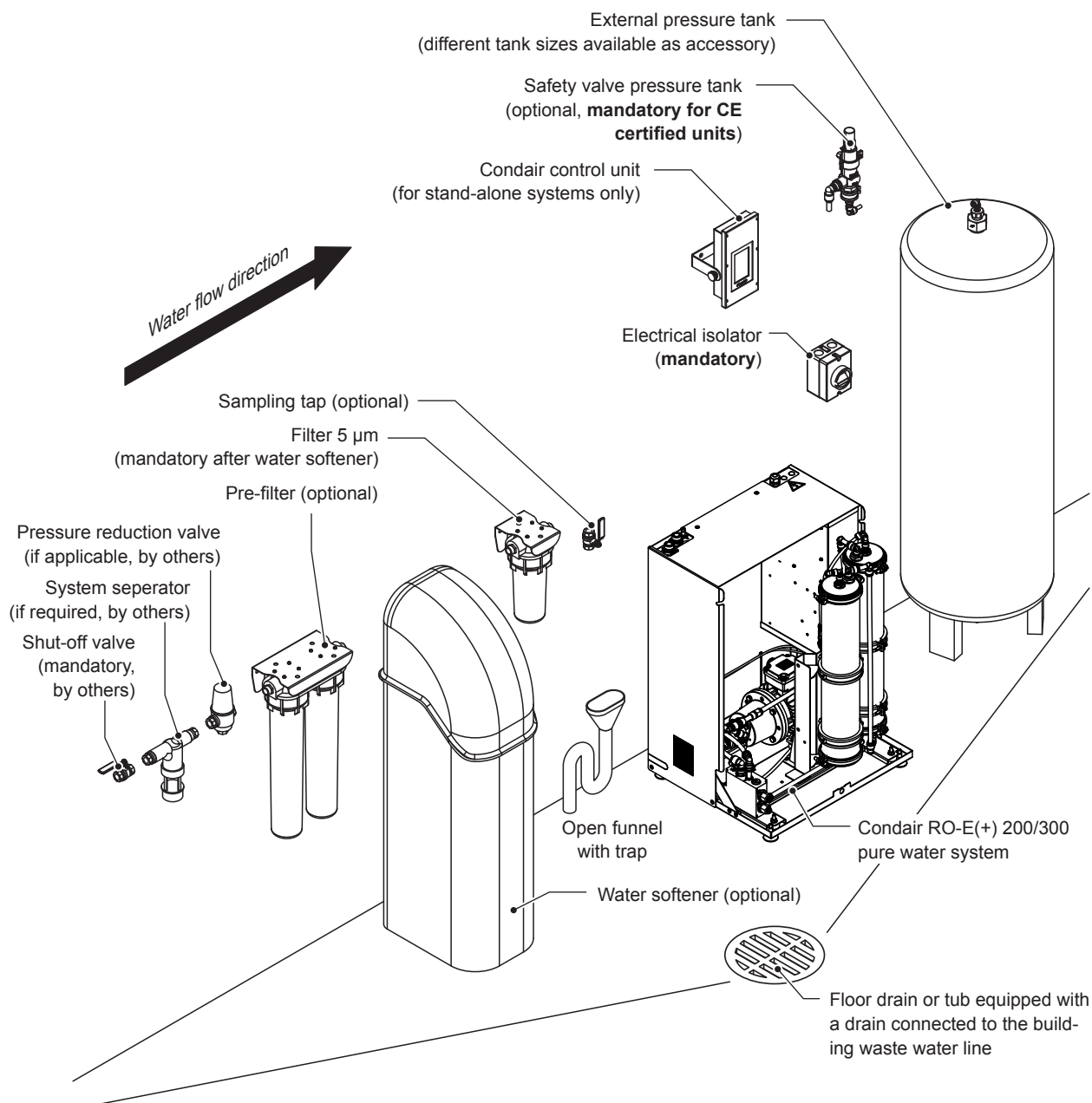


Fig. 5: Positioning of the system components for Condair RO-E(+) 200 - 300 pure water systems with external pressure tank (unit cover of Condair RO-E(+) unit removed for better visibility)

General positioning notes

- Whenever possible place/mount the system components on the same level and in the same room.
- The components upstream of the Condair RO-E(+) pure water system (shut-off valve up to and including test cock) must be installed in the sequence shown in [Fig. 4](#) and [Fig. 5](#).
- The external pressure tank(s) (up to max. 3 external pressure tanks possible) can be placed on the left or on the right side of the Condair RO-E(+) pure water system.
- Make sure the distances between the components are as short as possible (max. 3 m between each component).
- The pressure tank safety valve (optional, **mandatory for CE certified systems**) must be placed as follows:
 - for Condair RO-E(+) 40 - 100 pure water systems with internal pressure tank with or without optional external pressure tank(s):
approx. 5.91" (150 mm) above the unit (left of the centre of the unit), see [Fig. 4](#)
 - for Condair RO-E(+) 200 - 300 with external pressure tank(s):
approx. 5.91" (150 mm) above the (first) external pressure tank, see [Fig. 5](#)
- Make sure the drain line of the Condair RO-E(+) pure water system is as short as possible and the drain funnel is located below the drain connector of the Condair RO-E(+) pure water system.
- Make sure the reverse osmosis water line from the outlet of the Condair RO-E(+) pure water system to the connector of the consumer is as short as possible and the height difference is as low as possible. **The pressure drop of the reverse osmosis water line must not exceed 14.50 psi (1 bar).**
- Make sure that the temperature of the reverse osmosis water in Condair RO-E+ pure water systems in conjunction with adiabatic humidifiers **does not exceed 68°F (20°C)**.

The installer must ensure that the positioning and installation specifications are adhered to.

5.3.1 Mounting of the pre-filter

For installing the pre-filter, please follow the installation instructions in the separate instructions for the corresponding filter.

5.3.2 Positioning the optional water softener and the 5 µm filter (if applicable)

Place the water softener on the floor at the desired position and install the 5µm filter close to the water softener.

Information on the placement and connection of the water softener and the 5 µm filter can be found in the separate instructions for the respective water softener and the 5 µm filter.

5.3.3 Positioning the Condair RO-E(+) pure water system

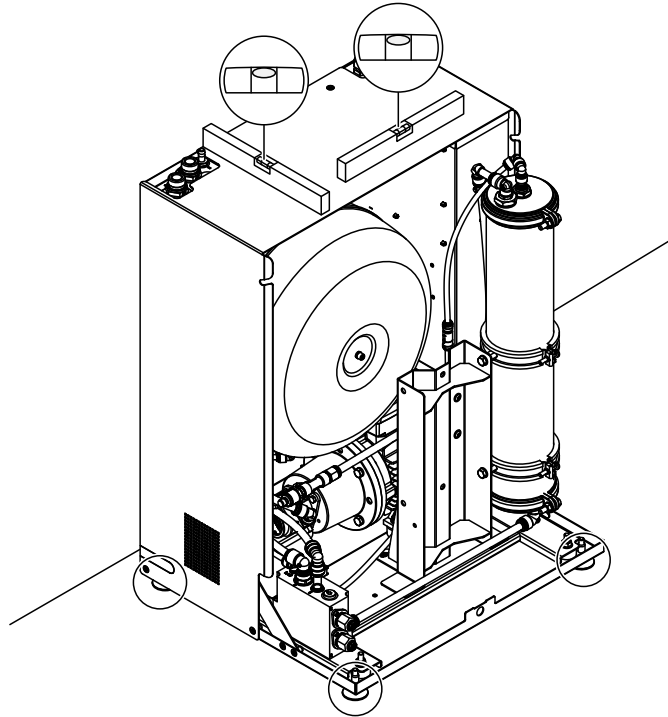


Fig. 6: Positioning the Condair RO-E(+) pure water system (unit cover of Condair RO-E(+) unit removed for better visibility)

Place the Condair RO-E(+) pure water system at the desired position and align unit with the four screw feet exactly horizontal using a level.

Important: For Condair RO-E(+) pure water systems with internal pressure tank, where the optional external pressure tank safety valve is used, there must be a distance of at least 1.97" (5 cm) between a wall and the back of the unit in order that the pressure tank safety valve can be connected.



DANGER!
Danger of electric hazard!

Do not connect Condair RO-E(+) pure water system to the mains yet.

5.3.4 Mounting the electrical isolator

Mount the electrical isolator at a suitable height as near as possible to the Condair RO-E(+) pure water system.

For mounting the electrical isolator, please refer to manufacturers installation instructions.

5.3.5 Positioning the external pressure tank

Place the external pressure tank as near as possible to the Condair RO-E(+) pure water system on the floor. See [Fig. 12](#) to [Fig. 14](#) for maximum length of the tank connection hoses.

The external pressure tank can be positioned to the left or to the right of the Condair RO-E(+) pure water system.

Secure the external pressure tank against tilting with appropriate securing devices.

5.3.6 Mounting the Condair control unit (for stand alone systems only)

For installing the Condair control unit, please follow the installation instructions in the separate instructions for the control unit.

5.3.7 Mounting the optional pressure tank safety valve

The optional pressure tank safety valve (e.g. for CE certified systems) must be installed on site and connected to the Condair RO-E(+) pure water system using the black John Guest (JG) fittings and hoses supplied.

1. Mark fastening holes on the wall above the Condair RO-E(+) 40/100 pure water system or above the (first) external tank for Condair RO-E(+) 200/300.
2. Drill holes (Diameter: 0.39" (ø10 mm), Depth: 2.95" (75 mm)).
3. Insert the supplied dowels into the holes.
4. Mount the upper and lower pipe clamps to the wall and align the center of the clamps vertically.
5. Insert the safety valve with the water supply connection on the bottom into the pipe clamps and fasten the clamps with the screws.

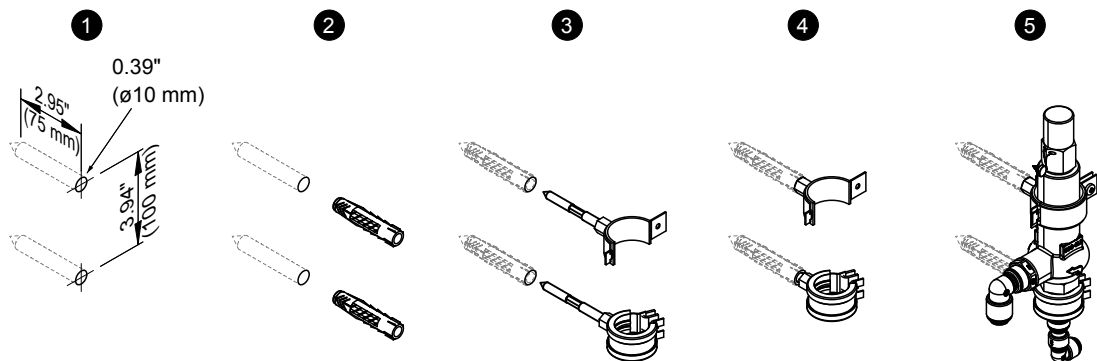
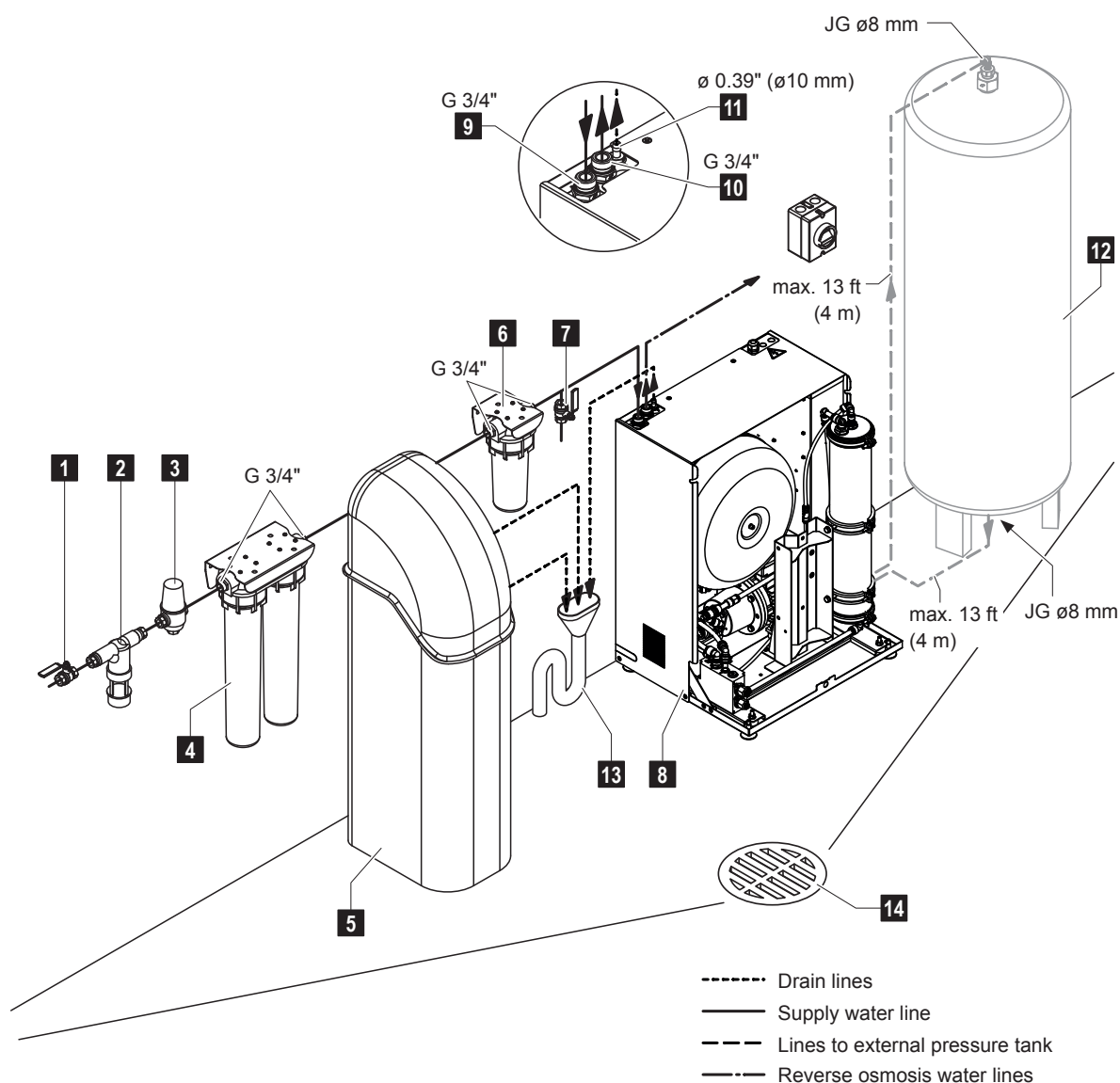


Fig. 7: Mounting the safety valve to the wall

5.4 Water installation

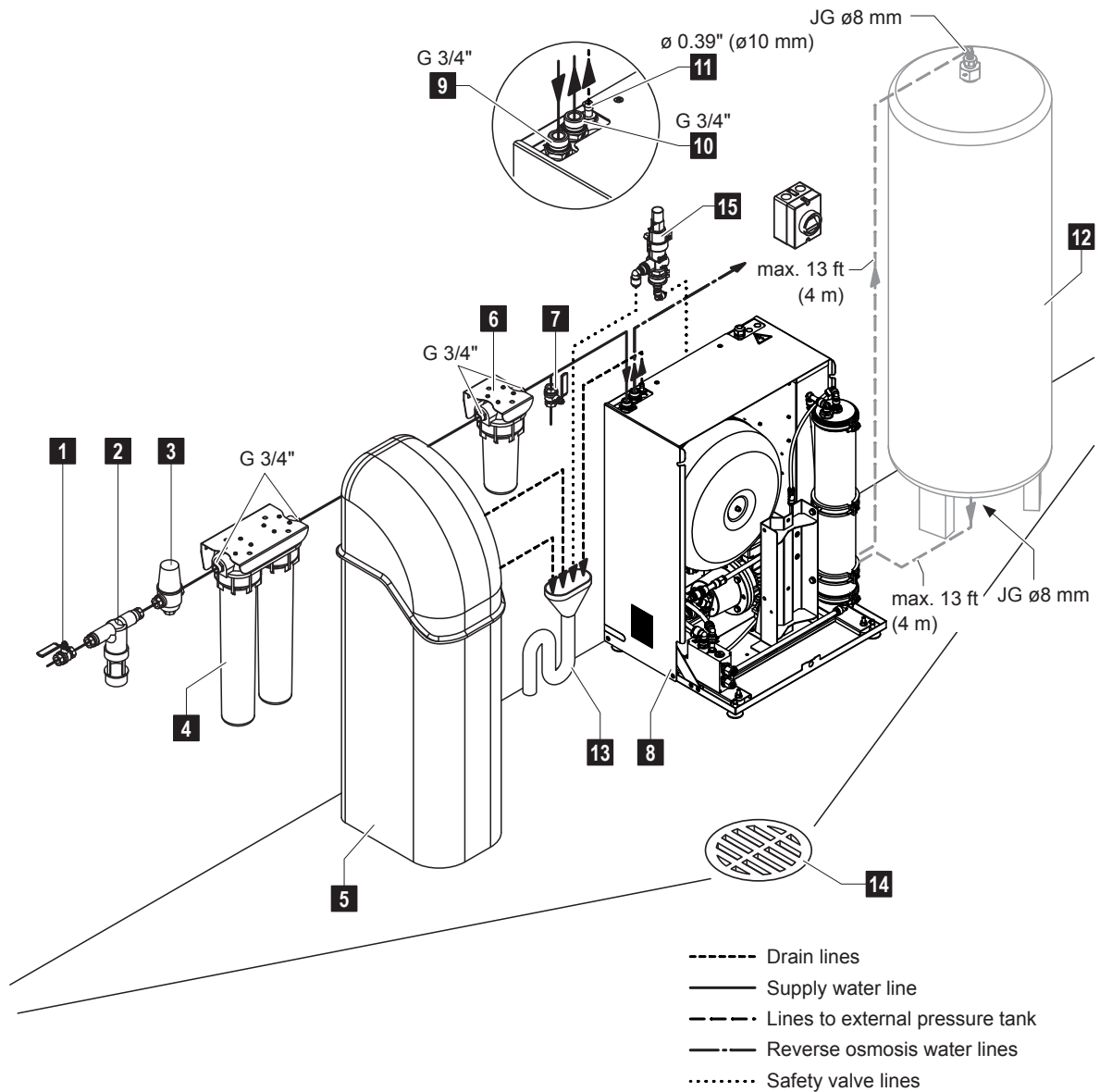
5.4.1 Principal water installation for Condair RO-E(+) 40/100 without pressure tank safety valve



- | | |
|---|---|
| 1 Shut-off valve (mandatory, available as accessory) | 8 Condair RO-E(+) pure water system |
| 2 Backflow preventer for fluid (where mandatory by local regulations, by others) | 9 Inlet connector Condair RO-E(+) pure water system (outside thread G 3/4") |
| 3 Pressure reducing valve (mandatory for water supply pressure >87.02 psi (>6 bar), available as accessory) | 10 Reverse osmosis water outlet connector Condair RO-E(+) pure water system (outside thread G 3/4") |
| 4 Pre-filter (mandatory, single, double or triple filter) | 11 Concentrate outlet connector Condair RO-E(+) pure water system (hose connector ø10 mm) |
| 5 Water softener (optional, for connection dimensions refer to the instructions of the respective softener) | 12 Optional external pressure tank (up to a max. of 3 pressure tanks possible) |
| 6 Filter after water softener (installation only mandatory if water softener is installed) | 13 Funnel with trap connected to building waste water line |
| 7 Sampling tap (optional, available as accessory) | 14 Floor drain |

Fig. 8: Principal water installation for Condair RO-E(+) 40/100 without pressure tank safety valve (unit cover removed for better visibility)

5.4.2 Principal water installation for Condair RO-E(+) 40/100 with pressure tank safety valve (e.g. CE certified systems)



- | | |
|---|--|
| 1 Shut-off valve (mandatory, available as accessory) | 9 Inlet connector Condair RO-E(+) pure water system (outside thread G 3/4") |
| 2 Backflow preventer for fluid (where mandatory by local regulations, by others) | 10 Reverse osmosis water outlet connector Condair RO-E(+) pure water system (outside thread G 3/4") |
| 3 Pressure reducing valve (mandatory for water supply pressure >87.02 psi (>6 bar), available as accessory) | 11 Concentrate outlet connector Condair RO-E(+) pure water system (hose connector $\varnothing 10$ mm) |
| 4 Pre-filter (mandatory, single, double or triple filter) | 12 Optional external pressure tank (up to a max. of 3 pressure tanks possible) |
| 5 Water softener (optional, for connection dimensions refer to the instructions of the respective softener) | 13 Funnel with trap connected to building waste water line |
| 6 Filter after water softener (installation only mandatory if water softener is installed) | 14 Floor drain |
| 7 Sampling tap (optional, available as accessory) | 15 Safety valve |
| 8 Condair RO-E(+) pure water system | |

Fig. 9: Principal water installation for Condair RO-E(+) 40/100 with pressure tank safety valve (unit cover removed for better visibility)

5.4.4 Principal water installation for Condair RO-E(+) 200/300 with pressure tank safety valve (e.g. CE certified systems)

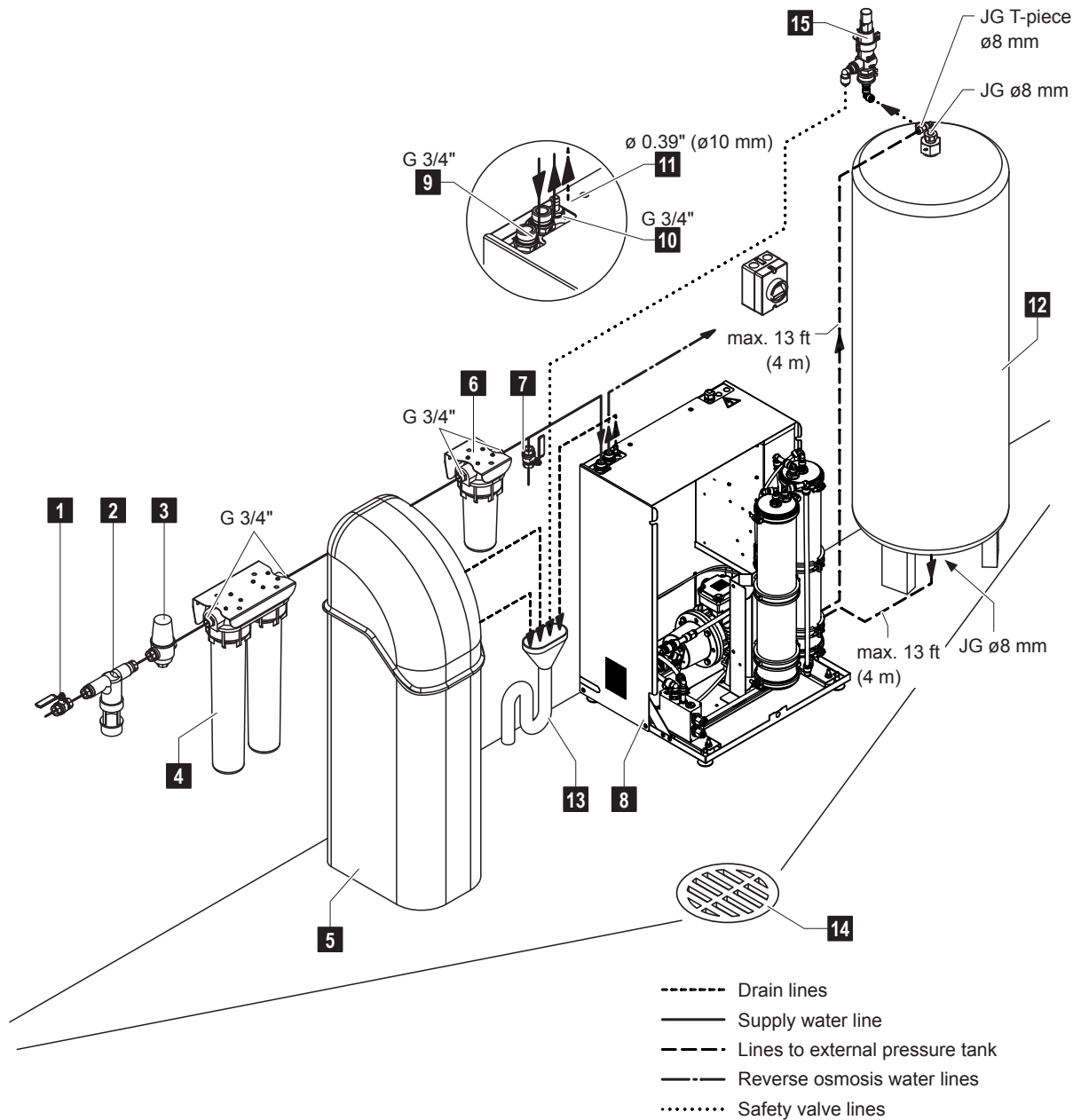


Fig. 11: Principal water installation for Condair RO-E(+) 200/300 with pressure tank safety valve (unit cover of Condair RO-E(+) removed for better visibility)

5.4.5 Supply water requirements for the Condair RO-E(+) pure water system

The supply water must meet the following requirements:

Water supply quality	Drinking water quality
Water supply pressure	23.2 - 87.0 psi (1.6 - 6 bar) Note: For higher supply water pressures, a pressure reducing valve set to 5 bar must be installed in the supply water line
Max. water temperature	68 °F (20 °C)
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
SiO ₂	max. 1 mg/l

Common preconditions for the use of a water softener on the Condair RO-E			
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 pH value, a water softener should be installed before the Condair RO-E pure water system.

Common preconditions for the use of a water softener on the Condair RO-E+			
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	650 µS/cm ¹⁾	650 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 pH value, a water softener should be installed before the Condair RO-E+ pure water system.

5.4.6 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 local regulations
Specifications:	According local regulations
Connection:	3/4" outside thread
Operating pressure	145 psi (10 bar)
Operating temperature:	43 - 104 °F (6 - 40 °C)
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
Connection:	3/4" outside thread
Operating pressure	145 psi (10 bar)
Operating temperature:	43 - 104 °F (6 - 40 °C)
Medium:	Pure water
Adhesive:	TANGIT

The corresponding ISO standards/DIN 8063 must be complied with regarding tolerances and dimensions.

5.4.7 Notes on supply water line

The supply water line to the Condair RO-E(+) pure water system must be carried out according to one of the overview diagrams (see [Fig. 8](#) to [Fig. 11](#)). Please note the following information:

- The installation material must correspond to the specifications in accordance with the information in [Section 5.4.6](#).
- It is mandatory to install a shut-off valve and a pre-filter in the water supply line upstream of the Condair RO-E(+) pure water system.
- If required by local regulations, a backflow preventer for fluid must be installed in the water supply line upstream of the Condair RO-E(+) pure water system.
- For connection pressures >87 psi (>6 bar), a pressure reducing valve (set to 87 psi (6 bar)) must be installed in the water supply line upstream of the Condair RO-E(+) pure water system.
- For connecting the pre-filter, the water softener and the 5 µm filter to the water supply line, please follow the instructions in the separate instructions for the corresponding water softener and filter.
- The optional sampling tap for checking the supply water quality must be installed in the water supply line immediately before the Condair RO-E(+) pure water system.

5.4.8 Notes reverse osmosis water line

The reverse osmosis water line must be routed from the outlet on the Condair RO-E(+) pure water system to the connection to the consumer according to the overview diagrams (see [Fig. 8](#) to [Fig. 11](#)). It must be ensured that the distance is as short as possible and the height difference to the consumer is as small as possible. The maximum permissible pressure loss of the reverse osmosis water pipe is 1 bar.

The connection material for the reverse osmosis water line must correspond to the specifications in [Section 5.4.6](#).

5.4.9 Notes on drain lines

Drain line water softener

The drain line of the water softener must be connected to the drain connection of the water softener according to the overview diagrams (see [Fig. 8](#) to [Fig. 11](#)) (for connection dimensions, see instructions for the corresponding water softener) and guided at a constant downslope to the open drain funnel with trap in the room (max. length of the drain line: 16.4 ft (5 m)). Before the funnel the drain line must be fixed in such a way, that the end of the drain line does not touch the funnel (min air gap 0.8" (2 cm)) and can not slip out of the funnel. The funnel must be positioned below the drain connector of the water softener.

Drain line of the Condair RO-E(+) pure water system

The drain line of the Condair RO-E(+) pure water system (inner diameter 0.39" (10 mm)) must be connected to the drain connection (hose connection with an outside diameter of 0.39" (10 mm)) according to the overview diagrams (see [Fig. 8](#) to [Fig. 11](#)) and guided down to the funnel with trap in the room (max. length of drain line 5 m). Just before the funnel the drain line must be fixed in such a way, that the end of the drain line does not touch the funnel (min air gap 0.8" (2 cm)) and can not slip out of the funnel. The funnel must be positioned below the drain connector of the drain connector of the Condair RO-E(+) pure water system.

5.4.10 Connection of the external pressure tank(s) to the Condair RO-E(+) pure water system

The external pressure tank(s) must be connected to the Condair RO-E(+) pure water system on site using the black JG hoses $\varnothing 8$ mm supplied.

Important: The maximum hose lengths shown in [Fig. 12](#) to [Fig. 14](#) must not be exceeded. Make sure the connection hoses are not routed higher than the connection on top of the pressure tank(s).

1. Loosen the six screws on the cover of the Condair RO-E(+) pure water system and remove the cover.
2. Break out the pre-cut hose passage on the desired side of the cover and attach the supplied edge protection to the cut-out.
3. On Condair RO-E(+) 40/100 pure water systems remove hose from "P. out" connection on the internal pressure tank to "P. in" connection of the inlet valve block.
4. Connect the supplied black JG hose $\varnothing 8$ mm to the angle connector of the "P. out" connection of the corresponding logic block (see [Fig. 12](#) or [Fig. 13](#)) or of the internal pressure tank (see [Fig. 14](#)), and lead the hose to the **upper** connection on the (first) external pressure tank, cut the hose to length and connect it to the angle connector of the pressure tank.
5. Connect JG hose $\varnothing 8$ mm to the angle connector of the "P. in" connection of the inlet valve block, and lead the hose to the **lower** connection on the (last) external pressure tank, cut the hose to length and connect it to the angle connector of the pressure tank.
6. Attach the cover of the Condair RO-E(+) pure water system. Make sure that the two hoses to the pressure tank are routed properly through the broken-out hose passage. Fix the cover with the six screws.

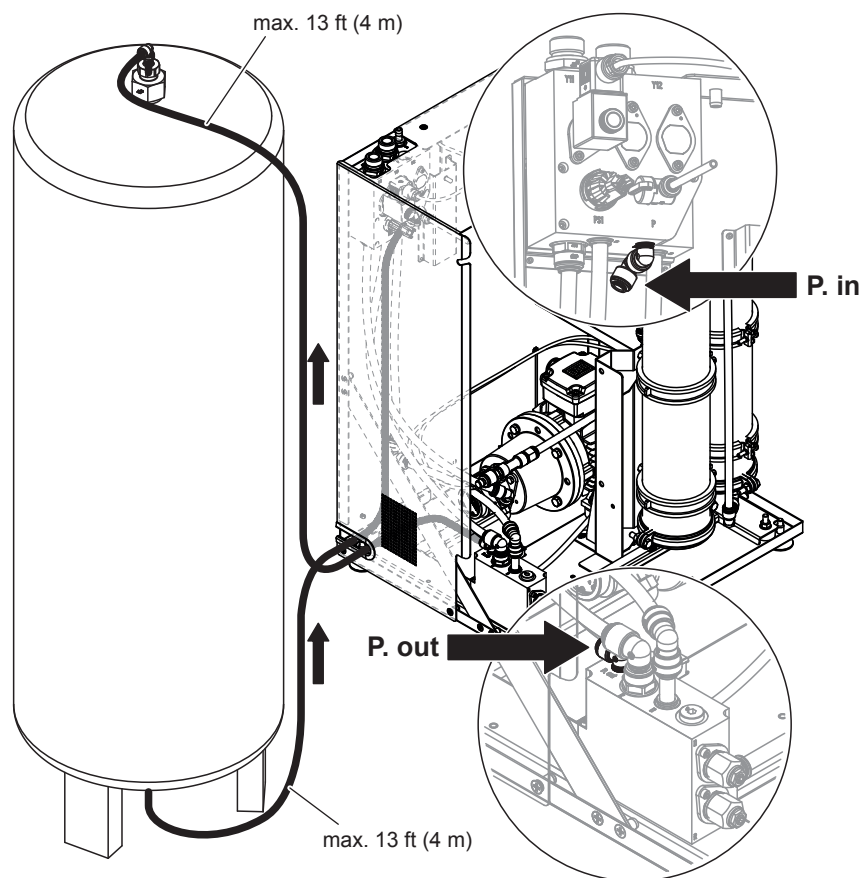


Fig. 12: Connecting the external pressure tank to the Condair RO-E 200/300 pure water system (figure shows RO-E 200, unit cover removed for better visibility)

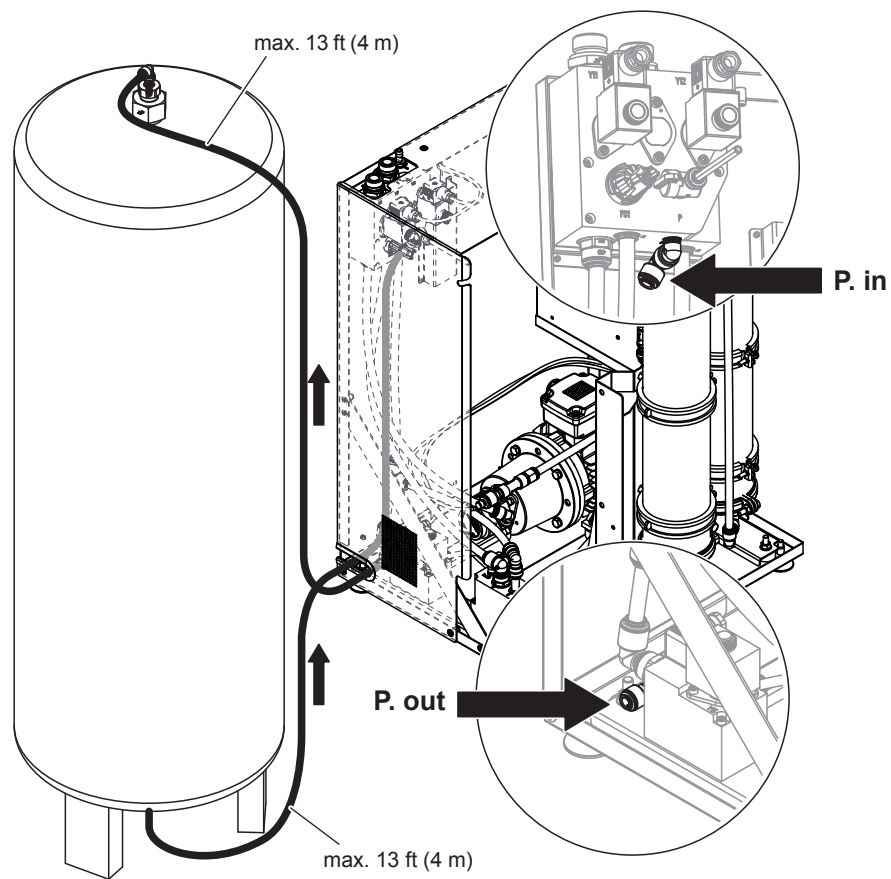


Fig. 13: Connecting the external pressure tank to the Condair RO-E+ 200/300 pure water system (figure shows RO-E+ 200, unit cover removed for better visibility)

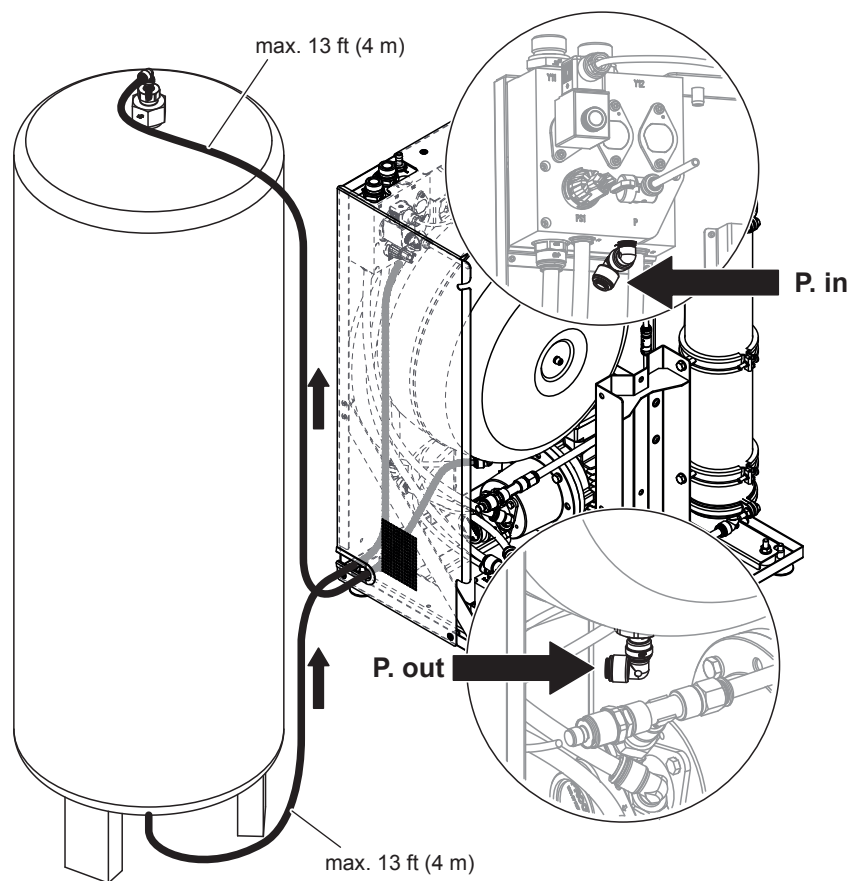


Fig. 14: Connecting the optional external pressure tank to the Condair RO-E(+) 40/100 pure water system with internal pressure tank (figure shows RO-E 100, unit cover removed for better visibility)

5.4.11 Connecting the optional pressure tank safety valve

Important installation notes:

- Only use the supplied black John Guest hoses and fittings supplied with the safety valve.
- Only use the original John Guest hose cutter to cut the black John Guest hoses to length.
- Make sure hoses are free of score marks and burrs before pushing the hoses into the fittings to prevent damage to the O-rings in the fittings.
- The safety valve must always be installed in a vertical position with the inlet connection at the bottom.
- The length of the hose from the connection on the internal or external pressure tank to the inlet connection on the safety valve must be as short as possible.
- For Condair RO-E(+) 40/100 pure water systems, the safety valve must always be mounted right above the Condair RO-E(+) pure water system so that the pipe from the inlet connection at the safety valve has a constant downslope to the connection at the Condair RO-E(+) pure water system.
- For Condair RO-E(+) 200/300 pure water systems with one or more external pressure tanks, the safety valve must always be mounted right above the first external pressure tank so that the line from the inlet connection on the safety valve has a constant downslope to the connection at the pressure tank inlet.
- For Condair RO-E(+) 200/300 pure water systems with several external pressure tanks, the safety valve must always be connected to the first pressure tank.
- The drain hose must be routed from the connection on the safety valve with a continuous downslope to the open funnel with siphon in the room. Just before the funnel the drain hose must be fixed in such a way, that the end of the drain hose does not touch the funnel (min air gap 0.8" (2 cm)) and can not slip out of the funnel.

5.4.11.1 Connecting the pressure tank safety valve to the Condair RO-E(+) 40/100 pure water systems

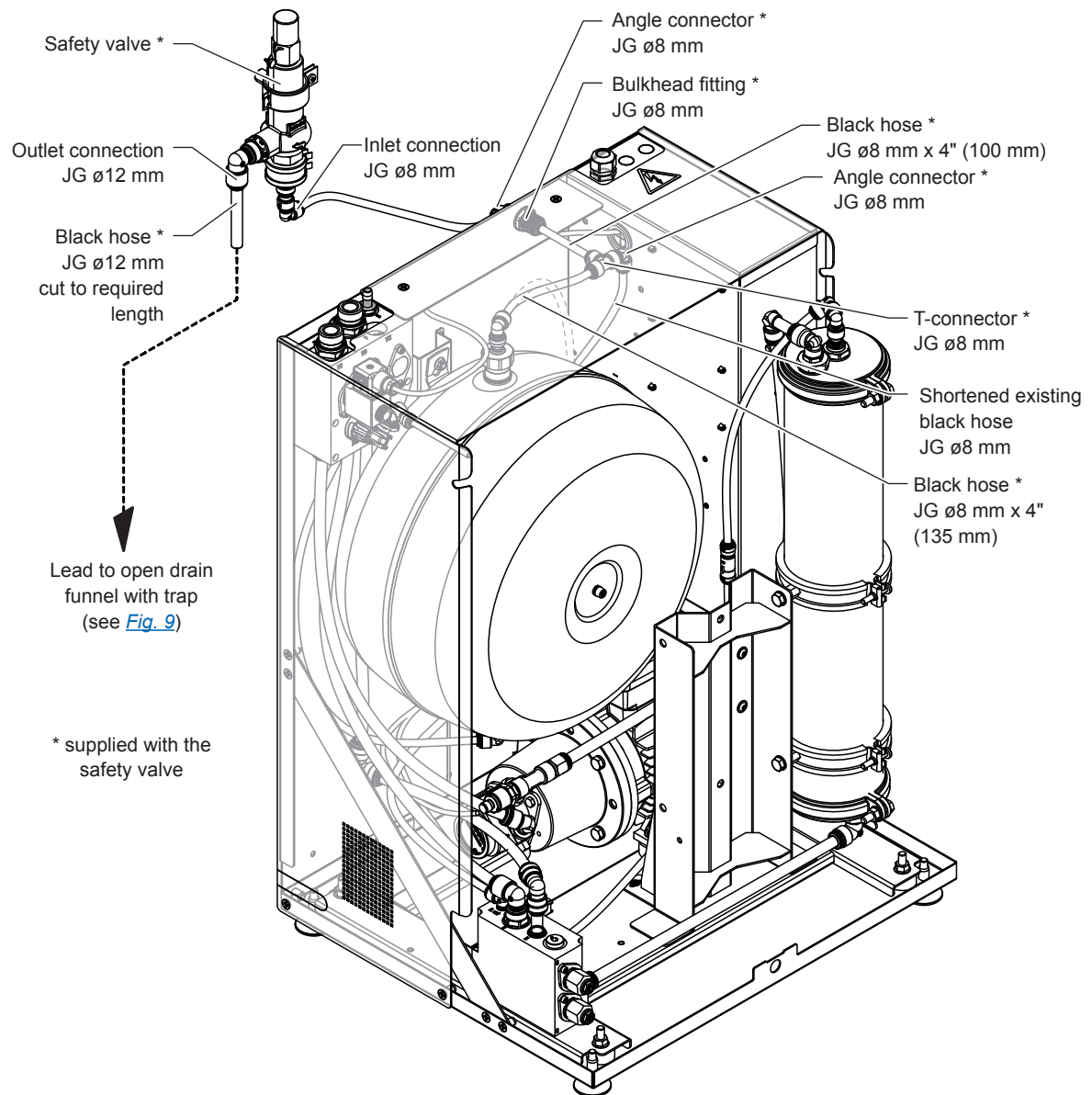


Fig. 15: Connecting the pressure tank safety valve to the Condair RO-E(+) 40/100 pure water system (figure shows RO-E 100, unit cover unit removed for better visibility)

Connection

2. Loosen retaining screw and remove unit cover.
2. Install the JG bulkhead fitting with the angle connector in the rear wall of the housing.
3. Connect the ø8 mm JG hose to the elbow connector of the JG bulkhead fitting and route the hose to the inlet of the safety valve, cut the hose to length and connect it to the elbow connector of the safety valve.
4. Loosen the ø8 mm JG hose on the upper connection of the internal pressure tank and shorten it by 235 mm.
5. Connect the ø8 mm JG T-connector with installed angle connector with the hoses shown in [Fig. 15](#).
6. Connect the ø12 mm JG hose to the outlet connection of the safety valve and route it the hose with constant downslope to the open drain funnel with trap.
7. Attach unit cover and secure it with the retaining screw.

5.4.11.2 Connecting the pressure tank safety valve to the Condair RO-E(+) 200/300 pure water systems

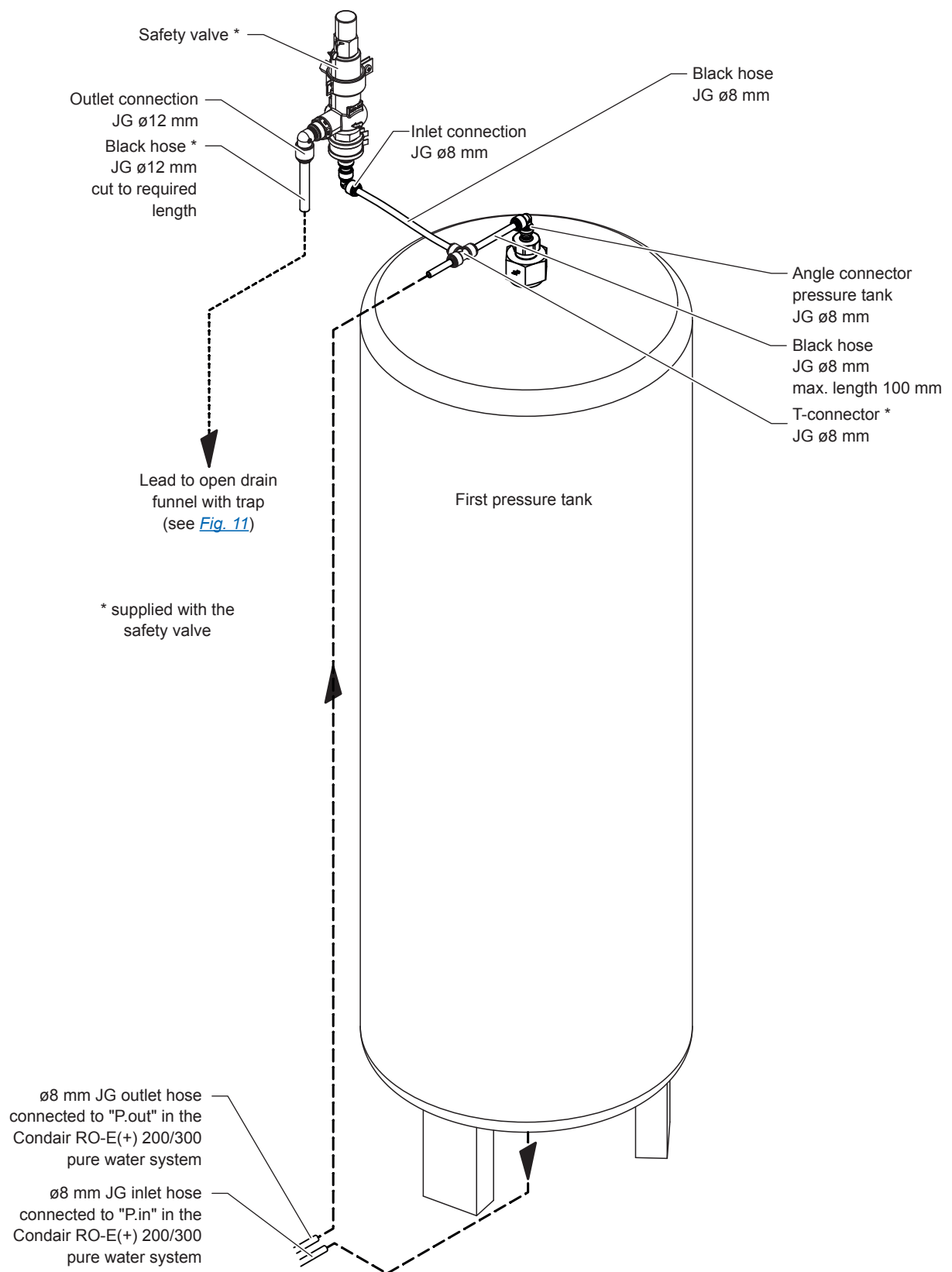


Fig. 16: Connecting the pressure tank safety valve to the Condair RO-E(+) 200/300 pure water systems

Connection

1. Cut the ø8 mm JG hose connected to the upper angle connection of the external pressure tank approx. 2" (50 mm) to max. 4" (100 mm) away from the upper angle connection.
2. Connect the open hose ends of the cut hose to the ø8 mm JG T-connector as shown in [Fig. 16](#).
3. Connect the ø8 mm JG hose to the open connection of the T-connector and route the hose to the inlet angle connection of the safety valve. Cut the hose to length and connect it to the angle connection of the safety valve.
4. Connect the supplied ø12 mm JG hose to the outlet connection of the safety valve and route it the hose with constant downslope to the open drain funnel with trap.

5.5 Electrical installation

5.5.1 Notes on electrical installation



DANGER!
Risk of electric shock!

The Condair RO-E(+) pure water system is mains powered. Live parts may be exposed when the control compartment or the terminal box of the pump motors/are open. Touching live parts may cause severe injury or danger to life.

Prevention: Before carrying out any work on the components of the Condair RO-E(+) pure water system make sure the system is disconnected from the mains and secured against inadvertent power-up.

Important: The frequency converter in the Condair RO-E(+) pure water system contains capacitors. These can remain charged with a potentially deadly voltage for a certain period of time after the Condair RO-E(+) pure water system has been disconnected from the power supply. Therefore, wait at least 10 minutes after disconnecting the power supply. Then make sure the appropriate contacts on the frequency converter and the terminals on the pump motor are free of voltage before starting any work on these components!



CAUTION!

The electronic components inside the control compartment of the Condair RO-E(+) pure water system, the Condair control unit and the control compartment/control unit of the corresponding Condair humidifier are 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 relating to the electrical installation may only be carried out by a Condair service technician or by service personnel trained and authorized by Condair.** It is the owner's responsibility to verify proper qualification of the personnel.
- The electrical installation must be carried out according to the appropriate wiring diagram (see [Section 7.2](#) and [Section 7.3](#)), the notes on electrical installation as well as the applicable local regulations. All information given in the wiring diagram 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-E(+) pure water system 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 in [Section 5.5.3](#).

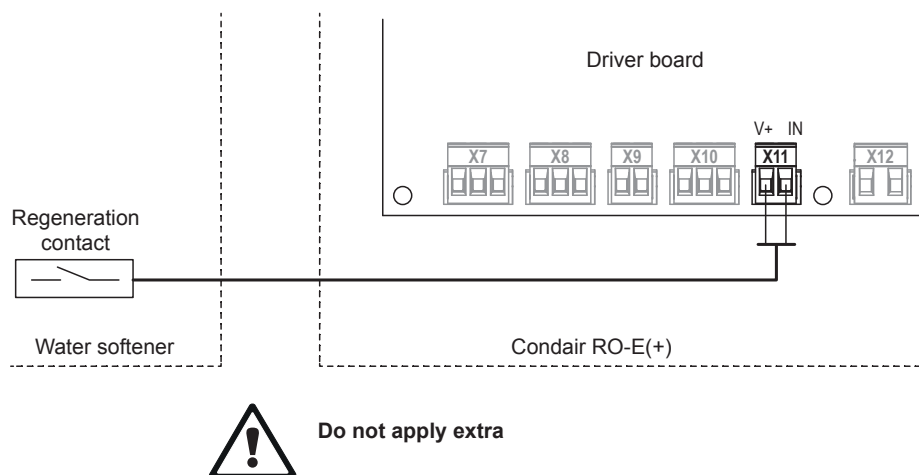
5.5.2 Electrical connections of the water softeners

Single water softener "Envirofalk 40 CK"

Power supply

The water softener Envirofalk 40 CK is connected to the mains via the supplied power adapter.

Connecting the potential free regeneration contact of the water softener



Connect the potential free regeneration contact of the water softener Envirofalk 40 CK according to the wiring diagram above to terminals "V+" and "IN" of terminal block "X11" on the driver board of the Condair RO-E(+) pure water system.

Double water softener "Envirofalk MC-N2C/N2CT"

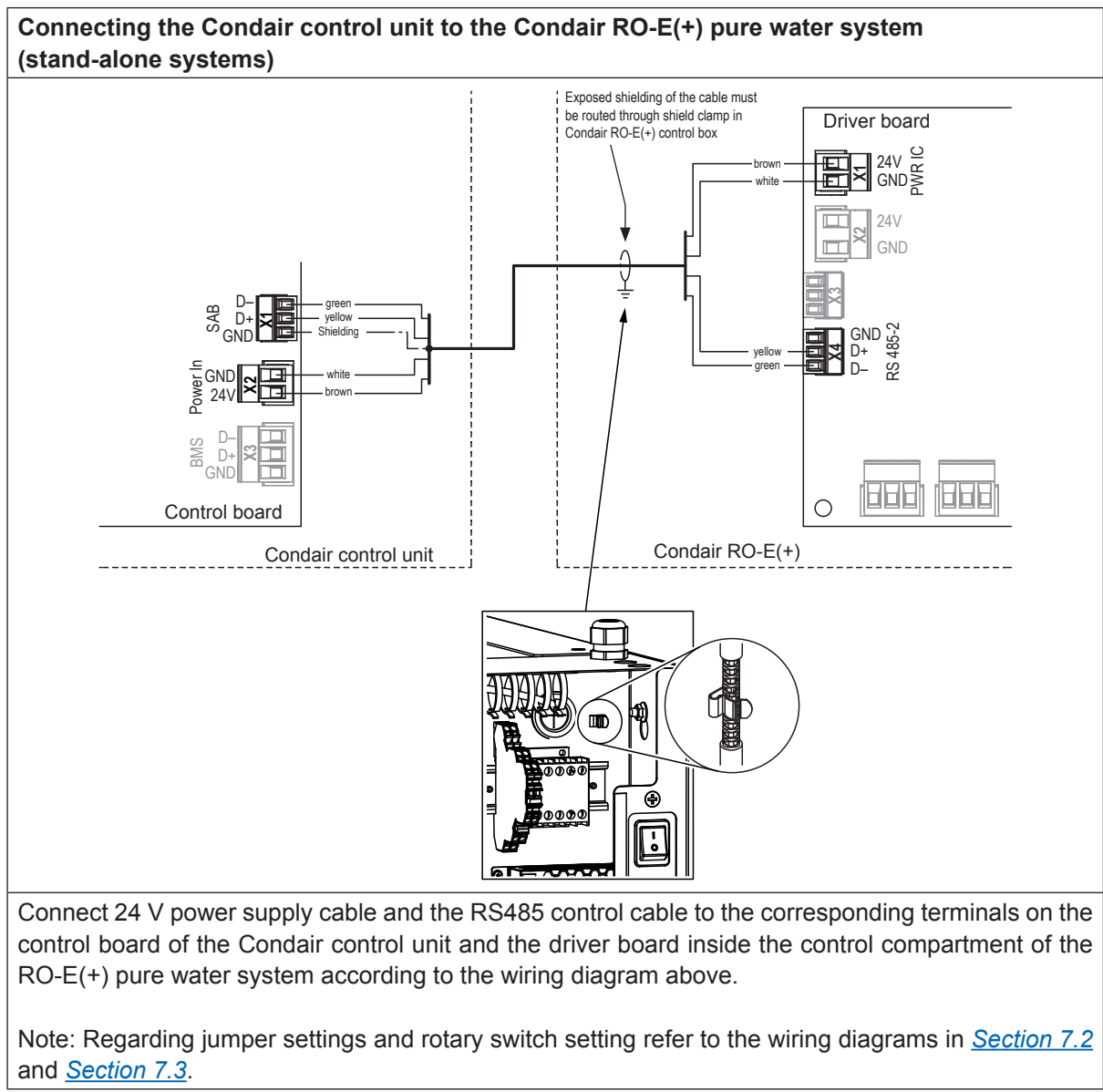
Power supply

The water softener Envirofalk MC-N2C/N2CT is connected to the mains via the supplied power adapter.

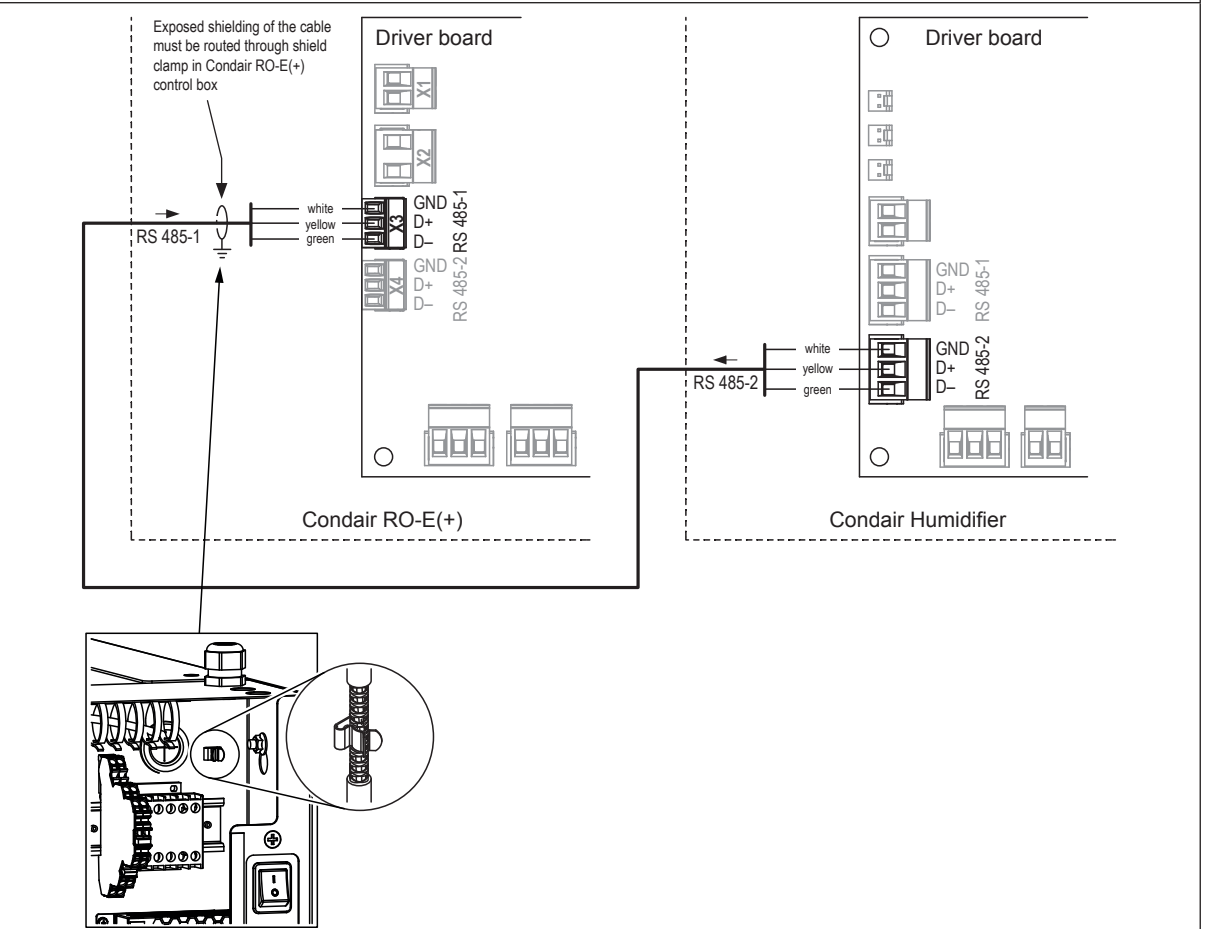
Double water softener Kinetico

The Kinetico double water softener does not require any electrical connections.

5.5.3 Electrical connections of the Condair RO-E(+) pure water system



Connecting the Condair RO-E(+) pure water system to the Condair humidifiers (integrated systems)



Connect RS485 control cable to terminal "RS485-1" ("X3") on the driver board inside the control compartment of the Condair RO-E(+) pure water system and to the terminal "RS485-2" on the driver board inside the control compartment/control unit of the appropriate Condair humidifier (Condair DL, RS, etc.) according to the wiring diagram shown above.

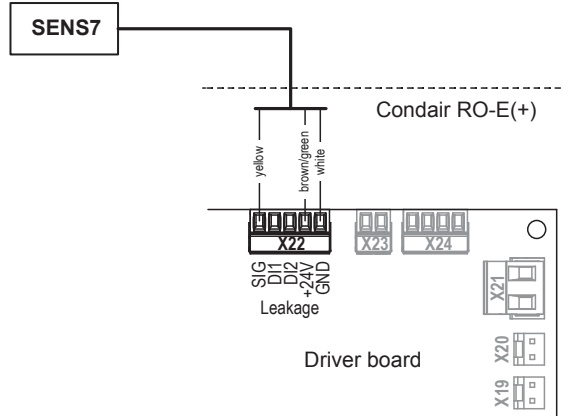
Driver board DL II: X14 or X15.1

Driver board RS: X14 RS485-1 or X15 RS485-2.

Driver board RSII: X14 RS485-1 or X15 RS485-2.

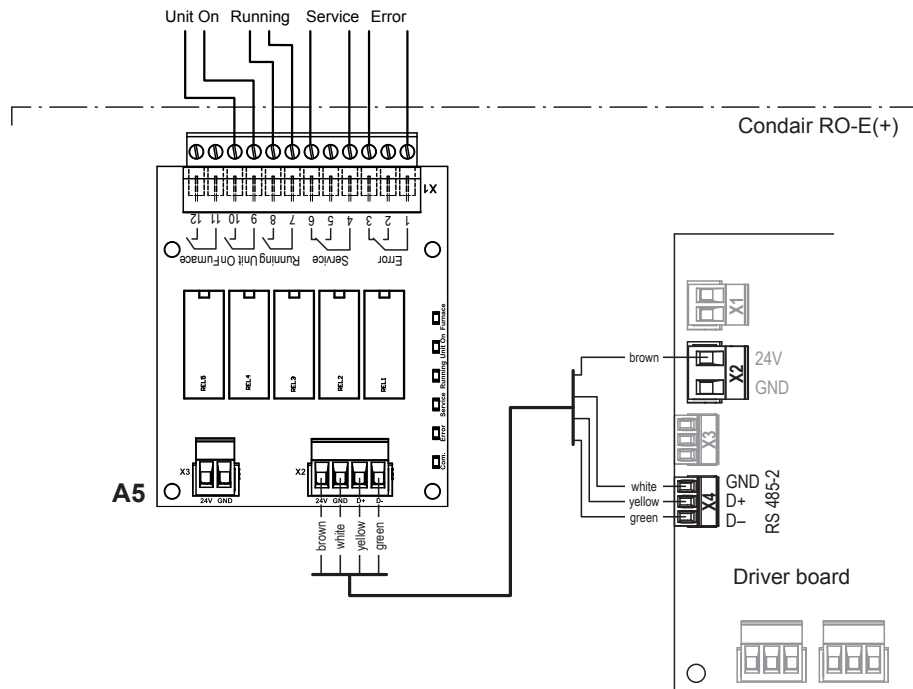
Note: Regarding jumper settings and rotary switch setting refer to the wiring diagram in [Section 7.2](#) and [Section 7.3](#).

Connecting the optional leak sensor



Connect the optional leak sensor "SENS7" has to be connected according to the wiring diagram above to the corresponding terminals of the plug "X22" on the driver board in the control compartment of the Condair RO-E(+) pure water system.

Connecting the optional remote operating and fault indication



Connect the remote operating and fault indication board "A5" to the corresponding terminals on the driver board using the four-core cable supplied, as shown in the wiring diagram above.

The remote operating and fault indication board contains five potential-free relay contacts for the connection of the following operating and fault indications:

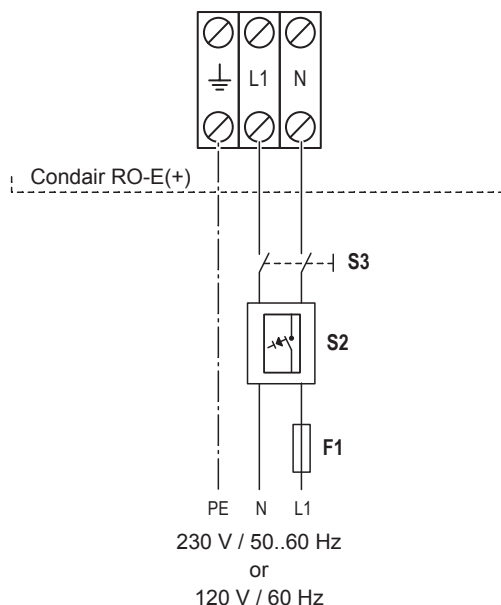
- "Error" (Terminal 1 and 3):
This relay is activated if an error is present.
- "Service" (Terminal 4 and 6):
This relay is activated when the set maintenance interval time has expired (default setting) or a warning is pending (must be configured accordingly in the control software)
- "Running" (Terminal 7 and 8):
This relay closes as soon as the Condair RO-E(+) pure water system produces reverse osmosis water.
- "Unit on" (Terminal 9 and 10):
This relay closes as soon as the voltage supply to the Condair RO-E(+) pure water system is switched on.
- "Furnace":
This relay is not supported.

The connecting cable(s) of the relays are routed downwards through the cable entry out of the control compartment and from there downwards out of the device.

The **maximum contact loading is 250V/8A**.

Appropriate suppressor modules are to be used for the switching of relays and miniature contactors.

230 VAC / 50-60 Hz or 120 V / 60 Hz power supply



The voltage supply (L1, N, PE) is to be connected in accordance with the above wiring diagram to the corresponding terminals inside the control compartment of the Condair RO-E(+) pure water system.

The supply cable must be fed into the control compartment via the cable gland at the top of the device.

The installation of the "**F1**" (fuse rating see [Section 5.2](#)) and the **electrical isolator "S3"** (all pole disconnecting device with a minimum contact clearance of 3 mm, supplied by others) in the mains supply line are mandatory.

For safety reasons the additional installation of a **residual current circuit breaker "S2"** in the mains supply line (supplied by others, requirements see [Section 5.2](#)) is recommended. However, the local electrical installation regulations must be observed and adhered to.

The electrical isolator must be mounted in direct proximity of the the Condair RO-E(+) pure water system (max. distance 40" (1 m)) and must be easily accessible in a height between 40" (1.0 m) and 59" (1.5 m).

CAUTION! Make sure the voltage indicated on the rating plate meets the local mains voltage. Otherwise, do not connect the unit.

The cross-section of the mains cable must comply with the applicable local regulations.

6 Product specification

6.1 Technical data

6.1.1 Technical data RO-E(+) pure water system

		Model			
		RO-E(+) 40	RO-E(+) 100	RO-E(+) 200	RO-E(+) 300
Pure water output at 5°C against 1 bar	RO-E	15.3 US gal/hr (58 l/hr)	27.7 US gal/hr (105 l/hr)	52.8 US gal/hr (200 l/hr)	75.3 US gal/hr (285 l/hr)
	RO-E+	9.5 US gal/hr (36 l/hr)	17.7 US gal/hr (67 l/hr)	32.8 US gal/hr (124 l/hr)	45.2 US gal/hr (171 l/hr)
Pure water output at 15°C against 1 bar	RO-E	25.9 US gal/hr (98 l/hr)	47.8 US gal/hr (181 l/hr)	93.0 US gal/hr (352 l/hr)	135.5 US gal/hr (513 l/hr)
	RO-E+	15.6 US gal/hr (59 l/hr)	30.1 US gal/hr (114 l/hr)	57.6 US gal/hr (218 l/hr)	82.4 US gal/hr (312 l/hr)
Max. pure water output per day at 15°C against 1 bar	RO-E	621 US gal/day (2.35 m³/day)	1149 US gal/day (4.35 m³/day)	2232 US gal/day (8.45 m³/day)	3251 US gal/day (12.31 m³/day)
	RO-E+	375 US gal/day (1.42 m³/day)	724 US gal/day (2.74 m³/day)	1382 US gal/day (5.23 m³/day)	1978 US gal/day (7.49 m³/day)
Recovery hard water		50 %			
Recovery softened water		70 %			
Admissible inlet water pressure		23 - 87 psi (1,6 - 6 bar)			
Admissible inlet water temperature		41 - 68 °F (5 - 20 °C)			
Salt rejection rate		95 to 98 %			
RO membrane type	RO-E	2606403	2606404	2606404	2606404
	RO-E+	50001	50039	50039	50039
Nominal volume pressure tank		Internal 6.6 US gal (25 l)	Internal 6.6 US gal (25 l)	External, see Section 6.1.3	External, see Section 6.1.3
Pump capacity		111 US gal/hr (421 l/hr)	214 US gal/hr (809 l/hr)	264 US gal/hr (1000 l/hr)	323 US gal/hr (1221 l/hr)
Permeate outlet pressure		21.8 - 72.5 psi (1.5 – 5.0 bar)			
Hydraulic connections					
Inlet water connection		G 3/4" (outside thread)			
Pure water connection		G 3/4" (outside thread)			
Drain connection		ø0.39" (ø10 mm) (hose connection)			
Electric connections					
Power supply 230 VAC		230 VAC / 50-60 Hz			
Electrical power		640 VA	640 VA	750 VA	900 VA
Current consumption		2.5 A	2.5 A	2.7 A	2.9 A
Power supply 120 VAC		120 VAC / 60 Hz			
Electrical power		640 VA	640 VA	750 VA	900 VA
Current consumption		4.8 A	4.8 A	6.5 A	6.7 A
Sound pressure level					
Without cover		max. 60 dB	max. 65 dB	max. 67 dB	max. 70 dB
With insulated cover		max. 55 dB	max. 58 dB	max. 59 dB	max. 60 dB

	Model			
	RO-E(+) 40	RO-E(+) 100	RO-E(+) 200	RO-E(+) 300
Housing dimensions with housing cover				
Height	31.18" (792 mm)			
Width	23.11" (587 mm)			
Depth	19.06" (484 mm)			
Weights				
Netweight	139 lbs (63 kg)	141 lbs (64 kg)	212 lbs (96 kg)	225 lbs (102 kg)
Ambient conditions operation				
Admissible ambient temperature	41 - 104 °F (5 - 40 °C)			
Admissible ambient humidity	10 - 80 %rh, non-condensing			
Ambient conditions storage				
Admissible ambient temperature	41 - 104 °F (5 - 40 °C)			
Admissible ambient humidity	10 - 75 %rh, non-condensing			
Protection class				
Control compartment	IP21			
Test certificates				
Test certificates	CE, DGUV, EAC, BTL, UL			

6.1.2 Internal pressure tank 26.6 US gal (25 l) for Condair RO-E(+) 40 & 100

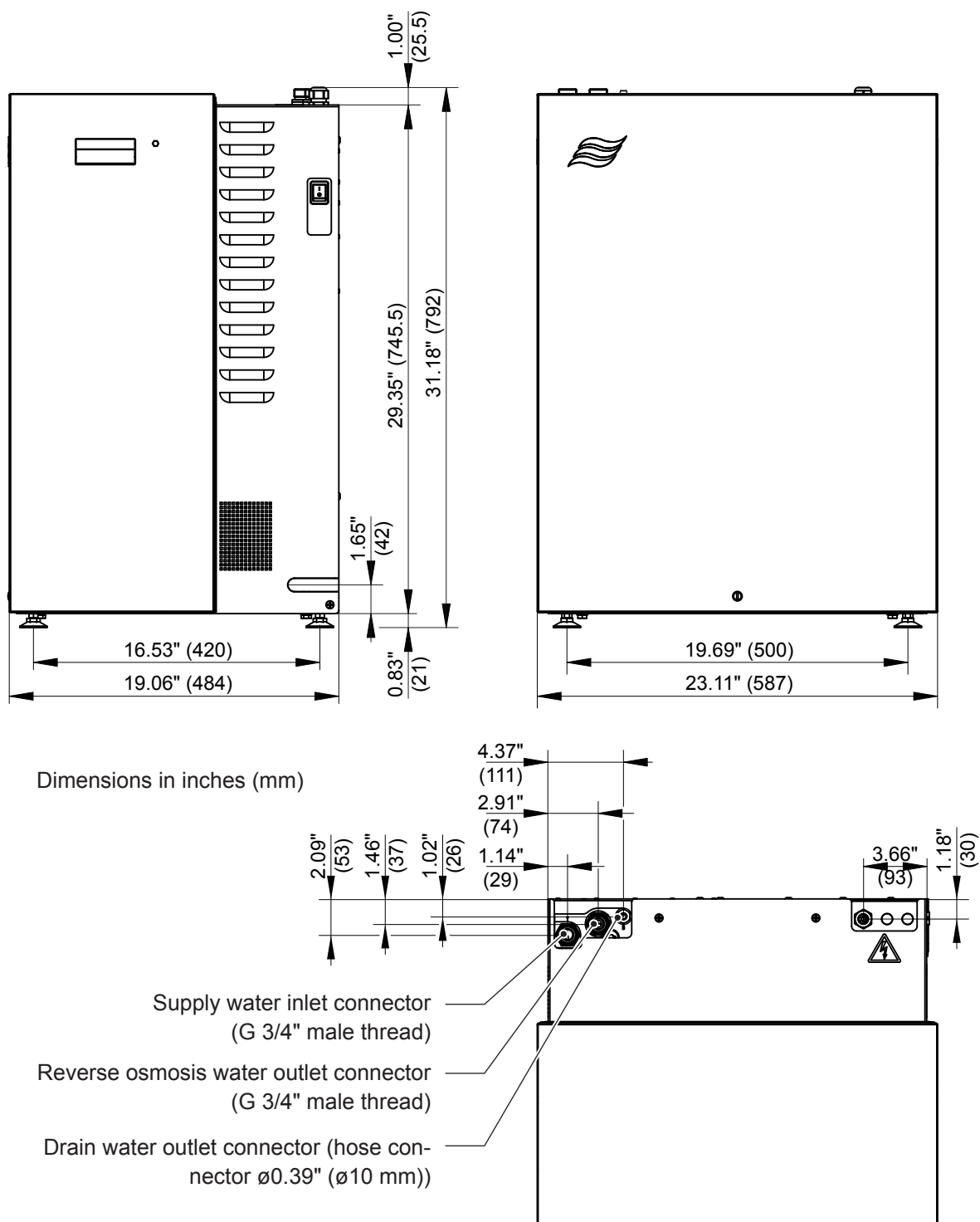
Nominal volume	6.6 US gal (25 l)
Usable volume at 5 bar	4.8 US gal (18 l)
Dimensions	Height: 18.58" (472 mm), Width: 9.88" (251 mm)
Netweight	approx. 18.7 lbs (8.5 kg)
Max. permissible pressure	145 psi (10 bar)
Tank pre-pressure	12 psi (0.8 bar)
Pressure tank connection	JG ø8 mm

6.1.3 External pressure tanks for Condair RO-E(+)

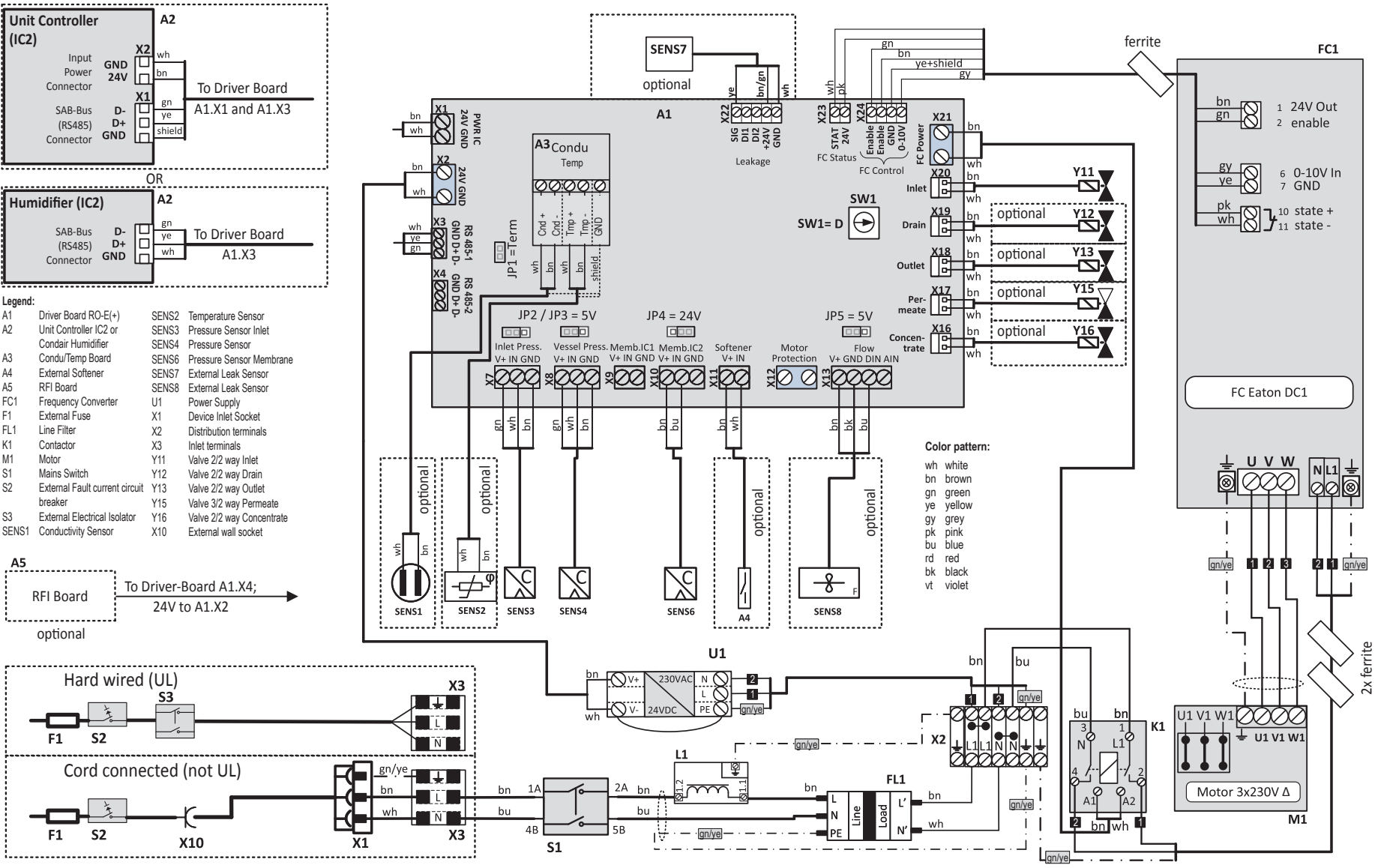
Nominal volume	14 gal (53 l)	20 gal (76 l)	32 gal (121 l)	44 gal (166 l)	85 gal (321 l)	119 gal (450 l)
Usable volume at 5 bar	9.8 gal (37.0 l)	14.0 gal (53.1 l)	22.3 gal (84.5 l)	30.6 gal (115.9 l)	59.2 gal (224.2 l)	83.0 gal (314.3 l)
Dimensions	Diameter	16" (40.6 cm)	16" (40.6 cm)	21" (53.3 cm)	21" (53.3 cm)	26" (66.0 cm)
	Height	22.2" (57.0 cm)	29.3" (74.4 cm)	29.3" (74.4 cm)	37.5" (95.2 cm)	46.0" (117.0 cm)
Netweight (empty)	27.0 lbs (12.24 kg)	40.0 lbs (18.14 kg)	54.0 lbs (24.49 kg)	65.0 lbs (29.48 kg)	118.0 lbs (53.52 kg)	154.0 lbs (69.85 kg)
Max. permissible pressure	125 psi (8.62 bar)					
Tank pre-pressure	12 psi (0.8 bar)					
Pressure tank connection	1" NPT		1 1/4" NPT			

7 Appendix

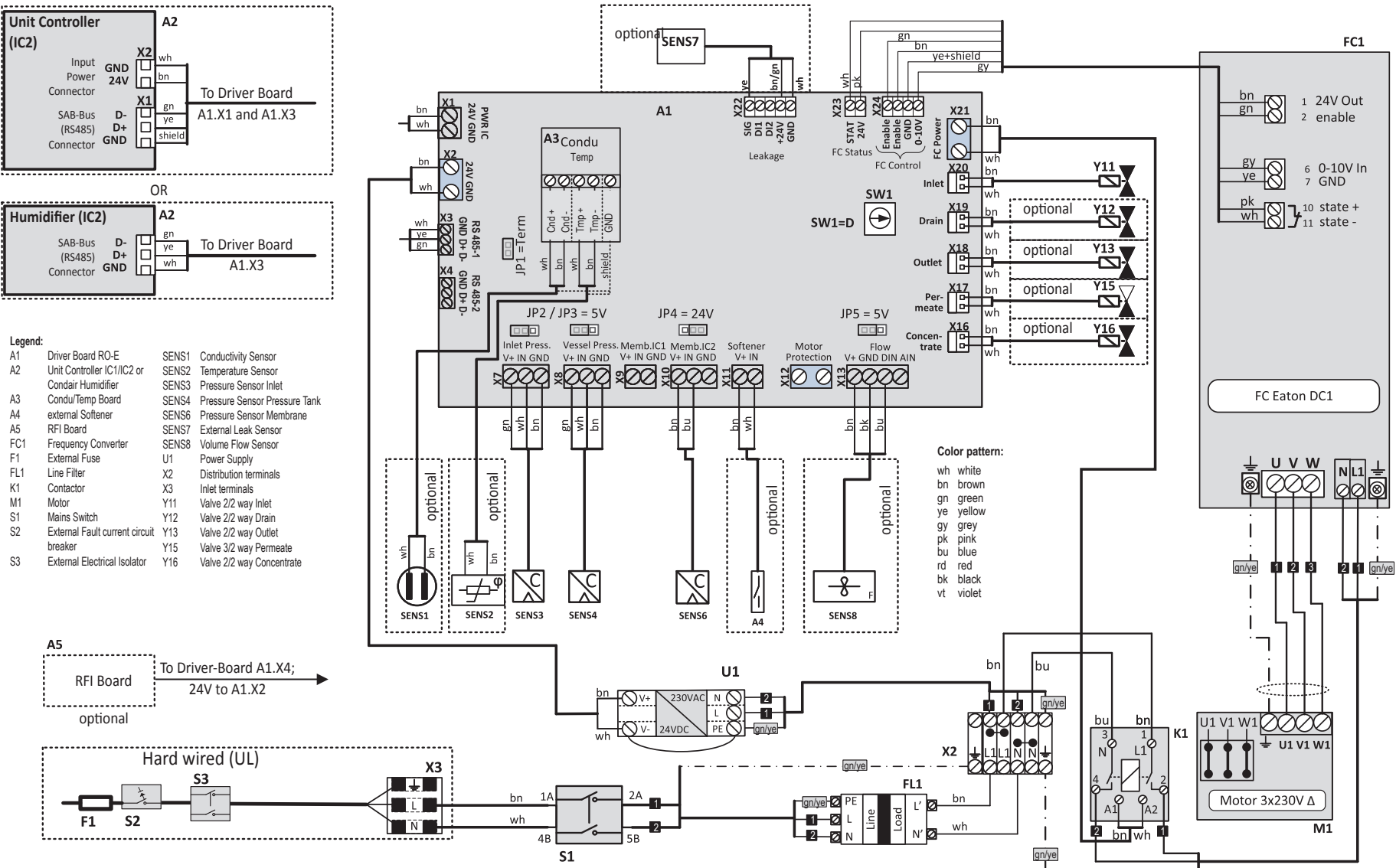
7.1 Dimensional drawing Condair RO-E(+) pure water system



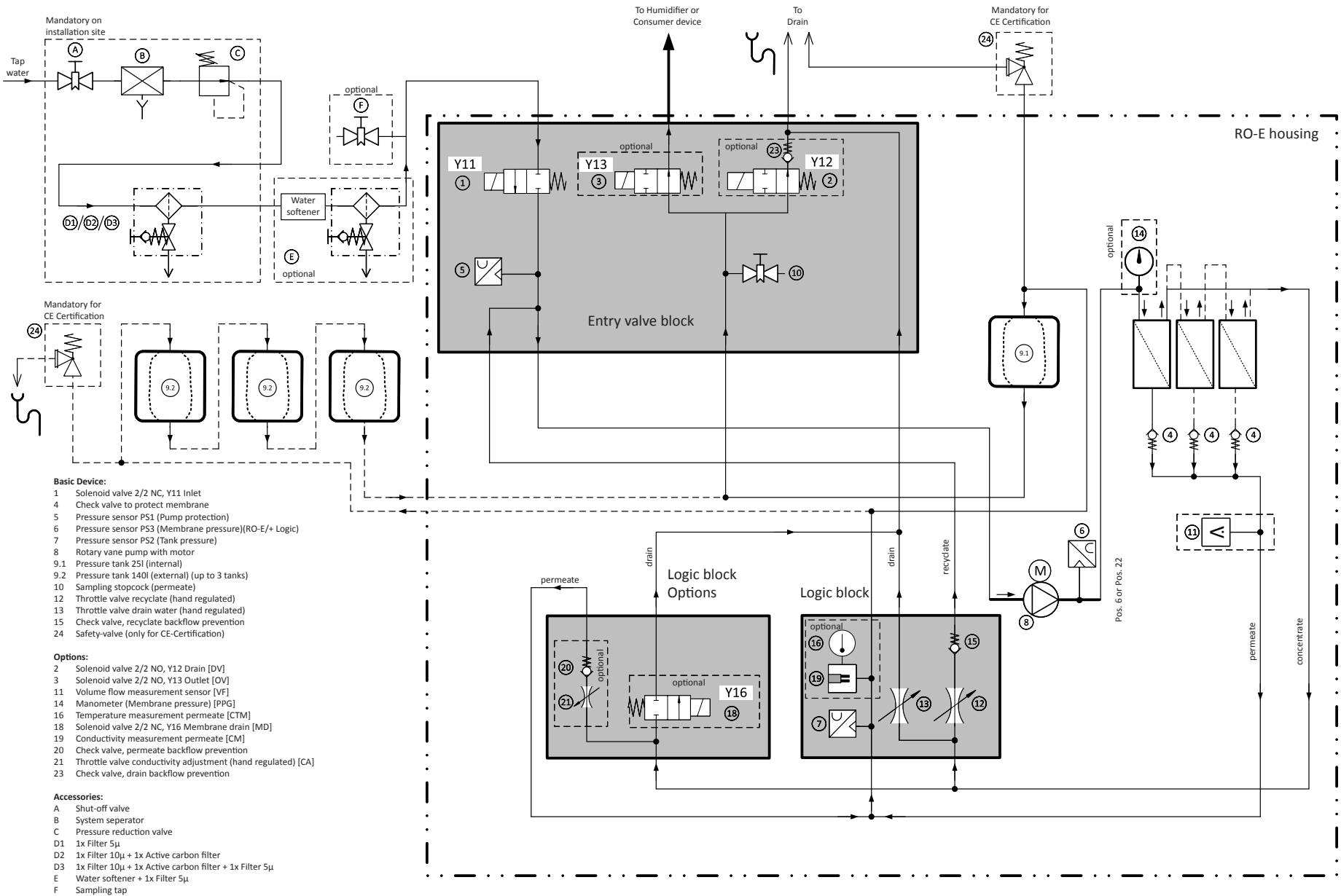
7.2 Wiring diagram Condair RO-E(+) pure water system - 230 V



7.3 Wiring diagram Condair RO-E(+) pure water system - 120 V



7.4 Hydraulic diagram Condair RO-E pure water system



Notes

Notes

Notes

Warranty

Condaire Inc. or Condaire Ltd. (depending on the entity that supplied the product, and hereinafter collectively referred to as CONDAIRE) warrant for a period of two years after installation or 30 months from the manufacturer's ship date, whichever date is earlier, that CONDAIRE's manufactured and assembled products, not otherwise expressly warranted, are free from defects in materials and workmanship. Notwithstanding the foregoing, the products listed below have an alternate warranty period:

- GS/GSTC Series heat exchanger(s) are warranted to be free from defects in materials and workmanship for a period of 3 years from installation or 40 months from the manufacturer's ship date, whichever is earlier.
- SAM-e Short Absorption Manifolds, except for the coupling seals, are warranted to be free from defects in materials and workmanship for a total period of 10 years from the manufacturer's ship date.
- Condaire RH Connect and Condaire RH Classic humidifiers are warranted to be free from defects in materials and workmanship for a period of 5 years from the manufacturer's ship date.
- Spare 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.
- No warranty is made against corrosion, deterioration, or suitability of substituted materials used as a result of compliance with government regulations.

CONDAIRE's obligations and liabilities under this warranty are limited to furnishing replacement parts to the customer, F.O.B. CONDAIRE's factory. The replacement parts are warranted for the balance of the term of the warranty on the original humidifier or 90 days, whichever is longer. Procedure:

1. Customer Requests Warranty as per instructions on the CONDAIRE Warranty Form.
2. CONDAIRE reviews the warranty claim and will respond in one of two ways:
 - a. Warranty Accepted – Replacement Part or credit granted.
 - b. Warranty Declined – Response with justification will be provided to the customer.
3. In some cases, CONDAIRE may request the part to be returned, freight prepaid by the customer, as part of the warranty acceptance or warranty determination process. Some reasons include:
 - a. Part must be analyzed to determine the root cause of failure.
 - b. Part must be returned to the supplier for claim/investigation.

When parts are requested to be returned, replacement parts will be sent by CONDAIRE to the customer against an invoice from CONDAIRE paid by the customer. The cost of the replacement parts will be reimbursed to the customer with a credit note after the parts are received and analyzed by CONDAIRE, if the warranty is accepted.

The warranties set forth herein are in lieu of all other warranties expressed or implied by law. No liability whatsoever shall be attached to CONDAIRE 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, with the exception of a purchased extended warranty described below, must be in writing, and signed by an officer of CONDAIRE.

CONDAIRE makes no warranty and assumes no liability unless the equipment is installed in strict accordance with the installation manual in effect at the date of purchase, and by properly qualified and licensed professionals capable of installing such equipment.

CONDAIRE 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.

CONDAIRE makes no warranty and assumes no liability whatsoever for damage to the products, humidifier, supply lines, drain lines, steam distribution systems, or the building as a whole caused by freezing.

CONDAIRE reserves the right to change the design, specifications, and performance criteria of its products without notice or obligation.

Extended Warranty

Extended warranties are available to purchase under the conditions listed above. Extended warranties must be purchased at the time of the original equipment order.



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