



air humidification systems

water treatment systems



WTS Water Treatment System

carel.com

Reverse osmosis water treatment system

The CAREL reverse osmosis water treatment system has been designed for use with the humiFog multizone, mc multizone, heaterSteam, gaSteam and ChillBooster

Supplied with mains drinking water, it generates demineralised water with physical/chemical, flow-rate and pressure characteristics suitable to supply the humidifiers.



The system is made up of:

- micrometric safety pre-filtering (to remove "impurities" from the water)
- activated carbon dechlorination system
- descaler liquid dosing system
- electrical control panel
- high pressure main pump
- TFC reverse osmosis membrane
- demineralised water storage tank
- constant pressure pumping unit with expansion vessel
- UV sanitisation system (on models for adiabatic humidifiers);

All the components in the system are contained in a single structure to optimise costs, reduce space and simplify installation.



Easy maintenance/setup

WTS is pre-configured for simple and fast setup. The automatic "flushing" procedure extends membrane life and reduces maintenance.



Savings

Using a multi-stage centrifugal pump, WTS can deliver reverse osmosis water at the right pressure and flow-rate without requiring booster pumps and expansion vessels.



Maximum hygiene

WTS provides reverse osmosis water only when required by the humidifier, thus avoiding storage. The water is also treated using the ultraviolet disinfection system.

What is reverse osmosis?

This is a technique in which the water being purified is pumped at high pressure and forced through a semi-permeable membrane with pores smaller than 0.001 µm in diameter: the majority of the dissolved ions are filtered by the membrane, thus producing relatively pure water. The removal of minerals, measured as a percentage of the original mineral content, may vary from 95% to 99% and even higher. Automatic operation, well as limited running costs (essentially the electricity required to pump the water), mean that this technique is widely used. Note however that reverse osmosis appliances are not ideal for treating water that is very hard and/or with significant quantities of contaminants: in these cases, to extend the operating life of the membrane, the water is pre-treated (filtering, deferrization, etc).

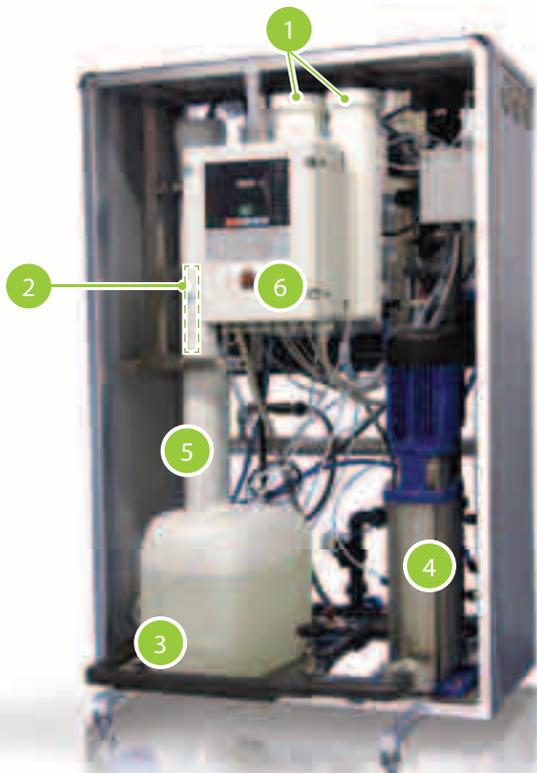
Observations on water softening

Reverse osmosis is a completely different treatment from water softening; the latter simply decreases the hardness of the water without removing the mineral salts, rather replacing the "fouling" salts, such as calcium and magnesium, with sodium. Softening is therefore not recommended for use with adiabatic humidifiers. Moreover, using softened water in isothermal humidifiers creates considerable amounts of foam and increases the risk of corrosion of the heating elements. In this case too, softened water is not recommended.

Why use demineralised water in humidifiers?

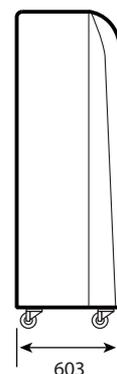
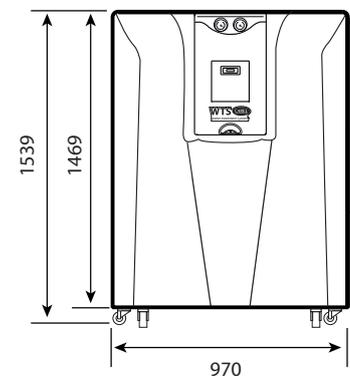
- Isothermal humidifiers (steam): to reduce maintenance and unit downtime, minimising the accumulation of mineral salts and scale in the cylinders
 - Adiabatic humidifiers (atomisers): to prevent scale forming in the nozzles, accumulation of mineral salts in air handling units (filters, droplet separators) and avoid introducing mineral salts into the humidified rooms; to improve hygiene conditions in ventilation systems and reduce maintenance costs.
- Limits on maximum conductivity and hardness of water are defined by standards such as UNI8884, VDI6022, VDI3803, L8.

Unit components



- | | |
|--|----------------------------|
| 1 prefilter & dechlorination | 4 multi-stage pump |
| 2 U.V. lamp (not visible in the photo) | 5 reverse osmosis membrane |
| 3 descaler liquid tank | 6 electrical control panel |

Dimensions (mm)



Weight: 80 kg (empty)

Models available

Code	Description
CMRO000090	90 kg/h reverse osmosis system for heaterSteam and gaSteam steam humidifiers
CMRO000180	180 kg/h reverse osmosis system for heaterSteam and gaSteam steam humidifiers
CMROUV0320	320 kg/h reverse osmosis system with UV sanitation system, for humiFog, mc and ChillBooster adiabatic humidifiers
CMROUV0600	600 kg/h reverse osmosis system with UV sanitation system, for humiFog, mc and ChillBooster adiabatic humidifiers
CMROUV1200	1200 kg/h reverse osmosis system with UV sanitation system, for humiFog, mc and ChillBooster adiabatic humidifiers
CMROL00000	25 kg pack of Antiscalant descaler liquid *

(*) the sequestration and particle dispersion action drastically reduces the precipitation of salts on the osmotic membranes, extending their working life. This is required for correct operation of the system
THIS IS REQUIRED FOR CORRECT OPERATION OF THE SYSTEM

Water characteristics

Inlet water (*)	mains drinking water, conductivity < 1000 µS/cm
Demineralised water output	treated water conductivity ≤ 20 µS/cm
Recovery factor	70 %

(*) To guarantee perfect operation, the characteristics of the water must be provided in advance to CAREL, on a special form, so as to check compatibility with the treatment system.

This information is usually available from the mains water supplier; often it is found free-of-charge on the supplier's website.

Technical specifications

	CMROUV0320	CMROUV0600	CMROUV1200	CMRO000090	CMRO000180
	for humiFog, MC & Chillbooster			for heaterSteam & gaSteam	
Maximum capacity of humidifier connected (l/h)	320	600	1200	90	180
Ultraviolet sanitation system	yes	yes	yes	no	no
Water fill					
Water connection	3/4"	3/4"	3/4"	3/4"	3/4"
Water inlet flow-rate (l/h)	600	1000	2000	600	1000
Water inlet pressure (bar)	2.5 to 4	2.5 to 4	2.5 to 4	2.5 to 4	2.5 to 4
Water drain					
Water connection	3/4"	3/4"	3/4"	3/4"	3/4"
Water flow-rate (max) (l/h)	280	500	800	280	500
Water outlet					
Water connection	1"	1"	1"	1"	1"
Maximum outlet flow-rate	320 l/h	600 l/h	1200 l/h	5.3 l/min	10 l/min
Electrical connections					
Power supply (V-Hz)	220-50	220-50	220-50	220-50	220-50
Total power consumption (kW)	2.20	2.20	2.20	2.20	2.20

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