HOBART

WATER TREATMENT

HYDROLINE

HOBART

WATER – minerals/salts dissolved in fresh water

HARDNESS MINERALS

Total hardness (TH)

all dissolved calcium and magnesium salts

CARBONATE HARDNESS (CH)

all minerals contributing to carbonate hardness

They include calcium and magnesium carbonate in the form of:

chalk, limestone or marble

NON-CARBONATE HARDNESS (NCH)

all minerals contributing to non-carbonate hardness

They include calcium and magnesium sulphate in the form of:

gypsum or epsomite

MINERALS NOT AFFECTING WATER HARDNESS

All other minerals

(other than calcium and magnesium)

e.g. sodium and potassium salts and sodium chlorite (cooking salt)

HOBART WATER TREATMENT SYSTEMS HYDROLINE

HOBART warewashing technology is synonymous with innovation, economy and quality. More than 100 years of experience in the field and thousands of satisfied customers all over the world speak for themselves.

To obtain perfect dishwashing results, the quality of the chemicals and the water used in the process are as important as the efficiency of the dishwasher. Consistent high performance can only be achieved if all these components are perfectly matched.

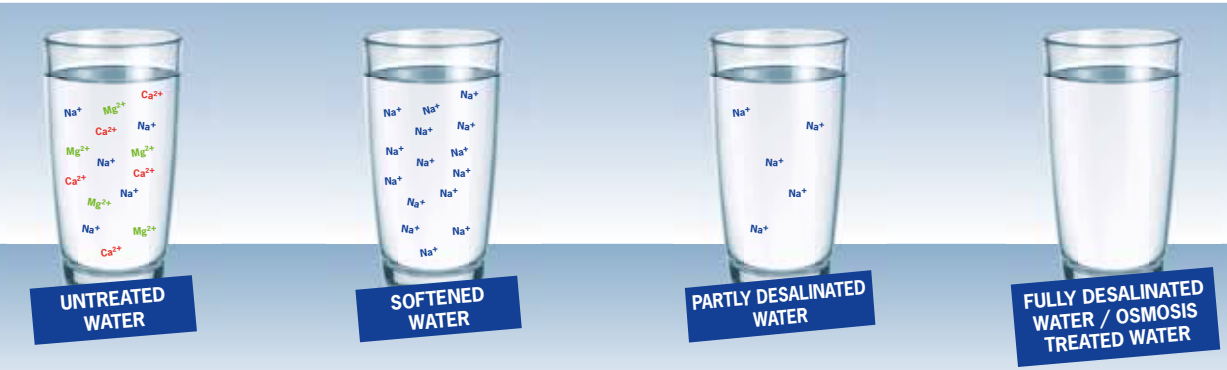
Our customers know that HOBART can deliver just that: a range of optimised products for brilliantly clean glassware, dishes and cutlery.

As a reliable partner of the catering industry, HOBART offers not only highly effective water softening units that protect your equipment, but also demineralisation systems and reverse osmosis technology solutions that guarantee spotlessly clean wash ware.

HOBART has the right solution for all applications and any machine type, irrespective of the capacity.

Rely on our expertise and experience in the field of warewashing.

YOUR HOBART TEAM



HOBART

HOBART WATER SOFTENING SYSTEMS HYDROLINE PROTECT

Hotels, restaurants, bakeries and butcher shops require warewashing systems that guarantee perfectly hygienic results, even when in constant use.

Hard water can, however, cause damage to the machine, as mineral scales tend to build up on heating rods as water is heated. This can lead to prolonged wash cycle times and poor machine performance.

If the water hardening minerals are not removed from the water, they form a solid layer of limescale around the heating rods. As a result, the heating rods might burn out, and the dishwasher does not work any longer.

Hard water also reduces the effectiveness of detergents and rinse aids, as the minerals contained in the water chemically react with the detergents. In areas where the water hardness is 3 °dH or higher, HOBART therefore always recommends installing a water softening system. The HOBART water softening solutions are tailor-made for HOBART dishwashers. They prevent limescale deposits in the machine as the respective minerals are removed by ion exchange.

The HOBART water softening system HYDROLINE PROTECT protects the machine, reduces downtimes and thus helps saving money.

WATER SOFTENING SYSTEM HYDROLINE PROTECT SE-H

CUSTOMER BENEFITS

- Protects equipment against limescale
- Optimises the effectiveness of detergents
- Automatic regeneration of water softening system
- Programmable regeneration times

SUITABLE FOR THE FOLLOWING HOBART MACHINES:

- Cutlery- and Dishwasher PREMAX FP
- Dishwashers PROFI FX/FXL
- Cutlery- and Dishwasher PREMAX AUP/AUPL/AUPT
- Dishwashers PROFI AMX/AMXX/AMXXL/AMXT
- Utensil washer PREMAX UPT
- Utensil washers PROFI UX/UXT/UXTH/UXTLH

WATER SOFTENING SYSTEM HYDROLINE PROTECT SD-H

CUSTOMER BENEFITS

- Protects equipment against limescale
- Optimises the effectiveness of detergents
- Automatic regeneration of water softening system
- Continuous soft water supply
- No disruption for regeneration thanks to double-chamber system

SUITABLE FOR THE FOLLOWING HOBART MACHINES:

- Cutlery- and Dishwasher PREMAX FP
- Dishwashers PROFI FX/FXL
- Cutlery- and Dishwasher PREMAX AUP/AUPL/AUPT
- Dishwashers PROFI AMX/AMXX/AMXXL/AMXT
- Utensil washer PREMAX UPT
- Utensil washers PROFI UX/UXT/UXTH/UXTLH

HOBART

HOBART WATER DEMINERALISATION SYSTEMS HYDROLINE STAR

There is nothing more inviting to guests than spotless dishes, perfectly clean cutlery and brilliant glassware. Water full of minerals leaves behind unpleasant spots and residue during the drying process.

To remove these stains, glassware and cutlery usually need to be polished when removed from the dishwasher. This is not only rather costly as it ties up staff, but also not very hygienic, as germs are easily transferred onto the washed goods. In addition, mineral deposits can leave behind an unpleasant odour in glasses, so that wine and other drinks do not taste as nice as they should.

To ensure that your guests can enjoy perfectly clean and hygienic tableware, HOBART recommends desalinating the water supplied to your dishwasher.

Partial demineralisation systems remove all calcium and magnesium ions contained in the water. The water is thus free of chalk and other minerals that might leave behind unpleasant stains. Such systems are the ideal solution for the cleaning of dishes, cutlery and glassware in areas where carbonate hardness is rather high relative to the overall water hardness.

In full demineralisation systems, all salts dissolved in the water are removed. This is the preferred solution in areas where the fresh water has a high salt and mineral concentration.

The HOBART demineralisation systems HYDROLINE STAR and STAR EXTRA guarantee spotless washing results. In addition, you save money as there is no need for time-consuming polishing of glasses and cutlery. Demineralised water also protects your machine against damage from mineral deposits.

PARTIAL DEMINERALISATION SYSTEM HYDROLINE STAR PD

CUSTOMER BENEFITS

- Prevents salt and limescale stains on dishes, glassware and cutlery in areas where carbon hardness is high
- Protects equipment against limescale deposits
- Optimises the effectiveness of detergents
- Easy, tool-free exchange of cartridge
- Inlet and outlet hoses need not be disconnected to change the cartridge
- Designed for vertical or horizontal installation
- Remaining cartridge capacity is indicated on dishwasher
- Capacity: 13,000 l, approx. 5,000 wash cycles*

SUITABLE FOR THE FOLLOWING HOBART MACHINES:

- Glasswashers PREMAX GCP/GP
- Glasswashers PROFI GC/GX
- Cutlery- and Dishwasher PREMAX FP
- Dishwashers PROFI FX/FXL

*at carbonate hardness of 10 °dH and water consumption of 2.5 l per cycle

FULL DEMINERALISATION SYSTEM HYDROLINE STAR EXTRA FD

CUSTOMER BENEFITS

- Prevents salt and limescale stains on dishes, glassware and cutlery in areas where total hardness is high
- Protects equipment against limescale deposits
- Optimises the effectiveness of detergents
- Easy, tool-free exchange of cartridge
- Inlet and outlet hoses need not be disconnected to change the cartridge
- Designed for vertical or horizontal installation
- Remaining cartridge capacity is indicated on dishwasher
- Capacity: 5,400 l, approx. 2,000 wash cycles*

SUITABLE FOR THE FOLLOWING HOBART MACHINES:

- Glasswashers PREMAX GCP/GP
- Glasswashers PROFI GC/GX
- Cutlery- and Dishwasher PREMAX FP
- Dishwashers PROFI FX/FXL

*at carbonate hardness of 10 °dH and water consumption of 2.5 l per cycle

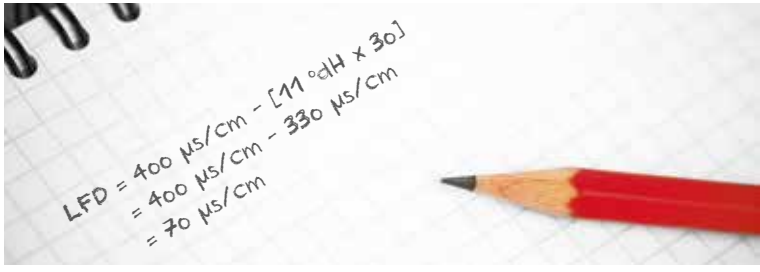
WHICH DEMINERALISATION SYSTEM IS THE RIGHT ONE FOR YOU?

To choose the right demineralisation system for your needs, you must first determine the following parameters:

1. **Raw water conductivity**
   This parameter (in µs/cm) is measured with a conductivity meter.

2. **Raw water carbonate hardness**
   This parameter (in ° dH) is determined in carbonate hardness test.

3. **Decarbonised water conductivity**
   Formula: Decarbonised water conductivity = raw water conductivity - (raw water carbonate hardness x 30)



In the above example, the conductivity of the decarbonised water is below 100 µs/cm, which means that the water is suitable for washing glassware. Partial demineralisation is therefore sufficient.

Table: demineralisation system

based on decarbonised water conductivity

	HYDROLINE STAR Partial demineralisation	**HYDROLINE STAR EXTRA** Full demineralisation
Cutlery	< 80 µs/cm	≥ 80 µs/cm
Glassware	< 100 µs/cm	≥ 100 µs/cm
Black porcelain	< 200 µs/cm	≥ 200 µs/cm
White porcelain	< 400 µs/cm	≥ 400 µs/cm

PARTIAL DEMINERALISATION SYSTEM HYDROLINE STEAM CD

CUSTOMER BENEFITS

- Protects utensils used for steaming and baking against limescale
- Prevents blockage by limescale of small nozzles in food steamers and ovens
- Prevents corrosion on glass panes
- Easy, tool-free exchange of cartridge
- Inlet and outlet hoses need not be disconnected to change the cartridge
- Filter head with digital indicator for remaining cartridge capacity
- Designed for vertical or horizontal installation
- Capacity: 10,800 l*

SUITABLE FOR:

- Pressure steam cookers
- Convection steamers
- Ovens

*at carbonate hardness of 10 °dH

HOBART

HOBART REVERSE OSMOSIS SYSTEMS HYDROLINE PURE

Reverse osmosis systems are the ideal solution for busy restaurants and hotels that require spotlessly clean tableware and where the dishwasher is running all day.

By washing with water that has been nearly 100% demineralised, they can do away with time-consuming polishing of glassware and cutlery. All tableware is simply spotless the moment it comes out of the dishwasher – ready for placing on tables. The HYDROLINE PURE RO-I and PURE RO-C are extremely easy to operate and require only minimum maintenance. As they are designed as self-contained systems, there is no need to replace cartridges or other consumables.

Spotless wash results, ample supply of demineralised water at all times and reduced operating and service costs – all this can be achieved by installing the reverse osmosis system HYDROLINE PURE from HOBART. The fresh mains water enters an enclosed system and is forced at high pressure through a special extremely fine membrane. This semi-permeable membrane allows water to pass while dissolved minerals and other impurities are removed. On one side of the membrane, the mineral and salt concentration of the water thus increases. On the other side, virtually mineral-free water is now available to be fed to the dishwasher.

Reverse osmosis systems from HOBART have a water recovery rate of up to 70%.

The reverse osmosis solutions HYDROLINE PURE RO-I and PURE RO-C guarantee perfectly clean wash results, and are optimised for your actual water requirements.

REVERSE OSMOSIS SYSTEM HYDROLINE PURE RO-C

CUSTOMER BENEFITS

- Continuous treatment system providing demineralised water for top-quality wash results
- Prevents salt and limescale stains on dishes, glassware and cutlery
- Protects your equipment against limescale deposits
- Optimises the effectiveness of detergents
- Unrivalled capacity at very low operating costs

SUITABLE FOR THE FOLLOWING HOBART MACHINES:

- Cutlery- and Dishwasher PREMAX AUP/AUPL/AUPT
- Dishwashers PROFI AMX/AMXX/AMXXL/AMXT

REVERSE OSMOSIS SYSTEM HYDROLINE PURE RO-I

CUSTOMER BENEFITS

- Compact design: suitable for installation below, on top of, behind, or beside dishwasher. Increases total unit height by only 120 mm
- Continuous treatment system providing demineralised water for top-quality wash results
- Prevents salt and limescale stains on dishes, glassware and cutlery
- Protects your equipment against limescale deposits
- Optimises the effectiveness of detergents
- Unrivalled capacity at very low operating costs

SUITABLE FOR THE FOLLOWING HOBART MACHINES:

- Glasswashers PREMAX GCP/GP
- Glasswashers PROFI GC/GX
- Cutlery- and Dishwasher PREMAX FP
- Dishwashers PROFI FX/FXL

HYDROLOGY LEXICON

CALCIUM IONS
See water hardening minerals

GERMAN WATER HARDNESS / °dH
Unit for total water hardness. 1 °dH corresponds to 10 mg calcium oxide, or 7.19 mg magnesium oxide per litre of water. Official SI unit: mmol/l 1 °dH equals 0.1783 mmol/l

1 °dH is equivalent to:

English hardness of	1.25 °e
American hardness of	1.04 °aH
French hardness of	1.78 °fH

RECOMMENDED CONDUCTIVITY
The recommended conductivity for water used in dishwashers to achieve spotless results depends on type of ware to be washed.
White porcelain: < 400 µS/cm
Black porcelain: < 200 µS/cm
Glassware: < 100 µS/cm
Cutlery: < 80 µS/cm

TOTAL HARDNESS
Measure for the total concentration of water hardening minerals. Total hardness includes both carbonate hardness and non-carbonate hardness.

WATER HARDENING MINERALS
These minerals include calcium and magnesium, which are dissolved in water in the form of sulphates (gypsum, epsomite) or carbonates (chalk, dolomite). Apart from causing mineral scale, these substances also reduce the effectiveness of detergents and rinse aids, as they react with the soap contained in these products.

HARD WATER
Water containing water hardening minerals. The hardness of the water is generally indicated in degrees of German water hardness (°dH).

LIMESCALE
When hard water is heated, the calcium dissolved in the water precipitates in the form of limescale. These

HYDROLOGY LEXICON

permanent, solid deposits can only be removed mechanically or by chemical reaction.

CARBONATE HARDNESS
Measure for the amount of calcium and magnesium in carbonate form (chalk, dolomite) dissolved in the water. When these minerals precipitate as water is heated, they form permanent deposits that are not water-soluble. The total hardness of water is calculated by adding carbonate hardness and non-carbonate hardness.

CONDUCTIVITY
The conductivity of water indicates its salt content. The higher the salt concentration in the water, the greater the conductivity. The unit for conductivity is µS/cm. See also recommended conductivity.

MAGNESIUM IONS
See water hardening minerals

SODIUM IONS
See water hardening minerals

MINERALS NOT AFFECTING WATER HARDNESS
These minerals include in particular potassium salts and sodium chlorite (cooking salt). As water dries on the surface on glassware or cutlery, these water-soluble salts might form salt deposits and stains.

NON-CARBONATE HARDNESS
Measure for the amount of calcium and magnesium in sulphate form (gypsum/epsomite) dissolved in the water. As water evaporates, these substances form gypsum deposits on surfaces. These deposits are water-soluble. The total hardness of water is calculated by adding carbonate hardness and non-carbonate hardness.

REGENERATION OF WATER SOFTENING SYSTEM
In ion exchange units, the water hardening minerals in the water (calcium/magnesium) are exchanged with minerals that do not affect the water hardness (sodium). This is done by means of a special synthetic resin cartridge.
If its capacity is spent, the resin must be re-charged with sodium ions in the form of regeneration salt.
This process is generally referred to as regeneration.

HYDROLOGY LEXICON

REGENERATION OF PARTIAL OR FULL DEMINERALISATION SYSTEM
In ion exchange units, the water hardening minerals in the water (calcium/magnesium) and the salts that might leave behind water spots are exchanged with other minerals. This is done by means of a special synthetic resin cartridge. If its capacity is spent, the resin must be re-charged. This process is generally referred to as regeneration.

REGENERATION SALT
Coarse sodium chlorite salt for the regeneration of water softening systems. Provide the sodium ions that are exchanged for calcium and magnesium ions to soften the water. For integrated water softening units, we recommend using a special regeneration salt with a grain size of 3 to 8 mm. For external systems, we recommend a special salt available in tablet form.

PERMANENT HARDNESS
See non-carbonate hardness

TEMPORARY HARDNESS
See carbonate hardness

PERMEATE
Demineralised water obtained by reverse osmosis treatment. The permeate is fed to the dishwasher.

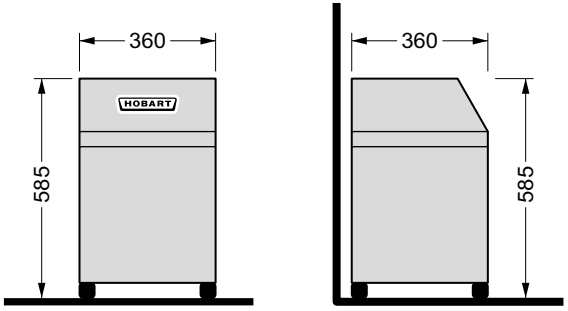
RETENTATE
Raw water retained by the membrane in a reverse osmosis system. The retentate contains increased amounts of minerals that have been removed from the permeate fraction.

WATER TREATMENT
Measures taken to change the water quality by removing dissolved minerals from water by ion exchange of filtration.

WATER-SOLUBLE MINERALS
Dissolved minerals contained in water, originating from natural salts such as cooking salt or iron and copper compounds.

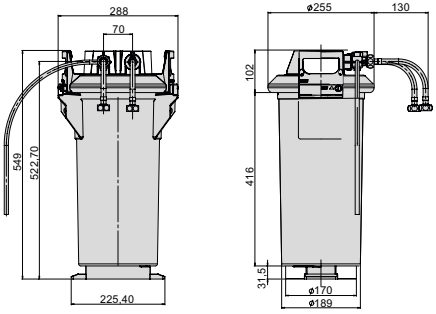
TECHNICAL DATA – WATER SOFTENING SYSTEMS

MODEL	HYDROLINE PROTECT SE-H	HYDROLINE PROTECT SD-H
Type	Single-chamber	Double-chamber
D x W x H in mm	400 x 230 x 572	360 x 360 x 585
Inlet temperature	4 - 65 °C	4 - 65 °C
Performance (continuous operation)	10 l/min	20 l/min
Flow pressure	3 - 6 bar	3 - 7 bar
Inlet hose connection	R 3/4"	R 3/4"
Outlet hose connection	R 3/4"	R 3/4"
Regeneration method	Time-controlled	Volume-controlled
Capacity	1,000 l at 8 °dH (total hardness)	1,140 l at 8 °dH (total hardness)
Power supply	230/50/1	-
Total loading	0.03 kW	-
Recommended for	hardness > 1 °dH	hardness > 1 °dH
Required for	hardness > 3 °dH	hardness > 3 °dH
Weight	12 kg	21 kg



TECHNICAL DATA – DEMINERALISATION CARTRIDGES

MODEL	HYDROLINE STAR PD	HYDROLINE STAR EXTRA FD	HYDROLINE STEAM CD
Type	Partial demineralisation	Full demineralisation	Partial demineralisation
D x W x H in mm	550 x 288	550 x 288	550 x 288
Inlet temperature	4 - 60 °C	4 - 60 °C	4 - 30 °C
Performance	5 l/min	5 l/min	1,7 l/min
Flow pressure	2 - 6 bar	2 - 6 bar	2 - 6 bar
Inlet hose connection	R 3/4"	R 3/4"	R 3/4"
Outlet hose connection	R 3/4"	R 3/4"	R 3/4"
Capacity	13,000 l at 10 °dH (carbonate hardness)	5,400 l at 10 °dH (total hardness)	10,800 l at 10 °dH (carbonate hardness)
Weight	dry: 18 kg full: 24 kg	dry: 18 kg full: 24 kg	dry: 18 kg full: 24 kg
Application	Warewashing	Warewashing	Food preparation

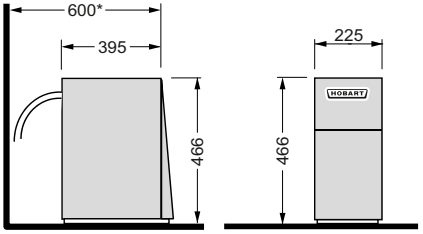


TECHNICAL DATA – REVERSE OSMOSIS SYSTEMS

MODEL	HYDROLINE PURE RO-C	HYDROLINE PURE RO-I
Type	Reverse osmosis	Reverse osmosis
D x W x H in mm	460 x 225 x 466	RO-I 400: 567 x 460 x 120 RO-I 500: 567 x 600 x 120 RO-I V: 565 x 170 x 472
Inlet temperature	4 - 30 °C	4 - 35 °C
Performance	5 l/min	1.5 l/min
Permeate yield at 15 °C 70%	70%	60%
Flow pressure	2 - 10 bar	1 - 6 bar
Inlet hose connection	Integrated hose, R 3/4“	R 3/4“
Outlet hose connection	R 3/4"	R 3/4"
Max. raw water hardness	20 °dH	35 °dH
Max. raw water conductivity	2,000 µS/cm	1,200 µS/cm
Salt and mineral retention rate	98%	98%
Power supply	230/50/1	-
Total loading	0.72 kW	-
Upstream water softening system recommended*	hardness > 10 °dH	hardness > 6 °dH
Upstream water softening system required*	hardness > 20 °dH	hardness > 35 °dH
Weight	33 kg	20 kg
Application	Warewashing	Warewashing

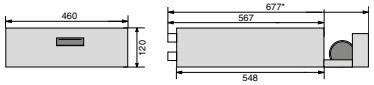
* to protect the membrane from blockage, we recommend installing an upstream water softening system, increasing the service life of the reverse osmosis unit.

RO-C

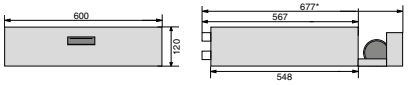


* including hoses, fittings, etc.

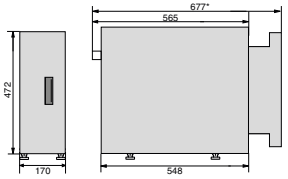
RO-I 400



RO-I 500



RO-I V



* drawer for pre-filter access opened

HOBART GMBH
Robert-Bosch-Straße 17 I 77656 Offenburg I Germany
Phone: +49(0)781.600-28 20 I Fax: +49(0)781.600-28 19
E-Mail: info-export@hobart.de I www.hobart-export.com

Member of the *ITW* Food Equipment Group Europe

PR-06120315-735K-e