



WATER TREATMENT

**HYDROLINE**



**HOBART**



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.

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

	SOFTENER	PARTIAL DEMINERALISATION	FULL DEMINERALISATION	OSMOSIS
Machine protection	●	●	●	●
Detergent saving	●	●	●	●
Spotless wash ware		◐	●	●

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

Particularly suitable for high workloads!



## WATER – minerals/salts dissolved in fresh water

### HARDNESS MINERALS

**Total hardness (TH)**  
All dissolved calcium and magnesium salts

### MINERALS NOT AFFECTING WATER HARDNESS

**All other minerals**  
(other than calcium and magnesium)  
e.g. sodium and potassium salts and sodium chlorite (cooking salt)

### CARBONATE HARDNESS (CH)

**All minerals contributing to carbonate hardness**

They include calcium and magnesium in the form of carbonate

### NON-CARBONATE HARDNESS (NCH)

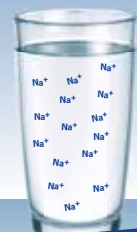
**All minerals contributing to non-carbonate hardness**

They include calcium and magnesium in the form of sulphate

WATER IS NOT ALWAYS THE SAME!



UNTREATED WATER



SOFTENED WATER



PARTLY DESALINATED WATER



FULLY DESALINATED WATER / OSMOSIS TREATED WATER

**DEMINERALISATION  
SYSTEMS STAR**



**REVERSE OSMOSIS  
PURE RO-I**



**REVERSE OSMOSIS  
PURE RO-S**

**SOFTENERS  
PROTECT**



**REVERSE OSMOSIS  
PURE RO-C**





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## HOBART WATER SOFTENING SYSTEMS HYDROLINE PROTECT

### WE KNOW:

Hard water attacks dishwashers and leads to limescale deposits on the heating elements. Thus, the programme time may increase, effectiveness of the detergent and dishwasher performance are impaired. In the worst case, the heating elements melt and the machine stops.

**For this reason, we recommend** a softening system for water from 3°dH. With an ion-exchange process, HOBART softening systems ensure that no limescale can build up in the dishwasher.

### HYDROLINE PROTECT

**protects the machine,  
reduces downtimes  
and thus saves hard cash.**

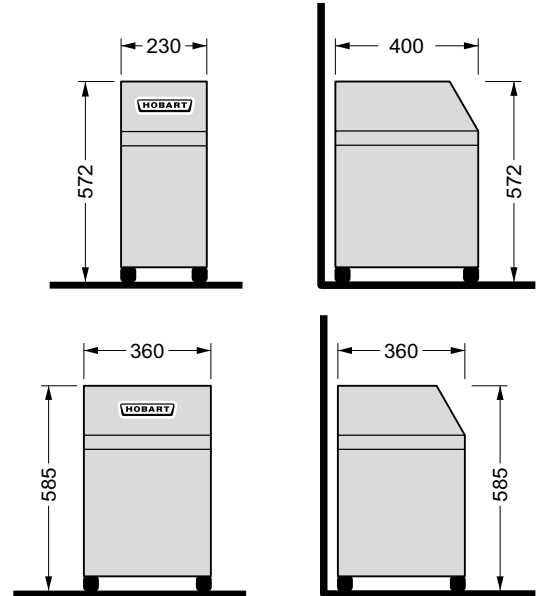


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## TECHNICAL DATA AND DRAWINGS

MODELS	HYDROLINE PROTECT SE-H	HYDROLINE PROTECT SD-H
Type	Single-chamber softener	Double-chamber softener
D x W X H in mm	400 x 230 x 572	360 x 360 x 585
Supply water temperature	4 – 65°C	4 – 65°C
Performance (continuously)	10 l/min	20 l/min
Flow pressure	3 – 6 bar	3 – 7 bar
Fresh water connection	R 3/4"	R 3/4"
Machine-side connection	R 3/4"	R 3/4"
Regeneration type	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	from 1°dH	from 1°dH
Required for	from 3°dH	from 3°dH
Weight	12 kg	19 kg



The water treatment system must be connected to the fresh water supply system by means of a backflow preventer conforming to DIN EN 1717.



### WATER SOFTENER HYDROLINE PROTECT SE-H



#### CUSTOMER BENEFIT

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

### WATER SOFTENER HYDROLINE PROTECT SD-H



#### CUSTOMER BENEFIT

- Protects machine 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
- Dishwasher PROFI AMX/AMXX/AMXXL/AMXT

#### SUITABLE FOR THE FOLLOWING HOBART MACHINES:

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

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## HOBART WATER DEMINERALISATION SYSTEMS HYDROLINE STAR

Spotless crockery, shining cutlery and sparkling glassware do not only require correct warewashing. If hard water is used, a correct upstream water treatment system is indispensable to achieve the desired result.

The process of **demineralisation** exchanges all the salts contained in the water. This guarantees a perfect wash result for glassware and cutlery, even if the untreated water exhibits a high salt and mineral content.

However, **partial demineralisation** is sometimes also sufficient: calcium ions and magnesium ions are removed from the water. Even if the water contains a lot of carbon, staining of the wash ware is reliably prevented.

The manual, time-consuming and on top of that unhygienic polishing of glassware can be dispensed with. And thanks to the improved water quality, your HOBART dishwasher will still deliver many years of reliably bright dishwashing results.

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## 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

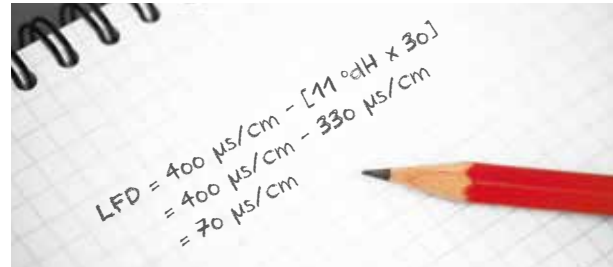
This parameter (in  $\mu\text{s}/\text{cm}$ ) is measured with a conductivity meter.

### 2. Raw water carbonate hardness

This parameter (in  $^{\circ}\text{dH}$ ) is determined in a 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  $100 \mu\text{s}/\text{cm}$ , 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	< $80 \mu\text{s}/\text{cm}$	$\geq 80 \mu\text{s}/\text{cm}$
Glasses	< $100 \mu\text{s}/\text{cm}$	$\geq 100 \mu\text{s}/\text{cm}$
Black porcelain	< $200 \mu\text{s}/\text{cm}$	$\geq 200 \mu\text{s}/\text{cm}$
White porcelain	< $400 \mu\text{s}/\text{cm}$	$\geq 400 \mu\text{s}/\text{cm}$

### PARTIAL DEMINERALISATION HYDROLINE STAR PD



#### CUSTOMER BENEFIT

- Prevents salt and limescale stains on dishes, glasses and cutlery in areas where carbon hardness is high
- Protects machine 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  $\pm$  approx. 5,000 wash cycles\*

### FULL DEMINERALISATION HYDROLINE STAR EXTRA FD



#### CUSTOMER BENEFIT

- Prevents salt and limescale stains on dishes, glasses and cutlery in areas where total hardness is high
- Protects machine 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  $\pm$  approx. 2,500 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



#### SUITABLE FOR THE FOLLOWING HOBART MACHINES:

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

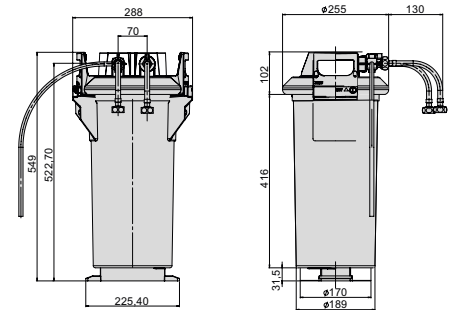
\* at carbonate hardness of 10 °dH and water consumption of 2.0 l per cycle

\* at total hardness of 10 °dH and water consumption of 2.0 l per cycle



## TECHNICAL DATA AND DRAWINGS

MODELS	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
Supply water 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
Fresh water connection	R 3/4"	R 3/4"	R 3/4"
Machine-side 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	18 kg	18 kg	18 kg
Application	Warewashing	Warewashing	Cooking





## PARTIAL DEMINERALISATION HYDROLINE STEAM CD



### CUSTOMER BENEFIT

- 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

High degree of capacity utilisation and still a spotless wash result! The HOBART dishwasher and the HYDROLINE osmosis technology make up a perfect team for bright results – irrespective of water quality and capacity utilisation.

The HOBART reverse osmosis technology routes the inflowing mains water under high pressure through a membrane inside a closed system. The osmotic membrane is so fine that it only allows pure water to pass and retains dissolved substances like minerals and salts. Minerals originally contained in the water are dissolved and separated.

### The HOBART reverse osmosis systems HYDROLINE PURE

**RO-I** = Integrated in the machine

**RO-S** = Small, minimum space requirement due to horizontal or vertical installation

**RO-C** = Compact dimensions despite high capacity

Do you waste a lot of time for the troublesome polishing of glasses and cutlery? Not with HOBART! The HOBART reverse osmosis systems ensure that the polishing of washware belongs to the past.

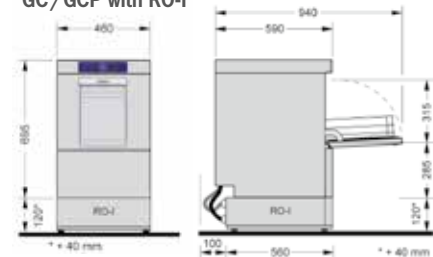
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## TECHNICAL DATA AND DRAWINGS

### MODELS

MODELS	HYDROLINE PURE RO-I	HYDROLINE PURE RO-S
Type	Reverse osmosis	Reverse osmosis
D X W x H in mm	560 x 460 x 120   560 x 600 x 120	565 x 156 x 459
Supply water temperature	5 – 35°C	5 – 35°C
Performance at 15°C	2 l/min	2 l/min
Flow pressure	1 – 6 bar	1 – 6 bar
Fresh water connection	R 3/4"	R 3/4"
Machine-side connection	R 3/4"	R 3/4"
Max. supply water hardness	35°dH	35°dH
Max. supply water conductivity	1,200 µS/cm	1,200 µS/cm
Power supply	–	230/50/1
Total loading	–	0.2 kW
Upstream softener recommended*	from 10°dH	from 10°dH
Upstream softener required*	from 35°dH	from 35°dH
Weight	20 kg	20 kg
Application	Warewashing	Warewashing

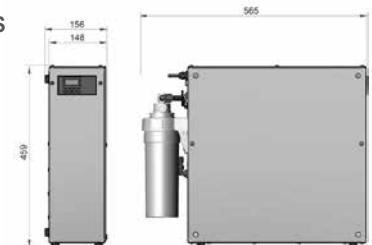
GC/GCP with RO-I



GXC with RO-I



RO-S



\* The installation must be performed according to EN 1717. The corresponding back flow prevention type EA for the raw water supply is integrated in the RO. A back flow prevention for the drain connection is part of the optional installation kit. From 10° dH, we recommend installing an upstream water softening system to prevent the blockage of the membrane. Hard water reduces the permeate output and shortens the service life of the membrane.

## REVERSE OSMOSIS HYDROLINE PURE RO-I



### CUSTOMER BENEFIT

- Minimum space requirement: Machine with integrated reverse osmosis has a total height of only 815 mm and fits under the counter
- Provides demineralised water in continuous operation for highest demands on the wash result
- Prevents salt and limescale stains on glasses
- Protects machine against limescale deposits
- Optimises the effectiveness of detergents
- Minimum operating costs at highest capacity
- Direct communication with the dishwasher
- Fast and easy removal of the pre-filter

### SUITABLE FOR THE FOLLOWING HOBART MACHINES:

- Glasswasher PREMAX GCP
- Glasswashers PROFI GC/GXC

## REVERSE OSMOSIS HYDROLINE PURE RO-S



### CUSTOMER BENEFIT

- Minimum space requirement: Vertical or horizontal installation next to the dishwasher
- Continuous treatment system providing demineralised water for top-quality wash results
- Prevents salt and limescale stains on dishes, glasses and cutlery
- Protects machine against limescale deposits
- Optimises the effectiveness of detergents
- Minimum operating costs at highest capacity
- Bypass function: washing operation of the dishwasher is always guaranteed
- Easy to operate with integrated display
- Fast and easy removal of the pre-filter

### SUITABLE FOR THE FOLLOWING HOBART MACHINES:

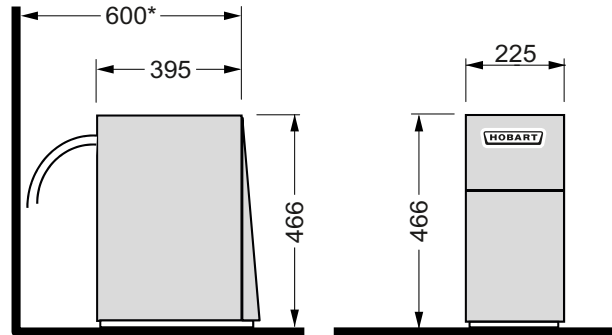
- Glasswashers PREMAX GCP/GP
- Glasswashers PROFI GC/GX/GXC
- Cutlery and dishwasher PREMAX FP
- Dishwashers PROFI FX/FXL



## TECHNICAL DATA AND DRAWINGS

### MODELS

MODELS	HYDROLINE PURE RO-C
Type	Reverse osmosis
D X W X H in mm	460 x 225 x 466
Supply water temperature	4 – 30°C
Performance at 15°C	5 l/min   500 l/Tag
Flow pressure	2 – 10 bar
Fresh water connection	Integrated hose, R 3/4"
Machine-side connection	R 3/4"
Max. supply water hardness	20°dH
Max. supply water conductivity	2,000 µS/cm
Power supply	230/50/1
Total loading	0.72 kW
Upstream softener recommended*	from 10°dH
Upstream softener required*	from 20°dH
Weight	33 kg
Application	Warewashing



\* incl. hoses, connections, etc.

\* The water treatment system must be connected to the drinking water supply system by means of a backflow preventer conforming to EN 1717. The outlet of the reverse osmosis system must be equipped with a backflow preventer conforming to EN 1717 to ensure that dirty water from the dishwasher does not enter the treatment system. From 10° dH, we recommend installing an upstream water softening system to prevent blockage of the membrane. Hard water reduces the permeate output rate and shortens the service life of the reverse osmosis system.



## REVERSE OSMOSIS HYDROLINE PURE RO-C



### CUSTOMER BENEFIT

- Continuous treatment system providing demineralised water for top-quality wash results
- Prevents salt and limescale stains on dishes, glasses and cutlery
- Protects machine against limescale deposits
- Optimises the effectiveness of detergents
- Minimum operating costs at highest capacity

### SUITABLE FOR THE FOLLOWING HOBART MACHINES:

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





## HYDROLOGY LEXICON

### 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

### 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
Glasses:	< 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 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 watersoluble. The total hardness of water is calculated by adding carbonate hardness and non-carbonate hardness.

### CONDUCTANCE

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.

### **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.

### **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.

### **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 or filtration.

### **WATER-SOLUBLE MINERALS**

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

**HOBART GMBH**

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