

PROFILL PRIME

A robust mobile filling and rinsing device for preparing the heating and cooling systems for ideal water quality levels.



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TABLE OF CONTENTS

- 03 PROFILL PRIME DESCRIPTION
- 04 DEMINERALISATION
- 06 INTERNAL AND EXTERNAL VIEW
- 07 FILLING AND RINSING RESIN REQUIREMENTS
- 08 MEASUREMENTS
- 10 INITIAL FILLING AND REPLACING RESIN
- 11 OPERATING THE CONDUCTIVITY / TDS METER
- 13 FILLING & RINSING SYSTEMS (DIAGRAM)
- 14 ACCESSORIES
- 15 WARRANTY CONDITIONS

PROFILL PRIME DESCRIPTION

WHAT IS IT?

The ProFill Prime uses the same technology as our fixed ProFill units and is based on either the 12.5 L or 25 L model. It is used for the initial filling and demineralised filling of heating and cooling systems or for resin rinsing when remedial cleaning of systems previously treated with chemicals is required. Installed in-line with the water supply to fill the system, ProFill Prime ensures that when used with our controlled pH resin, the filling water is supplied in accordance with the VDI 2035 and CSA TM20 guidance, which is endorsed by CIBSE and SWKI BT102–01 Switzerland guideline and the Norm H 5195–1 Austrian guideline. When used for resin rinsing systems it is connected to either the flushing by-pass valve that is supplied with all our Protector units or other convenient flushing points on the system.

HOW DOES IT WORK?

An integrated meter records the initial filling volume which can be recorded for future service records. Recording the meter reading before and after each resin change allows you to monitor resin life. The meter is also used to record the system volume that has been rinsed when carrying out remedial cleaning, the increasing volume of water that passes before the resin expires provides a good indicator of how the system water quality is improving.

The meter that can either record $\mu\text{S}/\text{cm}$ or TDS has an inlet and outlet sensor, when filling it provides the starting conductivity of the incoming mains water supply and the outlet conductivity is monitored to maintain the required conductivity for the system requirements, the increasing conductivity reading on the outlet is an indicator that the resin is expiring. The meter also displays the actual flow rate and the volume.

When rinsing systems, the reducing levels of the inlet conductivity is the indicator that the system water quality is improving.

Although the ProFill Prime can be used at a high pressure of 10 bar and high temperature of 80°C it should be noted that the resin life expectancy above 60°C is reduced by around 25%. We recommend lowering the temperature of the system when resin rinsing to prolong the life of the resin. All resin used for rinsing should be disposed of under environmental control procedures as it will contain system debris and chemical residue that is stripped from the system and encapsulated within the resin for safe disposal.

The ProFill Prime operates through the process of demineralisation, where water flows over the ion exchange resin, and through this process, becomes demineralised water suitable for heating and cooling systems.

Please go to page 05, for the science behind demineralisation.



WHY DO WE DEMINERALISE THE FILLING WATER OF HEATING & COOLING SYSTEMS?

Modern heating systems are sensitive to hard and corrosive filling water. Increased heating loads and more compact heat exchangers result in higher surface temperatures and thus in the formation of limescale build-up, which prevents a good heat transfer and could limit efficiency or lead to premature failures and malfunctioning of the system. In addition, materials such as aluminium or stainless steel are also very sensitive when exposed to poorly conditioned water.

For these reasons, many heating and cooling equipment manufacturers require the use of conditioned filling water, the most common method of ensuring compliance with the VDI 2035 part 1 guideline.

The main aim of VDI 2035 and CSA TM20 guidelines are to prevent scale formation and water-side corrosion damage.

To achieve these goals, the guideline foresees different procedures, demineralisation, hardness stabilisation, and pH stabilisation which is applicable to the process of heating water conditioning for water heating installations in accordance with DIN EN 12828 within buildings when the flow temperature does not exceed 100°C.

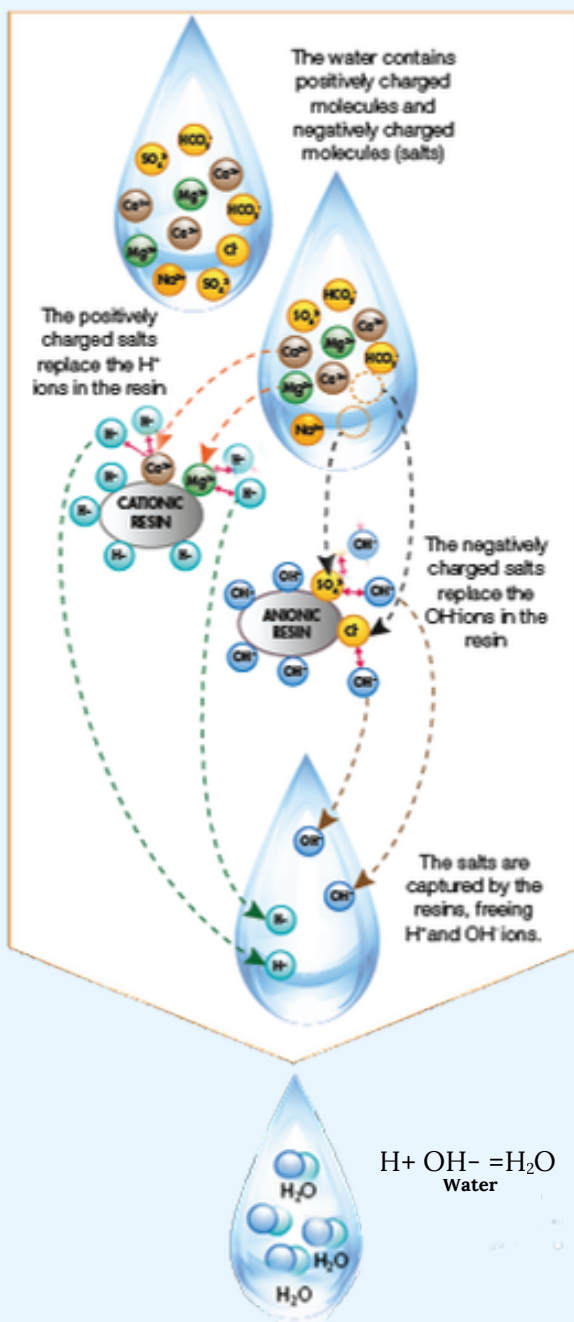


Limescale on surfaces lead to high temperature differences in the heat exchanger itself - thermal stress causes cracks with leaks.



Lime scale in a heating pipe, significant reduction in diameter.

PROCESS OF DEMINERALISATION



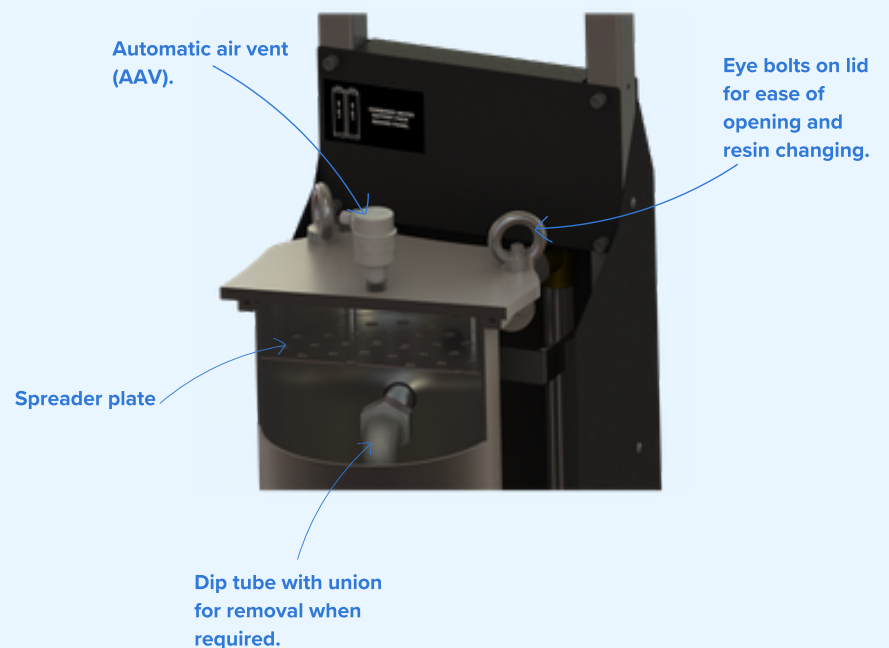
The resin beads have two types of ion exchange with the untreated water. As the untreated water passes through the Protector Prime, positively charged ions from the water will swap with positive hydrogen ions on the resin (cation exchange) .

Similarly, negative ions in the untreated water will swap with negative hydroxyl ions on the resin beads (anion exchange).

The ions will be exchanged until none is left in the water other than hydrogen and hydroxyl ions, making H₂O, demineralised water.



INTERNAL & EXTERNAL VIEW



FILLING AND RINSING RESIN REQUIREMENTS

FILLING THE SYSTEM

The amount of resin required to fill a system using the ProFill Prime will be determined by two factors:

1. Where in the country the filling is taking place as this will change the hardness of the incoming water and this will change the life expectancy of the resin.
2. The actual system volume.

When you know the incoming water hardness using the chart below it will provide you with a guide to how many litres of demineralised water 12.5 litres of resin can provide, you can then calculate how many litres of resin you will require for your project.

RESIN RINSING

It is impossible to accurately calculate how much resin will be required to rinse a system as no two systems are the same, the things that can affect how much resin is required are as follows:

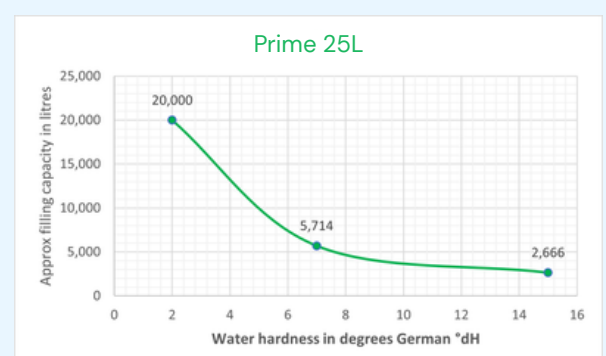
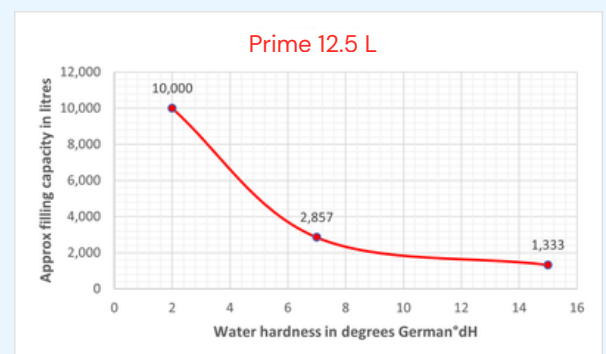
- Existing conductivity and chloride levels.
- Levels of corrosion & bacteria present
- Chemical composition of system water
- Levels of chemical present (inhibitors, biocides etc)

Please contact us with your system details and current water quality results and we will be able to offer you some guidance on the expected amount of resin needed.

You can find your water company and then your water hardness guide from your local water provider.
<https://www.water.org.uk/advice-for-customers/find-your-supplier/>

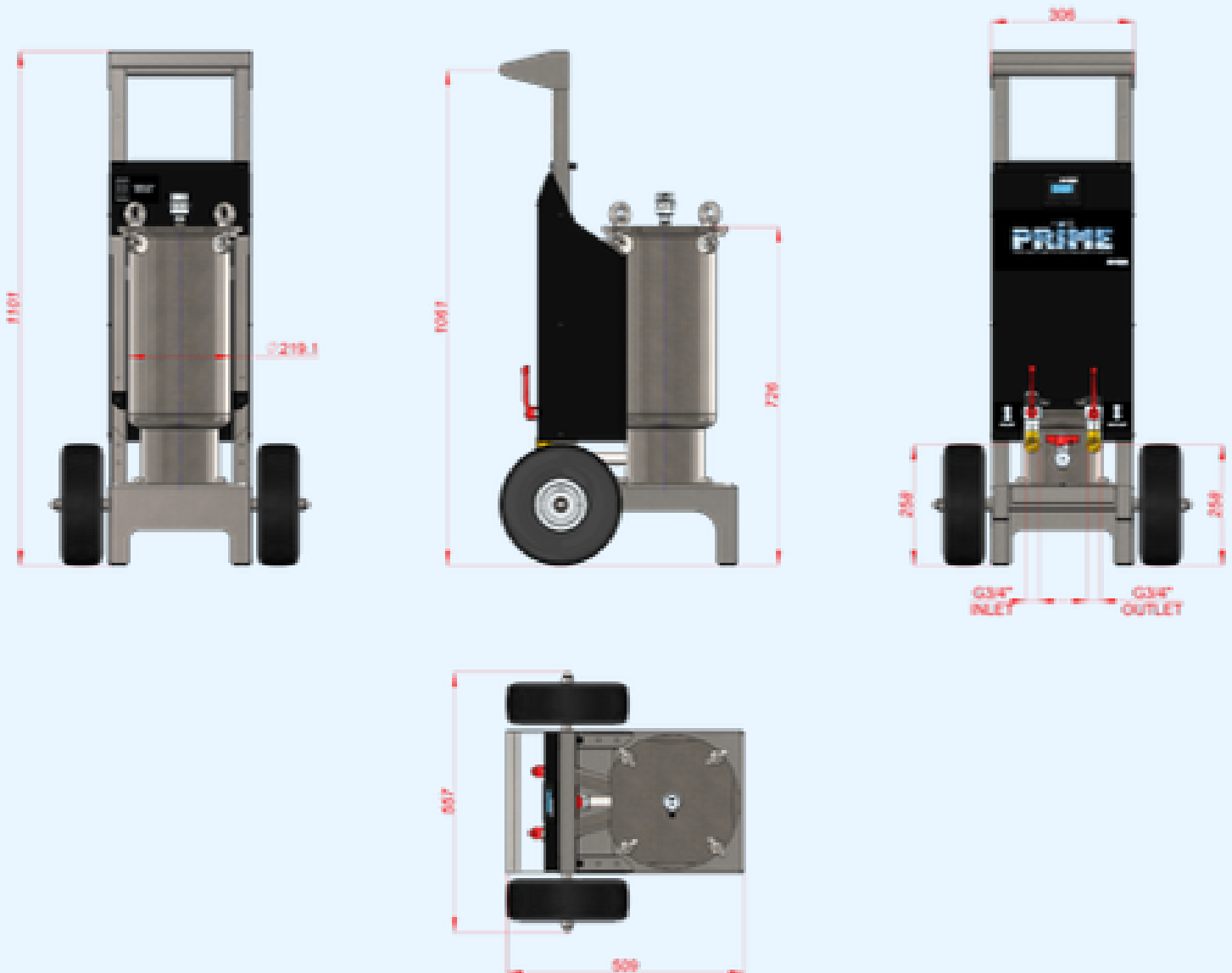
	2 °dH	7 °dH	15 °dH
Prime 12.5L	10,000	2,857	1,333
Prime 25L	20,000	5,714	2,666

Table showing what the approximate filling capacity in litres is with different water hardness in degrees German °dH.



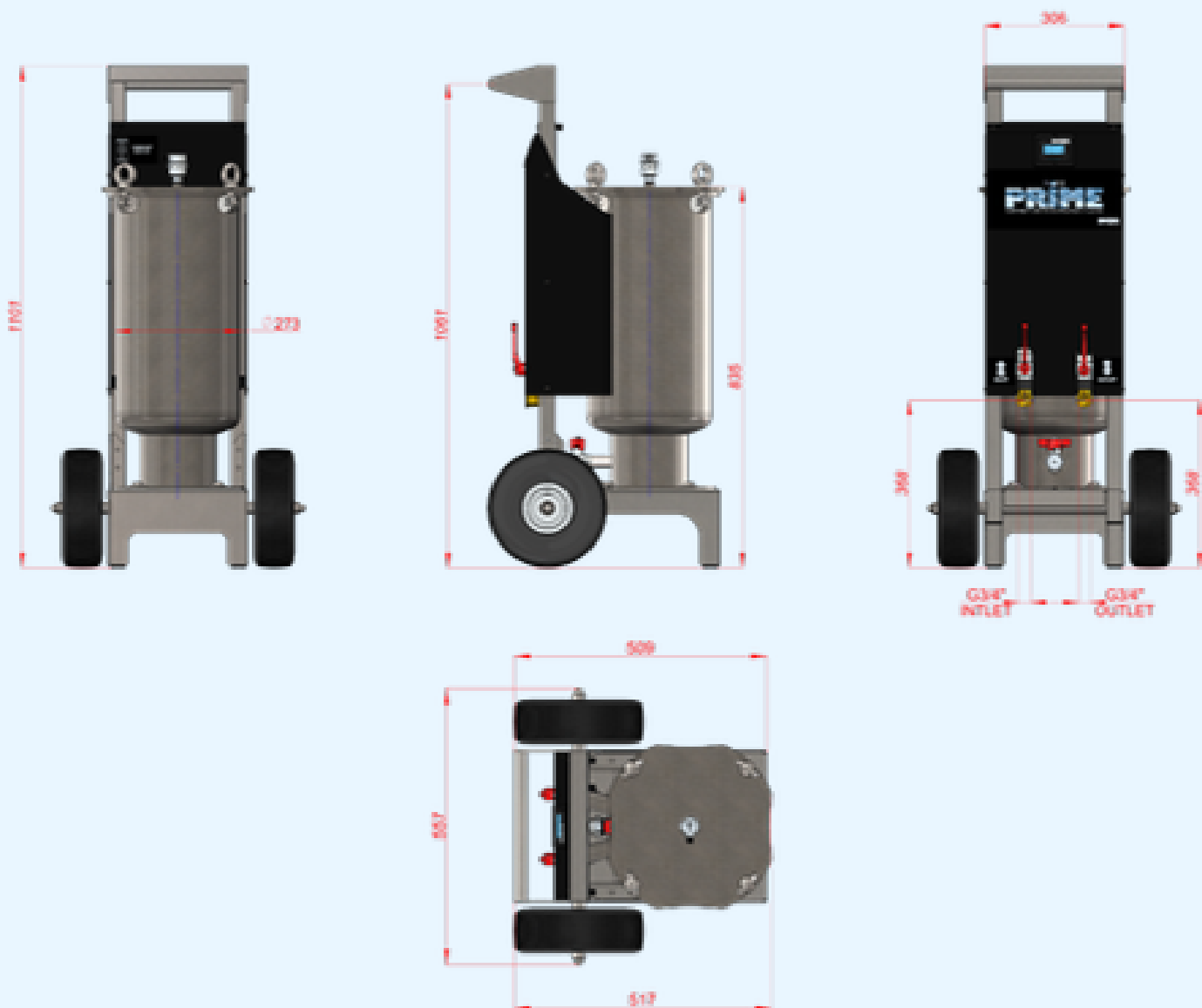
12.5L MEASUREMENTS

Unit	Max Pressure	Max Temp	Delivery Capacity	Height	Width	Depth	Weight
ProFill Prime 12.5L	10 bar	80°C	20 l/min	1101 mm	557 mm	509 mm	42 kg



25L MEASUREMENTS

Unit	Max Pressure	Max Temp	Delivery Capacity	Height	Width	Depth	Weight
ProFill Prime 25L	10 bar	80°C	20 l/min	1101 mm	557 mm	517 mm	53 kg



INITIAL FILLING & REPLACING RESIN

INITIAL FILLING

1. Undo eye bolts and remove the lid and the seal.
2. Pour in the new resin. Replace the seal ensuring there is no resin on the seal.
3. Replace the lid and tighten the eye bolts.
4. Open the inlet valve and automatic air vent. When all the air is dispensed then open the outlet valve.
5. Record the water meter reading
6. Check the lid is sealed and water tight.



REPLACING THE RESIN

1. Close ball valve in the outlet, connect a hose at the drain valve and route into the supplied collection sack; flush out the resin at main pressures. Close the inlet valve and drain water, then close drain valve.
2. Continue by following the steps, 1 to 6 under “Initial Filling”

TRANSPORTATION

When you have finished a project and you still have usable resin within the Prime. To prolong resin life, do not let it dry out and instead keep the resin wet and covered in water at all times,



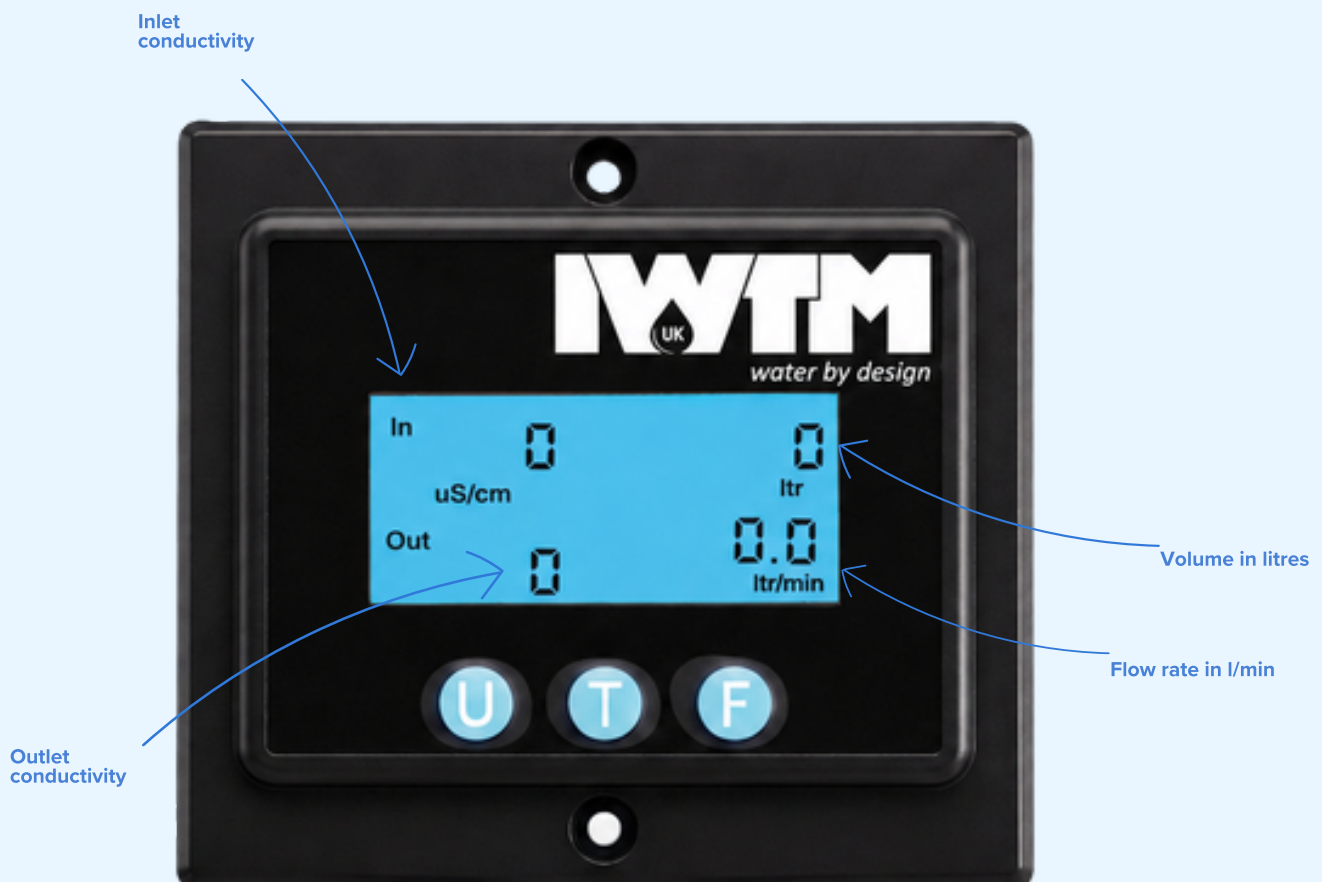
OPERATING THE CONDUCTIVITY / TDS METER

MEASURING FLOW

The Combo meter shows real time flow rate and accumulated volume. The maximum accumulated volume is 199999 litres(gallons).
Reset : Keep pressing the button “F” for five seconds to reset the accumulated flow volume to zero.

SETTING LITRE OR GALLON MODE

You can switch from litres to gallons mode by pressing and holding the button “F”, then press the button “T”, then release both the buttons, press button “F” choose gallons or litres, then press button “T”.
When a beep is heard, the setting is switched. The screen shows “gal/min”



OPERATING THE CONDUCTIVITY / TDS METER

SETTING TDS OR CONDUCTIVITY

The default setting of the ES0671L-66TM Combo meter is for conductivity mode. The screen shows “ $\mu\text{S}/\text{cm}$ ”. You can switch the mode between the conductivity and TDS (Total Dissolved Solids) by the pressing the button “**U**”

MANUAL TDS / CONDUCTIVITY MEASUREMENT

Press the button “**T**” to measure TDS or conductivity and keep the value displayed on the screen.

The maximum measurable TDS and conductivity values are 1999 ppm and 1999 $\mu\text{S}/\text{cm}$.

AUTOMATIC TDS/CONDUCTIVITY MONITORING

Press and hold the button “**F**”, then press the button “**U**”, then release both buttons when “0” blinks on the screen. Press the button “**F**” to select the TDS or conductivity setting from 10 to 300 ppm or $\mu\text{S}/\text{cm}$. The sequence is OFF - 0 – 10 – 20 290 - 300 – OFF – 0 – 10. Then press the button “**T**” to save the TDS or conductivity setting.

The Combo Meter measures the TDS / conductivity for every 20L. If the measured value is below the set value, the green light blinks for 30 seconds. If the measured value is above the set value, the red light continues to blink, and an alarm is generated.

LOW BATTERY POWER ALERT

When the battery power is low, the empty battery symbol on the screen blinks. Replacing the batteries clear the alert. The last settings are stored in the memory and restored after the batteries are replaced.

SPECIFICATION

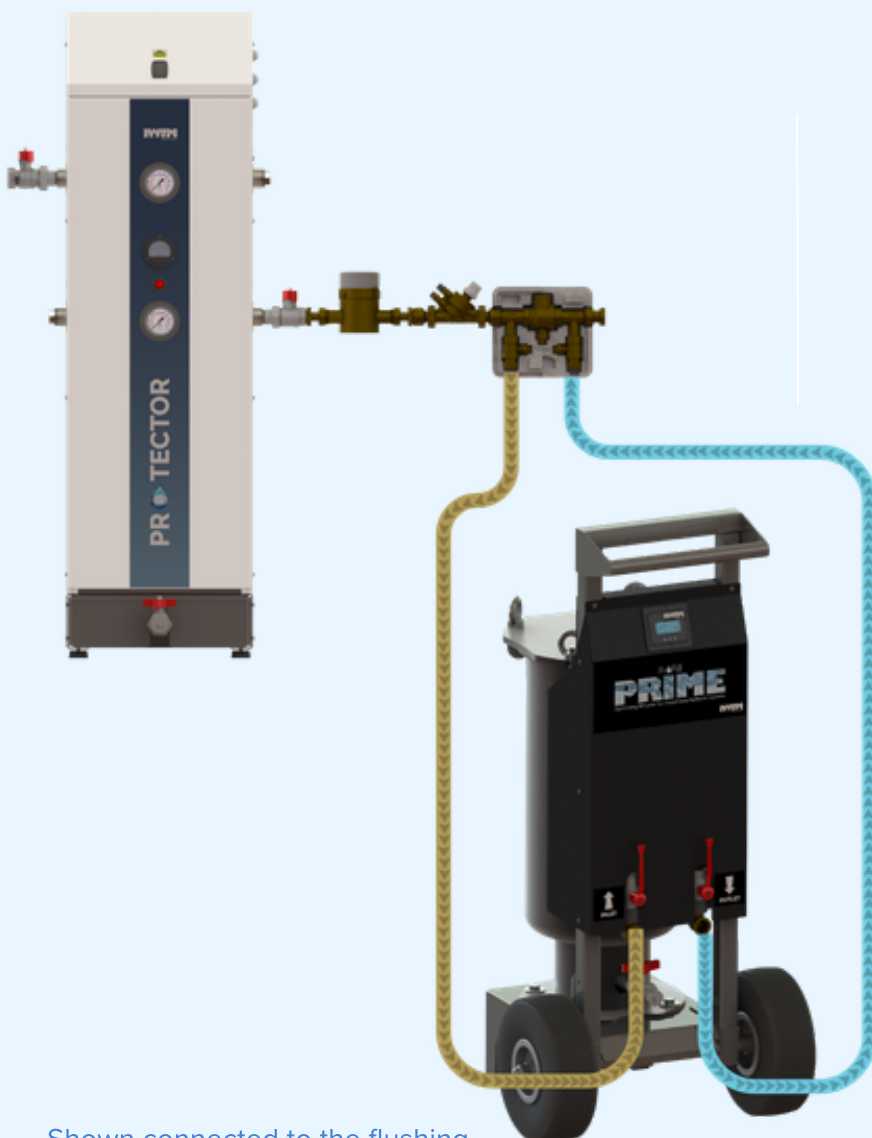
Flow range : 2.0 - 60 l/min.

Working temperature : 0 – 80 °C

Pressure : Max. 10 bar

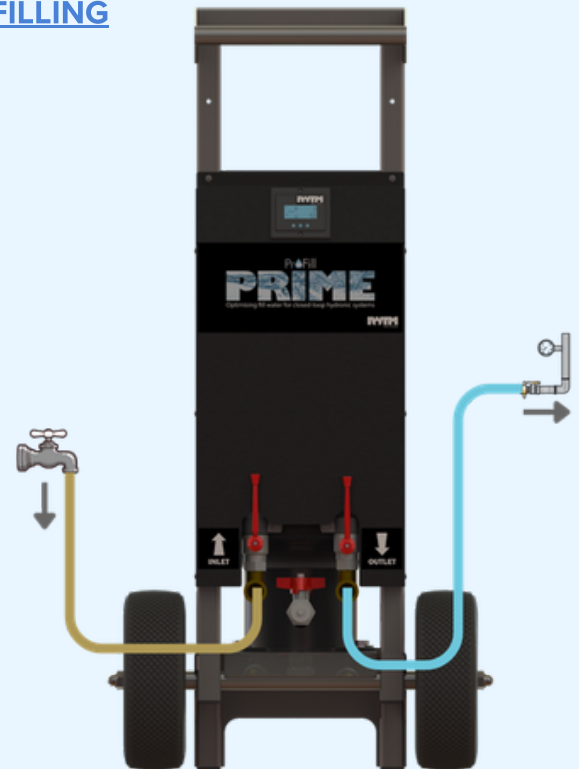
FILLING AND RINSING SYSTEMS DIAGRAM

RINSING



Shown connected to the flushing by-pass supplied with the Protector.

FILLING



Connection principle only, ensure local water authority guidelines are followed.

ACCESSORIES

Part No.	Description
PRIME – Complete Unit	
170171	PROFILL PRIME 12.5L
170172	PROFILL PRIME 25L
PRIME – Spare Parts	
210111	HOUSING GASKET Ø273 (EPDM) – O-Rings
170143	AAV
200032	CONDUCTIVITY/TDS METER
PRIME – Ion Exchange Resin	
201651	PRIME PH RESIN 12.5L
200922	PRIME RESIN 12.5L





WARRANTY CONDITIONS

The stainless steel tank assembly for IWTM Protector® units, including the Protector, ProFill, ProFill Prime and the marine units, models T50/T100/T260/T500/T800 and T1000, is guaranteed for a period of 25 years against rusting through. This warranty is subject to the following conditions:

Protector and Industrial unit warranties will only be validated if the system is installed, with manufacturers recommendations, with an appropriate ProFill demineralising device ensuring that all manual or automatic make up and refill water is demineralised in accordance with VDI 2035.

Periodic maintenance must be undertaken at least every 12 months in accordance with our manuals, proven to have been carried out by a specialist service company with clear, documented evidence.

This 25-year warranty only extends to the main tank and not to any supplied accessories, meters, AAVs, anodes, filters, etc. The warranty provides for a replacement product only and not for labour or any other costs associated with the replacement of the equipment.

PLEASE SEE OUR FULL TERMS AND CONDITIONS ON YOUR
QUOTATION FOR FURTHER DETAILS

Environmental Culture Change

be a part of it

clean | protect | prevent



Founded in 1992, IWTM have been working with chemical free water treatment using electrochemistry for over 30 years and have offices in Norway, UK, Finland, Sweden, Canada, USA and a worldwide presence in the Marine sector.

We have developed models specifically suited to the higher demands of the marine industry operating at higher pressures and higher temperatures. The marine products are provided worldwide on the world's largest cruise ships working with the leading operators in this sector.

Having secured DNV approval in 2003, we are still the only chemical free water treatment manufacturer to have this certification and approval. DNV is a globally leading quality assurance and risk management company operating in more than 100 countries.

The IWTM Protector® is our most recently developed product. The Protector range is now available to our land-based customers.

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