

# PROTECTOR DIGITAL

FOR P10, P25, P40 & P70

ALL-IN-ONE FILTRATION AND WATER TREATMENT UNIT  
WITH REAL TIME MONITORING.



[WWW.IWTM-UK.COM](http://WWW.IWTM-UK.COM)

T: +44 208 255 2903

E: [INFO@IWTM-UK.COM](mailto:INFO@IWTM-UK.COM)

# TABLE OF CONTENTS

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**03** PROTECTOR DIGITAL DESCRIPTION

**04** TECHNICAL DATA

**07** PROTECTOR FUNCTIONS

**08** FILTERING ELEMENTS

**09** DETAILED INTERNAL AND  
EXTERNAL VIEW

SEE P25, P40, P70 MANUAL FOR  
FURTHER DETAILS.



# PROTECTOR DIGITAL DESCRIPTION

ALL-IN-ONE FILTRATION AND WATER TREATMENT UNIT WITH REAL TIME MONITORING.

## WHAT IS IT?

IWTM Protector™ Digital uses the same technology as our analogue range, but as well as protecting your water system, Protector Digital also constantly collects live data, which can be used to analyse what is happening in the system and provide advanced warning of the need to perform preventive maintenance, thus saving you time and money.

Protector is a unique side stream filtration device that engineers the system water to a non-corrosive state. It provides corrosion protection in both new and existing heating and cooling systems, by removing sludge, particles, oxygen, and other corrosive products. Therefore, the system is maintained in the best possible way, by constantly filtering and engineering the water using electrochemistry and anode technology. The result is that its cleaning and engineering the water at the same time.

## NEXT GENERATION OF ELECTROCHEMISTRY

The units provide faster clean-up of old systems and quicker compliance with pre commissioning targets on new systems due to the higher flow rates through the reaction tank (cathode) and the inbuilt ss micron filter that enables finer filtration. The unscreened larger anodes last longer and release the magnesium hydroxide quicker for faster pH control. Compliance with VDI 2035 is still obtained as the anodes sit inside the basket to capture the magnesium residue when the anodes expire.

Each filter contains neodymium magnets to retain ferrous particles, magnesium anodes to consume oxygen and increase the pH value, and a stainless-steel micron filter (40µm) or bag filter (various micron sizes, down to 1 µm) to filtrate the water and remove any suspended solids. The two filter types are entirely interchangeable.

## HOW DOES IT WORK?

The Protector is completely insulated and cladded to prevent heat loss and condensation.

In closed systems the typical installation will be in side stream, but it can also be installed in the main flow in a modular arrangement for larger systems. This provides a method of easy installation, operation and maintenance. You can either connect the Protector Digital's data to your building control system using one of the Protector's built-in protocols, or connect it to the Internet and let it send the data to IWT Database, which can be monitored and analysed both by you and our specialists. Protector is equipped with a large touchscreen, allowing you to see the data even without connecting the Protector to any network.

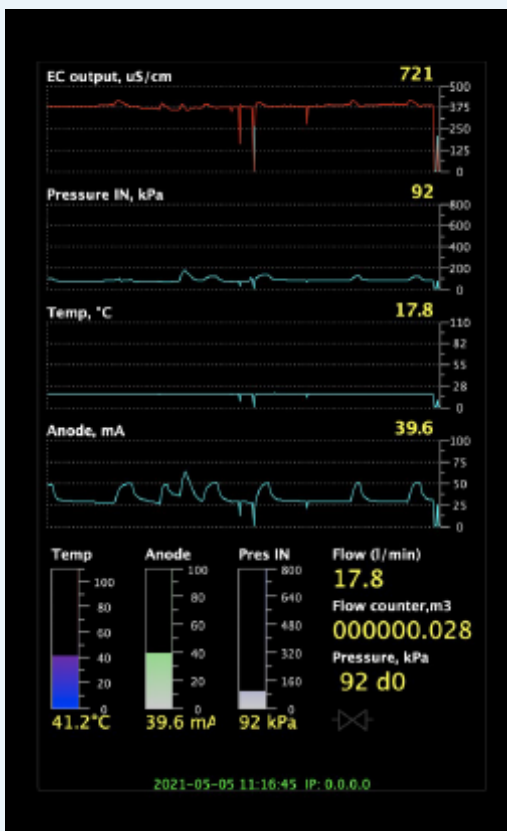
The water enters from the inlet connection, then passes around and down past magnets and anodes. The dry internal magnets will prevent the ss micron filter from clogging up as the magnet sleeve will retain the magnetic particles (magnetite) in place until the magnet is removed for cleaning and blow down. During this process, oxygen will be consumed by dissolving the anodes, and excess air will rise up and out of the vent valve. The water will now flow through the filter element/ filter bag so that particles will physically be stopped by either of the filters. The result will be clear water with controlled alkaline pH, without oxygen or particles and sludge.

## MAINTENANCE

When the progressive build-up of suspended solids retained by the ss micron filter causes an excessive increase of pressure differential between the inlet and outlet connections, the ss micron filter must be cleaned. To perform the cleaning operations, there are two options either a normal backflush of the filter or by complete removal and washing of the filter. The filter can be used to remove chemicals and inhibitors but works well with organic glycol.

# TECHNICAL DATA

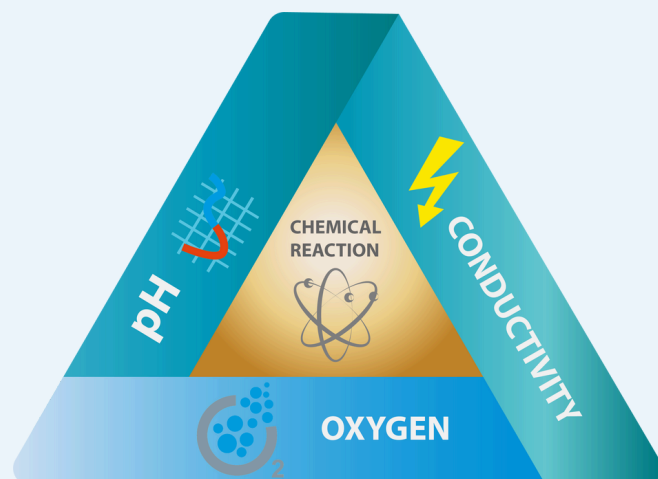
Value	Range	Standard	Full
Water flow	3..50 l/min	✓	✓
Flow counter	0..9999 m3	✓	✓
Water temperature	0..110 °C	✓	✓
Electrical conductivity (EC)	0..2000 uS/cm	✓	✓
Anode current	0..200 mA	✓	✓
Pressure	0..1000kPa (10bar)	✓	✓
Pressure difference	0..100kPa	✓	✓
pH	0..14	✓	✓
Dissolved oxygen (DO)	0..100% saturation	⊖	✓



Protector Digital measures and monitors three key requirements of VDI 2035 to

- pH
- Conductivity
- Dissolved Oxygen

as well as anode output, flow, temperature, pressure and pressure differential over the filter.

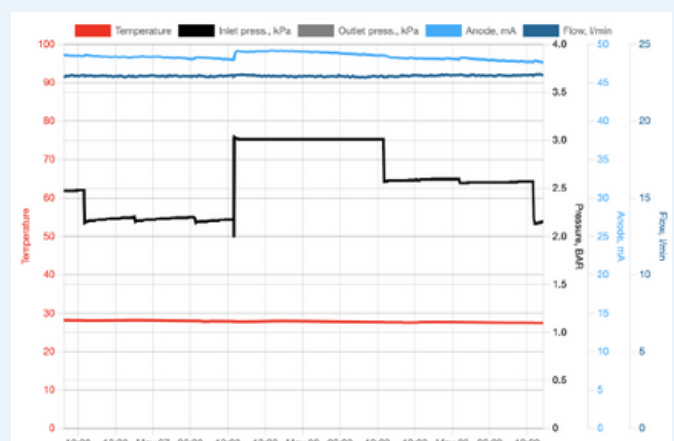
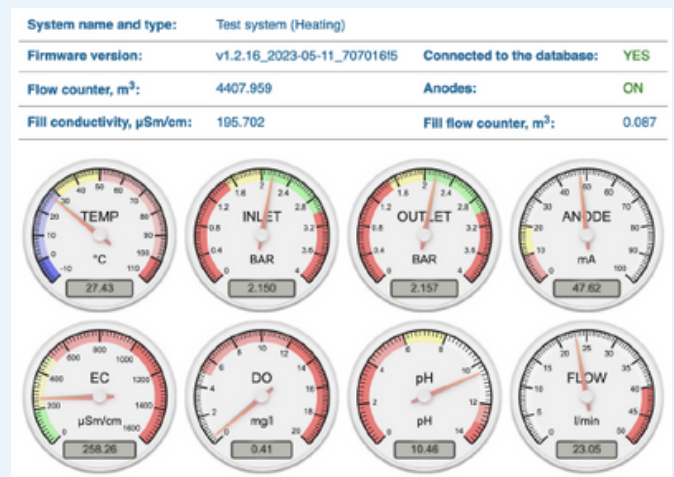


# TECHNICAL DATA

## COMMUNICATION PORTS AND PROTOCOLS

Port	Protocol	Usage
RS485 1	MODBUS RTU/Master	1. MODBUS/RTU sensors (pH, DO, ORP) 2. Digital Filling Unit
RS485 2	MODBUS/RTU Slave	Connect to a building control system
4..20mA input	-	1. 4..20mA pH/DO/ORP sensors 2. Pressure sensors
4..20mA out	-	Connect to a building control system
Ethernet RJ-45	MODBUS/TCP	Connect to a building control system
	BACNet/IP	Connect to a building control system
	HTTPS (out)	Send data to IWT CRM.
	HTTP (in) on local port 80	Local web-server. View data on the Protector built-in web page

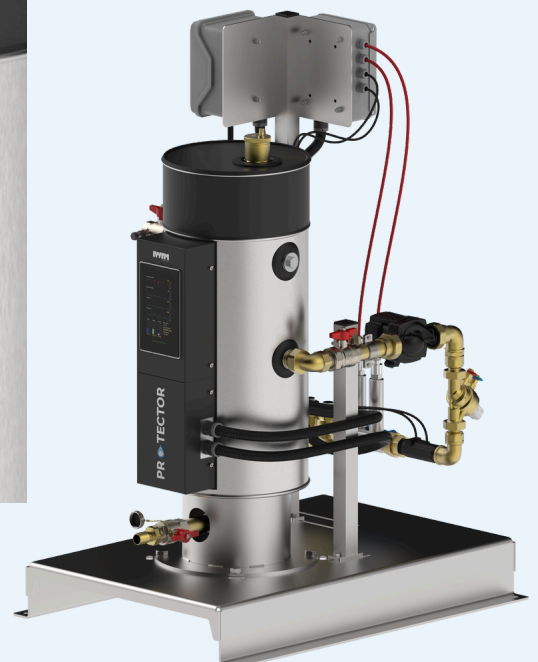
- DHCP client for TCP/IP. When you connect Protector Digital to your LAN, it will try to automatically obtain IP address from your DHCP server.
- Modbus-RTU slave (over RS485). You can connect the Protector Digital to different gateways using RS485 interface. Instant values from all sensors are provided by Modbus-RTU.
- Modbus-TCP. The most convenient way to connect Protector Digital to your building control system. Many systems support Modbus-TCP, and Protector Digital allows getting instant values from all the sensors by this protocol.
- Built-in web-server. Using the IP address on screen, you can connect to the Protector Digital using any Internet browser. You will see a web-page showing all instant and historic data in charts.
- BACNet/IP. Used to connect Protector to a Building Control System (BCS).



# TECHNICAL DATA

## SUPPORTED SENSORS

Value	Manufacturer	Output	Model	Comment
EC/T/Flow	IWTM	Raw	FS-8800	7 wires connected directly to terminals
Pressure	Any	4..20mA	Any	Range 0..1000kPa
pH	Hamilton	4..20mA	POLILYTE PLUS H ARC 120	
DO	Hamilton	RS485	VisiFerm RS485 -ECS 120 H4	
Conductivity	Hamilton	4..20mA	CONDUCELL UPW ARC PG13,5	
Flow	Any	Pulse	Any	Supports hall-effect (3-wire with 5V power) and mechanical (2-wire) turbine flow meters
Anode current	n/a	Current	n/a	Direct connection to terminals. Max current is 200mA.

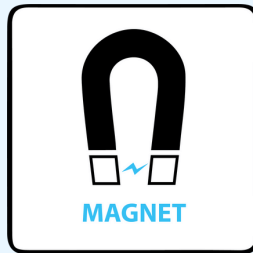




# PROTECTOR DIGITAL FUNCTIONS



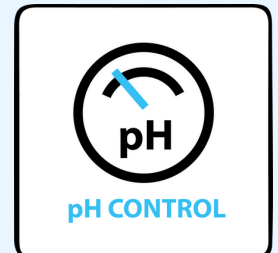
PARTICLE  
FILTRATION



MAGNETIC  
PROTECTION



REDUCES  
DISSOLVED OXYGEN



CORROSION  
PREVENTION

## Prevents Corrosion

Protector's water treatment features prevent corrosion in the system. This is achieved thanks to magnesium anodes that lower oxygen, regulate pH, and reduce electrical conductivity.

## All In One

Protector is an "all in one solution". It combines several different technologies in one single extremely functional and reliable device.

## Traps Ferrous Particles

Protector is equipped with Neodymium Magnets that trap ferrous particles, drastically increasing the time before manual intervention is needed.

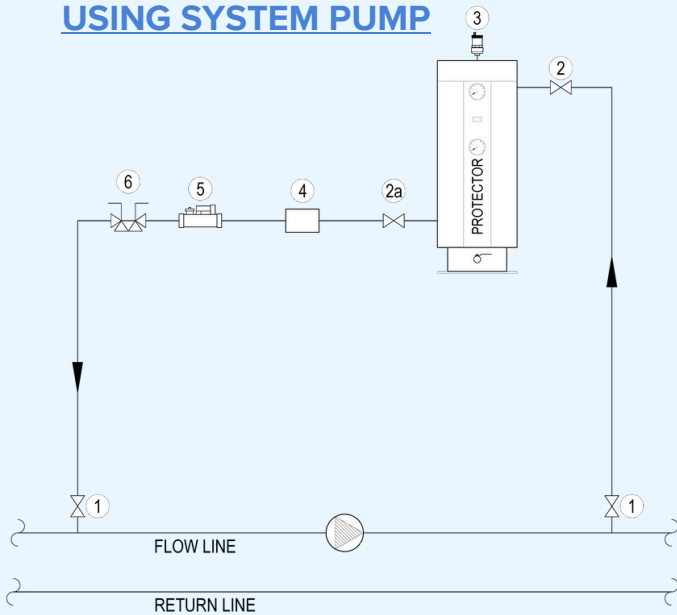
## Removes Contamination

Protector cleans and restores recirculating systems by removing suspended particles.

+ PROVIDES	- REPLACES
Sludge and particle removal	Bag filters
Magnetite Removal	Magnet filters
pH adjustment	Chemicals
Oxygen consumption	Air separators
Anodic water treatment	Dosing pots + automatic dosing systems

# PROTECTOR DIGITAL FUNCTIONS & FILTERING ELEMENTS

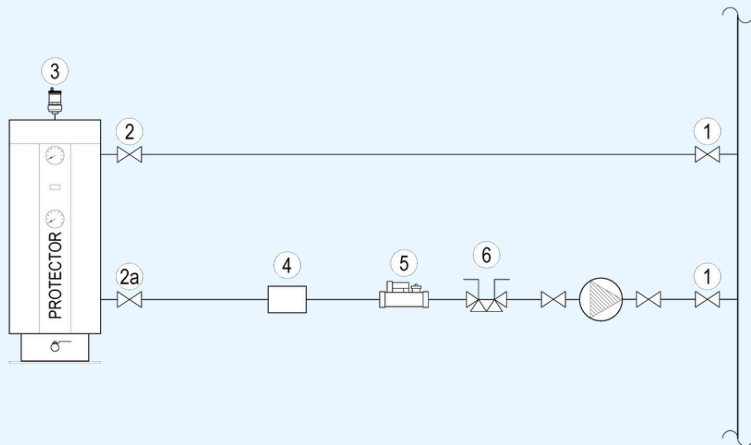
## USING SYSTEM PUMP



Protector keeps your system clean by adapting to your needs. Two different filtering elements, completely interchangeable, remove suspended particles from the recirculating system.

The use of different gauge filters by progressive stepped filtration helps to avoid filters blocking too early.

## USING INDIVIDUAL PUMP



## FINE FILTRATION

The ss micron filter can be replaced with filter bags with a filter degree down to 1 µm.

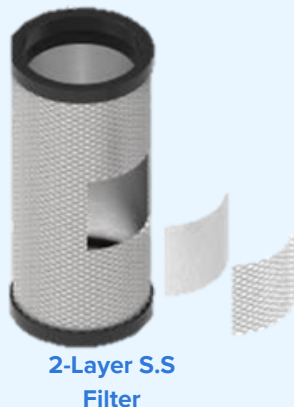


## PARTICLE FILTRATION

Protector comes as standard with a robust stainless steel filter which is 40 micron nominal. Stainless steel AISI 316.

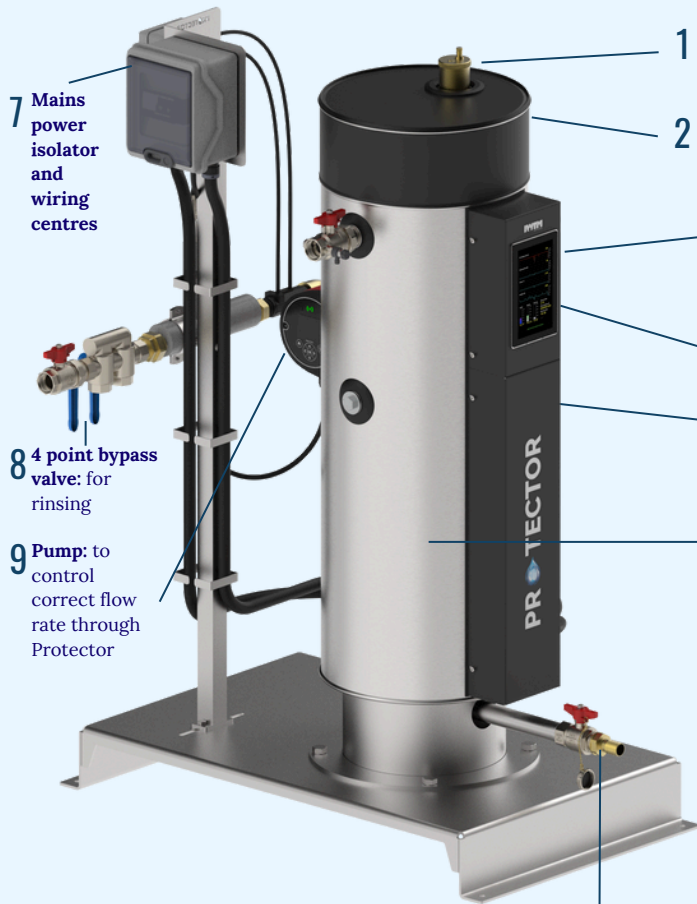
The ss micron filter has a large surface which gives a long operating time before cleaning and thus less flushing and refilling.

*Note: P70 only has 40 micron filter*





# DETAILED EXTERNAL & INTERNAL VIEW



**7** Mains power isolator and wiring centres

**8** 4 point bypass valve: for rinsing

**9** Pump: to control correct flow rate through Protector

**1** Vent pipe + automatic vent valve: An automatic vent valve is installed at the top of the vent pipe.

**2** Top insulation cap: Easily removed when the Protector unit needs maintenance.

**3** Internal Inlet Pressure Sensor: Stainless Steel pressure gauge that measures the inlet pressure. Scale 0-10 bar. (read by control panel)

**4** Touch screen digital display

**5** Internal Outlet Pressure Sensor: Stainless Steel pressure gauge that measures the outlet pressure. Scale 0-10 bar. (read by control panel)

**6** Vessel insulation and cladding: External cladding in stainless steel and internal Armaflex insulation against cold/hot to prevent condensation.

**10** Drain: The filter is emptied with a manual valve in-stalled on the drainpipe. Can be easily connected to any existing drain manifold / pipe, or automatic drain.

**1** Vent valve + vent pipe (not shown): An automatic vent valve is installed at the end of the vent pipe.

**2** Inlet diverter: Water entering the Protector is immediately directed towards the inner walls, accelerating the flow and creating a "vortex" that improves separation efficiency.

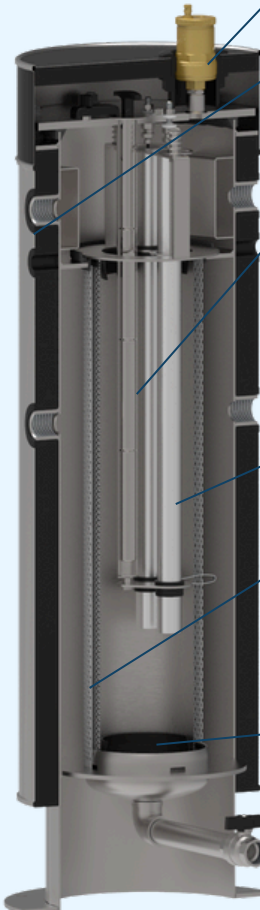
**3** Neodymium Magnets: These dry magnets are installed in front of the sacrificial anodes to protect them from ferrous particles, the neodymium magnets (total length 600mm) are coated in stainless steel to increase their durability and to make maintenance easier. In fact, they do not require manual cleaning because, once extracted from the filter thanks to the handle located on the lid, the dirt precipitates into the filtering element.

**4** Sacrificial Anodes: Magnesium Anodes that provide Cathodic protection and lowers the conductivity of the fluid. The anodes also scavenge oxygen and regulate the pH.

**5** Interchangeable filter elements / bags: Stainless steel filters comes as standard at 40 micron nominal. S.S micron filter can be replaced with bag filters down to 1 µm. This guarantees a supremely clean circulation water that provides optimal values for the plant and its components.

**6** Large collection area: The base design ensures circulation is retained for longer periods, lengthening the time before a manual clean of the filter.

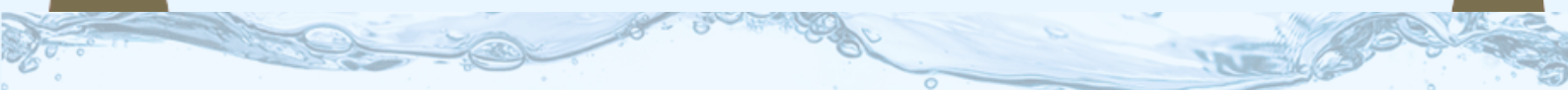
**7** Drain: The filter is emptied with a manual valve installed on the drainpipe. Can be easily connected to any existing drain manifold / pipe.

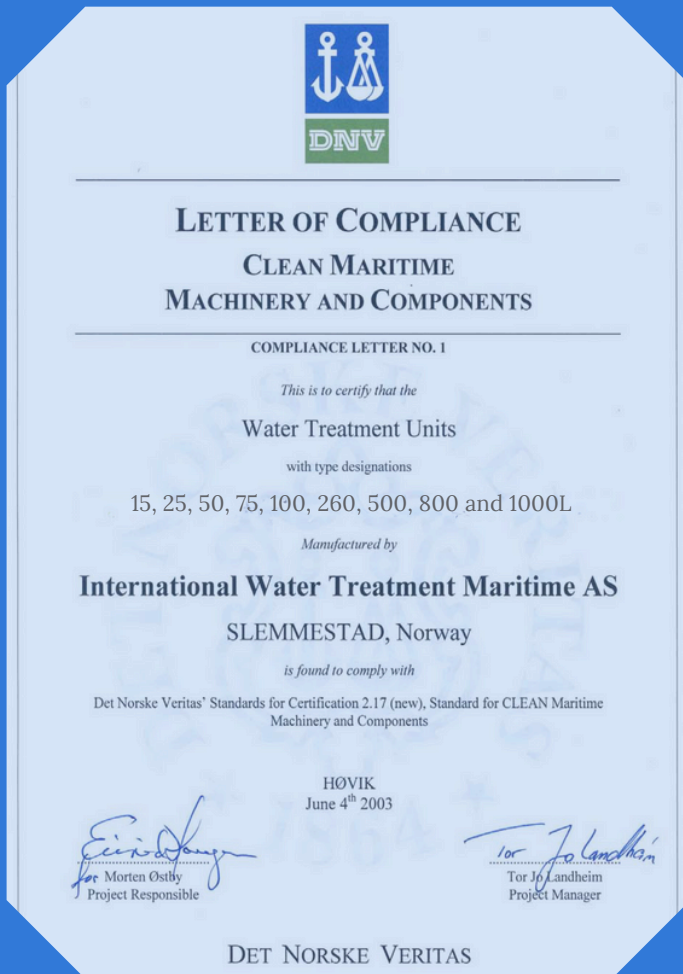


# Environmental Culture Change

*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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SUTTON BUSINESS CENTRE  
RESTMOR WAY WALLINGTON  
SM6 7AH

WWW.IWTM-UK.COM  
T: +44 208 255 2903  
E: INFO@IWTM-UK.COM