water by design

PROTECTOR P40 2022

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PROTECTOR P40 DESCRIPTION

ALL-IN-ONE FILTRATION AND WATER TREATMENT UNIT.

WHAT IS IT?

Protector P40 is a model from our IWTM Protector™ range, 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 strainer basket 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 filter element (55µm) 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.

The Protector P40 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.

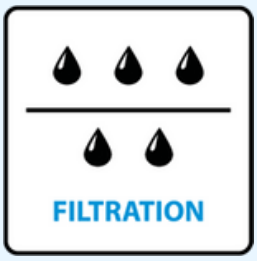
HOW DOES IT WORK?

The water enters from the inlet connection, then passes around and down past magnets and anodes. The dry internal magnets will prevent the filter basket 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.

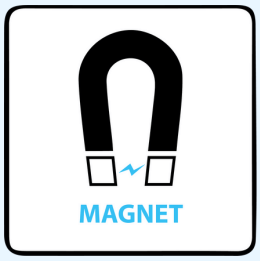
MAINTENANCE

When the progressive build-up of suspended solids retained by the stainless-steel screen causes an excessive increase of pressure differential between the inlet and outlet connections, the screen 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.

PROTECTOR P40 FUNCTIONS

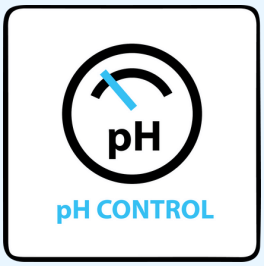


PARTICLE FILTRATION



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

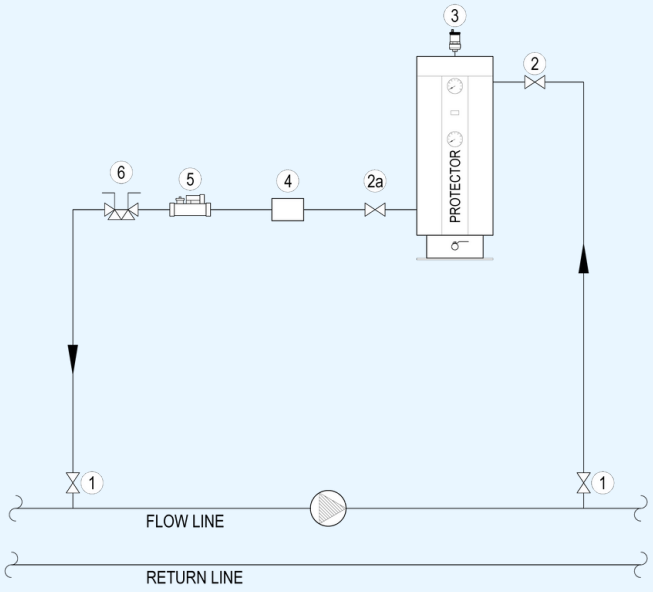
Protector is equipped with Neodymium Magnets that trap ferrous particles, drastically increasing the time before manual intervention is needed.

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 P40 FUNCTIONS



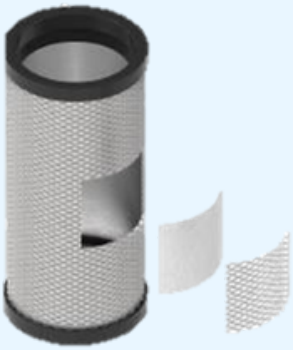
Protector P40 keeps your system clean by adapting to your needs. Two different filtering elements, completely interchangeable, remove suspended particles from the recirculating system.

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

FILTERING ELEMENTS

PARTICLE FILTRATION

Protector P40 comes as standard with a robust stainless steel filter which is 40 micron nominal (55 absolute). Stainless steel AISI 316, 55µm filter.



2-Layer S.S Filter

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

FINE FILTRATION

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

DETAILED EXTERNAL & INTERNAL VIEW

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.

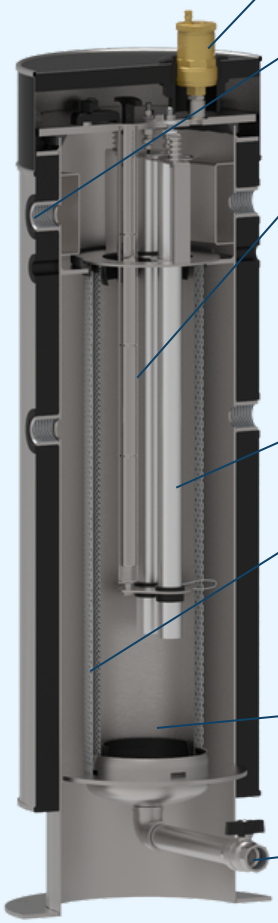
LCD display

The display is a touch panel , here it is shown, flow , pressure, conductivity and anode current, If sensors are connected pH and DO.

3

It can also be used to set desired pressure to make automatic pressure control (refill) , drain andalso shut of anode whencertain parameters are achived

4 **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.

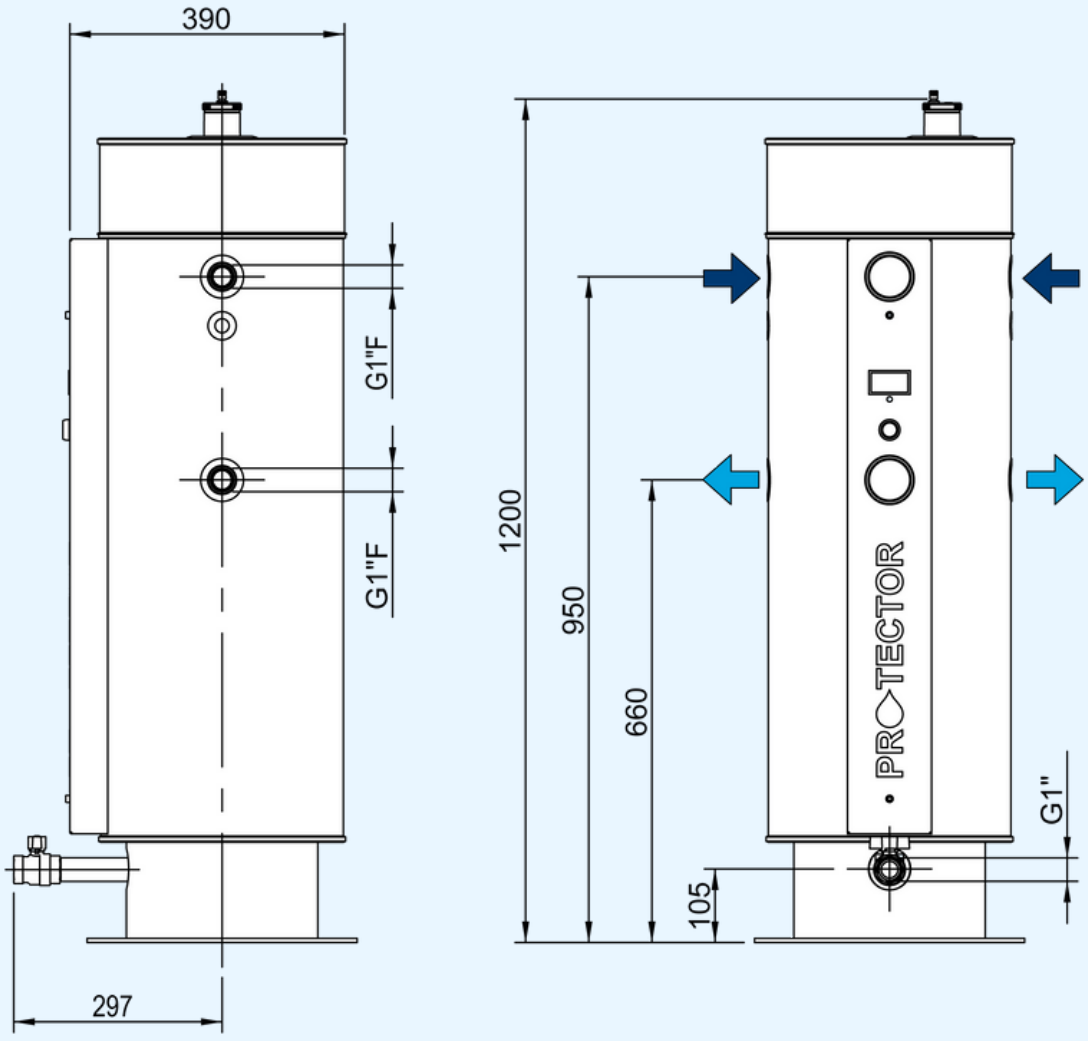
4 **Sacrificial Anodes:** Magnesium Anodes that provide Cathodic protection and lowers the conductivity of the fluid. The anodes also scavenge oxygen and regulate the pH.

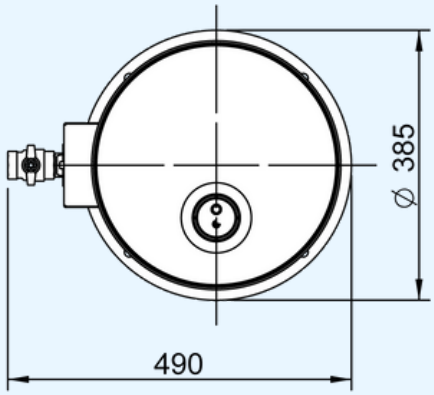
5 **Interchangeable filter elements / bags:** Stainless steel filters comes as standard at 40 micron nominal (55 absolute). S.S filter screens can be replaced with bag filters down to 1 µm. This guarantees a supremely clean circulation water that provides optimal values for the plant and its components.

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.

DIMENSIONS





EMPTY WEIGHT:: 59KG

FULL WEIGHT: 116KG

SHIPPING WEIGHT: 69KG

TECHNICAL DATA

TECHNICAL SPECIFICATIONS

Parameter	Value
System Volume	Max 40m³ - *Heating* Max 30m³ - *Cooling*
Water Flow	20-40 l/min
Design Pressure (bar)	PN 10
Max. Temperature (°C)	95
Tank Volume	57L
Design code	PED 2014/68/EU
Connections	1" FBSP

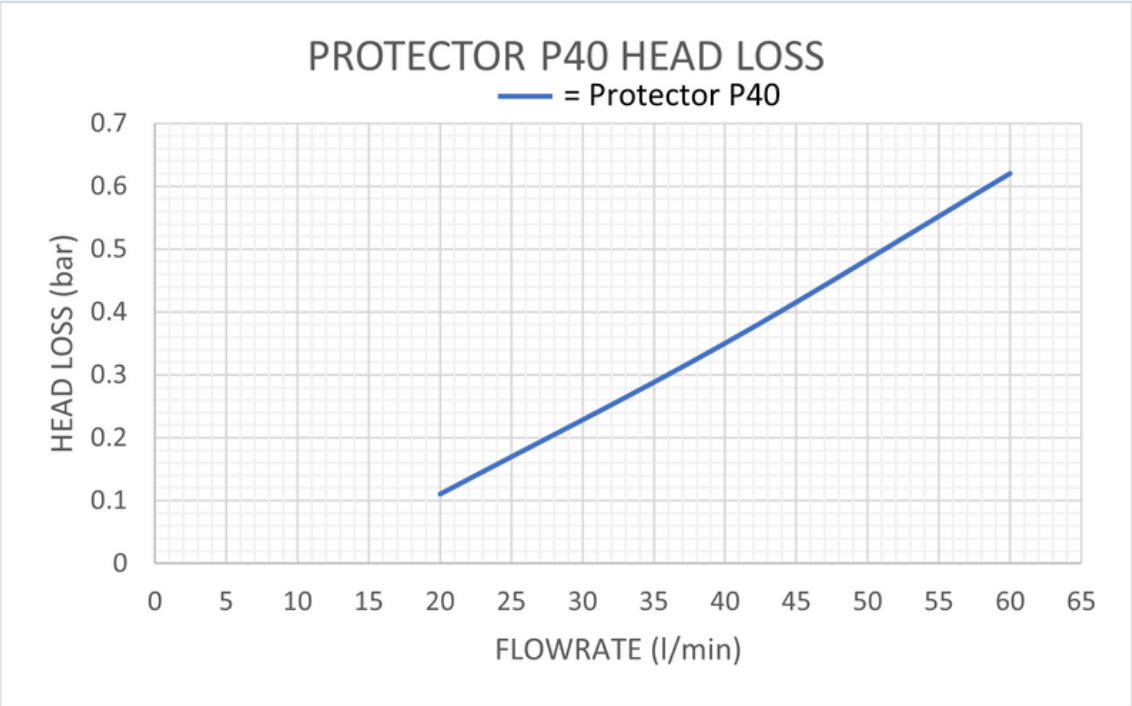
*Flow rate referred to clean water at 110µm filtration degree.

MATERIALS

Component	Component Material
Filter Housing	Stainless Steel AISI 304
Filter Screen	Stainless Steel AISI 316L
Gaskets EPDM *	EPDM *
Insulation / cladding	Armaflex / Stainless Steel
Pressure Gauges	Stainless Steel AISI 304
Anodes	Magnesium
Magnets	Neodymium
Surface Finishing	Shot Peening and Passivation

*Certified for the following European Drinking Water regulations: UBA, DVGW standard W-270, WRAS and ACS.

HEAD LOSS



Head loss is calculated with 110µm stainless steel filter and clean water.

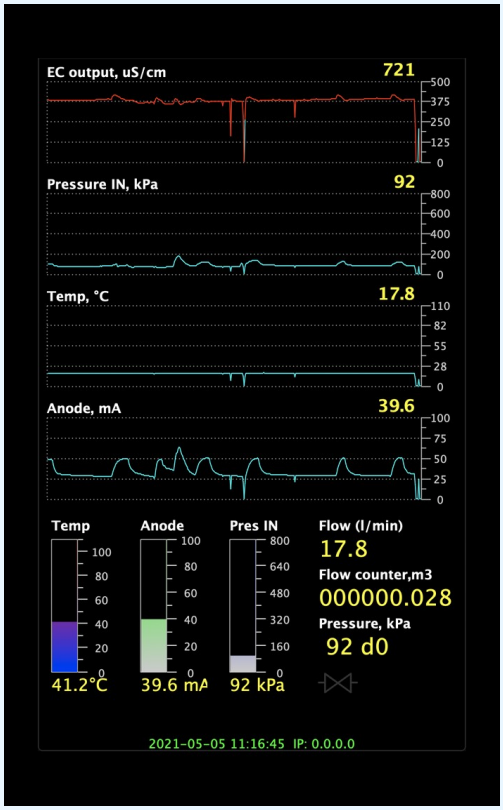
Note: Talk to us for systems that operate at higher pressures or higher temperatures.

DIGITAL

Protector Digital not only protects your water system, but constantly collects a lot of data, which can be used to analyze what happens with the system and perform preventive maintenance, thus saving your time and money.

You can either connect the Protector to you 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 is monitored and analyzed by our specialists.

Protector is equipped with a large touch-screen, allowing you to see the data even without connecting the Protector to any network.



#	Value	Range	Protector Digital				
			Base	Plus	pH	DO	Full
1	Water flow	3..50 l/min	✓	✓	✓	✓	✓
2	Flow counter	0..9999 m3	✓	✓	✓	✓	✓
3	Water temperature	0..110 ºC	✓	✓	✓	✓	✓
4	Electro conductivity (EC)	0..2000 uS/cm	✓	✓	✓	✓	✓
5	Anode current	0..20 mA	✓	✓	✓	✓	✓
6	Pressure	0..1000kPa (10bar)	–	✓	✓	✓	✓
7	Pressure difference	0..100kPa	–	✓	✓	✓	✓
8	pH	0..14	–	–	✓	–	✓
9	Dissolved oxygen (DO)	0..100% saturation	–	–	–	✓	✓
Functions							
10	Automatic drain (sludge back-flush)		–	✓	✓	✓	✓
11	Low pressure alarm		–	✓	✓	✓	✓
12	Low flow alarm		✓	✓	✓	✓	✓

DIGITAL

SUPPORTED SENSORS

#	Value	Manufacturer	Output	Model	Comment
1	EC/T/Flow	IWTM	Raw	FS-8800	7 wires connected directly to terminals
1	Pressure	Any	4..20mA	Any	Range 0..1000kPa
2	pH	Mettler Toledo	4..20mA	InPro3250i	Requires M100 or M200 transmitter from Mettler Toledo in a separate box.
3	DO	Mettler Toledo	4..20mA	InPro6850i	
4	pH	Sensorex	RS485	S272	
5	ORP	Sensorex	RS485	S272	
6	DO	Sensorex	RS485	LUMIN-S	
7	Flow	Any	Pulse	Any	Supports magnetic (3-wire with 5V power) and mechanical (2-wire) turbine flow meters.
8	Anode current	n/a	current	n/a	Direct connection to terminals. Max current is 200mA.

IMPORTANT NOTES:

1. Never connect sensors with the device powered on.

2. MODBUS/RTU (RS485) sensors are detected on boot within 15 seconds. If not detected, please turn off, check connections and turn on.

SETTING A STATIC IP ADDRESS

By default Protector tries to obtain IP-address from a local DHCP server. If you want to use a statis IP, please do the following:

1. Check current IP-address of the PLC on the bottom of the screen.

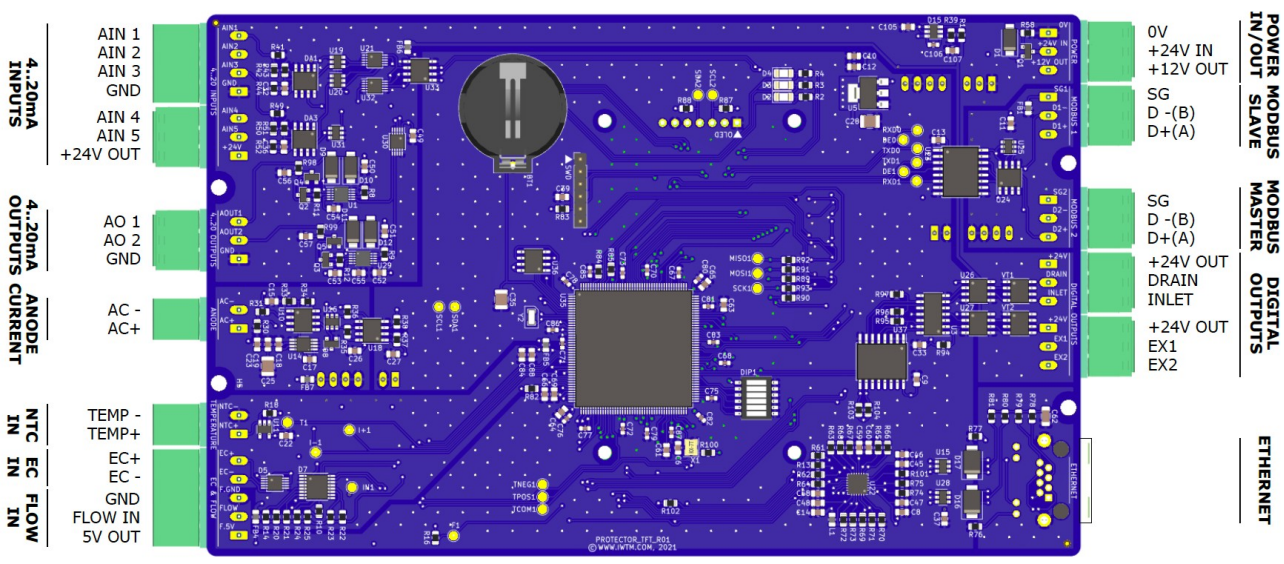
2. In any browser open http://<ip-address>/ipaddr.shtml

3. Uncheck “USER DHCP” and enter address, mask, gateway and DNS.

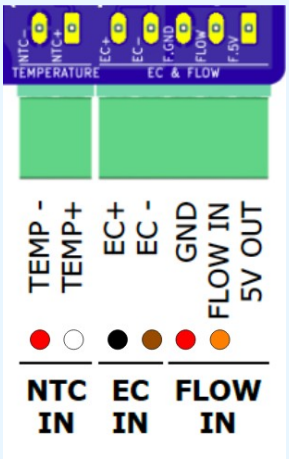
4. Click “SAVE”.

DIGITAL

CONNECTION DIAGRAMS

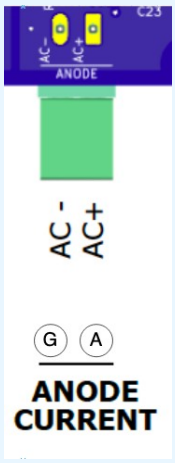


COMBINED METER (EC/FLOW/TEMP)



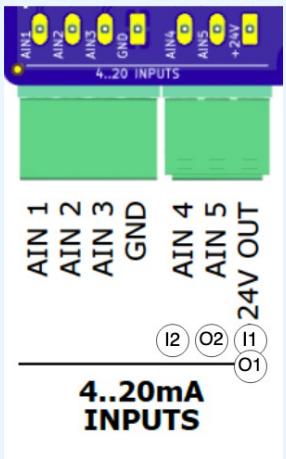
NTC TEMP-	RED
NTC TEMP+	WHITE
EC +	BLACK
EC -	BROWN
FLOW GND	RED
FLOW PULSE	ORANGE

ANODE CURRENT



GROUND	AC -
ANODES (all in parallel)	AC +

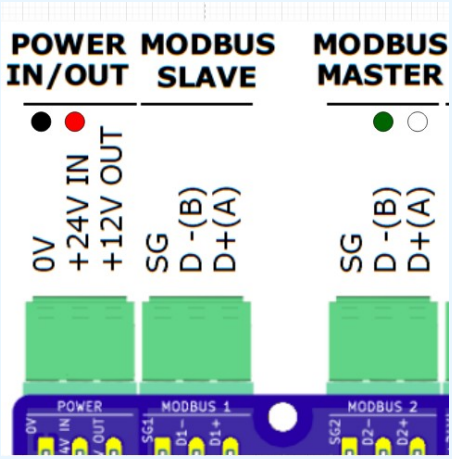
INLET/OUTLET PRESSURE TRANSMITTERS



INLET PIN 1	24V OUT
INLET PIN 2	AIN 4
OUTLET PIN 1	24V OUT
OUTLET PIN 2	AIN 5

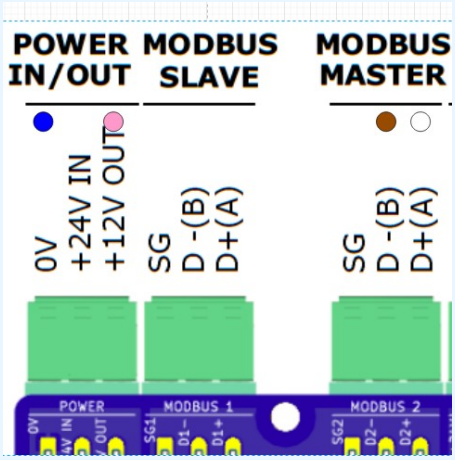
DIGITAL

SENSOREX pH/ORP (MODBUS/RTU)



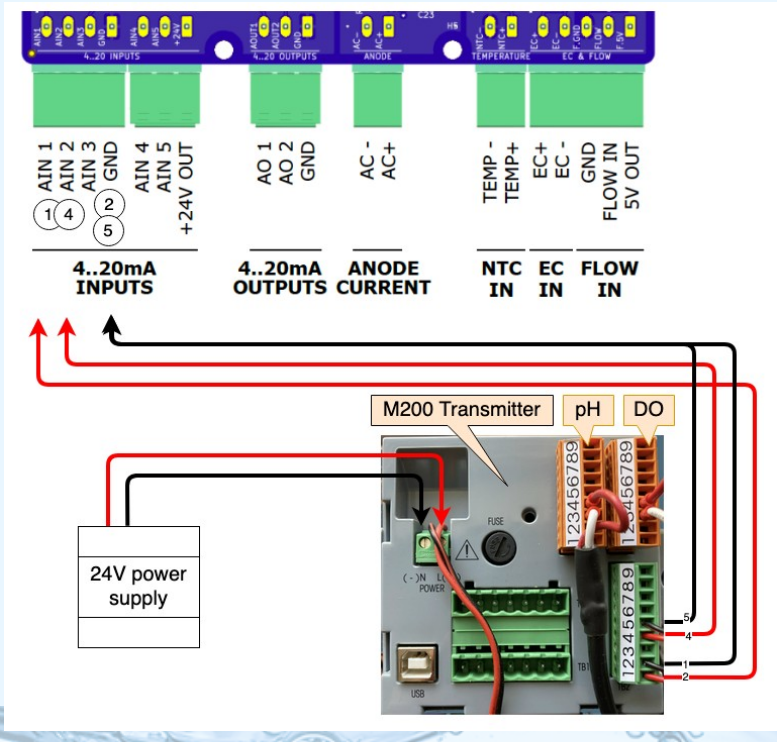
RED V+	+24V IN
BLACK V-	0V
WHITE A+	D+ (A)
GREEN B-	D- (B

SENSOREX LUMIN-S DO (MODBUS/RTU)



PINK 12V DC	+12V OUT
BLUE GROUND	0V
WHITE RS485 A	D+ (A)
GREEN RS485 B	D- (B

METTLER TOLEDO pH/DO WITH M200 TRANSMITTER



M200	Protector
1	AIN 1
2	GND
4	AIN 2
5	GND

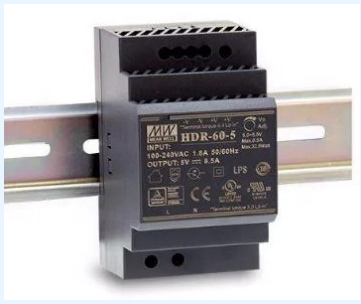
DIGITAL

POWER SUPPLY

Requirements:

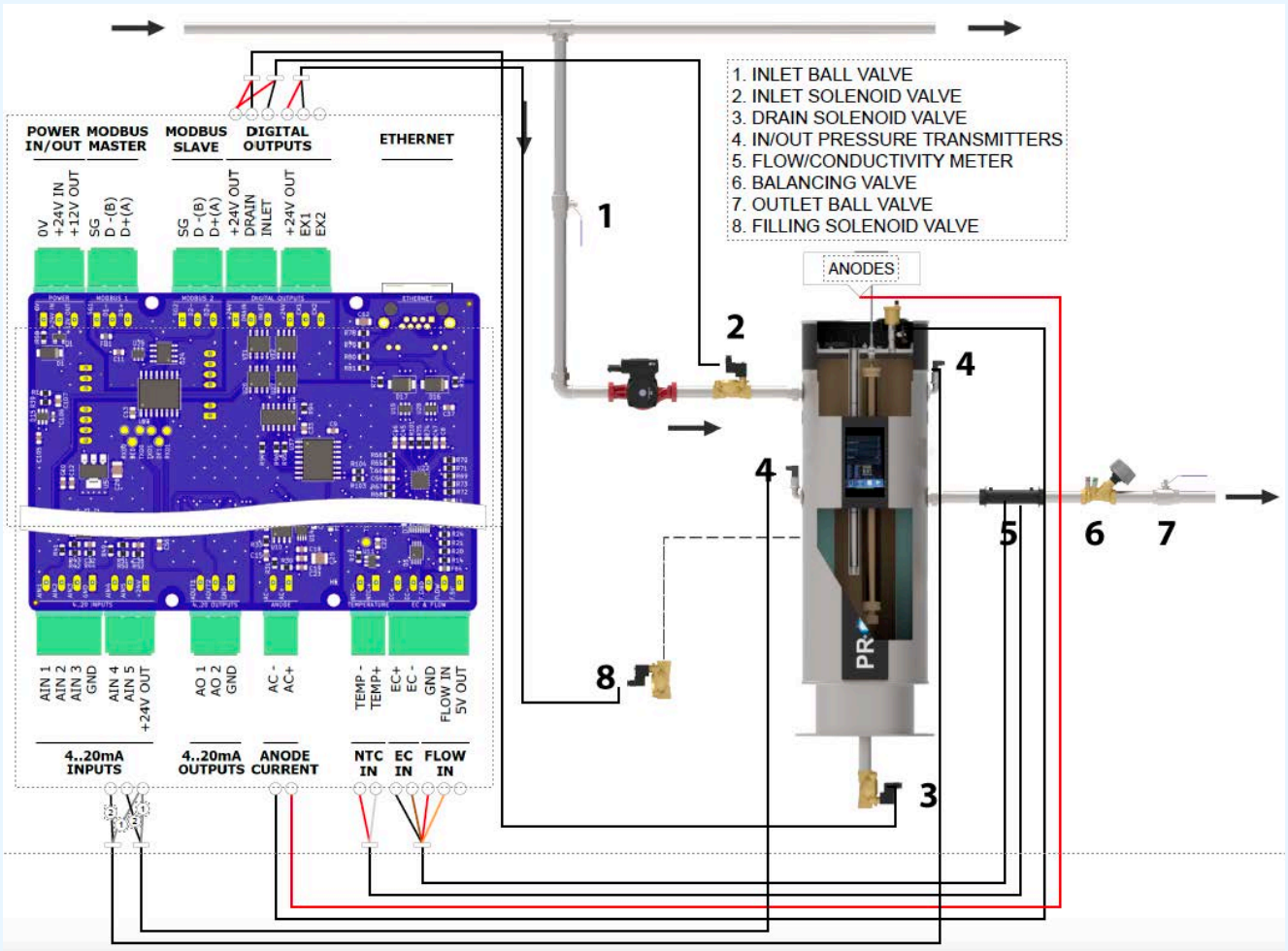
Options	No valves	2 valves	3 valves
Voltage	24v		
Output current	1A	2A	2.5A
Power	40W	65W	90W

Recommended power supplies:

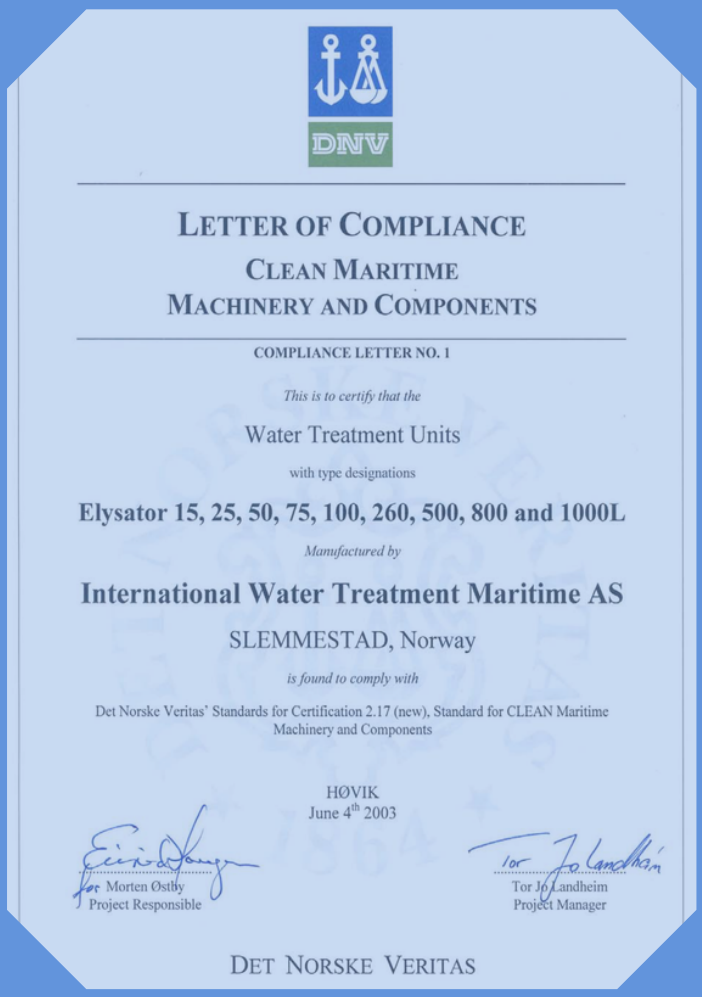
#	Image	Manufacturer	Model	Comment
1		MEAN WELL	HDR-60-24	For Protector Digital
2		MEAN WELL	GST60A24-P1J	For a standalone box: DC plug: 5.5*2.1

DIGITAL

DIGITAL


1. INLET BALL VALVE
2. INLET SOLENOID VALVE
3. DRAIN SOLENOID VALVE
4. IN/OUT PRESSURE TRANSMITTERS
5. FLOW/CONDUCTIVITY METER
6. BALANCING VALVE
7. OUTLET BALL VALVE
8. FILLING SOLENOID VALVE
ANODES
POWER IN/OUT
MODBUS MASTER
MODBUS SLAVE
DIGITAL OUTPUTS
ETHERNET
4..20mA INPUTS
4..20mA OUTPUTS
ANODE CURRENT
NTC IN
EC IN
FLOW IN


IWTM
UK
water by design
Environmental
Culture Change
be a part of it
clean | protect | prevent



DNV

LETTER OF COMPLIANCE

CLEAN MARITIME
MACHINERY AND COMPONENTS

COMPLIANCE LETTER NO. 1

This is to certify that the

Water Treatment Units

with type designations

Elysator 15, 25, 50, 75, 100, 260, 500, 800 and 1000L

Manufactured by

International Water Treatment Maritime AS

SLEMMESTAD, Norway

is found to comply with

Det Norske Veritas' Standards for Certification 2.17 (new), Standard for CLEAN Maritime Machinery and Components

HØVIK
June 4th 2003

for Morten Østby
Project Responsible

Tor Jo Landheim
Project Manager

DET NORSKE VERITAS

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.

Version 2: December 2022

IWTM AS

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