IWTM
water by design

ProFill

DIGITAL FILLING UNIT

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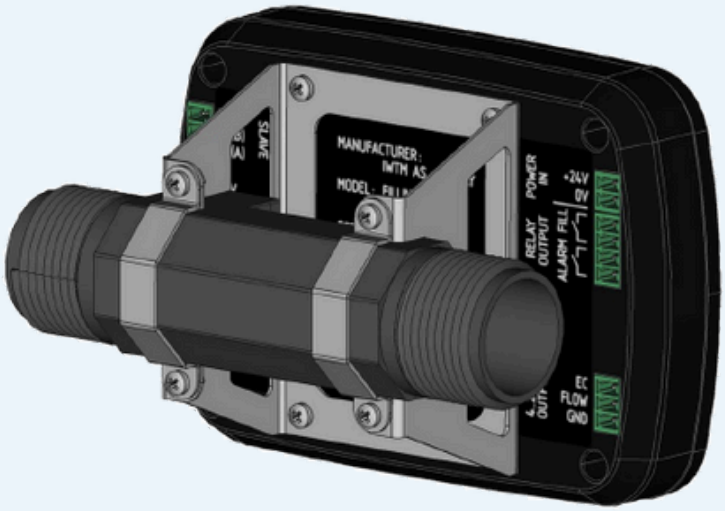
DATA SHEET



OVERVIEW

Our Digital Filling Unit is a device used on our ProFills and ProFill Arrays for measuring the water flow rate and accumulated volume, conductivity and temperature and for sending alarms via our app or to your BMS system.

It can be used:

- With a ProFill or other filling system.
- In any closed or potable water system as an online monitor

It is able to control solenoid valves when the conductivity is too high, and it's time to change the ion exchange resin. It has 4..20mA outputs and Modbus/RTU allow to connect to our Protector or ClearView or to a building management system (BMS) and can send data via a data only sim card slot

Protection:

- IP67 front panel.
- IP44 bottom part.

Pipe thread: 1" BSP

FUNCTIONS

Measure and display:

- instant water conductivity
- instant flow
- total water volume since last reset
- water temperature

Control:

- flow valve (optional), max 250V/5A.
- external alarm (flashlight or buzzer), max 250V/5A.

If conductivity is higher than pre-set value:

- warn by flashing EC value on the display and buzzer
- activate alarm relay output.
- close flow valve (if connected)

Outputs:

- 4..20mA for conductivity and flow
- Modbus/RTU (galvanically isolated).

VALUES MEASURED

Value	Range	4..20mA	Modbus/RTU
Water flow	3..100 l/min	✓	✓
Flow counter	0..999999 m3	-	✓
Water temperature	0..60 °C	-	✓
Electrical conductivity (EC)	0..2000 uS/cm	✓	✓

USER MANUAL

WIRING

1. Connect 24V power supply shipped with the unit to “Power in” connector.

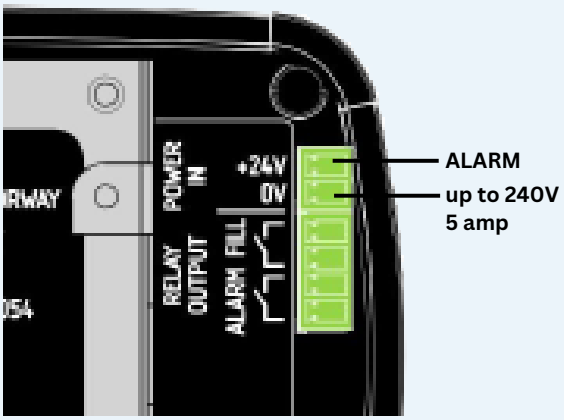
2. If you need an external alarm, connect it to “RELAY OUTPUT/ALARM” and power supply (max 250V/5A AC/DC).

3. Connect 4..20mA outputs to your BMS. They have a common GND pin.

CONNECTIVITY

Alarm

The alarm is connected as shown of the figure on the right. Max voltage for the power source is 250V, max current is 5A.



4..20mA OUTPUTS. Connect the unit 4..20 outputs to corresponding 4..20mA inputs in your system. The GND pin is common for both outputs.

#	Value	Range
1	Water flow	0..100 l/min
2	Electrical conductivity (EC)	0..1000 uS/cm

WIFI AND CELLULAR

DFU can be connected to the Internet by means of a cellular network or WiFi. “REMOTE CONTROL” section of the Mobile application guide (page 7) describes how to connect DFU to a local WiFi network. An IoT SIM-card is needed to connect to a cellular network. Traffic depends on how often the remote control application is used, but normally 25-100Mb/month should be enough.

USER MANUAL

water by design

MODBUS/RTU.

Connect the Digital Filling Unit to your BMS, Protector Digital or any other data collection system using RS485 interface.
Default modbus settings are: Speed 19200 8N1, address 101 (0x65) .
Read holding registers using “0x03” command.
Write holding registers using “0x06” command.

Instant values from all sensors are provided by Modbus/RTU in the following
holding registers:

Reg #	RW	Type	Value	Units	Range
0	R	UINT16	Modbus Address	-	1-254
1	R	UINT16	Modbus Speed	baud	
2	RW	UINT32	Runtime (RTU)	seconds	
6	RW	float dcba	Read: Flow counter Write:):reset the counter	m3	0..999999
8	RO	float dcba	Flow, liters/min, (3...100 l/min) , zero when no flow	l/min	3..100
10	RO	float dcba	Conductivity	uS/cm	0..2000
12	RO	float dcba	Temperature	°C	0..60
16	RO	UINT16	Max Conductivity	uS/cm	0..2000

BUTTONS AND ON SCREEN MENU

BUTTONS AND ON-SCREEN MENU

MAIN SCREEN

1. Water conductivity

Blinking when over limit

2. Conductivity limit

3. Wifi Status

blinking - connecting to network

stable - connected to network

stable - connected to IoT server over WiFi.

4. Cellular status

blinking - SIM card found, connecting

stable - connected to cellular network

stable - connected to IoT server over cellular network

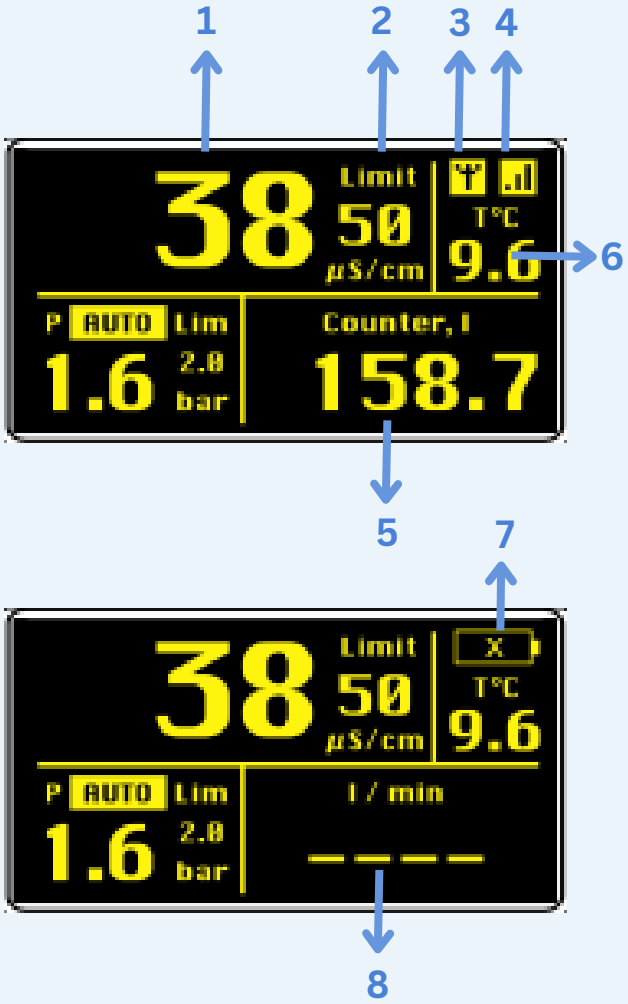
5. Flow counter or flow (8)

Press to switch between counter (5) and flow (8)

6. Water temperature

7. Battery status

Flashing battery status indicates that it's time to replace built-in battery. Battery type is CR2032.



BUTTON FUNCTIONS ON THE MAIN SCREEN

Press				
Single	Open "settings"	-	-	Switch counter/flow
Long	Show QR- Code	-	-	Reset main flow counter

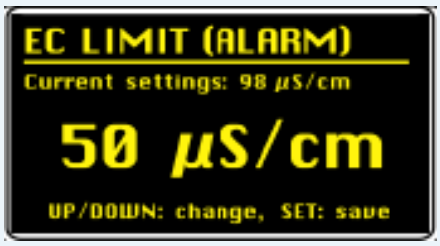
BUTTONS AND ON SCREEN MENU

SETTINGS

1. Press ⚙ button to open the Settings screen
2. Use △ and ▽ buttons to select an item
3. Press SET to open the item

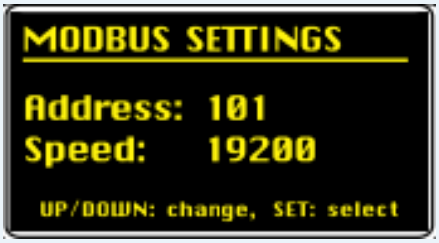
EC LIMIT

1. Use △ and ▽ to change value
2. Press SET to save value and return to main screen



MODBUS SETTINGS

1. Use △ and ▽ to change current field (blinking)
2. Press SET to save value and select next field
3. Press ⚙ button to exit to the main screen

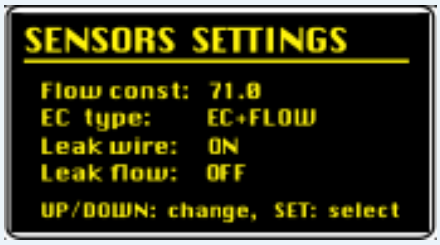


DATE AND TIME

If DFU is connected to the Internet it will take exact time from the net, so there is no need to set it manually.

1. Use △ and ▽ to change current field (blinking)
2. Press SET to save value and select next field
3. Press ⚙ button to exit to the main screen

SENSOR SETTINGS



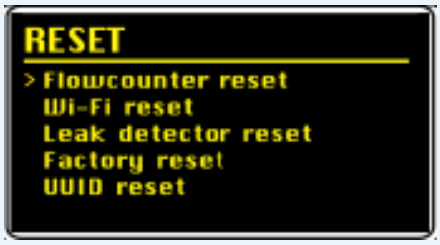
1. Use △ and ▽ to change current field (blinking)

2. Press SET to save value and select next field

3. Press ⚙ button to exit to the main screen

For “EC type” select “EC+FLOW” for a combined EC-flow-temperature sensor (default), or “EC only” for any other combination of EC and flow sensors.

RESET MENU



1. Use △ and ▽ to select an item

2. Press SET to open the item.

3. Press and hold SET button to reset and return to the main screen.

Description

1. “Flowcounter reset” will set main flow counter to 0.

2. “Wi-Fi reset” will erase WiFi settings. New WiFi connection can be set up only using mobile application.

3. “Factory reset” will erase all data except module identity number (UUID).

4. “UUID reset” will reset module identity number. Use this function if you want to be sure that the module cannot be controlled remotely by any mobile device it was added to before. For example, if you have got a used DFU from another person or company.

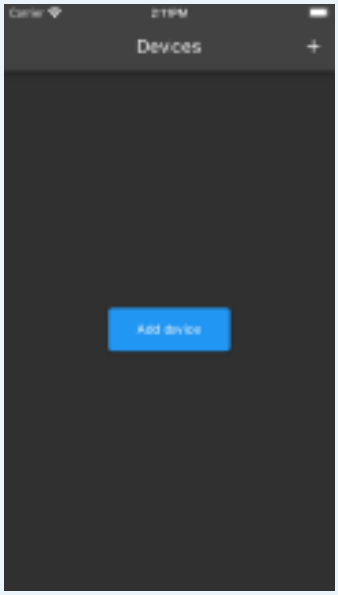
REMOTE CONTROL

REMOTE CONTROL

DFU can be controlled remotely from Android or iOS mobile application called “DFUremote”. The unit has to be connected to the internet via WiFi or cellular network. Download the application from Play market or AppStore:

On DFU press ⚙ for 2 seconds to show QR-code

On mobile run the app and tap the “Add device”



Scan the QR-code with device camera.

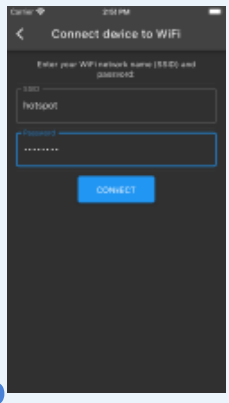
Select connection type: cellular or WiFi.

CELLULAR CONNECTION

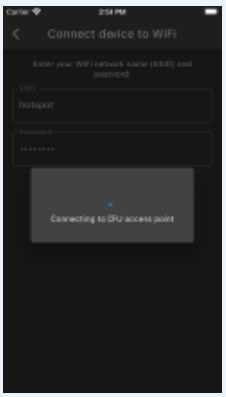
1. Insert an IoT nano sim-card into slot on the bottom side of DFU.
2. Wait until cellular indicator looks like this: 📶

WIFI CONNECTION

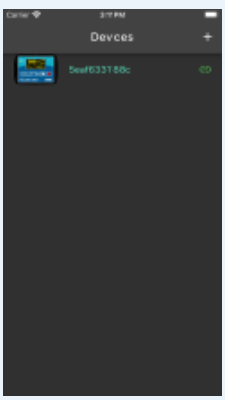
Enter your local WiFi name and password.



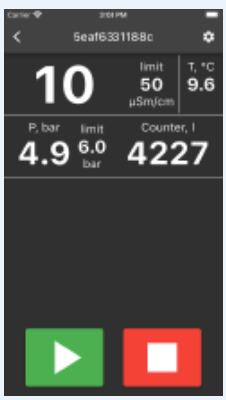
Wait until the DFU is configured



If connected the app will show list of devices.



In case of a single device the app will switch to it.



MOBILE APP

MOBILE APP

Device list

1. Device UUID or name (if set)
2. Alarm indicator
3. Online indicator
4. Rename/Delete buttons (swipe to the right to see)

Device details

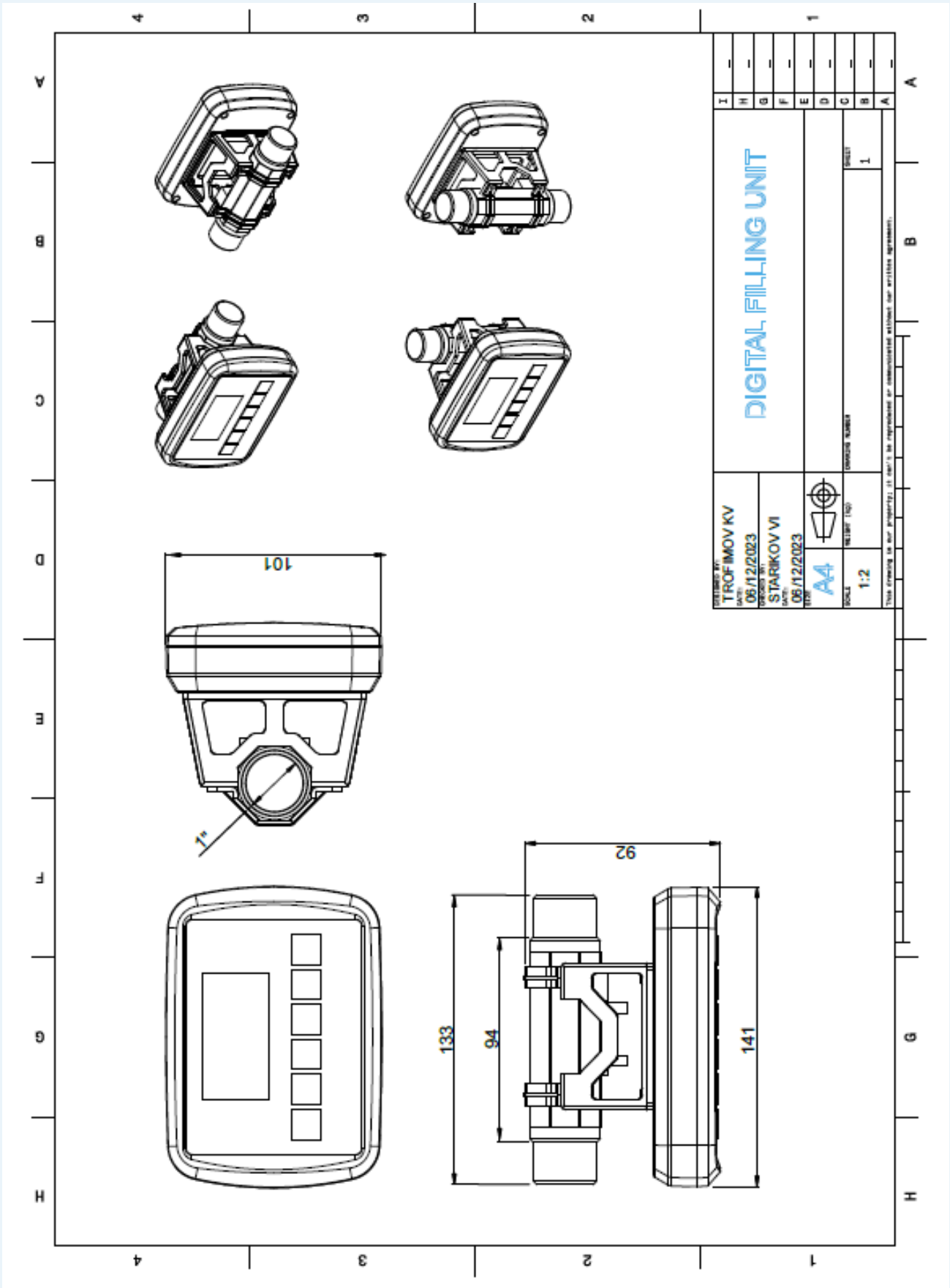
6. Conductivity
7. Conductivity limit
8. “Settings” button (opens device settings page)
9. Water temperature

13. Flow counter, liters
14. Flow, liter per minute

Device Settings

1. Device name
2. Edit device name
3. Delete device
4. Online indicator
5. Push notifications switch.
If off, the device will not send any notifications to any mobiles.
6. Reset flow counter
7. Change conductivity limit

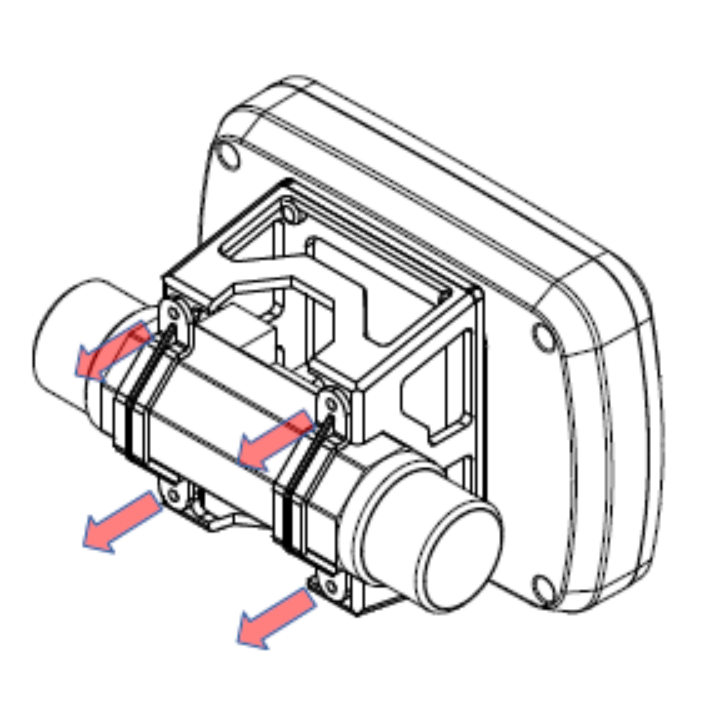
DIMENSIONS

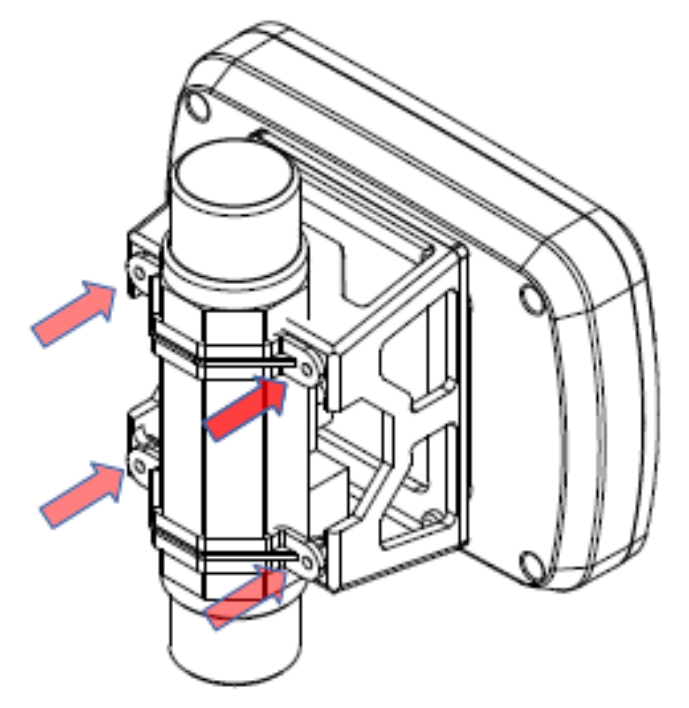

DIGITAL FILLING UNIT
TROFIMOV KV
06/12/2023
STARIKOV VI
06/12/2023
A4
1:2
101
1"
92
133
94
141

BRACKET

MOUNTING ON A VERTICAL PIPE

1. Remove 4 screws on the back side.
2. Rotate the pipe.
3. Fix the pipe with the screws.





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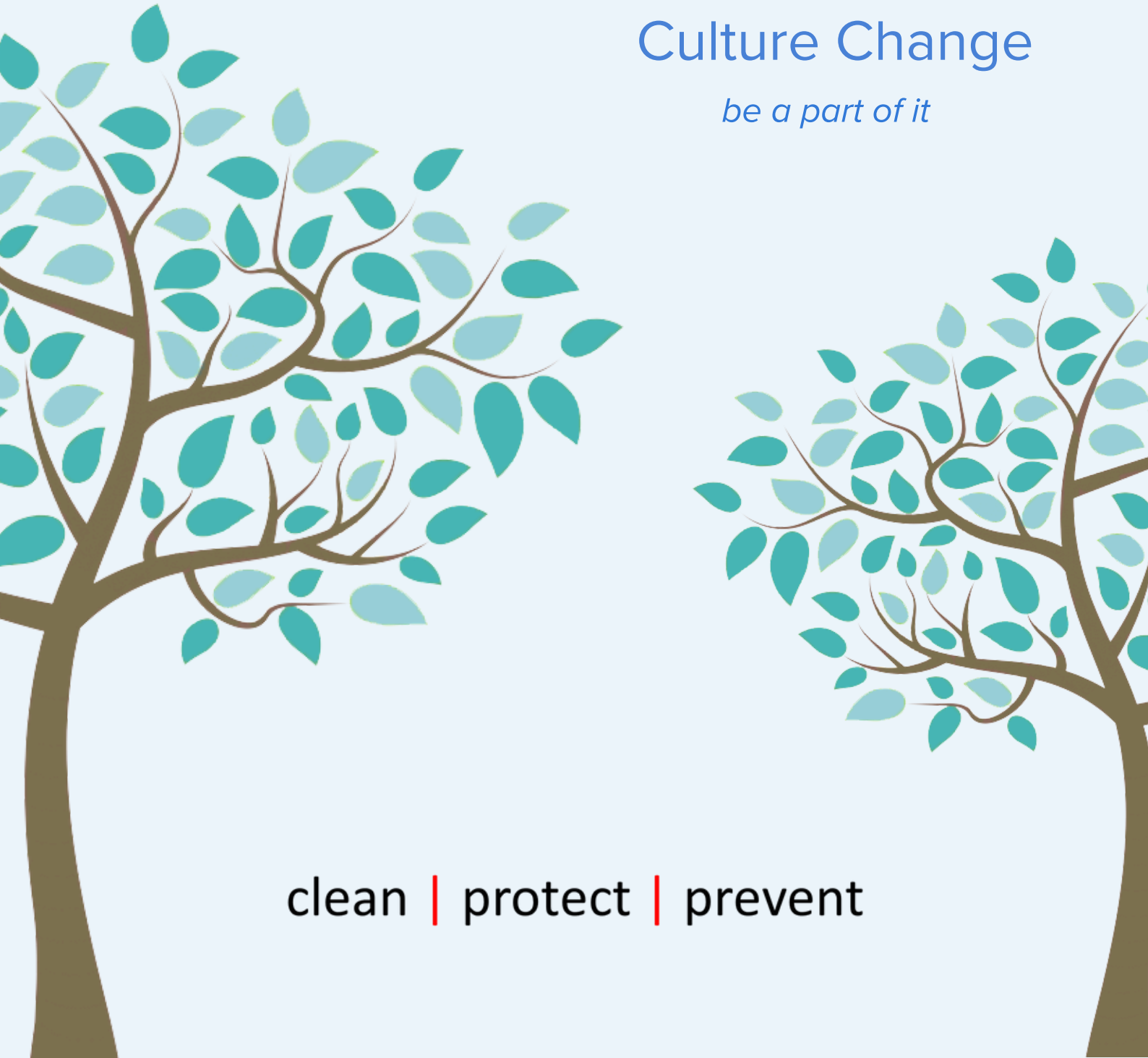
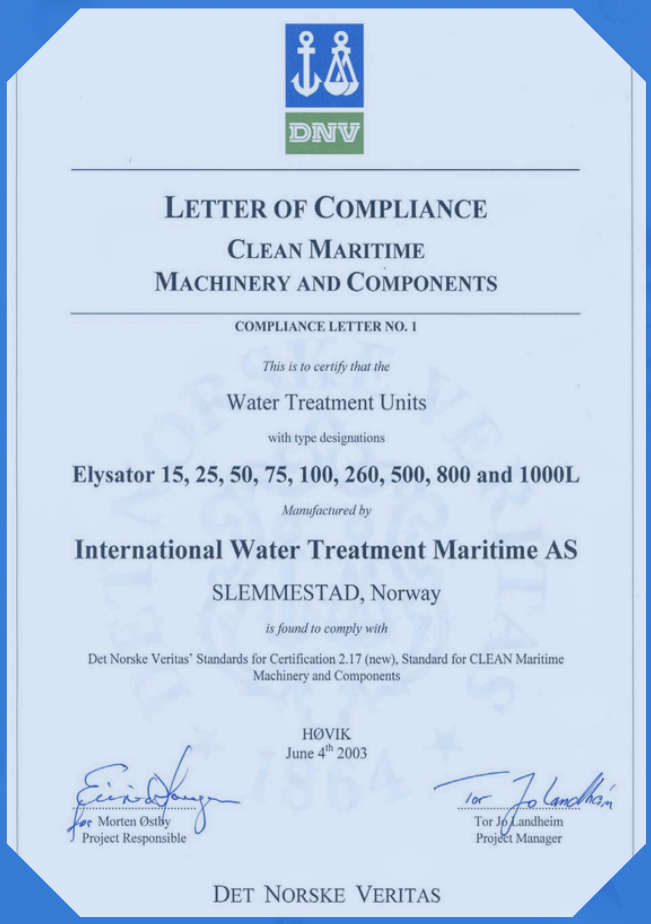
Environmental Culture Change

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
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.

SUTTON BUSINESS CENTRE
RESTMOR WAY WALLINGTON
SM6 7AH

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

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