ionix
FILLING STATION

IONIX 300

FILLING STATION

INSTRUCTIONS

eleXion

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Contents:

IONIX FILLING STATION

FS300

1. Overview.

IoniX FS 300 from eleXion, is a specially designed filling station for larger system volumes where a higher fill rate is required.

The ioniX FS 300 is exclusively available for hire only.

IoniX FS 300 has been designed for technical water treatment applications and should only be operated using Xi+ ion exchange resin or softening resin available through eleXion.

System top up water and circulation water can be treated to known chemical free guidelines such as VDI 2035.

IoniX FS 300 are supplied with an inbuilt electrical conductivity meter, which allows for real time monitoring of both the inlet and outlet water supplies.

The electrical conductivity meter continuously registers the electrical conductivity of both the inlet and outlet water supplies.

An audible alarm is heard once the outlet resin reaches above the required 10 us/cm indicating the resin has expired and needs replacing.

2. General safety information.

The ioniX FS 300 should never be moved via the wheels once filled with resin. The wheels, axel and handle have been designed purely to maneuver the empty ioniX 300 into position, ready for connection to the system.

The ioniX 300 should never be transferred downstairs and caution should be taken when moving the unit down slopes or across surfaces which are not flat and/or stable.

If maneuvering the ioniX 300 via mechanical means (forklift) then please ensure the unit is suitably supported.

eleXion holds no responsibility over the transportation of the unit.

The ioniX 300 FS is a unit for hire, meaning it has been used on multiple sites. The unit has been thoroughly cleaned upon delivery to site, however the unit may not be sterile and an onsite disinfection may be required.

The ioniX range of filling devices should only be installed and operated in accordance with this instruction manual and should only be operated by suitably trained personnel.

The conductivity sensors have been calibrated from the warehouse before dispatch. On site calibration may also be required, please see section 10 of this manual for more details.

Each filling station is manufactured from high grade 316 stainless steel.

The DN150 lid has been manufactured to withstand pressures of up to 10 bar, with the supplied gasket being designed to withstand temperatures up to 90 degrees with a long service life.

All filling stations are pressure tested by the factory to ensure they are compliant with the information in this manual.

The devices should never be exposed to higher temperatures or pressures than listed in the below technical data.

ioniX filling stations can be operated under high temperatures and pressures, precautions should take place when handling or servicing the filling station.

Onsite risk assessments and appropriate PPE should be worn before working on any eleXion system.

ioniX filling stations should never be worked on until, the filling station is electrically isolated from the power supply, hydraulically isolated from the mains supply and/or system pipework, the pressure drained from the vessel and once the filling station is at a temperature where it is safe to handle.

The ioniX filling station must be installed with an electrical isolation switch which is earthed.

The filling station should always be both electrically & hydraulically isolated before carrying out any maintenance work. Failure to do so may result in personal harm.

Di water produced is intended only for technical use and not human consumption.

Personal injury and property damage resulting from the failure to comply with these instructions are not covered by the Product Liability. The manufacturer also assumes no liability for any other damage caused by the failure to comply with these instructions.

Please read these instructions carefully before using the device. For your own safety and others, it is essential to follow the safety instructions in this instruction manual.

You must always adhere to the relevant local safety regulations. It is the installers' responsibility to comply with the local regulations that apply to them and keep to up to date with the latest regulations.

3. Application.

IoniX filling stations from eleXion have been specially designed for the use in both heating and cooling systems, allowing them to become complaint with "chemical free guidelines" and in line with many of the world's leading HVAC manufactures technical instructions and their requirements for water treatment.

Compatible guidelines:

- VDI 2035
- SWKI BT 102-01
- ÖNORM 5195-1
- EN12828
- DIN50930
- BSRIA BG50
- CIBSE CP1

IoniX filling stations are designed to be used with ion exchange resins for the complete desalination of the fill water or softening of the fill water, depending on application.
When used with Xi+ resin (our in house mixed bed ion exchange resin), the Di water produced will be suitably conditioned for use in both heating and cooling systems.

Caution should be taken with third party resins, as they may not be suitable for use in HVAC systems.

Other technical applications and industries can also utilise the Di water produced from ioniX filling stations.

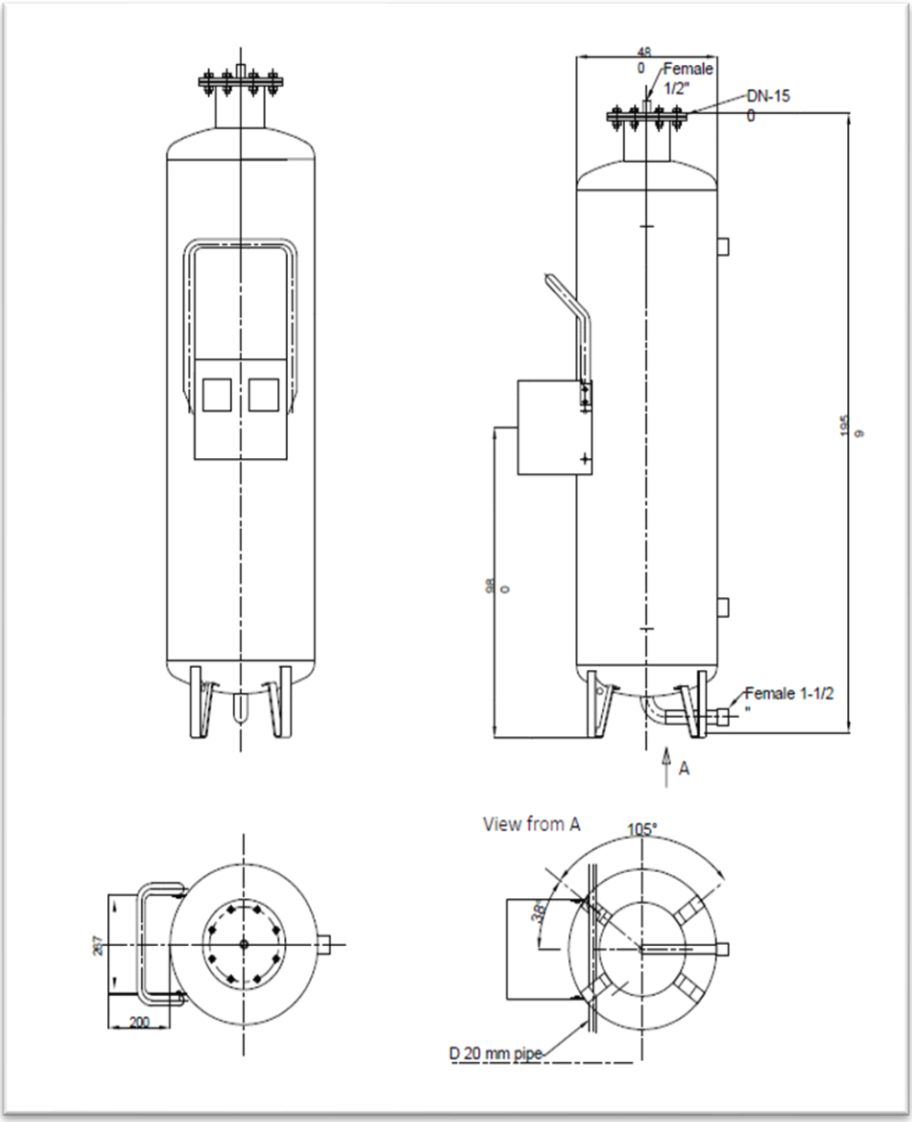
4. Product Datasheet.

IONIX FS 300	
Dimensions	
Tank height	1950 mm
Tank Diameter	480 mm
Tank width including computer box	680 mm
Connection sizes	
Air vent	½”
Inlet	1 ½”
Outlet	1 ½”
Drain	1 ½”
Operating information	
Test pressure	15 bar
Maximum operating pressure	10 bar
Maximum operating temperature	90 Degrees
Resin Maximum operating temperature	60 Degrees
Performance	
Tank volume	300L
Maximum flow rate	200 lpm
Estimated capacity of resin @ xx litres	
100 µS/cm	120,000
200 µS/cm	60.000
300 µS/cm	39,900
400 µS/cm	30,000
500 µS/cm	28,000
600 µS/cm	20,100
700 µS/cm	17,100
800 µS/cm	15,000

Conductivity meter – EXN-TDS210-B	
Electrical requirements	
Power supply	AC:220VAC±10%
Max amp	3 amp
Communication	
Serial communication	RS485
Output	Current (4-20 m
Relay outputs (x2)	Relay 2 relays AC250V
Operating information	
IP rating	IP54
Operating temperature	0 – 60 degrees
Relative humidity	5 -95% non-condensing
Sensor information	
Material	SS 316
Maximum temperature	80 degrees
Maximum pressure	10 bar
Sensor type	NTC 10K
Sensor accuracy	+/-0.3
Temperature compensation	Yes
Measuring range	0-2000 µS/cm
Dimensions	
Height	100 mm
Width	100 mm
Depth	150 mm
Screen size	2.8 inch

Drawings:

IoniX FS300



5. ioniX FS 300 system mains water connection considerations.

The ioniX system can be utilised for the initial filling of any sealed system.

The temporary connection of the ioniX FS300 should be compliant with this instruction manual and local building regulations.

The connection to any system maybe be subject to technical requirements depending on national or local regulations.

A suitably approved backflow protection device, complaint with DIN EN 1717 (RPZ valve) may be required when connecting the ioniX FS 300 directly to the mains supply.

Where an ioniX filling station is installed direct to the mains and there is a hydraulic break between the heating/chilled system then a suitable CAT 3 double check valve will need to be installed.

Please check with your local water board to ensure the protection provided is sufficient and in line with building regulations/local water bylaws.

eleXion holds no responsibility for the incorrect use or classification of back flow prevention and it is the responsibility of the installer to ensure compliance.

ioniX filling stations should be positioned so that all future top up water passes through the filling station, ensuring all future top up/initial fill water is conditioned and in line with required guidelines.

Both manual fill and automatic top up device positions should be considered when positioning an ioniX filling stations.

Where the inlet pressure exceeds 10 bar a suitable pressure reducing valve should be fitted to prevent exceeding the maximum recommended pressure.

The filling station should be installed on a secure and level base, suitable to take the weight of the filling station when at full capacity and weight.

6. Installation set up.

The ioniX system can be utilised for the initial filling of any sealed system.

1. Position the ioniX FS 300 into the ideal location for the site, a local drain and water supply should be considered. Please note the unit should be located on a flat stable surface, capable of withstanding the weight of the unit once in use.
2. The ioniX FS 300 should ideally be operated by two experienced personnel.
3. The ioniX FS 300 will need to be connected to the mains water supply and also directly to the system, when utilised for initial filling or between two suitable points to the system (flushing bypass) if completing inline conditioning.
4. Suitable pressure and temperature hoses should be used, ideally stainless-steel hose with protected braiding. Please note the connection size for all hoses (in/out/drain) are 1 ½” flat face BSP.
5. Connect the mains water supply to the top connection, labelled inlet connection (Figure 3).
6. Connect the FS 300 to the system by using the bottom connection, labelled outlet connection (Figure 4).
7. Ensure all isolation valves are closed.
8. Using a suitable step ladder or platform, remove the lid by removing the 8 x M16 bolts (Figure 8).
9. Once the lid is removed it is now possible to pour the resin into the FS300. Open Xi+ resin bags and

pour very carefully into the FS 300 unit via the lid opening (Figure 7). PLEASE NOTE - Resin that falls onto the floor can cause the surface to become slippery, please ensure either a hoover or dustpan/brush is available to clear any spillage.

10. Fill the ioniX FS 300 unit until the top nozzle is covered (typically 300 litres), adding a little water will help the resin sit flat, allowing more resin to be poured into the unit.
11. Once the unit is full of resin, ensure no resin is sitting on the flanged lid, replace the rubber seal and tighten all 8 bolts, please ensure the AAV isolation valve is left open (Figure 8).
12. The FS 300 unit is now ready to fill, open the inlet isolation valve and allow the unit to self-vent (Figure 3).
13. Once vented and all connections are watertight, it is recommended to drain a minimum of 600 litres of water. **Drain via the outlet hose (Figure 4) Do not use the base drain!**
14. With the system fully vented, watertight and connected to both the mains supply and system, the FS 300 unit can be plugged into the power supply.
15. The FS 300 has been supplied with an RCD plug supply and uses 240v AC (Figure 1). An adaptor has been provided for connections to a step-up transformer, 110v to 230v (Figure 2). The RCD may need to be removed when connecting to the step-up transformer, should recurring interruption take Place as a result of the transformer used (alongside RCD).
16. The conductivity meters will then display their current EC readings in uS/cm.
17. The conductivity meters have been preset for initial system filling and the outlet computer will raise an audible alarm once the electrical conductivity reaches above 10 uS/cm.
18. The system is now ready to be filled, opening the inlet and outlet isolation valves will allow water to pass through the ioniX FS 300 into the system, where it will be filled with demineralised water (Figure 3 & 4). Please ensure you monitor the outlet computer and replace the resin when required.
19. The flow rate can be adjusted via Autoflow control if required (Figure 3).

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

7. Replacing the resin.

Before initial use and after the resin has been exhausted (indicated via the outlet computer) the resin will require changing.

After replacing the resin, it is always advisable to flush through the resin with raw water. It is not advisable to transfer resin from site to site when using an ioniX mobile filling station. If the resin is transferred, please thoroughly flush this through before using.

The filling station should be flushed through with a quantity of water corresponding to twice the filter volume before use.

It is highly recommended that two personnel work together when replacing the resin.

1. Isolate the power supply before servicing the ioniX FS300.
2. Ensure the system is isolated from the system closing the inlet and outlet isolation valves supplied (Figure 3 & 4).
3. On existing installations &/or after inline treatment the existing resin will need removing (not the case for first time fills).
4. Connect a suitable 1 1/2" full bore hose to the base drain of the ioniX filling station (Figure 5).
5. The system is subject to high pressures and the drain hose must be made secure when draining the filling station.
6. The drain hose should be positioned into the supplied woven bag.
7. The bag should be positioned on top of a drain or within a bucket large enough to take the water volume of the filling station (Figure 6). A transfer pump may be required to drain the water from any container used.
8. Open the drain valve to release the pressure from the filling station (Figure 5).
9. Resin should start to flow into the woven bag with the water being expelled into the drain/bucket.
10. Open the inlet isolation valve to the ioniX filling station slowly, this aids in rinsing the vessel of any resin stuck within the vessel.
11. Continue the process until the water runs clear and no resin is seen entering the woven bag.
12. Once all water has been drained from the filling station carefully open the ioniX FS300 via the flanged lid (Figure 8).
13. Looking inside the filling station, ensure all the resin has been removed.
14. On confirmation that all resin has been removed from the base drain can now be closed (Figure 5).
15. Open the vacuumed sealed, Xi+ ion exchange resin and carefully pour into the ioniX filling station (Figure 7).
16. Inspect the rubber gasket before closing the lid, if the rubber is damaged or worn, please replace (Figure 8).
17. Once the lid has been closed, the filling station can now be filled by opening the inlet isolation valve slowly (Figure 3).
18. Slowly open the air vent connection located on the lid of the ioniX filling station and once this has stopped venting close the air vent.
19. Then fully open the inlet isolation valve and slowly start to open the outlet isolation valve (Figure 4).
20. Check all connections are watertight.
21. Reinstate the power supply to the filling station.
22. Take note of the water meter fill rate and log for future diagnostics.

8. Inline conditioning.

Where a standard ioniX filling station can be installed as a permanent fixture to any system to prevent any untreated top up water from entering the system, there are also applications where inline treatment may be required using the ioniX mobile filling station.

9. What is inline conditioning.

Inline treatment is where a system is initially filled with raw water. Then, by using the side stream method, the system water is gradually conditioned bringing down the conductivity of the circulating water in line with required parameters and industry guidelines.

This method can be used on new systems where the system has been filled with raw water or on existing fouled systems where incorrect water treatment has resulted in unwanted corrosion deposits, bacteria, biofilms and scale build up.

XI+ mixed bed ion exchange resin is manufactured to remove organic matter only (natural salts and minerals), when using to extract stagnated chemical additives, it will heavily influence the capacity of the resin and its performance.

It is always advisable to reduce the chemical concentration of any system prior to inline conditioning.

A prefilter is advisable to prevent any contaminates from entering the resin bed and to protect the resin.

IoniX filling stations can be used on the vast majority of systems while in operation as they are rated to 90 degrees at 10 bar, however when operating at above 60 degrees the capacity of the resin will be negatively affected.

It would be preferable to reduce the operating temperature of the system to 60 degrees while completing the inline treatment.

At above 60 degrees degradation of anion resin causes poor silica removal capacity, resulting in the deterioration of the treated water quality.

10. Inline conditioning processes.

On completion of the system being filled, fully vented and pressure tested, inline conditioning can take place.

1. Ensure all parts of the system are open, all pumps and valves are operational. We need to ensure that circulation is achieved throughout the entire system.

2. Using suitably pressure and temperature rated hoses, connect the ioniX filling station to the system. Please refer to below schematics for examples.

3. Please take precautions when handling the equipment as it can be subject to high temperatures and pressures.

4. Before opening the 8" quick connection lid, always ensure the system has been isolated from the circulation system, the vessel pressure has been released and the filling station is electrically isolated from the power supply.

5. The ideal position for the connection of the ioniX filling station is at any flow/return circuit where the system flow temperature does not exceed 60 degrees.

6. The ioniX filling station can also be connected to the flushing bypass connection supplied with the elector tank. It is preferable to use the flushing bypass of the elector tank as these are subject to flow restrictors ensuring the recommended flow rate is not exceeded. The flow restrictor cartridge can however be removed for temporary filtration should the flow rate be too low.

7. Always respect the flow rate at the outlet of the ioniX filling station, failure to do so will result in inefficient water conditioning where minerals/salts slip through the resin bed.

8. Using the supplied digital flow meter, you can measure the flow rate through the filling station. If the flow rate is too high simply close the inlet valve until the desired flow rate is achieved.

9. Install the prefilter to the inlet of the ioniX filling station, this will protect the resin from being polluted by foreign matter. It is recommended that a filter no greater than 30 Micron is used on the inlet of the filling station. NB. The smaller the pre filter the better protected the resin will be.

10. Once connected to the system via the hoses, fill and vent the filling station slowly ensuring no leaks are present.

11. IoniX mobile filling stations consists of two combo meters, one on the inlet and one on the outlet.

12. Ensure the combo meters are appropriately connected and the set values are correct. It is advisable that the outlet computer is set to raise an alarm when 15 µS/cm is exceeded. It is advisable for most applications for the circulation water be in the range of 10-100 µS/cm and the inlet computer should represent the limit you are trying to achieve.

13. To ensure the capacity limits are not exceeded it is not advisable to leave the ioniX filling station unattended unless you can calculate expected conditioning time.

14. During the process of inline treatment it is advisable to check all parts of the systems are receiving circulation.

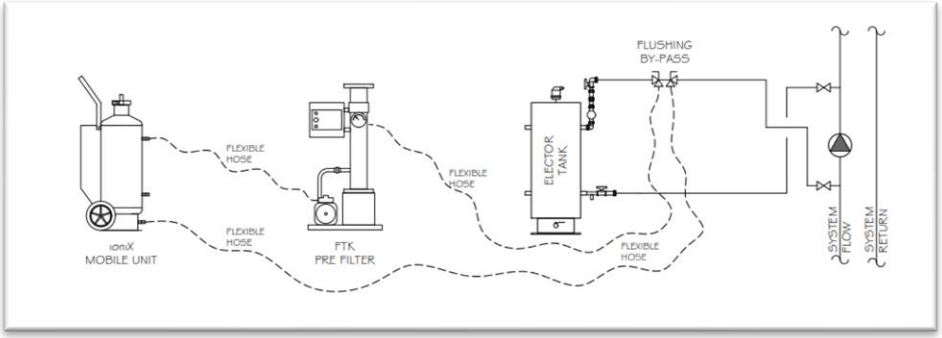
15. Water sampling of the pH and electrical conductivity via onsite testing equipment is advisable. Sample points have been provided on the inlet/outlet of the ioniX filling stations.

16. Once the required water conditioning parameters have been achieved and meet the recommended guidelines, the ioniX mobile filling station can be safely disconnected from the system. Ensure that the pressure has been removed from the vessel and if hot the vessel has been

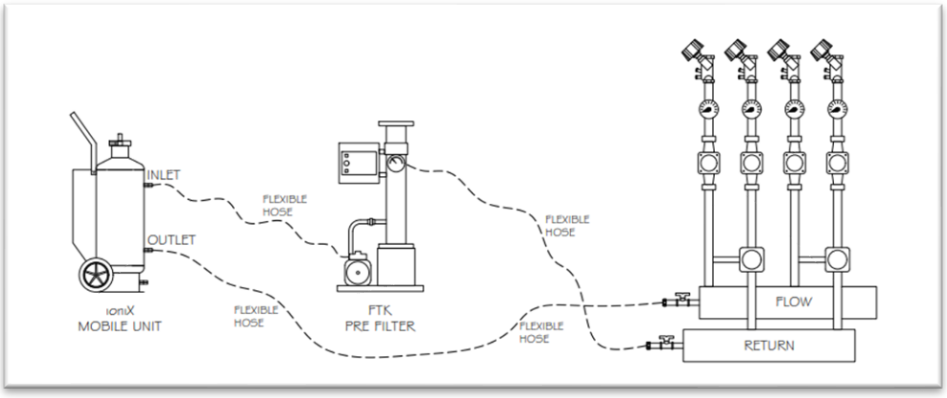
allowed to cool before disconnecting.

INLINE TREATMENT EXAMPLES:

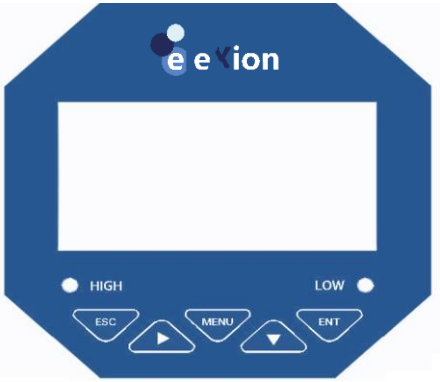
IN-LINE TREATMENT USING IONIX MOBILE + FTK PRE FILTER UTILISING FLUSHING BYPASS FROM ELECTOR TANK INSTALLATION



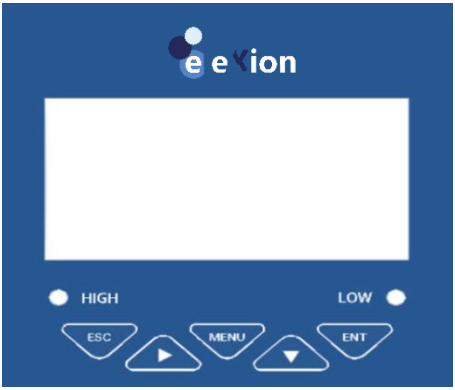
IN-LINE TREATMENT USING IONIX MOBILE + FTK PRE FILTER CONNECTING TO SYSTEM PIPEWORK AT THE LOWEST TEMPERATURE POINT



11. Electrical conductivity control.



★ TDS210-B



★ TDS210-C

Sign	Button name	Function description
ESC	ESC	Under "Monitoring page" - Alarm view Under "Menu page" - Return to the previous page
▶	RIGHT	Enter the menu under “monitoring interface” Exit the menu under “monitoring interface”
MENU	MENU	Enter the MENU on the “monitoring page” Exit the MENU on the “menu page”
▼	DOWN	Under “menu page” - Select the related menu Modify the values in the configuration state
ENT	ENTER	Under “Menu page” - Enter the sub-menu or confirm modification

Table 1 Definition of buttons

MENU + ▶	SHORTCUT KEY	Press and hold to enter the online calibration function interface
MENU + ▼	SHORTCUT KEY	Press and hold to enter the alarm setting function interface
MENU + ENT	SHORTCUT KEY	Press and hold to enter the electrode constant setting function interface

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System menu.

EC Monitoring page:

TDS Monitoring page:

- Push MENU to enter password verification page, input password to enter the home page.
- Push ESC to enter alarm inquiry page, to inquire the current warning.

Password verification page:

---------- User Password: ----------

Password: 0000

- The initial password 0000, if you need to change it, please use the password modification function.
- If you forget your password, please contact us for more information.

Page of main menu:

---------- Main Menu ----------

1. System Setting
2. Signal Setting
3. Remote Setting
4. Alarm Setting
5. Information Inquiry

- System Setting: settings of language, buzzer and backlight, modification of password and factory settings.
- Signal Setting: constant of electrode, online calibration, unit switch, TDS coefficient, temperature correction, temperature coefficient and temperature compensation switch.
- Remote Setting: settings of RS485 parameters and 4~20mA transmission output.
- Alarm Setting: settings of parameters of high and low warning.
- Information Inquiry: current version number.

System Setting page:

---------- System Setting ----------

1. Language
2. Buzzer
3. Backlight setting
4. Change password
5. Factory setting

- Language: Chinese or English.
- Buzzer: ON/OFF setting.
- Backlight :ON/OFF setting of monochrome LCD screen
- Change Password: password modification and log-in with new password.
- Factory setting: return to factory settings.

Signal Setting page:

---------- Signal Setting ----------

1. Electrode Constant
2. Online Calibration
3. Unit Switch
4. TDS Coefficient
5. Temp Switch
6. Temp Modification
7. Temp Coefficient

- Electrode constant: electrode constant, normally of 4 types: 0.01, 0.1, 1.0,10.0.
- Online calibration: single point calibration of any standard solution can be carried out. First, set the temperature compensation mode to automatic compensation or manual compensation (the temperature has a great impact on the accuracy during calibration), then enter the conductivity calibration input interface and input the calibration solution value to be calibrated (common standard solutions are 147.0 μ s / cm, 1413 μ s / cm and 12.88ms/cm, which can be calibrated according to the field standard), press ENT to enter the conductivity calibration interface, and then put the connected electrode into the standard solution. After the indication is stable, press ENT to calibrate. (press ▶ to clear the calibration value, and the calibration range is 0.5 ~ 1.5 times of the standard solution value)
- Unit switch: The unit can be switched to ppm, μ s / cm or m Ω * cm. When switching to ppm, TDS of solution is measured; when μ s / cm is switched, conductivity (EC) of solution is measured; when m Ω * cm is switched, resistivity (ER) of solution is measured.
- TDS Coefficient: The conversion coefficient of conductivity and total dissolved solids, 0.5 by default, and the setting range is 0.4 ~ 1.0.
- Temp Switch: auto temperature compensation NTC10K or PT1000 or manual temperature compensation, temperature range:-10℃~130.0℃.
- Temp Modification: the temperature value of automatic temperature compensation can be corrected within ± 20.0 ℃.
- Temp Coefficient: temperature compensation coefficient, 0.02 as default, and the setting range is 0.00 ~ 0.03.

Remote setting page:

---------- Remote setting ----------

1. RS485 setting
2. Current Transmission

- RS485 setting: settings of 485 communication address (1 ~254)and baud rate(2400,4800,9600,19200)bps.
- Current transmission: settings of 4mA corresponding value and 20mA corresponding value of 4-20mA output.

Alarm Setting page

---------- Alarm Setting ----------

1. High Relay
2. Low Relay

- High alarm relay: set the pull in value and off value of high alarm relay.
- Low alarm relay: set the pull in value and off value of low alarm relay.
- The alarm signal type will be automatically selected according to the current measured signal value. After setting, the alarm information will not be cleared due to the change of the measurement signal type. The alarm value of the same signal type only needs to be set once.

12. Water treatment log.

Service date	Water meter reading	Fill volume since last service visit	Conductivity meter reading	Resin replaced Y/N	Resin expected to last until next service visit Y/N

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eleXion WATER TREATMENT

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