Multiplelabs
Turnkey Laboratories Solutions

Analytical®
Technologies Limited

ATL PW series Purified Water Plant (Pharma Grade)

EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

ATL PW series Purified Water Plant(Pharma Grade)

This purified water plant is composed of Reverse-Osmosis system(RO) and with pre-treatment filtering system. The main RO system is from USA, The pipelines from RO system to user points is SUS316L stainless steel, pipeline inside and outside mirror surface sanitary level in accordance with cGMP regulations.

Application:

This purified water plant is suitable for production of pharma. grade purified water in pharmaceutical industry, such as purified water for solid dosage, liquid dosage, injectable dosage, large volume I.V. solution, kidney dialysis etc.

Option: with optional EDI system, ultra-filtering system etc, it can make WFI water (Water For Injection) for injectable dosage, large volume I.V. solution, kidney dialysis etc.

Basic Technical Process Flow Chart

Raw water tank

For receive city supply tap water

Source water pump

Mechanical Sand Filter

1). Use

The suspended, agglomerate flakes in the water can't be removed by deposition or other method, but the water through mechanical filtering can remove the suspended solids, organic impurities, reducing water turbidity and improving clarity.

2). Main technical parameter

Raw water turbidity ≤50mg/L (with coagulating agent) or≤15mg/L (without coagulating agent)
Outlet water turbidity ≤3mg/L
Filtering speed ≤10m/h
Recoil intensity: quartz sand 15L/m^2.s

Active Carbon Filter

1). Use

Active carbon filter remove these organic objects in water by absorption method.Carbon filter has two functions:

1.absorption organic objects in water, the absorption rate is around 60%;
2.absorption the rest chlorine.

Using the carbon filter, is to pre-treat of the raw water, to reach in-feed water quality of RO system.Active carbon has huge surface area, has strong absorption for these organic objects.After water through active carbon layer, the organic objects are absorbed, reducing the content. At the same time,active carbon remove the chlorine, grease, colloid silicon and suspend objects in water, prolong the resin life.

Active carbon also remove foreign odor, coloring matter in water, improving clarity. After using a period, absorption decreasing, need regenerating or replacing.

2). Main technical parameter

working pressure≤0.6MPa, for small ≤0.4MPa,

working temperature: normal

Feeding water turbidity ≤5degree,

Filtering speed: removing turbid & chlorine 6～12m/h,

Anti-wash expansion：30～50%。

▸▸ Fine filter:

Fine filter is used as security filter, it is made from 5μm micro porous pp filter cartridge. This is the last stage before RO system, it can prevent the small particle come into RO membrane.

▸▸ High-pressure Pump

Grundfos or other similar brands）

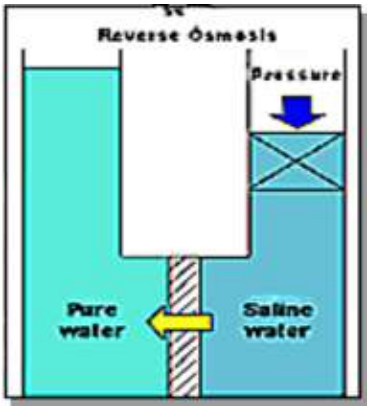
Reverse-Osmosis System(RO System): (USA DOWS CHEMICAL OR HAUDRAULICS Membrane)

Application:

Separate these other objects from the purified water under the function of high resolution infiltration by pressures, which cannot be passed through RO membrane. Because the diameter of infiltration membrane is very small (less than 1 um approx.), it can effectively eliminate the dissolved salt in water, colloid, microbiology, heavy metals, organic matter, pyrogen, virus and germ etc.

Reverse Osmosis:

The purified water flows to saline water through semi-transparent embrane, which called osmosis, until the balance is built. Then the static pressure difference between two sides of membrane is osmosis pressure.When adding external pressure on saline water, add chemical potentials on the salt solution, make water on saline water flow to purified water through semi-transparent membrane, which is called Reserve -osmosis.



Application Range

- Pharmaceutical: purified water for all pharmaceutical use, oral solid dosage, oral liquid dosage,Injectable, I.V.Solution, kidney dialysis, medicine preparations, semi-solids, cleaning etc.;
- Food: Drinking water, mineral water, purified water, beer, milk, etc.;
- Sea water, salted water desalination: living water on islands, ships, high-saline area, etc.;
- Chemical water: chemical cooling, fertilizer, chemicals manufacturing, etc.;
- Electronic water: semiconductors, integrated circuits, tube manufacturing, etc.;
- Electricity: Power Boiler Feed Water

Technical Parameters:

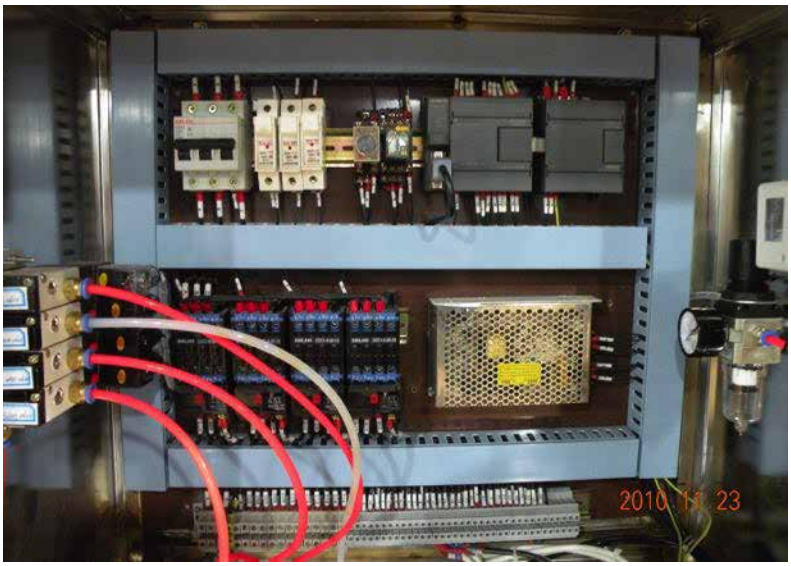
- Desalination rate: ≥97%-99%
  Recovery rate: 60%-75%
- Thermal source eliminating rate: ＞99%
  Germ eliminating rate: ＞99%-100%
- Material of construction:
  Reverse-Osmosis membrane: USA DOWS CHEMICAL OR HYDRANAULICS;
  Outside cover: Stainless steel sus304;

No.	items	Parameters
I.	**RO Input water requirement**	
1	Pollution index（FI）	＜5
2	Solid density index(SDI）	＜5
3	Water temperature/°C	15~35
4	PH	3~10
5	CODMn（KMNO4 O2）	＜1.5mg/L
6	Surplus chlorines(Cl2)	＜0.1mg/L
7	Iron content(Fe)	＜0.05mg/L
II.	**RO Working conditions**	
1	Max input water temp.°C	45
2	Input water PH	3~10
3	Max working pressure	600(4.16)
	PSi(MPa)	
4	Input max SDI(15minutes)	＜4
5	Input max turbidity	1.0NTU
6	Input max free chloride	＜0.1ppm
7	Single membrane max pressure loss	10PSi(0.7kgf/cm2)
8	Single membrane Max rate of input and output	5:1
III.	**Pressure before membrane**	1～1.4MPa
IV.	**Pressure after membrane**	0.8～1.3MPa
V.	**Output water quality standard**	Chinese Pharmacopeia CP2010,

					European Pharmacopeia EP6, or special arrangement for USA Pharmacopeia USP32 AS OPTIONAL.				
MODEL	ATL PW-2RO -0.5	ATL PW-2R O-1.0	ATL PW-2R O-2.0	ATL PW-2RO -3.0	ATL PW-2RO -4.0	ATL PW-2RO -5.0	ATL PW-2R O-6.0	ATL PW-2R O-8.0	ATL PW-2RO -10.0
Output (T/h)	0.5	1	2	3	4	5	6	8	10
Input water(T/h)	0.7	1.4	2.8	4.2	5.6	7	8.4	11.5	14
Power(KW)	5	6	7	9	10	14	14	25	25

CONTROL CABINET: SIEMENS PLC AND TOUCH SCREEN WITH CONDUCTIVITY METER

Optional:WITH TEMPERATURE RECORDER IF SPECIAL REQUIRED.



Optionals:

O-1. Heat Exchanger

Plate type heat exchanger provides the heating of raw water to the room temperature, avoids the low temperature and abnormal working for the RO system.

Also, it can heat the water to high temperature to do Pasteur sterilization of mechanical filters and active carbon filter, avoid microbiological growth.

O-2. Chemical Dosing system to feed chemicals to balance the PH

O-3. Water Softener to reduce the hardness of in-feed water

O-4. Electro De-ION(EDI) System for HPW or UHPW.

It is used for pharmaceutical/chemical industry high pure water HPW, and electronic/ power industry and other industry ultra pure water UHPW.

EDI application

EDI is widely used in electronics, electrical, biological, pharmaceutical, chemical and many other fields, is the best replacing technology to traditional mixed-bed ion-exchange process. Electrical ion method processes the revolutionary significance to the water treatment technology. It combines with the electro dialysis and the ion exchange technology, uses the two ends electrodes high voltage to make the electrified ion in water move, and suit the selectivity resin membrane and resin of ion exchange to move the ion with acceleration, so as to reach the purpose of water purification, continuous production of high-quality water, without use acid, alkali.Steady water quality, small land area, simple operation, low running cost, no soda acid regenerative and useless water emission, can run continuously and revive, making water treatment fully into the green industry.

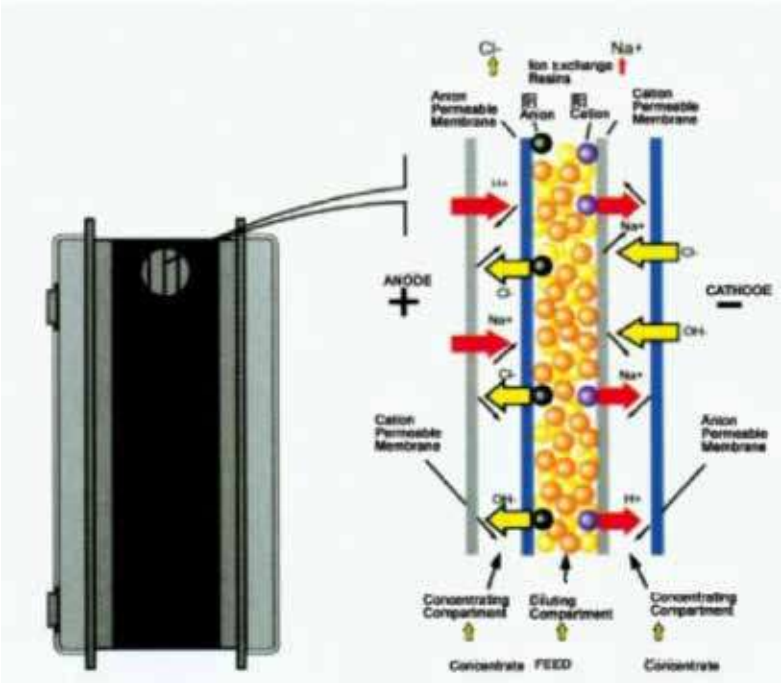
EDI working principle

EDI includes electrodes, fresh water channel, thick water channel.
Anion membranes and cation membranes separate fresh water channel, thick water channel, Ion-exchange resin fill inside by a certain way, compose EDI with positive, negative electrodes together.

Salt ions in water flow through EDI unit with three migration as the following:

a. Ion exchange with positive/negative resin, combination to resin particles;
b. Ions in the electric field migrate through ion channel formed by the resin particles;
c. Ion migrate to thick water chamber through ion-exchange membrane, so the desalination process finished;

Under certain electric current, the interface between resin, membrane and water, occur polarization, force the water into H+ and OH-, then regenerate the resin.



EDI unique condition has a good removal for weak electrolyte:

- Due to resin, membrane, water interface generate polarization, force water into H^+OH^-, causing local PH valuechanges.
- Varbonic acid, silicon acid, boric acid and other weak electrolytes due to local changes in PH value, ionized HR to $H^+ + R^-$
- Ion after ionization was removed under the action of electric field:

Removal rate of silicon up to 95%-99%

Removal rate of CO up to 99%

Removal rate of boric up to 96%

▸▸ Feeding Water Quality:

Water supply：RO water

Water conductivity：＜40 us/cm

Silicon：＜1ppm（in SiO2）

Fe, Mn, Sulfite：＜0.01ppm

Total chlorine：＜0.01ppm(in CL-)

Rigidity：＜1 ppm(in CaCO3)

Dissolved Organic Substance：＜0.5ppm TOC(in C)

PH：4-11

▸▸ Output Water Quality:

Electrical Conductivity: ＜1.3uS/cm(25), as per USP32 Pharmacopeia

Recycle ratio: 90-95%

Power: 0.12-1.06Kwh/m3

Water temperature: 5-38

Input water pressure: 0.31-0.68MPa

Pressure difference between input water and output water: 0.14-0.24MPa

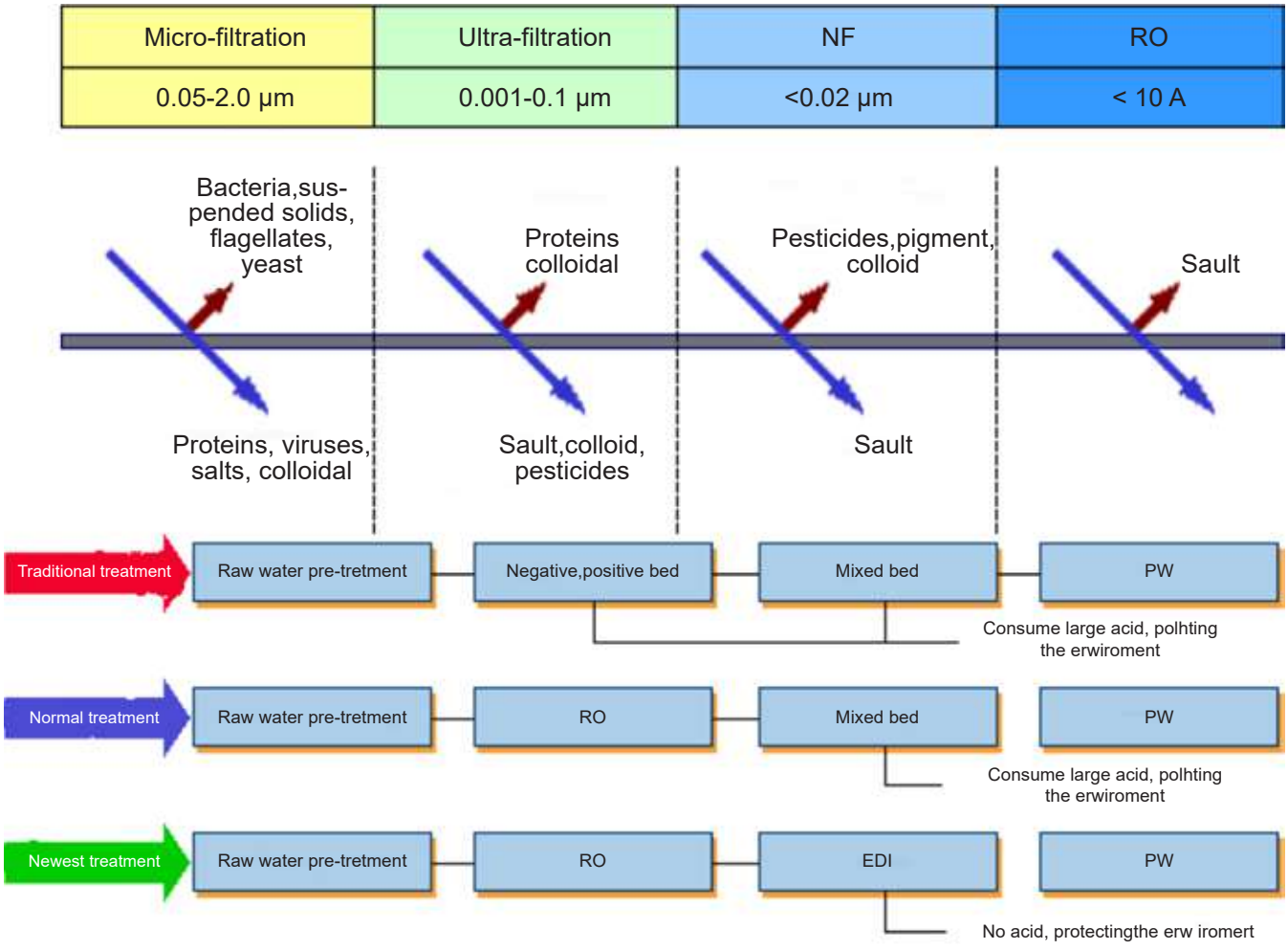
▸▸ EDI Features:

- Continuous production, good quality and stable water, low cost;
- No waste water, chemical pollutants, conductive to water saving and environmental protection, saving investment in sewage treatment;
- Compact structure, small land area;
- Finish all commissioning before in the factory, small work load on the site, easy training;
- Simple routine maintenance, simple operation, low labor intensity;
- Saving cost, no use acid, alkali etc chemicals.

O-5. Ultra-Filtering System UF:

Ultra-filtration and micro-filtration is advance developed membrane separation technology relying on the new materials science. In recent years, ultra-filtration and micro-filtration manufacturing technology and application technology rapidly develop and grow maturity, are more widely applied in various fields of industrial and municipal construction.

Ultra-filtration and micro-filtration is using porous materials blocking ability, to remove the certain impurity particles in water by physical interception way. Under the pressure drive, the solution of water, organic low-molecular weight, inorganic ions and other small size of the material is able to pass through the porous fiber walls to reach the other side of membrane, while the bacterial, colloidal, particulate matter, organic molecules and other large size material cannot pass through the fiber wall, it reach the purpose to separate different components in the solution. This process operate in normal temperature, no phase change, does not produce secondary pollution.



O-6. PURIFIED WATER STORAGE TANK

For the storage of purified water.

Single layer stainless steel tank

With manhole

With liquid level sensor

With temperature sensor

With vent filter

With three foot support

With bottom diaphragm valve

Optional:

With heat insulation

With jacket for heating

Working volume:

- 500L
- 1000L
- 1500L
- 2000L
- 2500L
- 3000L
- 4000L
- 5000L
- 6000L
- 7000L
- 8000L
- 9000L
- 10,000L
- 15,000L
- 20,000L

O-6. PURIFIED WATER STORAGE TANK

Include:
Water pump,
PLC and touch screen control system,
Automatic discharge valves,
UV sterilizer
Or Ozone sterilizer
Or Heat Exchanger etc
according to the user requirement.

Capacity:
500L-20,000L/h

Hydraulic:
20m-70meters

Pictures For Reference:

Highest Standard 2RO+EDI+UF System
with PLC and Touch Screen Automatic Control System

ECO TYPE:FOR THE ECONOMIC CHOICE
SIMPLE PRESS BUTTON CONTROL SYSTEM
WITH PLASTIC PIPES CONNECTION

Analytical®
Technologies Limited

HPLC Servicing, Validation, Trainings and Preventive Maintenance :

HPLC Servicing :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

Trainings :We also take up preventive Maintenace to reduce downtime of HPLC's Trainings.

AMC's/CMC :AMC's/CMC :We offer user training both in-House and at customer sites on HPLC principles, operations, trouble-shooting.

Validations :Validations :We have protocols for carrying out periodic Validations as per GLP/GMP/USFDA norms.

Instruments :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.

About Analytical Technologies

Analytical Technologies is synonymous for offering technologies for doing analysis and is the Fastest Growing Global Brand having presence in at least 96 countries across the global. Analytical Technologies Limited is an ISO:9001 Certified Company engaged in Designing, Manufaturing, Marketing & providing Services for the Analytical, Chromatography, Spectroscopy, Bio Technology, Bio Medical, Clinical Diagnostics, Material Science & General Laboratory Instrumentation. Analytical Technologies, India has across the Country operations with at least 4 Regional Offices, 6 Branch Offices & Service Centers. Distributors & Channel partners worldwide.

Our Products & Technologies

UV/VIS Spectro 2080+ Double Beam

Infra FTIR

Optima Gas Chromatograph 3007

Optima Gas Chromatograph 2979 Plus

Flash Chromatograph

Atomic Absorption Spectrophotometer

Liquid Partical Counter

Optical Emission Spectrophotometer

DSC/TGA

Semi Auto Bio Chemistry Analyzer

HEMA 2062 Hematology Analyzer

Micro Plate Reader/Washer

URINOVA 2800 Urine Analyzer

Total Organic Carbon 3800

Fully Automated CLIA

NOVA-2100 Chemistry Analyzer

PCR/Gradient PCR/ RTPCR

TOC Analyzer

Laser Particle Size Analyzer

Ion Chromatograph

Water purification system

Regulatory compliances

Corporate Social Responsibility

Analytical Foundation is a nonprofit organization (NGO) found for the purpose of:

1.Research & Innovation Scientist's awards/QC Professional Award : Quality life is possible by innovation only and the innovation is possible by research only, hence ANALYTICAL FOUNDATION is committed to identify such personallities for their contributions across various field of Science and Technology and awarding them yearly. To participate for award, send us your details of research / testing / publication at Info@analyticalfoundation.org

2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

3. ANALYTICAL FOUNDATION aims to DETOXIFY human minds,souls and body by means of yoga, Meditation, Ayurveda, Health Care, Awards, Media, Events, Camps etc.

Reach us @

Analytical®
Technologies Limited

HPLC Solutions | MultipleLabs | Analytical Bio-Med | Analytical Distributors | Analytical Foundation (Trust)

Corporate & Regd. Office:
Analytical House, # E67 & E68,
Ravi Park, Vasna Road, Baroda,
Gujarat 390 015. INDIA

T: +91 265 2253620
+91 265 2252839
+91 265 2252370
F: +91 265 2254395

E: info@hplctechnologies.com
info@multiplelabs.com
info@analyticalgroup.net
info@analyticalbiomed.com

W. www.analycalgroup.net
www.hplctechnologies.com
www.multiplelabs.com
www.ais-india.com

Sales & Support Offices:
across the country :
Distributors & Channel
partners World Wide