

SPECIFICATION FOR AUTOMATIC WATER DEMINERLISING PLANT

1. Major Parameter –

a) Input raw water supply-

pH	: 8.5
Total dissolve Solids	: 1200ppm
M. Alkalinity PPM as CaCo3	: 520
Total Hardness PPM as CaCo3	: 312
Chloride PPM	: 46
Sulphate PPM	: 10
Silica as SIO2	: 10

b) Output treated water quality from D/M plants should confirm IS – 1069/93 or latest and also have following parameter,

pH	: 7 - 7.5
Hardness as CaCO3	: 0 mg/l
Chloride as NaCl	: 0mg/l
Electrical Conductivity	: <1 μ S/Cm.
Total Dissolved Solids	: <1 PPM
Output per Regeneration	: 80 m3
Maximum Flow Rate	: 5 m3/hr

Automatic D/M Plant consisting of following-

c) Raw Water Pumps-

2 Nos , maximum working pressure 3.5 kg/cm²,
having 30 mtrs head, flow rate 5 m³/hr.

Total Dissolved Solids <1 PPM

d) Filtration System-

Multi Grade Filter (MGF)

Quantity	: 2 nos (1 working + 1 stand by)
Flow Rate	: 3 m ³ /hr
Operating Pressure	: 2-3 kg/cm ²
Material of Construction (MOC)	: FRP with poly vinyl ester coating.
Vessel Dimensions	: 350mm Dia x 1650 Height on straight (HOS)
Piping	: UPVC
Valve type	: Multiport Diaphragm type.
Media	: Suitable amount of filter media.

Activated Carbon Filter (ACF)

Quantity	: 2 nos (1 working + 1 stand by)
Flow Rate	: 3 m ³ /hr
Operating Pressure	: 2-3 kg/cm ²
Material of Construction (MOC)	: FRP with poly vinyl ester coating.
Vessel Dimensions	: 350mm Dia x 1650 Height on straight (HOS)
Piping	: UPVC
Valve type	: Multiport Diaphragm type.
Media	: Suitable amount of activated carbon media.

e) Pressure Filter System

Quantity	: 2 nos (1 working + 1 stand by)
Flow Rate	: 2m ³ /hr.
Automatic Program Logical Controller (PLC)	: 2 nos
PP Filters Cartridge	: 16 nos.
FRP Filter Casings	: 8 nos.
Leaf Filter Cartridges	: 16 nos.
Chlorination System	: 2 nos.
Antiscalent System	: 2 nos.
Conductivity System	: 2 nos.
Dechlorination System	: 2 nos.
Pressure Gauges	: 4 nos.
Pressure Pump	: 2 nos.

f) Filter water Collection Tank –

Quantity	: 1nos.
MOC	: High Density Poly Ethylene (HDPE)
Capacity	: 10 m ³ .

g) Drinking Water System-

Quantity	: 1 nos.
PP Cartridge Filter	: 2 nos.
Drinking Water Pump	: 1 nos,
Flow Rate	: 1M3/hr, head 20 mtrs.
UV Sanitization System	: 1 nos to make water potable and drinkable.

h) Strong Acid Cation (SAC)

Quantity	: 1 nos.
Flow Rate	: 5m3/hr.
Vessel Dimension	: 300 mm Dia x 1500 mm Height on straight (HOS)
Material of Construction (MOC)	: MSFRP Poly vinyl ester coated internally pressure vessel fitted with strainer on plate at top & bottom as collecting and distributing system painted externally with epoxy & PU paint.
Operating Pressure	: 3.5 kg/cm ² .
Resin name/Type	: Agrion C 100H+, suitable for HCl regeneration.
Resin Quantity	: 100 Ltrs to generate 80000 ltrs DM water is generated in one regeneration cycle.
Regenerant	: HCl 30%
Regenerant Quantity	: 24 Ltrs.
Regeneration Tank	: 1nos.
Frontal Piping	: UPVC, one set.
Valves	: PP Automatic Pneumatic Actuated Diaphragm Type.
Ejector	: PP, 1 nos.
Pressure gauge	: 1 nos with SS316 needle valve.
Sampling point	: 1 Nos with SS316 needle valve.
Hardware	: One set of nut bolts, washers, gaskets etc.

i) Strong Base Anion (SBA)

Quantity	: 1 nos.
Flow Rate	: 5m3/hr.
Vessel Dimension	: 300 mm Dia x 1500 mm Height on straight (HOS)
Material of Construction (MOC)	: MSFRP Poly vinyl ester coated internally pressure vessel fitted with strainer on plate at top & bottom as

Operating Pressure	: 3.5 kg/cm ² .
Resin name/Type	: Agrion 600MP, suitable for NaOH regeneration.
Resin Quantity	: 100 Ltrs to generate 80000 ltrs DM water is generated in one regeneration cycle.
Regenerant	: NaOH 100%
Regenerant Quantity	: 8 Kgs.
Regeneration Tank	: 1nos.
Frontal Piping	: UPVC, one set.
Valves	: PP Automatic Pneumatic Actuated Diaphragm Type.
Ejector	: PP, 1 nos.
Pressure gauge	: 1 nos with SS316 needle valve.
Sampling point	: 1 Nos with SS316 needle valve.
Hardware	: One set of nut bolts, washers, gaskets etc.
Conductivity Meter	: 1 Nos.

j) Mixed Bed (MB)

Quantity	: 1 nos.
Flow Rate	: 5m ³ /hr.
Vessel Dimension	: 300 mm Dia x 1500 mm Height on straight (HOS)
Material of Construction (MOC)	: MSFRP Poly vinyl ester coated internally pressure vessel fitted with strainer on plate at top & bottom as collecting and distributing system painted externally with epoxy & PU paint.
Operating Pressure	: 3.5 kg/cm ² .
Resin	: Cation & Anion Resin
Resin name/Type	: Agrion C100H+ suitable for HCl regeneration, Agrion 600MP, suitable for NaOH regeneration.
Resin Quantity	: 25 Ltrs Agrion C100H+ and Agrion 600MP 40 Ltrs to generate 80000 ltrs DM water is generated in one regeneration cycle.
Regenerant	: HCl 30% & NaOH 100%
Regenerant Quantity	: 8 Ltrs. HCL & 3Kgs NaOH
Regeneration Tank	: 2nos.
Frontal Piping	: UPVC, one set.

Valves	: PP Automatic Pneumatic Actuated Diaphragm Type.
Ejector	: PP, 1 nos.
Pressure gauge	: 1 nos with SS316 needle valve.
Sampling point	: 1 Nos with SS316 needle valve.
Hardware	: One set of nut bolts, washers, gaskets etc.
Conductivity Meter	: 1 Nos.
Flow Meter	: 1 nos.

k) Skid –

Quantity	: 1nos.
MOC	: MS, Epoxy coated.

l) DM Water Collection Tank-

Quantity	: 1 Nos.
Capacity	: 5 m3.
MOC	: High Density Poly Ethylene (HDPE).
Level Indicator	: 1 Nos
Level Switch	: 1 Nos. with high and low level Actuator.

m) Automation of Automatic DM Plant-

Program Logical Controller

Quantity	: 1 No.
Make	: Delta UK or equivalent.
Panel	: 1 no for PLC.
Solenoid Valves	: 25 nos.
Pneumatic Valves	: 25 nos.
Cabling	: Complete cabling and cabling tray of the plant.
Data Recording	: Laptop with cable for data recording and transfer.
Software/ Hardware	: Provided in soft & hard copy.

m) Features of PLC-

1. Auto manual selection
2. Each valve can be operated manually through PLC if needed for maintenance purpose
3. Each valve can be operated manually in case of PLC hardware or software malfunctioning and valve can be operated through individual switches provided inside panel facia

4. Each valve can be operated manually through puppet on solenoid valves in case of power failure or electrical malfunctioning.
5. User modes for selecting Administrator / Supervisor / Operator mode with their unique passwords
6. 7" Colour touch screen for operation.
7. Connectivity through USB connection
8. Data downloading equipment provided with cable for data record maintaining
9. Single panel with 3 compartments for PLC, Electricals & Pneumatics
10. Self Diagnostic mode for fault finding & Alarms
11. Mimic on screen for plant operation.
12. Operates on 24 Volt DC hence no electrical soaks etc. Signal for the operating of the valves with indicator as well as hooters alarm facilities in the PLC in case of any fault.
13. Panel having various optional facilities and safety features like AUTO / MANUAL controls in case of the PLC failures. TRF is to take care of the power. Fuses of the PLC mounted outside.

n) DM Plant Erection Requirement-

Floor – Scraping of 2- 4" of old broken floor of D/M Plant room (20 ft X 50 ft) laying of new RCC 4" having reinforced bars of strength.

Self Leveling 2mm Epoxy Floor Coating – after curing of 30 days of new RCC floor, whole floor to be coated with GP SNGF Epoxy primer, 1 Coat, having 80-100 micron Dry Film Thickness (DFT)

After curing of primer for 6- 8 hrs laying of 2mm Epoxy self leveling GP SL Guard 721HT, Coat in Sky Blue colour to be applied to make the floor smooth, even and shining.

2. Minor Parameter-

Complete DM Plant system is installed in one room with all switches, pipelines etc in same room and easy to operate.

3. Concomitant Accessories (Standard Accessories)

Pressure filter System	: 2 nos
Multipor Valves For MGF & ACF	: 2 nos.
Flow Rate	: 3m3
Ejector for SAC & SBA	: 2 nos.
Conductivity Meter	: 2 Nos.
Pressure Gauge for DM Plant	: 4 nos.
Instruction Manual	: 2 nos.
Floor	: Repairing and epoxy self levelling of DM plant room

4. Optional Accessories- : NIL

5. Spares-

Pneumatic valves	: 2 nos
Solenoid Valves	: 2 nos
Ejector for SAC & SBA	: 2 nos.
Printed Operation & Instalation Manual	: 2 nos.

6. Warranty Requirement-

Required for 24 months from date of installation and commissioning. Supplier to ensure after sales service and supply of spares during and after warranty period for 10 years minimum.

7. AMC Requirement- : Not Required

8. Special Requirement-

1. Installation and commissioning shall be carried out by firm at consignee premises along with all accessories like switch board, electrical cable, starter, main switch, MCBs, all civil, repairing, painting works, pipelines etc required during installation & commissioning. Railway shall provide water supply, electrical supply and air supply at site of installation.
2. Before participation in this tender if required supplier may visit site for exploring this work.