

ENVIRONMENTAL MANAGEMENT SYSTEM
STANDARD OPERATING PROCEDURE



1. Title	Standard operating procedure for “Reverse Osmosis Unit”
2. Purpose	To define the procedure and controls to operate RO unit(s)
3. Scope	This procedure is relating to the production of treated water, storage of treated water, storage and consumption of consumables and tools related RO unit(s)
4. Responsibility	RO – unit in-charge(s)

5. Procedure

5.1. Operation of raw water pump

- Ensure the Raw Water Tank is fully filled with water.
- Ensure the Valve in the Inlet pipe connected to the Raw Water pump in open Position.
- Ensure the Rejection valve in the RO System is completely in open position.
- Switch on the Raw Water Pump

5.2. Operation of antiscalant dosing pump

- Ensure the antiscalant dosing pump tank is filled with antiscalant and mixed properly with RO output water.
- Keep the switch of the antiscalant dosing pump in the position “ON”
- Ensure the availability of water in the RO inlet water storage tank
- Switch ON the power supply
- Open the raw water supply valve
- Switch ON the feed pump
- Backwash and rinse the sand and carbon filter for 10 minutes [feasible pressure range in the filter pressure gauge for normal operation is $< 2 \text{ kg/cm}^2$]
- Change the multiport valve to service
- Switch ON high pressure pump [feasible pressure range in the high-pressure pump gauge for normal operation is between 10 and 15 kg/cm^2]

- Adjust the pressure on the control valve – RO – 1000 LPH and Reject – 1200 LPH
[feasible pressure range in the inlet pressure gauge for normal operation is between 6 and 15 kg/cm²]
- Check TDS for the RO treated water as per IS 10500:2012 standard requirements
- Fill the information in the daily log report and maintain it
- Once the RO treated water tank is full, neutralise the pressure control valve
- Switch OFF high pressure pump
- Switch OFF feed pump
- Close the raw water valve
- Switch OFF main supply

5.3 Maintenance of pressure sand filter (PSF)

- Regularly once in twenty-four hours pressure sand filter has to be backwashed, rinsed and the filter valve should be kept in the position of “ON” position.
- Initially please ensure the pump is kept in the “OFF” position.
- Keep valve of the PSF in “backwash” position.
- Switch on the raw water pump and run the pump till all the suspended solids collected in the PSF is drained out through drain pipe and clear water flow through drain pipe (operation may take minimum 10 minutes).
- After PSF is fully backwashed, switch off the raw water pump.
- Keep the valve of the PSF in “rinse” position.
- Switch on the raw water pump and run the filter for 5 minutes till the media settles to the normal position.
- Switch off the raw water pump keep the valve of the PSF in the position” position.
- Switch on the raw water pump.

5.4. Maintenance of activated carbon filter (ACF)

- Regularly once in twenty-four hours activated carbon filter has to be backwashed, rinsed and the filter valve should be kept in the position of “ON” Position.
- Initially please ensure the pump is kept in the “OFF” position.
- Keep valve of the ACF in “Backwash” position.
- Switch on the raw Water pump and run the pump till all the DIRT Coloured water collected in the ACF is drained out through drain pipe and CLEAR water flow through drain pipe (Operation may take minimum 10-15 minutes).

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- After ACF is fully backwashed, Switch off the raw water pump.
- Keep the valve of the ACF in “RINSE” Position.
- Switch on the raw water pump and run the filter for 5-8 minutes till the media settles to the normal position.
- Switch off the raw water pump keep the valve of the ACF in the position “ON” position.
- Switch on the raw water pump.

5.5. Maintenance of micron filter

- In the position of the entire system regularly once in month both the micron filters housing has to be removed and the cartridges has to be washed with normal water and do not use any sort of brushes and washing soap or liquid.
- The cartridges after washing it have to be properly inserted inside the housing and fit the same as early position and tighten it properly.
- Compulsory once in 3 months the pre-filter micron cartridges has to be replaced.

5.6. Precautionary measures

- DO not switch on the high-pressure pump without or immediate switching on the raw water pump.
- Do not switch on the raw water pump without keeping raw water tank outlet valve in open position.
- Do not operate the Valves of PSF and ACF when the raw water pump is the on position.
- Do not exceed the pump pressure $>10 \text{ Kg/cm}^2$

5.7. Process of chemical cleaning

- Chemical Cleaning process shall be recommended based on the flow, taste and output of the water time to time.
- Using Hazardous chemicals may be result in failure of RO Membranes.

6. References

1. IS 16240 : 2015 - Reverse Osmosis (RO) Based Point-of-Use (PoU) Water Treatment System — Specification

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