



STANDARD OPERATING PROCEDURE

Department: Engineering

TITLE: Operation of Purified Water System

SOP No.		Revision No.	
Effective Date		Supersedes No.	
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1.0 OBJECTIVE:

To lay down a procedure for Operation of Purified Water System.

2.0 SCOPE:

This SOP is applicable for Operation of Purified Water System at

3.0 RESPONSIBILITY:

Officer / Executive - Engineering

4.0 ACCOUNTABILITY:

Head – Engineering

5.0 DEFINITION:

Not Applicable

5.1 Purified Water is water that has been mechanically filtered or processed to remove impurities and make it suitable for use.

5.2 Parameters of Water Purity:

Purified water is usually produced by the purification of drinking water or groundwater. The impurities that may need to be removed are:

- Inorganic ions (typically monitored as electrical conductivity or resistivity or specific tests)
- Organic compounds (typically monitored as TOC or by specific tests)
- Bacteria (monitored by total viable counts or epifluorescence)
- Endotoxins and nucleases (monitored by LAL or specific enzyme tests)
- Particulates (typically controlled by filtration)
- Gases (typically managed by degassing when required)



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6.0 PROCEDURE:

6.1 Pre Startup Checks:

- 6.1.1 Check the Water Level of RO-I Water and Make Up.
- 6.1.2 Check the Voltage.
- 6.1.3 Check the Air Pressure; it should be 5 kg/cm² for Pneumatic Valve Operation.

6.2 Start Operation:

- 6.2.1 Switch "ON" the Main Control Panel.
- 6.2.2 The Log In screen shall appear on MMI, enter the User name and password.
- 6.2.3 Start the dosing system by pressing the AUTO start virtual button, then option START and STOP shall appear on screen.
- 6.2.4 Select the START button.
- 6.2.5 Select HSRO system screen and press AUTO start virtual button, then options START and STOP shall appear on screen.
- 6.2.6 Select the START button.
- 6.2.7 Select PW distribution button and press AUTO start virtual button, then options START and STOP shall appear on screen
- 6.2.8 Select the START button.
- 6.2.9 Set the flow of RO permeate and rejection as per ratio, if required.
- 6.2.10 EDI system shall start automatically once the second RO system start.
- 6.2.11 Observe the EDI Ampere Load, it shall be around 3 to 6 Amps.
- 6.2.12 Conductivity and pH will display in HMI and conductivity meter.

6.3 Stop Operation:

- 6.3.1 Push the AUTO button of dosing system.
- 6.3.2 The option START and STOP shall appear on screen.
- 6.3.3 Push the STOP button.
- 6.3.4 Push the AUTO button of HSRO system.
- 6.3.5 The options START and STOP shall appear on screen.
- 6.3.6 Select the STOP button, the system shall stop.



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6.3.7 Select the AUTO button of PW distribution system.

6.3.8 Options START and STOP shall appear on screen.

6.3.9 Select the STOP button to stop the distribution system.

6.4 Record the Operation Details of RO in **Annexure-I**, Titled “**Purified Water Generation Record**”.

7.0 ABBREVIATIONS:

RO	Reverse Osmosis
EDI	Electron Deionization Unit
L	Liter
Hr	Hour
PLC	Programmable Logic Controller
kg	Kilogram
cm	Centimeter
NMT	Not More Than
NLT	Not Less Than
Amps	Amperes

8.0 ANNEXURES:

ANNEXURE No.	TITLE OF ANNEXURE	FORMAT No.
Annexure-I	Purified Water Generation Record	
Annexure-II	Flow Rate of Water	
Annexure-III	Pressure Record of RO	

9.0 DISTRIBUTION:

- Master Copy Quality Assurance Department
- Controlled Copy No. 01 Engineering Department

10.0 REFERENCES:

Not Applicable



PHARMA DEVILS

ENGINEERING DEPARTMENT

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11.0 REVISION HISTORY:

Revision No.	Change Control No.	Details of Changes	Reason of Changes	Effective Date	Done By



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ANNEXURE – I

PURIFIED WATER GENERATION RECORD

Section: **Frequency:** After Every Two Hours

Date	Time	RO-I Feed (Tag No. 101.3 pH 01)	Conductivity RO-I (Tag No. 117.1 CT-01)	Conductivity RO-II (Tag No. 119.1 CT-01)	Conductivity EDI (Tag No. 119.1 CT-02)	EDI Load	Done By Sign & Date	Remarks
Limit→		8.0 -8.5	< 45 $\mu\text{S}/\text{cm}^2$	< 7 $\mu\text{S}/\text{cm}^2$	< 1.3 $\mu\text{S}/\text{cm}^2$	3 - 6 Amps		

**Checked By
Sign & Date**



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ANNEXURE – II

FLOW RATE OF WATER

Section: _____ **Frequency:** After Every Two Hours

Date	Time	RO-I Permeate	RO-I Reject	RO-I Recycle	RO-II Permeate	RO-II Reject	RO-II Recycle	EDI Permeate	Done By Sign & Date	Remarks
Limit→		NLT 3000 L/hr	NLT 1200 L/hr	NLT 4000 L/hr	NLT 2200 L/hr	NLT 600 L/hr	NLT 4500 L/hr	NLT 2000 L/hr		

Checked By
Sign & Date



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ANNEXURE – III

PRESSURE RECORD OF RO

Section:

Frequency: After Every Two Hours

Date	Time	RO-I Feed	RO-I Permeate	RO-I Reject	RO-II Feed	RO-II Reject	Done By Sign & Date	Remarks
Limit→		NLT 8 kg/cm ²	NLT 3 kg/cm ²	NLT 7 kg/cm ²	NLT 10 kg/cm ²	NLT 9 kg/cm ²		

**Checked By
Sign & Date**