

R.O Plant for Residential & Studio Apartment at Bath Island, Bungalow No. 2, 3 & 4 Karachi.

Technical Specification

Application: 38,000 GPD RO 6M3/HR Product Water



Item	Description	QTY	
1.	Model: SS-38,000 Make: SO SAFE Application: Membrane Process Specifications: As per the enclosed technical specifications.	1	
2.	Package Equipment will be palletized and / or boxed, film wrapped where applicable, and marked for identification.	1 set	included
3.	Transport Mode by Truck	1	included

Item	Technical Specification	
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1. **Raw Water Booster Pump** 1
 This pump is used to boost water pressure from a positive suction water tank and deliver to pretreatment at pressure and volume required.

Pump Power	7.5	H.P.	5.6	kW
Flow rate	70.0	USGPM	15.9	m ³ /hr
Pressure	60.0	PSI	4.1	BAR

Application: Service and backwash
Brand:
 GOULDS italy
Motor: TEFC
Pump fluid end: SS 316L
Pressure Gauge: 0-100 PSI
Check Valve: PVC SCH 80
Inlet and Outlet Valve: Ball or Butterfly type

2. **Multi Media Filtration Package** 1
 This system is used to reduce sand and sediment (turbidity).

Media tank: 42" Ø x 72"
Make: SO SAFE
Tank material: Fiberglass

Flow rate	70.0	USGPM	15.9	m ³ /hr
Media per tank	45.0	Cu. Ft.	1.3	m ³

Valve sequence: manual backwash
Media content: gravel, Silica sand and anthracite
Valve: manual
Test pressure: 150 psi
Wetted parts: 316 Stainless steel
Pressure Gauge: inlet and outlet of each tank

3. **Chemical Dosing package** 2
 The dosage injection pump will allow injecting different chemical into the feed water or permeate (product) water of the water treatment plant.

Brand: Etatron Italy or Aqua Italy
Application:
 pre-scaling inhibitor
 Installation Kit in PVDF
 Chemical tank 80 liters HDPE
 Tank

Recovery design	40.0%			
Influent Flow Rate	70.0	GPM	15.9	m ³ /hr
Effluent Flow rate	27.0	GPM	6.1	m ³ /hr
	38,000	GPD	147	m ³ /hr
Water Temperature	77.0	°F	25.0	°C
Influent Quality	36,000	PPM	MG/L	TDS
Effluent Quality	<500	PPM	MG/L	TDS
Inlet pressure	30.0	PSI	2.1	BAR

Technical Specifications

Frame

The system is skid mounted on heavy-duty steel frame epoxy coated.

High Pressure Pump

Heavy Duty High-pressure pump with corrosion resistant parts

Flow rate	70.00	USGPM	15.91	m ³ /hr
Discharge Pressure	850.0	PSI	58.6	BAR

Brand: Fedco / Goulds

Pump Fluid End: 2205 Duplex stainless steel

Quantity of pumps: 1

Type: Axial Positive Displacement

High Pressure Motor

The high-pressure motor is for heavy-duty industrial application. This motor is designed to operate on a 24 hour per day.

Brand: Omega/Fedco /Siemens

Power	40.0	H.P.	29.8	kW
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Type: TEFC

Qty: 1

Reverse Osmosis Pressure Vessel

Heavy duty reverse osmosis pressure vessel housings are constructed in fiberglass

Quantity: 2

Brand: First line or Equivalent

Model: 1200 PSI / Multi side port

Reverse Osmosis Membrane Elements

The reverse osmosis membranes used in this application are TFC. This is a thin film composite (TFC) spiral wound membrane.

Number of stages: 1

Total Membranes: 10

Brand: DOW Filmtec / toray/LG

Model: SW30HRLE-400

Sample Permeate Ports

Sample ports will be installed in each reverse osmosis pressure vessel to allow evaluation of the product water quality.

Qty: 2 nos

Main Electrical Enclosure

The Motor control panel and the low voltage control panel are corrosion resistant.

Type: NEMA 12

Product Water Flow meter

The inline Rota meter flow meter will read product water flow rate.

Brand: EU

Reject Water Flow meter

The inline Rota meter flow meter will read reject water flow rate.

Brand: EU

Pressure Gauges

Stainless steel liquid filled pressure gauges for maximum monitoring and visibility.

Brand: Wika Germany

Case material: 304 stainless steel

Wetted part: 316 Stainless steel

Dial size: 2.5" Diameter

Process Connection: ¼" NPT

Reject Water Pressure Regulator Valve

Heavy-duty stainless steel pressure regulator. This regulator will allow the operator to adjust the backpressure in the reverse osmosis membranes.

Material: stainless steel 316L

Raw Water Actuator Valve

This valve will close and open at every start up and shut down of the plant

Valve: Electric Motorized actuator

Wetted parts: 316 Stainless steel

Make: EU/USA

Electrical Components

The plant will include all the necessary contactors, starters, Magnetic starters, overload relays, terminal blocks, relays, circuit breakers, and indicator lights. All of these components are UL listed approved.

Safety Features

All pressure switches are provided to protect the reverse osmosis plant against inadequate flows, and pressure to, and from the inlet, and outlet of the plant.

Quantity: 3

Functions: High Pressure Pump suction & discharge and permeate

Brand: Sick Germany

Material: Stainless steel wetted parts

Hour meter

The screen will also illustrate the total accumulated operational hours

Main Discount Switch

This allows interrupting the power to the High Voltage panel prior to servicing it and meets UL standards.

5. **Programmable Logic Control (PLC)**

The equipment features state of the art PLC system to accurately monitor, and control all the different I/O of the plant.

Brand: Delta or equivalent

1

Human Interface (HMI) Monitor

The equipment features a HMI to visualize the different functions of the plant to guarantee a smooth operation in the field.

Brand: delta

Model: 5" monochrome

- 6. **Low Pressure Piping and Valves** 1
Low-pressure piping and valves will be supplied in rigid and flexible plastic.
Material: PVC SCH 80 and flexible polyethylene tubing

- 7. **High Pressure stainless steel piping** 1
Material: 316L stainless steel

- 8. **Pre-filter Housing** 1
Integrated cartridge filtration
Application: 5-micron cartridge filter
Brand: EU/USA
Material: ABS
NO of cartridges: 7 cart 30"

- 9. **High Pressure Motor Variable Frequency Drive (VFD)** 1
Digital high power Variable Frequency Drives (VFD) to allow accurate speed of the high pressure motor and also smooth start and stop operation.
Motor Controller: Variable Frequency Drive (VFD) for speed control
Make: Delta/Invnt/ABB

- 10. **TDS (Total Dissolved Solid) Meter – Permeate water and feed water** 2
Inline Permeate water TDS monitor for continuous reading with low / high set points.
Brand: Createc
Application: NEMA 4x / IP65
Inlet TDS controller : up to 45,000 ppm
Out let TDS controller up to : 1000 ppm

- 11. **Clean In Place (CIP) Unit for Membranes** 1
This CIP skid will allow the operator to clean the membrane with all the correct solution in order to maintain the membranes in optimum conditions and extend the longevity.

Pump Power	5.5	H.P.	4.1	kW
Flow rate	55.0	USGPM	12.5	m ³ /hr
Pressure	50.0	PSI	3.4	BAR

Tank: 300 gallons

Tank Material: HDPE

Pump make : Goulds Italy

Pump: 316 Stainless steel fluid end

Electrical Control Panel: NEMA 12

Filter Canister: 5 microns cartridge (share with RO system)

Skid: Stainless steel frame

Piping: PVC SCH 80

Float: Low Level

Pressure Gauge: 0-100 PSI

- 12. **Membrane Fresh Flush System** 1
Fresh Flush System will allow the system to flush the membrane with permeate water at every shut down in order to maintain the membranes in optimum conditions and extend the longevity.
Piping: PVC SCH 80
Actuator valve : Motorized
Make: EU/USA

PH Meter – Permeate water

1.

Inline Permeate water ph monitor for continuous reading with low / high set points.

Brand: Createc

Application: NEMA 4x / IP65

ONE YEAR RUNNING CARTRIDGES AND CHEMICALS.

1. Anti scallent per year : 920 liters
2. Cartridges PP yarn 30" 5 micron: 168 nos
3. Membrane cleaning once a year
4. Biocide : 365 Kg

BUYERS RESPONSIBILITY

1. Bore
2. Drain lines up to plant room
3. 3 phase electrical connection in plant room.
4. LT panel and transformer
5. All civil works

Project Information:

Case-specific:

System Details

Feed Flow to Stage 1	67.50 gpm	Pass 1 Permeate Flow	27.00 gpm	Osmotic Pressure:	
Raw Water Flow to System	67.50 gpm	Pass 1 Recovery	40.00 %	Feed	411.65 psig
Feed Pressure	873.16 psig	Feed Temperature	25.0 C	Concentrate	702.4 ₃ psig
Flow Factor	0.85	Feed TDS	36000.0 mg/ ₁ l	Average	557.04 psig
Chem. Dose (100% H2SO4)	0.00 mg/ ₁	Number of Elements	10	Average NDP	307.0 ₉ psig
Total Active Area	4000.0 ₀ ft ²	Average Pass 1 Flux	9.72 gfd	Power	32.05 kW
Water Classification: Well Water SDI < 3				Specific Energy	19.79 ₁ kWh/kg

Stage	Element	#PV	#Ele	Feed Flow (gpm)	Feed Press (psig)	Recirc Flow (gpm)	Conc Flow (gpm)	Conc Press (psig)	Perm Flow (gpm)	Avg Flux (gfd)	Perm Press (psig)	Boost Press (psig)	Perm TDS (mg/l)
1	SW30HRLE-400	2	5	67.50	868.16	0.00	40.50	855.92	27.00	9.72	0.00	0.00	172.60

Pass Streams (mg/l as Ion)						
Name	Feed	Adjusted Feed	Concentrate		Permeate	
			Stage 1	Stage 1	Stage 1	Total
NH4	0.00	0.00	0.00	0.00	0.00	0.00
K	0.00	0.00	0.00	0.00	0.00	0.00
Na	14161.49	14161.49	23556.65	67.89	67.89	67.89
Mg	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.00	0.00	0.00	0.00	0.00	0.00
Sr	0.00	0.00	0.00	0.00	0.00	0.00
Ba	0.00	0.00	0.00	0.00	0.00	0.00
CO3	0.00	0.00	0.00	0.00	0.00	0.00
HCO3	0.00	0.00	0.00	0.00	0.00	0.00
NO3	0.00	0.00	0.00	0.00	0.00	0.00
Cl	21838.51	21838.51	36326.83	104.70	104.70	104.70
F	0.00	0.00	0.00	0.00	0.00	0.00
SO4	0.00	0.00	0.00	0.00	0.00	0.00
SiO2	0.00	0.00	0.00	0.00	0.00	0.00
Boron	0.00	0.00	0.00	0.00	0.00	0.00
CO2	0.00	0.00	0.00	0.00	0.00	0.00
TDS	36000.01	36000.01	59883.48	172.60	172.60	172.60
pH	N/A	N/A	N/A	N/A	N/A	N/A

Design Warnings

-None-

Solubility Warnings

-None-

Stage Details

Stage 1 Element	Recovery	Perm Flow (gpm)	Perm TDS (mg/l)	Feed Flow (gpm)	Feed TDS (mg/l)	Feed Press (psig)
1	0.12	4.13	94.62	33.75	36000.01	868.16
2	0.11	3.35	129.12	29.62	41004.29	864.90
3	0.10	2.61	180.17	26.27	46212.37	862.16
4	0.08	1.97	256.30	23.66	51297.80	859.81
5	0.07	1.44	368.93	21.69	55928.93	857.76

Warranty

Warranty: SELLER guarantees that the commodity is made of the best materials and workmanship. The equipment will carry a 12 month's limited warranty from date of startup or 13 months from date of shipment whichever occurs first. The warranty will cover all parts manufactured by Seller. All other components will carry the original manufacturer's warranty.