

# ZC-FSHB5

## ZC-FSHB5 Reverse Osmosis Fresh Water Generator WITH

**5TONS/DAY(0.25 m<sup>3</sup>/h)**

### Technical Proposal

#### 1. General

##### 1.1 General description

Subject technical proposal specify requirement technical details, supply scope, testing scope, testing standard, packing, delivery and aft-sales service.

##### 1.2 Availability

The technical proposal specify design scheme, inspection protocol, and to be confirmed as attachment of contract.

#### 2. System requirement

2.1 Subject proposal relates the flow diagram, which comply with standard requirement of customer.

2.1.1 Fresh water standard comply with WHO

2.1.2 Capacity:6m<sup>3</sup>/24Hours

2.1.3 Salt content:≤500mg/L

2.2 Subject proposal conclude with follow requirement.

2.2.1 Raw water: sea water

2.2.2 Other basic design condition related

Model of Reverse Osmosis : One stage Reverse Osmosis

Purpose : Marine and offshore

Power supply: 380V, 50 HZ, 3P

#### 3. Function and service description

-Raw water boosting and pre-treatment system

-Online monitoring device of Reverse Osmosis product water salinity

-Semiautomatic cleaning and fore & back flushing system with compressed air acceleration of sand filter.

- Spares and special tools with reference to maker's standard
- On-site commissioning and conduct available upon demand of customer in China
- World-wide aft-sales service and maintenance upon request

#### 4. Environment condition

Environment working condition of ZC-FSHB5

Environment Tem: 0~45°C, Seawater Tem: 5~35°C, Humility: 20%~95%

#### 5. Performance

### 5.1 system function

- 1) Sea water 35000ppm, for desalinating sea water into fresh water 500ppm
- 2) Semi-automatic cleaning and back-flushing system equipped for sand filter,
- 3) There is over-pressure protection available for high pressure pump, when pressure is over 6.5Mpa, the system will shut down automatically.
- 4) High pressure pump equipped with low-pressure protection device, when pre-treated sea water pressure is less than 0.05Mpa, the system will shut down automatically.
- 5) Working parameter (Raw water flow, product flow, brine flow, operation pressure, product water conductivity)

### 5.2 Technical parameter

Product :	6m <sup>3</sup> /day (24hours)
Raw water :	≤35000PPM
Inlet temperature :	5~35°C
PH value of Raw W. :	3.0~10.0
Boosting inlet pressure :	0.1~1kg/cm <sup>2</sup> (Positive)
Salt content of product water:	≤500PPM
Desalination rate :	≥98.5%
Product water pressure :	≤0.3Mpa
Recovery :	≈28%
Power supply :	380VAC/50HZ/3φ
Power consumption :	≈2.75KW (Include boost pump)
Control cabinet :	220VAC
Control voltage:	220VAC
Motor :	IP: IP55 Insulation class: “F”
Outline :	L×W×H=1080×440×1600mm
Weight :	Dry: ≈280kg
Wet:	≈320kg

### 6. Supply scope

The system mainly includes follow parts

Item	Specification	Unit	Qty	Remark
Boost pump	Capacity: 2.0m <sup>3</sup> /h, head: 40m Type:CHL2-40	Set	1	SS316 Stainless steel
Sand filter	Φ×H=250×1350mm	Set	1	Glass fibers
Valve sets	DF-56	Set	1	
Fine filter	1×10"×5um	Set	1	5-micron size
Fine filter	1×10"×10um	Set	1	10-micron size
Filter core	10"-10u	Set	1	Fiber
Filter core	10"-5u	Set	1	fiber

Motor	Maker standard	Set	1	2.2kw
High pressure pump	WS-82	Set	1	
Belt		Set	2	
Motor wheel	Maker standard	Set	1	
Membranes	SW30-2540	Set	4	Importation ( D o w s )
Membrane shell	Ropv	Set	4	1000PSI
Pressure adjust valve	DN25	Set	1	316L needle valve
Intel water Pressure gauge	0.7Mpa	Set	1	High pressure inlet pressure
Operation Pressure gauge	10Mpa	Set	1	Membrane inlet pressure
Pressure gauge	0.7Mpa	Set	1	
Flow meter	Maker standard	Set	1	sea water inlet flow meter
Flow meter	Maker standard	Set	1	drinking water flow
Conductivity meter	CM230	Set	1	0~2000us, Ac:0.1us
Pressure switch		Set	1	0.065~1.2Mpa
Safety valve	SR3/8"	Set	1	Importation
Frame	Mild steel	Set	1	3 0 4 Stailless steel
Cleaning tank		set	1	U P V C
Piping system	DN25, DN15	set	1	PPR

## 7. Design and manufacture

7.1 Maintenance space: front & back >500mm; left & right >500mm

7.2 Pump module with compact design

7.3 Interface connection

1:Raw sea water inlet: DN25

2: Brine water, drain, unqualified water outlet: DN20

3: Product water outlet : DN15

4: Power connection: 3x380V, 50Hz

7.3 Material and corrosion proof requirement

The components and piping that contact sea water are made in antiseptis material

7.4 Color, name plate and mark

Name plate made in stainless steel, description in English/Chinese.

Electric drawing with plastic coated is available in control cabinet.

7.5 Quality control

7.5.1 The filters to be carried with pressure test under 0.6Mpa without deformation and damages.

7.6 Interchangeable

The system consists of more standard parts, which is interchangeable in right way. Key spare components of high pressure pump speck, and membrane Hydranautics, which is easy to be found world-widely.

7.7 security

1: Please fully follow the operation and guidance of subject specification.

2: Please rectify the rotation of motor before initial start-up.

- 3: The unit is to be required for good earthing.
- 4: RO frame made in 304 stainless steel coated.

## 8 Description of main components

8.1 1 Piece steel framework epoxy coated to accommodate the whole Reverse Osmosis Unit, dimensions 1080(L) ×440(W)×1600(H). The frame is made out of stainless steel.

8.2 1 Piece boost pump, the pump made in Stainless Steel. Mechanical seal, the pump is specially made with stable boosting pressure.

Capacity: 2.0m<sup>3</sup>/h, head: 40m

Type:CHL2-40

Power supply : 3×380VAC, 50Hz; 0.55kw stainless steel SS316L .316l.

Protection class : IP44

Insulation : F

8.3 1 Piece low speed high pressure triplex plunger, rubber damper of pump sets arranged already as per maker standard. The unit designed with a maximum pressure of 60 bar at a temperature of 25°C. This pump is the best in quality and performance in the market, which runs a very low number of revolutions which gives this pump a very high reliability against a low noise level. The pump is built together with a marine type electric motor of 2.2kW, belt driven.

Capacity : 2m<sup>3</sup>/h Work pressure : 55bar

Power supply : 3×380VAC, 50Hz; 2.2kw

Protection class : IP55

Insulation : F

8.4 1 Piece of sand filter, made of fiber glass, the sand filter will remove suspended solids, mud, which the size is over 20μ. The filter tank equips semiautomatic valve ensure fore and back-flushing, and keep treated sea water out of solid germs etc. which well accelerate back-flushing application.

Volume: 150L

Capacity: Max 2m<sup>3</sup>/h

Working pressure & test pressure: 2~4bar & 6bar

8.5 2Pieces fine filters with replaceable and washable filter candles from 10 and 5 μ. The unique design of the quick change filter candles .

Capacity : Max 2m<sup>3</sup>/h

Working pressure & test pressure: 2~4bar & 6 bar

Filter element#1: 10μ,

Filter element#2 : 5μ

8.6 4 Piece high pressure vessel to accommodate total 3 sets of membranes. These high-pressure vessels maker Ropv, which are made according to the latest techniques and have been tightness-tested on 1000-PSI, and tension test in 1500PSI.

Model: SW30-2540 QTY: 4PCS

8.7 4 Pieces membranes make DOW (USA). Those membranes are from the latest knowledge in membrane technology; the standards for membranes are continuously in progress by excessive study through DOW,They have reached the highest standard today.

Model : SW30-2540

Quantity: 4pcs

Configuration: Spiral wound  
Membrane Polymer: Composite Polyamide

8.8 1 Piece electrical operated high-pressure switch, this safety device switches off the whole unit during over pressure adjusted at 65 bar.

Pressure setting: 10~100bar

Relay contact: 230VAC, 1A

8.9 1 Piece electrical operated low-pressure switch, this safety device switches off the whole unit during low pressure adjusted at 0.5 bar before high pressure pump, and protects the high-pump from running dry.

Pressure setting: 0.1~10bar

Relay contact: 220VAC, 1A

8.10 1 piece stainless steel safety valve made in stainless steel 316L adjusted to 65 bar. This device is mounted to make this unit double safe against over pressure.

8.14 1 Salinity probe in the product water to measure the salt content in the product water.

9 Quality guarantee

9.1 inspection items

9.2 Workshop test

Issue workshop test certificate

9.3 Quality guarantee period one years aft delivery.

10 ASSEMBLY Spare parts

Spare parts list:

No.	Item	Specification	Unit	Qty	Remark
1	Belt		set	4	
2	Filter core	10"-10u	set	4	fiber
3	Filter core	10"-5u	set	4	fiber
4	Tool	Maker supply	set	1	
5	Membranes O-ring		set	5	
6	Pressure adjust valve		Piece	1	
7	Membranes cleaning solution	ZC-QX5	set	5	Fuse, indicator, relay
8	Membranes protector	ZC-BH5	set	5	

11. Documents

11.1 1sets of technical specification

11.2 1sets of operation and maintenance manual

11.3 System flow diagram

11.4 System outline

11.5 Electric drawing

12. Commissioning

The proposal includes 3 working days/ engineer on-site commissioning in China. Meanwhile we have included one month consumables for commissioning period.

Leading time: 10 days after contract signed

Suggest to buy consumables in one year:

No.	Item	Specification	Unit	Qty	Price	Account
1	Belt		set	4	10	40
2	Filter core	10"-10u	set	30	10	300
3	Filter core	10"-5u	set	30	10	300
4	High Pressure Hose		set	1	800	800
5	Membranes O-ring		set	4	15	60
6	Pressure adjust valve		Piece	1	220	220
7	Membranes cleaning solution	ZC-QX5	set	5	15	75
8	Membranes protector	ZC-BH5	set	10	15	150
	total:					1945