



موسى-دېلى
moosa-daly

Reverse Osmosis



Hydro Systems Division

moosa-daly's Hydro Systems Division specialises in the provision of high quality products and engineered solutions relating to temperature, pressure flow and level. DME's wide range of engineering capabilities enable us to provide total solutions for measurement and process applications, including centralised or remote monitoring via integrated Data Logging and Transmission systems.

moosa-daly's assembled solutions include fluid analysis, ultraviolet sterilisation and sea water desalination designed specifically for an offshore/ marine environment. Our products are all offered with options for installation and commissioning in port or offshore by our fully qualified service team based in Dubai.



Reverse Osmosis

The process of reverse osmosis takes sea water from the sea at the location of the rig, normally via the existing sea water ring main. The salt water is initially passed through a pre-filter designed to filter out any suspended solids (sometimes the current takes drill cuttings or other waste material into the vicinity of the deep well). From the Pre- filter skid, the water is fed to the reverse osmosis units. An optional dechlorination unit is available should the incoming seawater be chlorinated. There is also the option of including a booster pump if the sea water ring main pressure can not maintain the required feed water pressure.

A high pressure pump, operating at around 55 - 60 bar, pumps the filtered sea water through a series of membranes that allow passage of freshwater. The concentrated salt water is rejected as brine. In broad terms about 40% of the feed water is recovered as freshwater; the remaining 60%, is rejected as brine.

The permeate water can then be directed through a remineralisation column which adds some minerals back into the permeate. This stabilises the pH to protect downstream pipes and tanks, in addition RO water tastes 'flat' and has very small amounts of mineral remaining, so to improve the taste and hardness of the water, it is passed through the remineralisation column.

Advantages of Daly Watermakers

Standard Unit

The Daly R045 and Daly R082 are the standard units described in this document. They are optimally sized for an offshore rig and deliver 45m³ - 82m³ fresh water/day (283bbl/day - 515bbl/day) from Arabian Gulf (salinity up to 42,000ppm) seawater. Dimensions are given in the specifications below.

Custom build

Daly Reverse Osmosis units may also be custom built to suit the requirements of the individual offshore ship or rig. Specialising in engineering the systems to maximum efficiency with a small footprint, **moosa-daly** provides Watermakers with high volume and high quality output. The units may be engineered for specific locations in the world, taking into account local salinity and temperature conditions, with the membranes being selected accordingly.

System Assumptions

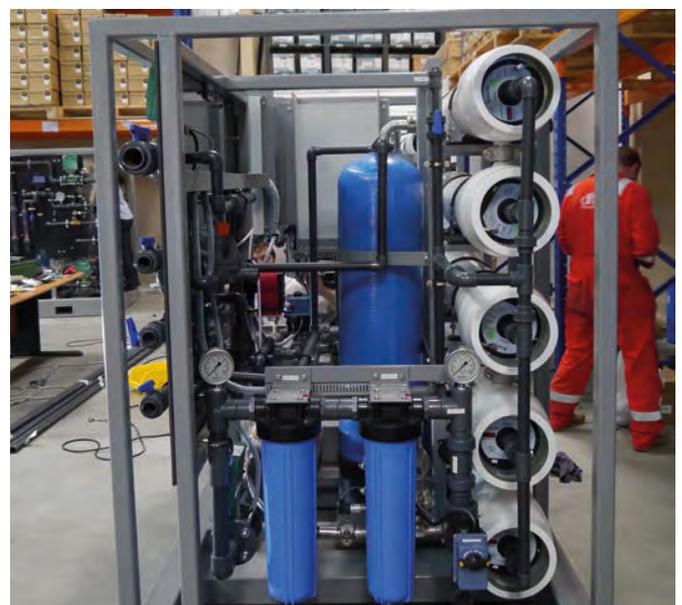
The following assumptions have been made for the Daly R045 & Daly R082 units:

- **Area of use:** Arabian Gulf
- **Permeate required:** 45m³ - 82m³/day
- **Electrical supply:** 480VAC 3Ø 60Hz
- **Sea water supply:** 115m³ - 210m³/day at 1.2 - 5.2 bar

Commissioning and Servicing

moosa-daly's commissioning engineers are fully T-BOISET trained and undertake the final set-up and commissioning of the Watermakers on the rig, whether they are in dock for maintenance or operational.

In the unlikely event that the units require a service intervention, **moosa-daly** engineers can attend at short notice. We keep all critical spares for these units in their warehouse in Dubai, although it is recommended that certain user-serviceable spares are also kept on the rig.



Sea Water Reverse Osmosis Skid (Watermaker)

Compact Units to provide 45m³ or 82m³/day permeate water

- **Unit size:** (1350mm width x 2000mm length x 1812mm high)
- **Frame Type:** Skid Mounted, Carbon Steel Epoxy Coated, 1 piece
- **Electrical Panel:** Schneider Type, 1000mm (h) x 800 (w) x 400 (d)
- **Piping and Fittings:** LP valves, pipes and fittings PVC throughout. HP Piping and Brine Control Valves are 316 SS. All Equipment Tagged and Labelled included.

Pre-filter Skid

Compact unit to suit 1 x 45 m³/day or 1 x 82m³/day reverse osmosis skid

- Skid Type: Dual Cartridge Filter Assemblies, duty and standby
- Frame Type: Skid Mounted, Carbon Steel Epoxy Coated, 1 piece
- Optional Booster Pump: Skid can be supplied with or without a feed booster pump dependent on the sea water ring main pressure
- Electrical Panel: Schneider Type, 600mm (H) x 400 (w) x 200 (d) with Start/Stop push buttons for booster pump operation, Indicators, E-Stop and Main Isolator
- Electrical Requirements: 480VAC, 60 Hz, 3 Phase

Notes:

- System sized for 1 Duty, 1 Standby Filter Operation which will ensure that continuous operation of the Reverse Osmosis system can be maintained.