



IND SERIES REVERSE OSMOSIS WATER TREATMENT SYSTEMS

General Description

Canadian Water Technologies offers Reverse Osmosis Water Treatment Systems designed specifically for industrial applications, designated the "IND" Series. These Water Treatment Systems consist of a Reverse Osmosis unit with pre-treatment and post-treatment options built to the clients specifications. The Water Treatment System can be arranged in a variety of configurations including modular integrated multiple skids. The RO unit includes a skid mounted high pressure multi-pump stainless steel feed system, fibreglass side entry pressure vessels, spiral wound thin film composite RO membranes, PVC low pressure feed piping, 304L stainless steel high pressure piping, 304L/PVC reject and reject/recirculation piping, PVC product piping, and a control panels. The Water Treatment System is pre-assembled, pre-wired, and hydrostatically tested at the manufacturing facility. The RO membranes can be factory installed and tested or shipped separately for field installation.

Mechanical Description

The major components are supported by an aluminum skid/frame, which is designed to provide easy access for servicing, maintenance, and monitoring system performance. The frame is a full frame configuration designed to offer maximum support and protection for the RO unit's components. The advantages of aluminum over steel for a large skid are many. First is the inherent lighter weight, which makes shipping, handling and placing easier. Secondly, aluminum doesn't rust like steel. This keeps the system looking better even after years of use. Because it doesn't need paint to prevent rusting, an aluminum skid can be easily welded on with out recoating. This makes site retrofits or upgrades quick and easy. The floor of the skid is a bright finish checker plate which provides better footing under wet conditions. The pressure vessels are arranged to accommodate future expansion if necessary, without disturbing the existing components.

The RO unit's piping is neatly arranged and supported on the frame. All piping is 304 stainless steel, including the high-pressure membrane feed piping, high pressure reject piping, pump feed, high pressure recycle, reject. The product header is PVC. The individual element pressure vessels are connected to the product header by flexible PVC tubing. All high-pressure valves, including the pump discharge/recycle valve, reject control valve, and reject/recycle valves are stainless steel.

Sample valves are provided for each of the RO unit's membrane housings product ports. These sample valves will be located at the end of the membrane assemblies for ease of sampling and data collection.

Pre chemical feed pumps and tanks are supplied on all "IND" series RO units with recovery rates of greater than 50 percent. These chemical feed systems come completely pre-wired and pre-plumbed, and are skid mounted. Post chemical feed systems are optional dependent on client requirements.

Skid mounted pre-filtration system is also provided for the RO system. Pressure indicators are mounted to provide pressure drop indication across the pre-filters.

Feed, product, and reject piping is designed for minimal removal during RO membrane loading and unloading.

Integral Clean-in-place cleaning system is provided mounted on the skid for periodic and routine cleaning/sanitizing of the Reverse Osmosis system.



All line pressures are monitored at the control panel with pressure transmitters located at all strategic monitoring locations. These include; the inlet feed, pump discharge/pre-membrane, post-membrane, recycle, and the product pressures.

Flows are monitored by digital display on the control panel with paddle wheel transmitters located at all strategic monitoring locations. These include; the product, concentrate/waste, and recycle flow.

Instrumentation options include the following parameter monitoring: feed and product conductivity, percent rejection, feed and product pH, and feed ORP. The selected parameters are displayed on the local screen at the control panel. Instrumentation and monitoring is critical to determining the performance of the RO, setting of the operating parameters, noting changes in source water quality, and predicting the service cleanings for the elements.

Fiberglass side port pressure vessels that house the RO membrane elements are used to facilitate a simple, compact, and easy to service feed and reject piping arrangement. These pressure vessels are registered and certified by the National Board of Boiler and Pressure Vessel Inspectors with an ASME stamp. The side port design makes loading and replacing of the RO elements a simple and quick operation as there is no fixed piping to be disconnected to remove the end caps.

CWT offers Filmtec reverse osmosis membrane elements including elements with the "iLEC" interlocking end caps. These elements offer the greatest surface area and thus are the highest producing eight inch by forty-inch elements on the market. They are also of a low energy design, which lowers overall operating costs by keeping pumping pressures, and thus energy costs down. The "i" series elements incorporate Filmtec's patented, industry leading interlocking end cap (iLEC), which reduces the risk of o-ring leaks that cause poor water quality.

CWT uses multi-stage centrifugal pumps that offer smooth operation, requires no hydraulic pulse controls to prevent shocking of the piping and membranes, and inherently needs no vibration dampening. The slim design of the pump allows the positioning of it on the RO skid. The system therefore can be fully fabricated and pre-piped with the pump in place. This means there is no mounting of the pumps on a separate skid, which saves on site installation costs. The pump is also fully wired to the control box, which simplifies the site electrical hook-up.

Electrical Description

The RO unit's control system is comprised of a control panel skid and skid mounted wiring. The control panel is a polyurethane coated NEMA 4 rated enclosure housing a programmable logic controller (PLC) for the integral control of the RO unit as well as discrete inputs and outputs for communicating with the pretreatment and post treatment equipment. The PLC is fully programmed and the control system is integrity tested at the factory prior to shipment. Electrical service to the RO unit is a dual voltage supply.

The control panel is mounted in such a way to allow easy access to process monitors and control devices such as lights and switches. The RO unit comes standard with a percent rejection water conductivity monitor. The monitor will display the system feed conductivity and product water conductivity. Alarm contacts and 4-20ma outputs will be provided from the instrument to monitor changing water quality and signal a product water alarm condition.

IND Series Water Treatment Systems are Available in Nano-filtration and Ultra-filtration Configurations



GENERAL TECHNICAL SPECIFICATIONS

Reverse Osmosis System Design Specifications

Feed Water Specifications	Not Supplied (2000 mg/l)
Capacity @ 25°C	Up to 0.5 us mgpm
Maximum Recovery	Up to 90%
Configurations	Single Pass / Double Pass / Duplex

Mechanical Component Specifications

Piping/Tubing

Rigid High Pressure	Stainless Steel
Rigid Low Pressure	PVC/LXT
Flexible Low Pressure	PVC/Nylon

Fittings

Rigid High Pressure	Stainless Steel
Rigid Low Pressure	PVC/LXT
Flexible Low Pressure	PVC/Nylon

Electrical Component Specifications

Enclosure	Nema 4 Rated
Voltage/Amps	460V - 3ph/110V - 1ph
CSA Certification	Manufacturers Site Approval

General Component Specifications

Pre-Filter Housing(s)	Stainless Steel
Pre- / Post Chemical Feed(s)	6 gpd / 45 gallon Tank
High Pressure Pump(s)	(1) Stainless Steel Multi-Stage Centrifugal – 15 HP
Membrane Model\Type	Filmtec BW30
Membrane Housings	Fibreglass / Stainless Steel
Membrane Housing Orientation	Horizontal
Frame/Skid	Aluminum

Feed Water Parameters

Feed Water Temperature	1°C to 40°C
Feed Water Pressure	30psi – 80psi
Feed Water SDI	<3
Feed Water Turbidity	Maximum 1 NTU
Feed Water Chlorine	Maximum .01ppm
Feed Water pH	2 to 11
Feed Water TDS	<2000 mg/l naCl



Model INDRO1X_

