MAXIMUM TREATMENT, MINIMUM EFFORT

Meet Stringent Nutrient Limits
Reduce Chemical and Energy Usage
Construct, Operate and Maintain Easily

INFLUENT → ANOXIC / ANAEROBIC ZONE → AEROBIC ZONE → EFFLUENT

Divert Gate → IR Gate → RAS → Effluent Weir

CARROUSEL SYSTEMS
OVIVO | NUTRIENT REMOVAL
OVIVO: AN ENGINEERING PROCESS POWERHOUSE

The Ovivo Carrousel Process Team, which consists of decades of biological wastewater treatment plant design and innovation, has provided expertise and design assistance for wastewater treatment plants of all shapes, sizes, and effluent requirements.

THE CARROUSEL® PROCESS FAMILY

<table>
<thead>
<tr>
<th>Stages</th>
<th>1-STAGE</th>
<th>2-STAGE</th>
<th>3-STAGE</th>
<th>3-STAGE</th>
<th>4-STAGE</th>
<th>5-STAGE</th>
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</thead>
<tbody>
<tr>
<td>BASIC CARROUSEL® SYSTEM</td>
<td>denitIR® CARROUSEL® SYSTEM</td>
<td>AlternatIR® SYSTEM</td>
<td>AIC® SYSTEM</td>
<td>BARDENPHO® CARROUSEL® SYSTEM</td>
<td>BARDENPHO® CARROUSEL® SYSTEM</td>
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<tr>
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<tr>
<td><strong>RE-AERATION</strong></td>
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</tr>
<tr>
<td><strong>EFFLUENT (mg/L)</strong></td>
<td>BOD≤5 NH3-N≤0.5</td>
<td>BOD≤5 NH3-N≤0.5</td>
<td>BOD≤5 NH3-N≤0.5 TN≤5-8 TP≤0.3*</td>
<td>BOD≤5 NH3-N≤0.5 TN≤5-8 TP≤0.3*</td>
<td>BOD≤5 NH3-N≤0.5 TN≤3 TP≤0.3*</td>
<td></td>
</tr>
</tbody>
</table>

* May require trim doses of metal salts

CAPABILITIES:
- Detailed Design Support
- Efluent Guarantees
- Process Modeling (Biowin)
- Equipment Sizing
- Automated Controls and SCADA
- Water Expert Compatible
- Retrofits and Upgrades
- 3-D Modeling and CAD Support
In the denitIR® Carrousel System an integral anoxic basin is added for Total Nitrogen removal without supplemental carbon addition. The internal recycle (IR) is large (6-15Q) and requires no additional pumping.

The automatically controlled EliminatIR™ Gate can be used to create anaerobic cycles in the anoxic zone to achieve phosphorus removal. This is called the AlternatIR System.

In the aerobic (Carrousel) zone, BOD and ammonia oxidation (nitrification) proceed to completion. The Excell® Aerator provides all aeration, velocity, and internal recycle pumping required at all influent loading conditions.

OVIVO: A HISTORY OF EXCELLENCE

- Installs 1st Carrousel® System: 1979
- Installs 1st BNR System: 1983
- Develops and installs 1st denitIR® Carrousel® System: 1988
- Develops and installs 1st ACE™ Control System to conserve energy: 1991
- Develops and installs 1st Dual-Impeller Aerator: 1998
ALL AERATOR MAINTENANCE FROM A CLEAN CONCRETE DECK
SYSTEM FULLY AUTOMATED TO REDUCE ENERGY AND MEET TIGHT N AND P LIMITS
NO IR PUMPS REQUIRED. IR CHANNEL DELIVERS 12Q OR HIGHER.

2001
Develops and installs 1st Deep Tank Carrousel® System

2006
Installs 600th Carrousel® System

2007
Introduces the Excell® Aerator II: Our most efficient Dual-Impeller Aerator for BNR Systems to date!

2009
Introduces the EliminaIR™ Gate to maximize, optimize and automate BNR

2010
Introduces the Oculus™ BNR Control System

2012
Introduces Ovivo® Connect™ Asset Management System

2013
Develops and installs the first Full BNR optimization Oculus™ MCC

2014
Introduces Carrousel® SwingIR™ System

2019
Introduces new ExcellAerator PRO for improved mixing
The Carrousel® System is a leading technology in wastewater treatment and biological nutrient removal. With over forty years of experience and more than 800 installations in North America, the Carrousel system has proven to be the most rugged, reliable and forgiving treatment system available. Each Carrousel System is engineered to achieve the highest quality effluent with the lowest cost of operation and maintenance. The Carrousel is universally praised for operational simplicity and dependable performance from start up to the most demanding situations.

Carrousel Systems offer the lowest number of aerators per basin compared to other oxidation ditch systems, such as those that use horizontal shaft aerators. This greatly simplifies installation and maintenance requirements.

At a minimum, a Carrousel System consists of a “racetrack” style reactor basin with at least one vertical shaft, low-speed mechanical aerator, the Excell® Aerator, installed in the center of one of the turns. The basic Carrousel System is capable of full BOD and Ammonia reduction. Nutrient removal is easily added to a Carrousel System via the addition of anoxic and anaerobic selector zones, or even with simple, optimized operational strategies.

The Carrousel System utilizes the Modified Lutzack-Ettinger (MLE) configuration for highly efficient denitrification. This process is known as the denitIR® System, where internal recycle (IR) flow is directed into the anoxic zone via a slip-stream channel using propulsion generated by the Excell Aerator. No additional energy for IR pumping is required. IR flowrate is varied by the EliminateIR™ Gate. The Oculus™ Control System automatically controls the aeration rate and IR flow.

Top: The Excell® Aerator is installed at one or more of the channel turns and provides all aeration and mixing required for full nitrification and BOD removal.

Bottom: Anoxic and anaerobic basins are easily added for Total Nitrogen and Total Phosphorus removal in Ovivo’s denitIR® configuration.
RETROFITS:
Upgrading your existing Carrousel System has never been easier or more worthwhile. Improve your efficiency, reduce your maintenance, or automate your process. Ovivo provides estimates for services and return on investment with a custom-made appraisal of your existing infrastructure.

OVIVO OFFERS COMPETITIVE TURNKEY AND TRADITIONAL UPGRADE AND RETROFIT PATHWAYS FOR YOUR EXISTING SYSTEMS, EVEN IF YOU DON’T ALREADY HAVE A CARROUSEL SYSTEM.

FIND US ON YOUTUBE!
SEARCH CARROUSEL® SYSTEM

Get your team on the same page. Upload and share documents & media. Create and manage service logs and maintenance schedules.

Learn more at WaterExpert.com

1-855-GO-OVIVO
info@ovivowater.com
ovivowater.com

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ALL OF YOUR MANUALS, ALL OF YOUR KNOWLEDGE, ALL IN ONE PLACE.