

## EEC OFFER GLOBAL PRODUCTION AND SERVICES



## EEC MBBR – MBR - BIOREACTORS

Features Compact plant with integrated tertiary membrane treatment

High effluent quality suitable for reuse

Innovative method combining MBBR & MBR technologies

Lower energy consumption than conventional MBRs

Smaller footprint than conventional MBRs

High performance and reliable operation

Quick installation and start-up

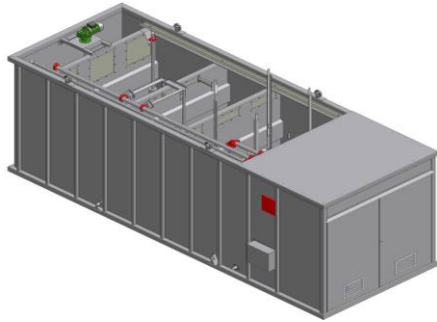
Fully automated operation and remote monitoring ability

EEC Europe – EEC USA – EEC Thailand – EEC India – EEC Brazil – EEC Australia – EEC Central America  
EEC Middle East – EEC Global Operation

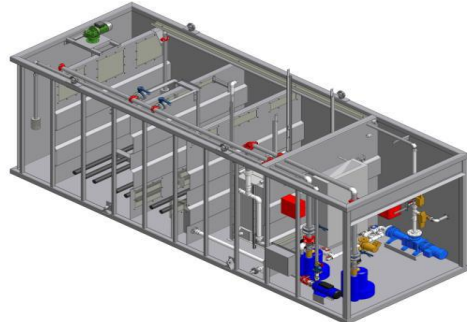
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## FEATURES AND GENERAL DESCRIPTION OF THE EEC MBBR-MBR SEWAGE TREATMENT PLANT



OPEN THE DOORS AND START SYSTEMS – FULLY AUTOMATIC



EASY TO TRANSPORT, EXPAND AND RELOCATE



### EEC SYSTEMS FEATURES

The “EEC MBBR – MBR” systems, manufactured by the EEC Group., offer a novel and dependable solution to wastewater treatment, recovery and reuse when a non-potable water quality is required, e.g. for field irrigation, industrial use, wash-water, flush water, aquifer recharge etc. The prefabricated **EEC-MBBR-MBR** compact systems are completely autonomous and provide a very high level of treatment (biological treatment + ultrafiltration + disinfection). These systems combine together the recent **MBBR** (Moving Bed Biofilm Reactor) and **sMBR** (submerged Membrane Bio-Reactor) innovative technologies.

- VERY COMPACT & OCCUPY VERY LESS SPACE THAN OTHER MBR PLANTS.
- LESS MAINTENANCE, LOW CAPITAL & OPERATING COST BENEFITS
- SIMPLE ASSEMBLY AND OPERATED BY ON SITE LABOUR.
- THE SYSTEM IS PREFABRICATED AND MOUNTED IN STANDARD ISO FREIGHT CONTAINERS
- EASILY TRANSPORTABLE TO ANY LOCATION UNLIKE OTHER CONVENTIONAL TREATMENT PLANTS
- THERE IS NO NEED TO ADD MICRO ORGANISM.
- EASY START UP, FULLY AUTOMATIC OPERATION, RELIABLE & ROBUST ONCE STARTED
- ONE CENTRAL CONTROL PANEL FOR EACY OPERATION.
- CLOG FREE AIR DISTRIBUTION SYSTEM AND AMB BIO MEDIA THAT COMES WITH 20 YEARS WARRANTY
- MEMBRANES ARE LOW MAINTENANCE WITH AUTO CLEANING PROCESS.



### EEC MBBR-MBR – PACKAGE PLANTS

Having great experience in the construction of compact package plants, **EEC** applies the up to date technologies for wastewater treatment. With the “**EEC MBBR-MBR**” systems, **EEC** succesfully manages to balance the need for an easy-to-uperate, compact and dependable wastewater treatment unit with the need for a high effluent quality.

**EEC offers standard models from 30 to 300 m3/day :**

We manufacture smaller plants from 1 m3 per day and up. Contact us for Quotes or Pamphlets.

The **EEC MBBR-MBR** system utilizes flat sheet ultrafiltration (UF) membranes with a mean pore size of 0.05 µm. The membranes are supplied by a renowned manufacturer and can produce high flux rates without suffering from severe fouling. **EEC** offers a number of standard models ranging from 30 to 300 m3/day. These models are divided into two basic series, the **EEC MBBR-MBR-M-3** series for high-rate biodegradation without total nitrogen removal, and the **EEC MBBR-MBR-M-4/5** series for extensive organic carbon removal along with complete nitrification/denitrification.



**EEC MBBR-MBR - EFFLUENT QUALITY -**

<p><b>EEC MBBR-MBR BioPlant Effluent Quality</b></p> <table border="0"> <tr> <td>BOD5 &lt;</td> <td>5,0</td> <td>mg/l</td> </tr> <tr> <td>COD &lt;</td> <td>50,0</td> <td>mg/l</td> </tr> <tr> <td>TSS ≤</td> <td>1,0</td> <td>mg/l</td> </tr> <tr> <td>TKN ≤</td> <td>5,0</td> <td>mg/l</td> </tr> <tr> <td>Turbidity &lt;</td> <td>1,0</td> <td>NTU</td> </tr> <tr> <td>E-coli</td> <td>0,0</td> <td>X/100 ml</td> </tr> </table>	BOD5 <	5,0	mg/l	COD <	50,0	mg/l	TSS ≤	1,0	mg/l	TKN ≤	5,0	mg/l	Turbidity <	1,0	NTU	E-coli	0,0	X/100 ml	<p>The diagram illustrates the MBBR-MBR process flow. It starts with an 'inlet' leading into an 'anoxic' zone, followed by an 'aerobic' zone. Both zones are part of the 'MBR' (Membrane Bioreactor) system. The effluent then moves to a 'filter tank' which contains ultrafiltration membranes. The final output is 'permeate'.</p>
BOD5 <	5,0	mg/l																	
COD <	50,0	mg/l																	
TSS ≤	1,0	mg/l																	
TKN ≤	5,0	mg/l																	
Turbidity <	1,0	NTU																	
E-coli	0,0	X/100 ml																	



**PRE-SEDIMENTATION SYSTEM**

It is assumed that the sewage piping system ends in a customer provided three-chamber combined settling/buffer/pump well tank system which separates paper, sanitary binds, and settleable solids. The buffer capacity must be sufficient to level out the daily peak flows.



**BIOLOGICAL TREATMENT SYSTEM**

The treatment plant will take suction from the pump well by its own feed pump. The pump is level controlled and has a capacity which is 2-3 times the average daily flow. The plant has therefore

an intermittent working mode in terms of hydraulic flow, while the air blower supplying air to the bioreactors is continuously running.

The biodegradation reactor comes in one or two stages depending on required cleaning efficiency. Plants with higher cleaning efficiency than 80-85 % need a two-stage system. The bioreactors are degrading the dissolved organic matter by oxidation into carbon dioxide, which escapes to the air, and to biomass that acts as activated sludge. A suspended, free floating biofilm carrier medium is providing a large, protected biofilm surface for the bacteria and is simultaneously accumulating the active biosludge inside the reactors.



## EQUIPMENT SPECIFICATION

### The basic system comes with the following standard equipment:

EEC package plants are fully automatic systems with automatic sludge separation. Main components pre-assembled and tested before shipping:

- Main Bio Reactor Tank with 3-5 chambers. Epoxy coated.
- AMB Bio Media™ **Proprietary Media 950 m<sup>2</sup>/m<sup>3</sup>.**
- SS Course Air Distribution systems with butterfly valves, coarse air, No clogging. EEC Design
- Non-Return valves (Check valves)
- Necessary Cables & Accessories
- MBR - Membranes
- Rotary Displacement Blower.
- Submersible Feed Pump.
- Displacement Sludge / Recycling Pump.
- Automatic sludge separator. EEC Design
- Dosing pump – If required.
- Necessary PVC Piping & valves
- Motor Control Panel.
- Complete plant EEC High-Speed Bio Tec as per requirements.

**NOTE:** The EEC MBBR-MBR has several options that may save your money and ease of mind when it comes to plant operation. Make sure you check our web site for more information or contact an EEC representative for additional information.

[www.eecusa.com](http://www.eecusa.com)

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## 7. TECHNICAL DATA

**ADDITIONAL DETAILS PROVIDED  
WITH QUOTE**

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Larger or smaller models are available upon request. Visit EEC's Web Site for additional information on different systems and solutions for your specific needs.



**EEC GLOBAL OPERATION LLC**

THE WORLD LEADER IN WASTEWATER PACKAGE PLANTS - GLOBAL PRODUCTION & SERVICE

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EEC's Research and Development team is continuously updating our technology and specifications [www.eecusa.com](http://www.eecusa.com)

## EEC REVERSE OSMOSIS

CONTACT EEC IF YOU NEED RO PLANTS – EVERYTHING FROM WELL WATER, BRACKISH, OR SEAWATER  
CONVERSION TO DRINKING WATER.  
EEC PROVIDES ONE STOP SOLUTION TO ALL YOUR WATER / WASTEWATER NEED.

