



**KelairPumps**

**CALL 1300 789 466**

## **KELAIR - BOXER** Packaged Sewage Treatment Plant

**WHEN PUMP  
KNOWLEDGE  
MATTERS**

The Kelair-Boxer is a pre-fabricated packaged sewage treatment plant suitable for the treatment of domestic sewage produced by very small population equivalents from 5 to 50 domestic residents.

Designed specifically for biological denitrification as this requirement has become increasingly important in many regions. Additional tertiary treatments such as phosphorous reduction, effluent disinfection and media filtration are available as options.

With very low energy consumption, alternative energy sources such as solar or wind are realistic options in remote areas. The treated effluent can be discharged to receiving waters, re-used for irrigation or discharged to wetlands for further polishing.

The Boxer System ensures safe and inexpensive shipping worldwide as the entire unit is designed to fit into a standard container for shipment. There is no on site assembly required as all quality control is carried out in the factory and therefore does not rely on siteworks.



### **OPERATION**

The Kelair-Boxer system is one of the most compact "all in one" systems available and is manufactured to a high standard with robust, quality materials.

The civil works are minimal, consisting of a flat concrete support slab the plan area of the unit which can be at ground level if the Boxer is installed on grade or roughly 2m below ground if the Boxer is to be buried.



The Boxer is completely enclosed with manhole access for maintenance. It is a modular unit that lends itself to future expansion or relocation.

### **KELAIR GUARANTEE**

We specialise in plants that are simple to install, operate and maintain as many are installed in very remote locations.

These environmental systems have been supplied to nearly 40 countries and we believe in repeat business so every customer is equally important to us.

Use Kelair's expertise and experience to find the optimum solution for sewage treatment.



### **FEATURES**

- Nutrient Removal
- Small Populations
- Low Energy Consumption
- Suits Solar or Wind Power
- Fully Monitored Operation
- Effluent Re-Use
- Minimum Space
- Simple Operation
- Easy to Maintain
- Relocatable

### **APPLICATIONS**

- Single houses
- Small buildings
- Construction sites
- Small housing developments
- Hotels
- Golf courses
- Holiday resorts
- Leisure developments
- Areas that are not connected to main sewers

### **KELAIR-BLIVET™**

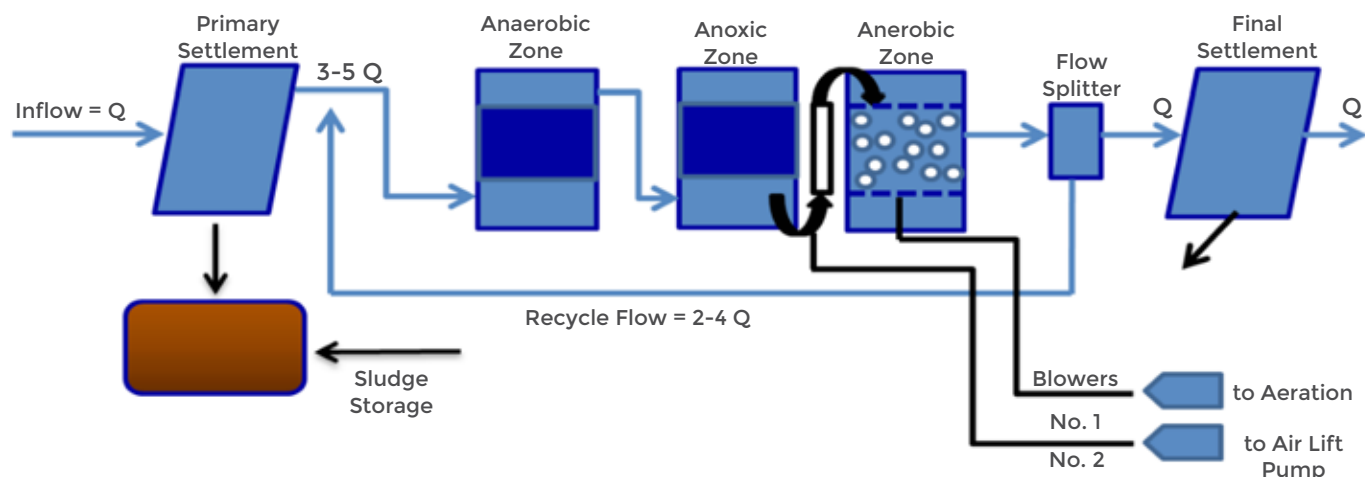
The Kelair-Boxer compliments the Kelair-Blivet™ which is suitable for populations from 30 to 500.

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## DENITRIFICATION SCHEMATIC



### Nutrient Removal

Stricter effluent standards are being introduced throughout the world. The Boxer package treatment plant has been designed specifically to meet these stricter standards and will remove nutrients down to low levels.

### Influent Loadings

Loadings are shown below in Population Equivalent (PE) which is the equivalent of a residential population. Applications like factories or offices will have a much lower PE than the number of people working there. For Hotels or game lodges the PE will be greater than the number of residents. Please contact us or our distributors to check exactly what size sewage treatment plant (STP) you require.

### Method of Operation

Raw effluent flows into the primary settlement zone where 75% of solids are removed using lamella (parallel) plates for more efficient settlement. This is also the sludge storage area. The settle effluent flows into the anaerobic zone which contains a plastic media onto which anaerobic bacteria can grow. This zone reduces dissolved oxygen in the wastewater as well as acting to digest solids produced in the wastewater treatment plant. Next is the anoxic zone where denitrification of the effluent occurs using a fixed media on which the denitrifying bacteria can grow. A constant forward feed flow from the anoxic to the aeration zone is achieved via our air lift pump. BOD reduction and conversion of ammonia to nitrate is achieved in the zone with media providing a surface on which the bacteria grows. There is a constant recycle between the aeration and the anaerobic zone. The level of recycle is between 2 & 4 times the incoming flow (recycle flow is variable depending on the concentration of the effluent and the discharge standards). Sludge is periodically removed from the aeration zone using an air lift pump to the sludge storage area. The clarifier or final settlement area uses lamella plates for efficient removal of solids and the sludge is returned to the storage area. A Saran filter is fitted to the clarifier to prevent to prevent carry-over of solids.

### Monitoring

A pump watch monitoring system is installed as standard. This will monitor performance as well as report any fault and assist with predictive maintenance.

## UNIT SPECIFICATIONS

Model	Weight Empty (tonne)	Weight Full (tonne)	Flow (m <sup>3</sup> /day)	Population Equivalent (PE)	LxWxH (m x m x m)
Boxer 10	0.8	7	1	5	1.50 x 2.27 x 2.23
Boxer 20	1.5	13	2	10	2.70 x 2.27 x 2.23
Boxer 30	1.6	16	3	15	3.20 x 2.27 x 2.23
Boxer 40	1.7	17	4	20	3.50 x 2.27 x 2.23
Boxer 50	1.9	21	5	25	4.50 x 2.27 x 2.23
Boxer 80	2.6	30	8	40	6.00 x 2.27 x 2.53
Boxer 100	3.4	40	10	50	8.00 x 2.27 x 2.53

Kelair reserves the right to make technical or other modifications to the design or specification at any time.

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