



KelairPumps

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KELAIR – BLIVET™ NR Biological Nutrient Removal Plant

**WHEN PUMP
KNOWLEDGE
MATTERS**

The Kelair-Blivet NR™ (Nutrient Removal) is a stand-alone, all-in-one, packaged sewage-treatment plant utilising the same technology as the standard Kelair-Blivet™ with an additional integrated denitrification module.



BIOLOGICAL NITRIFICATION / DENITRIFICATION

Regulatory authorities around the world have introduced stringent discharge standards for sewage and effluent treatment plants in an effort to decrease the negative impact wastewater discharge can have on the environment.

The Kelair-Blivet NR includes the option of biological nitrification and denitrification while still maintaining the advantages of the “All-in-one Packaged Sewage-Treatment Plant Design.” Phosphorus removal can also be partly catered for by biological removal and with the addition of chemical dosing for more stringent discharge requirements.



All-in-one nutrient removal

Self-adjusting to changes in flow

Installation

Quick to install and commission with minimal civil works

Compact

Takes up less space, unobtrusive

Unobtrusive

No unsightly open tanks or lagoons

Simple to Operate

Can be operated by non-technical staff

Natural process

No added chemicals

Easy Maintenance

Simple maintenance functions, does not require constant maintaining

Modular

Additional units can be installed later, as needs increase

Relocatable

The Blivet can be moved to another location at any time

Low Operating Cost

Labour and power requirements are very small



TECHNICAL FEATURES

- Parallel plates for primary settlement
- Patented Aerotor aerobic treatment
- Final settlement tank
- Low power consumption
- Ships in a standard container
- Easy assembly on site
- Flexible installation options - above ground, partially buried, at ground level
- Easy maintenance
- Modular
- Relocatable

APPLICATIONS

The Blivet NR is used in:

- Buildings
- Construction sites
- Housing Developments
- Hotels
- Golf Courses
- Holiday Resorts
- Leisure Developments
- Areas that are not connected to mains sewers

The Blivet NR is a pre-fabricated nutrient removal package sewage treatment plant suitable for population equivalents of 50 - 2,000 domestic residents.

The Blivet NR is one of the most compact system available worldwide and is especially suited to this type of installation.

The Blivet provides an immediate solution for sewage treatment in both permanent and informal settlements

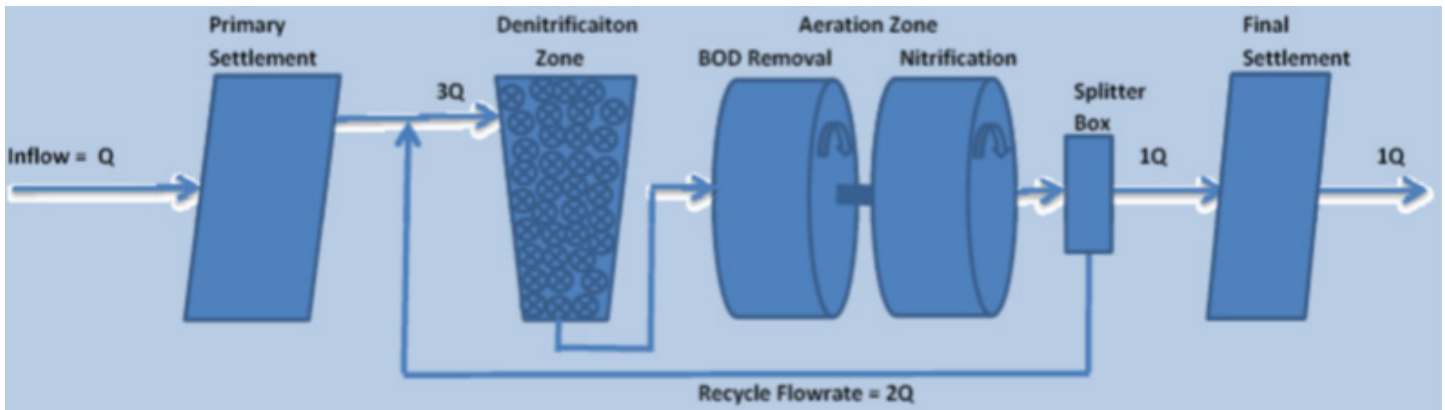
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DENITRIFICATION PROCESS

The Blivet NR treatment plant layout has 6 sections all of which are accommodated within one to two Fibre Reinforced Plastic (FRP) tanks depending on the effluent loadings.



1/ Primary Settlement

Each Kelair-Blivet NR unit is capable of receiving raw sewage and settling the gross solids without recourse to mechanical means. It incorporates lamella or parallel plates to enhance efficiency and utilisation of space. The Primary Settlement zone reduces the Suspended Solids by 75% and the BOD by 25% to 30%. This zone is relatively maintenance-free and contains no moving mechanical or electrical devices. Lockable FRP covers with easy man access and sufficient ventilation are provided.

2/ Denitrification Zone: Anoxic Zone

Effluent from the Primary Settlement zone is mixed with recycled flow from the end of the Aeration zone. These two streams are mixed in a ratio of 1 : 2 and then enter the Denitrification zone. The denitrification zone is composed of plastic media which provides a surface on which the denitrifying bacteria adhere. The denitrifying bacteria convert the Nitrate (NO₃) from the recycled flow to Nitrogen (N₂) Gas. The BOD in the incoming effluent provides the carbon that is required for the bacteria to grow. This also has the advantage of reducing the BOD load to the aeration zone by approximately 20%.

3/ Aeration Zone: BOD Removal and Nitrification Zone

The combined flows from the Denitrification zone is treated by means of an efficient and compact system requiring minimal power input and maintenance. It is a combined fixed film reactor and active aeration system mounted on a horizontal shaft. The rotational media is a spiral formation enclosed in an outer drum to provide active aeration, intense surface area and net hydraulic lift. The Biozone is self-cleansing and no extraneous pumping or sludge returns are required. For process efficiency it is, in effect, a plug flow system. The BOD is removed to low levels in the first rotor/s as carbonaceous bacteria are more robust than nitrification bacteria.

4/ Splitter Box

An important aspect of treating the effluent down to low nutrient levels is the recycle of flow back to the Denitrification zone. The splitter box can be adjusted to recycle different flow ratios depending on the outlet effluent requirements.

5/ Final Settlement

The Final Settlement or Humus Tank is a discrete compartment denying ingress of untreated or partially treated liquor. This zone has frequent automatic removal of sludge-to-sludge storage by means of a timed submersible pump. It also has a pump designed to return sludge to the aeration zone to maintain the concentration of nitrification bacteria within the Aeration zone.

6/ Sludge Storage

Sludge Storage is provided in the base of the units. Depending on the load applied there is approximately 12 weeks capacity provided. Normally desludging is carried out by suction-tanker.

UNIT SPECIFICATIONS

Model	Weight Empty (tonne)	Weight Full (tonne)	Drive (kW)	Usage (kWh/Day)	LxWxH (mxmxm)
BL300NR	1.95	1.95	0.37	2.50	3.40 x 2.27 x 2.89
BL500NR	3.15	19.15	0.37	4.50	5.30 x 2.27 x 2.89
BL1000NR	3.50	20.90	0.37	6.70	5.80 x 2.27 x 2.89
BL1500NR	4.30	27.05	0.55	7.00	7.40 x 2.27 x 2.89
BL2000NR	5.00	31.55	0.55	9.90	8.50 x 2.27 x 2.89
BL3000NR	6.15	38.55	0.75	13.50	10.20 x 2.27 x 2.89
BL3500NR	6.60	41.55	0.75	14.20	11.10 x 2.27 x 2.89
BL4000NR	7.30	44.80	1.1	14.90	11.90 x 2.27 x 2.89

SELECTION

The sizing of the Kelair-Blivet NR is dependent on loadings:

- Hydraulic
- BOD
- Suspended Solids
- Amonia

Contact Kelair for all sizing requirements.

At Kelair Pumps we know the importance of choosing the right equipment to match your process. Contact our team for specialist help and advice on your product selection and technical needs.

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