



KEE

Specialists in Domestic & Industrial Wastewater Treatment



NuDisc[®] HR Treatment Systems

- Carbonaceous, Nitrification and Nutrient Removing Range



NuDisc® Treatment Systems

Carbonaceous, Nitrification and Nutrient Removing Range

General Features

The KEE Process NuDisc® is a totally self-contained, covered, single piece packaged treatment system introduced to provide BOD removal, nitrification and nutrient removal.

NuDisc® is a 'PLUG & PLAY' system that provides installations which are compact, unobtrusive and virtually silent in operation. The NuDisc® offers a reliable, cost effective and low maintenance solution for wastewater treatment for sites not

connected to mains drainage. The whole plant is contained in a Glassfibre Reinforced Polyester (GRP) tank, designed to a structural code for partial installation in the dry stable ground with only the cover showing.



EASY SHIPPING:
The KEE 1600 NuDisc® being loaded at the docks on its way to Grenada in the Caribbean.



FOR HIRE:
KEE Free standing NuDisc® Single Piece Packaged Plant, easily delivered anywhere.



Applications

The NuDisc® is configured for CBOD only removal, nitrification, de-nitrification, effluent polishing with respect to suspended solids and disinfection as necessary.

The NuDisc® includes primary settlement stage, sludge storage, organic and hydraulic balancing through anoxic stage RBC, aerobic stage RBC and final settlement for removal of biological solids. All these stages are housed in a single factory built GRP tank with all the internal electrical wiring loom completed and the plant only requires to be connected to incoming power supply and the inlet and outlet drain, thus making it a truly 'PLUG & PLAY' system.

The KEE Process size range is designed to serve flows from a single house through to small groups of

houses, Public Houses, Restaurants, Filling Stations, Industrial Premises, Hotels, Guest Houses, Schools, Training Centres, Leisure Complexes, Caravan and Camping Sites, Theme Parks, Holiday Homes, Hospitals, Nursing Homes, Game Parks, Zoos etc.

A suitable plant can be selected to achieve the specified quality of final effluent which can include only BOD removal or can also include nitrification, denitrification or phosphorus removal or a combination of all these. NuDisc® is an integral single piece compact nutrient removing packaged plant capable of producing effluent with BOD of less than 5mg/l, suspended solids of less than 5mg/l, ammonical nitrogen of less than 1mg/l and phosphorus as PO₄ of less than 1mg/l. Final effluent total nitrogen can be configured to suit depending on influent characteristics and flow.



NuDisc® Technology

Ensures optimum performance by smoothing flows and spreading biological load evenly throughout the day.

Up-to-date technology

Operation/Design

Central to the operation of each NuDisc® is the Rotating Biological Contactor (RBC), which supports a biologically active film (biomass) of anoxic and aerobic micro-organisms.

Treatment Process

Wastewater flows into the Primary Settlement Tank (PST) [1], where solids are settled out and are retained. The accumulated sludge is drawn off periodically.

Partially clarified liquor containing fine suspended solids flows upwards into the first stage of the biozone which houses the upstream RBC [2]. The partially clarified liquor is then brought in contact with the upstream stage of the RBC reactor which is also configured to act as the anoxic stage for partial degradation of BOD and de-nitrification (if required). The biomass in the upstream RBC stage also provides biological attenuation of organic pollutants, which are partially treated and degraded into much more readily treatable substrates for the downstream RBC stage. As an optional item recycle pump or buckets are installed to facilitate de-nitrification where required.

Suspended solids return to the PST via the slot in the bottom of the upstream biozone and the liquor is transferred to the downstream biozone and RBC [3], for further treatment and nitrification where required. Any solids remaining are settled out in the hopper bottomed Final Clarifier [4]. The quality of the treated effluent is suitable for discharge to a watercourse, subject to approval from Regulatory Authorities or similar.

As an option the final effluent can be further improved to a much higher quality by treating through a built-in physical-biological tertiary stage [5]. This physical-biological filter includes media with extremely large surface area to volume ratio and is arranged in the unit to work as alternating aerobic and anoxic zones for the most effective breakdown of the residual organic constituents (hard COD) of the treated wastewater from the upstream and downstream RBC process. The tertiary filter stage is fitted with natural wind turbine or electric fan assisted aeration zones for creating the alternating aerobic-anoxic stages in the filter. The tertiary stage media structure is such that the effluent undergoes breakdown of the remaining soluble organic material and the fine solids contained in the wastewater. The fine organic solids are captured and retained in the media for breakdown.

Effluent Disinfection

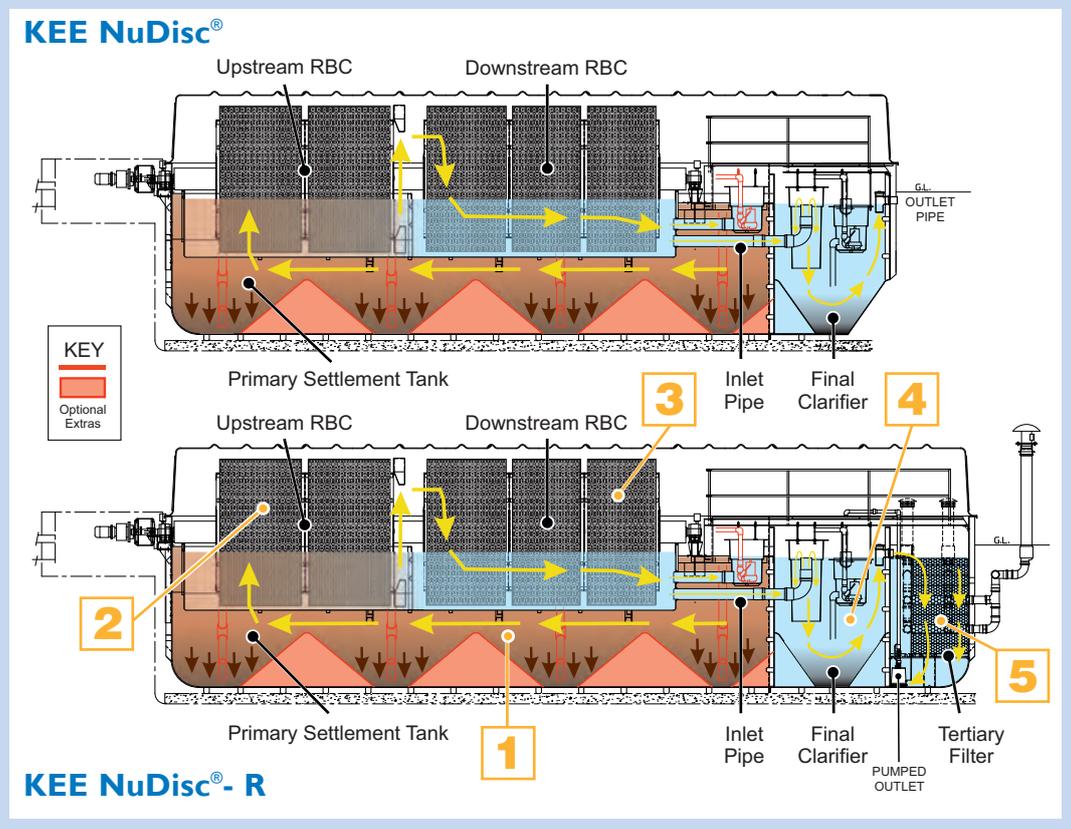
The treated effluent from the compact KEE NuDisc® can be disinfected using packaged built-in UV light disinfection system before discharge. The disinfected effluent can be either discharged to a watercourse (subject to regulatory authority approval) or recycled for irrigation or other applications such as toilet flushing or non-potable use.

The KEE Process NuDisc® technology ensures optimum performance by smoothing flows and spreading biological load evenly throughout the day. Nutrient removal can be included in new plants from onset or can be retrofitted to existing plants.

The NuDisc® System is configured to reduce the inhibitory effects of household chemicals, for example detergents and cleaning chemicals on the biological process. This unrivalled process stability of the NuDisc® system for small flows is an assurance for maintaining

constant effluent quality in spite of variations in plant usage and flow rates during the day. The diurnal peaks in the flow regime for domestic households are evened out in the anoxic RBC stage prior to the aerobic stage RBC and the final clarifier.

The new KEE range of NuDisc® units offer many advanced features specifically aimed at simplifying operation, maintenance and reducing cost. Long design life of structural components, high service factor for mechanical items, low power demand and ease of operation and maintenance provides extremely low life time cost.



Operation and Maintenance

Operation of the NuDisc® is simple and does not require specialist personnel knowledge.

Regular sludge removal and simple lubrication schedules for bearings and geared motor at regular intervals maintain the plant at its optimum performance. An improved final settlement chamber with sludge return system (optional on NuDisc® BA-BF), for the return of sludge to primary settlement chamber or first stage

RBC by means of pump assisted hydrostatic desludging reduces the risk of solids entrainment in the final effluent.

The RBC is driven at low speed by a small electric geared motor selected for long life and economic operation.

All the main structural components, including GRP tanks, RBC shaft, media support structure and media are designed for

30 years life; the mechanical items such as the drive and bearings are selected for 100,000 hours L₁₀ life.

When installed, used, operated and maintained in accordance with recommendations and installation guidelines, the NuDisc® offers a long life. Consequently NuDisc® offers low carbon footprint and the lowest lifetime cost and consistent performance compared to any other system on the market.

