



**PurewaterGroup**



# SCREENS

Coarse & Fine Screening of Fresh & Waste Water Streams

## INTRODUCTION

Purewater Systems provides screening equipment for both wastewater and for surface water intake stations, as first-line protection of downstream mechanical equipment operation, as well as to ensure efficient treatment process. Along with grit and oil-grease removal from raw sewage and industrial effluent streams, screening of gross solids is a critical component of most treatment systems, while fresh and sea water intake screens play an equally vital role in surface water abstraction from canals, rivers and offshore, of potable water and industrial process water systems.

PUREWATER's long, extensive experience in screening technology with its associate partners in Italy and in the Netherlands, has resulted in numerous screen installations of various designs and types within the Middle East, Europe and Africa over the past few decades. The major supplies have been for manual and mechanical inclined bar screens employed in sewage works, as well as a few for surface water pump stations, manufactured in various grades of stainless and carbon steel, depending on influent source and also to client requirements.

Some have been installed in shallow intake channels, while a few are fairly deep screens installed as far down as 10m+ for below grade pump stations.

Mechanical grab-type Screen-Cleaners and bar racks have been supplied by our partner company Landustrie to river management authorities worldwide, with several to Iraq and Middle East, for irrigation water pump stations.

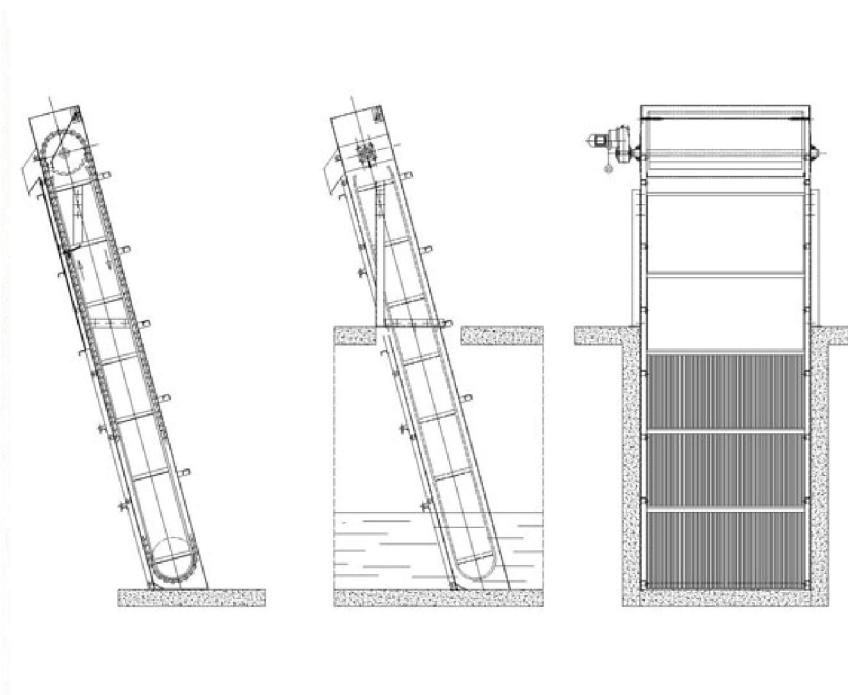
## COARSE BAR SCREENS

For sewage works or surface water intakes, a coarse bar screen normally precedes the finer screen beyond it, with bars spaced at 50-100 mm intervals to catch large floating matter such as plastics, timber, plants, storm debris, and "what-not". These slightly inclined screens can be either manually raked by field personnel, or mechanically operated on timer and/or set hydraulic level signal for unattended sites.

Recommended materials of construction are AISI-304 stainless steel /ASTM A276, or even AISI-316, while carbon or galvanized steel can be considered for irrigation or river water intakes.

## MECHANICAL FINE SCREENS

Fine screens can come in various designs and type of operation. Purewater's traditional inclined or Sub-vertical Continuous Chain Raked Screen is our primary recommended screen type for simple, robust and uninterrupted operation for long years, with no critical parts immersed below liquid level, and with minimal need of maintenance. It is a popular choice for most municipal sewage works where bars are spaced at interval of 10-25 mm to obstruct and remove minor floating and suspended solids from downstream processes.



Here again, the recommended materials of construction are AISI-304 stainless steel /ASTM A276, or even AISI-316, while carbon or galvanized steel can be considered for less corrosive media.

For automation of operation, ultrasonic level controls are normally installed upstream and downstream sides of the screen for sensing obstruction or build-up of solids to initiate the screen raking mechanism, which can alternatively be operated by a pre-set timer, or by other means. The mechanism is normally protected by mechanical or electronic torque limiter to disengage the motor against unexpected obstruction and possible damage.

For critical and confined locations, where possibility of fire hazard or even explosion from evolved sewer gases exists, Eexd motors and protective covers can be provided, upon specific request.

## MECHANICAL BAR SCREEN WITH ROTATING RAKE ARM

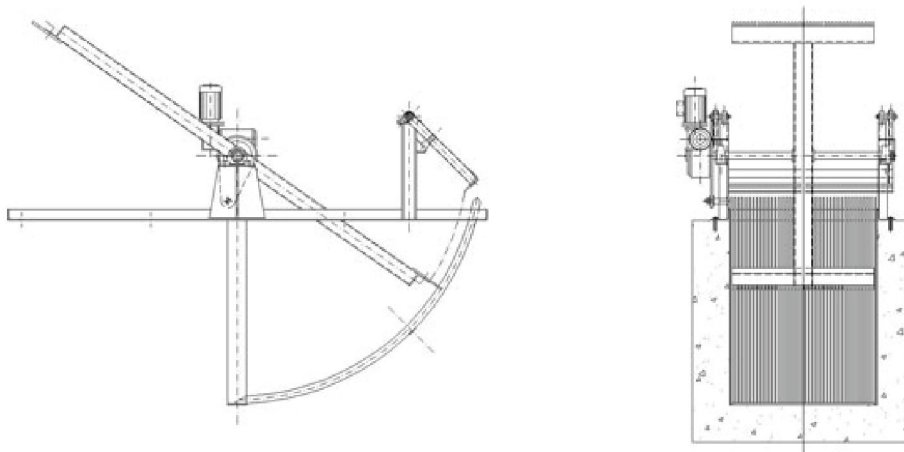
This type of rotating rake bar screen has been employed in smaller traditional sewage works and is not as popular today as the modern compact automated rotating screen with combined inner screw conveyor assembly deployed in rectangular influent channels.

The pivoting rake arm is made of profiles to ensure maximum rigidity and accurate engagement with the curved bar screen, anchored firmly within the normally shallow channel base and walls.

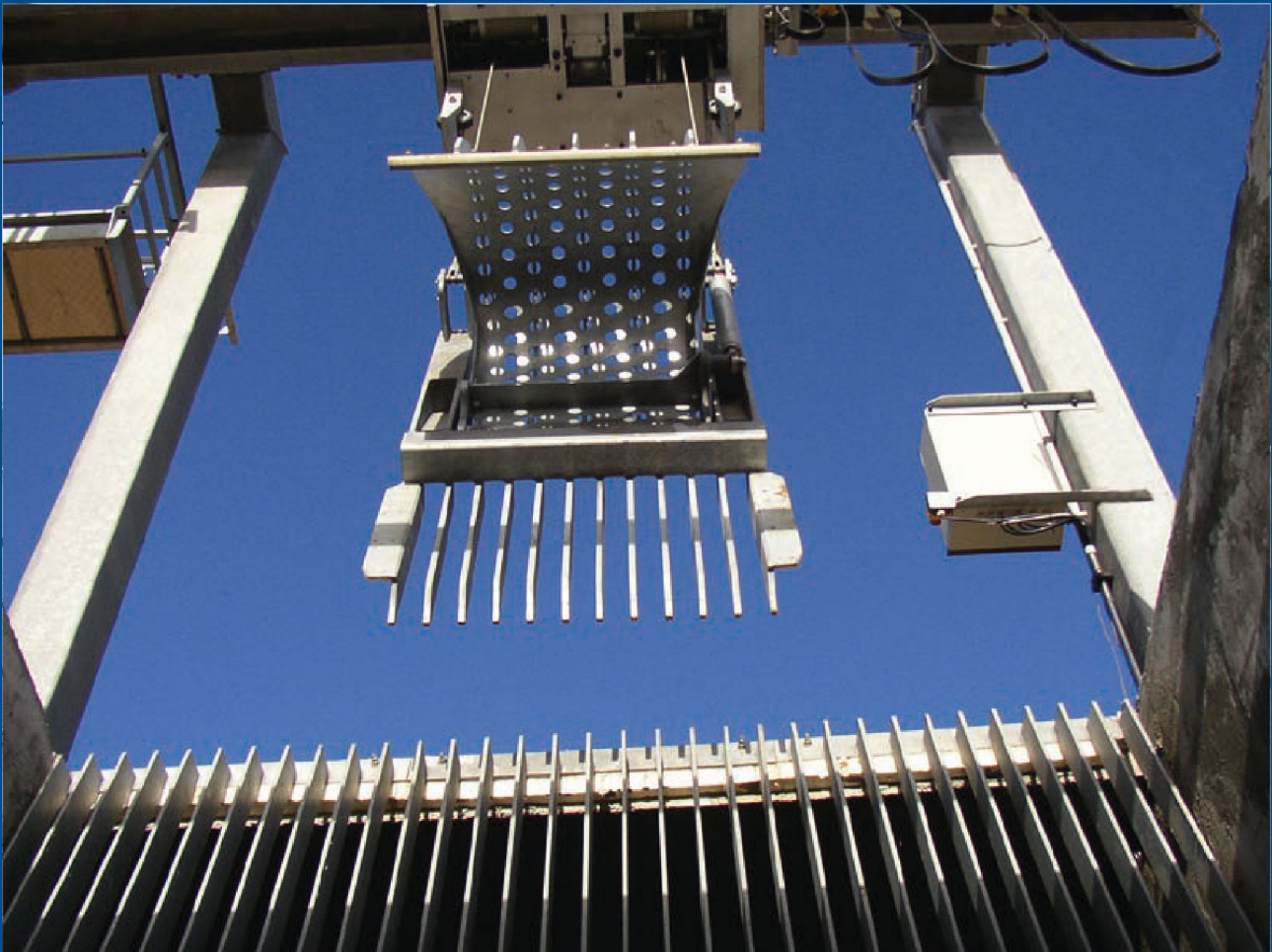
The drive group comprises of electric motor and reduction gearbox complete with mechanical limit switch (or, electric overload switch option placed in IP55 control panel). The controller houses the screen's power section and the logical sequence based on pre-set timer or, optionally, on effluent level sensing upstream of the screen.

Cleaning rakes at both ends of a double arm, pivots or rotates on bearings, and engages the bar rack in the channel, while a cleaning blade at point fixed around 50 cm above floor level engages and discharges raked screenings onto a conveyor belt or screw conveyor below it.

The screens are available in various stainless steel, in hd-galvanized steel, or in epoxy-coated carbon steel materials.



## GRAB-TYPE WEED SCREEN CLEANERS



( Courtesy of Landustrie Sneek BV )

Landy Screen-Cleaner showing motorised grab, bar racks and gantry, used for surface water intakes

## ROTATING DRUM SCREEN/FILTERS

These compact screens are used for downstream applications in treatment plants for finer material removal by means of electrically rotating cylindrical stainless steel mesh cylinder, or drum, either on final effluent stream, or for further processing, or for tertiary filtration in smaller sewage works. They are usually positioned in elevated location for gravity flow to enable fine screening and easy screenings removal by wash-water and a wiper mechanism. The feed hopper is fitted with an overflow to recycle back any excess flow.

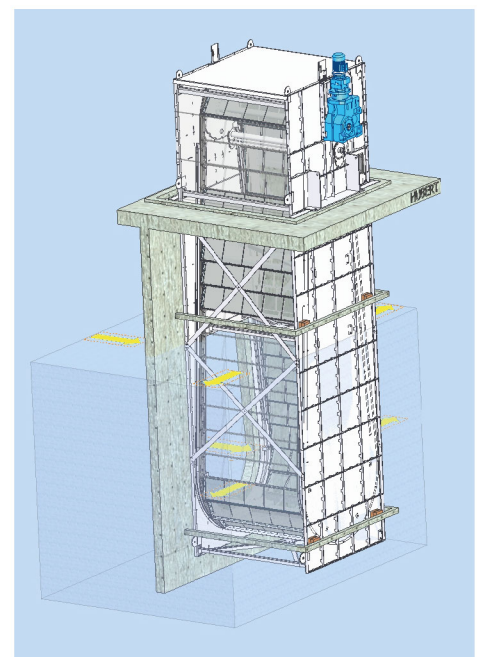


The filter drum is formed by a series of variable sectional profiles to ensure best screening results. The drum and ancillary parts are made of stainless steel, including a cover and support structure.

A wiper blade pressed on the drum periphery scrapes the screenings off the revolving mesh surface on continuous basis. The system is mechanised and normally operates unattended..

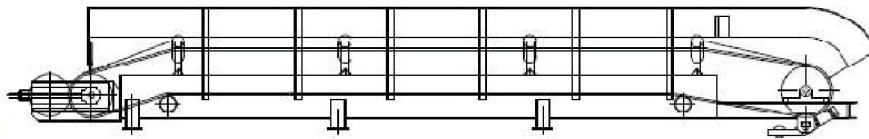
## OTHER MECHANICAL SCREENS TYPES THAT MAY OCCASIONALLY BE SPECIFIED BY CUSTOMERS ARE:

- Step Screens for Fine Material Separation in Sewage and Water Works
- Grab-Type Weed Screens for River & Canal Water Abstraction
- Rotating Vertical Channel Mesh Screens for Large Inshore & Offshore Water Abstraction



## CONVEYORS FOR SCREENINGS

Normally horizontal, or slightly inclined belt conveyors are employed to receive and transport the screenings discharged from the chute of the mechanical screens just above the operating floor level. The screenings are conveyed to the edge of the facility where waste skips are positioned to contain them, for periodic disposal.



Typical Belt Conveyor with odor containment enclosure

A popular alternative to the conveyor belt is a shaftless screw-type conveyor with a hopper below the screen discharge to receive the waste screened material to effectively transport it to a side skip. An added compactor option is available to compress the screenings at the terminal end of the conveyor in order to partially dewater the wastes and minimise its discharge volume.

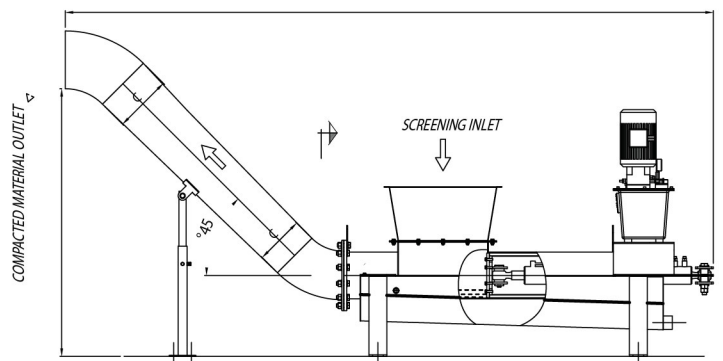
Covers are normally provided for screw conveyors to help contain nuisance odours and spillage in the vicinity, which is a clear advantage over open belts. However, special light metal containment coves can also be fabricated and placed on belt conveyors, on request.

Materials of construction of the conveyors are normally in coated carbon steel, or grades of stainless steel, and with durable vulcanized rubber conveyor and rollers for the first option. Local electric starter-control panel is available on request; but is preferable to integrate conveyor operation and starter with that of the adjacent mechanical screen system.



Screw conveyor-compactor for sewage screenings

(courtesy SAVI-WAM)



Screw Conveyor-Compactor schematic

WASTE SKIPS of various sizes and materials can be provided on request, either for day, weekly or longer storage, complete with hygienic covers and lifting points. Wheeled towable units can also be considered, as also special tractors can be provided on request to transport large wheeled skips to disposal locations.

## COMBINED EFFLUENT SCREEN-CONVEYOR-COMPACTOR

### SCREENING, DE-WATERING, CONVEYING & COMPACTING

The combined SCREENING-CONVEYING package is a compact prefabricated unit designed for small to medium sized sewage inlet works where separation of incoming solids and floating debris in the raw effluent takes place. Additionally the unit dewateres and compacts the screened solids by means of motorized screw conveyor to an external discharge point.

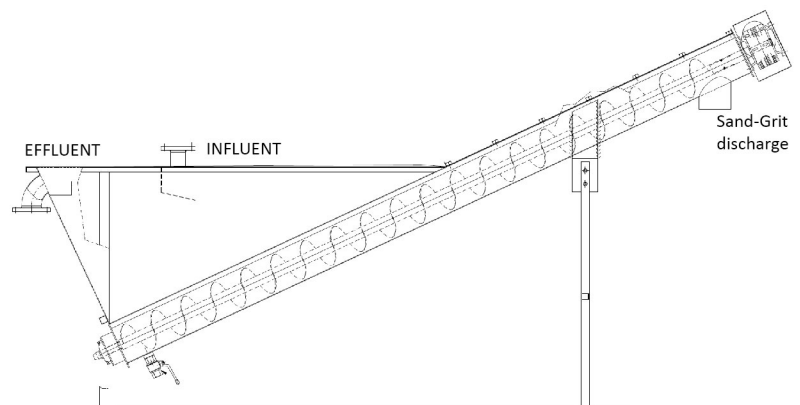
It consists of a stainless steel (304L or 316L SS) tubular structure with a perforated screenings basket, a conveyor screw with its reduced gear drive mechanism and a compaction end unit with elongated discharge point to a skip. The unit is normally placed within a concrete effluent channel, or can be supplied pre-packaged within a steel tank, complete with relevant controls, for intermittent or continuous operation.

The screening packages are available in various sizes for different effluent flow rates, handling rates of 1000 cu.m/h (see chart below).



## SAND-GRIT CLASSIFIER for Inlet Works

In wastewater treatment process the removal of coarse and fine solids such as sand and grit particles is vital for the protection of downstream mechanical machinery from abrasion and also avoid accumulation and disruption of process further down.



The pre-packaged Sand-Grit Classifier comprises of the main separation tank and the shaftless screw mechanism with its motorised reduced gear drive for extracting and conveying the sand & grit solids to the elevated discharge point. The tank, connectors and supporting structure are fabricated in grades of corrosion resistant steel, adequately coated.

The advantage of such a pre-packaged unit is its compactness, small footprint, durability of components, ease of operation and maintenance, plus lack of local civil works.



## INTAKE WEDGEWIRE DRUM SCREENS for river and off shore water abstraction

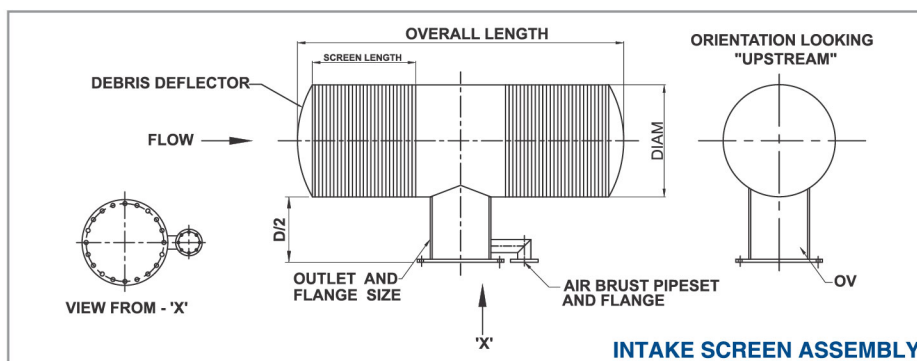
Specifications, dimensions and materials of construction will be supplied on specific request, with basic data on location, water abstraction rate, and usage.



Purewater group design and manufacture of stainless steel wedge wire screens for liquid-solid, solid - gas & solid-solid separation.

These screens are well known for great strength, long service life and excellent adaptability for high efficiency liquid/solid separation.

These Screens are manufactured by welding trapezoidal-shaped (V-shaped) wire on support rods, creating apertures (slots) which enlarge inwardly, meeting the most demanding standards for ruggedness, durability, and consistency in slot opening. The V-shaped opening allows only two points contact with the particles, thus preventing any risk of clogging.



The design and manufacturing process of the screen surfaces gives the following advantages

- Non-clogging opening
- Larger open area
- Low pressure drop
- Hydraulic efficiency
- Higher flow rates
- High Mechanical strength
- Abrasion-resistance
- Ease of cleaning

**PurewaterGroup**

Americas

Purewater Group Inc.  
6 Sand Hill Mews  
Maple, Ontario L6A 4Y4,  
Canada

Tel.: 416-843-6191  
Email: [info@purewater-group.com](mailto:info@purewater-group.com)  
Web: [www.purewater-group.com](http://www.purewater-group.com)