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MACHINEFABRIEK APPARATENBOUW

Bosker Automatic Raking Screens

For coarse filtration of raw water intakes

Key features & benefits

- Mobility of unit suits any application
- Fully automatic operation
- A range of lifting capacities
- Easy to retrofit to existing sites
- No submerged moving parts
- Pre-programmed differential level settings

How we create value

- Trouble-free operation
- Cost effective design
- Reduced footprint
- Reduced maintenance costs
- Eliminates need for conveyor and debris loading system
- Comprehensive, end-user friendly service
- Fully automatic operation

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Bosker Automatic Raking Screens

The Bosker automatic raking screen is designed for a wide range of applications where highly effective bar screen cleaning is required, including power stations (nuclear, fossil and hydro), land and storm drainage pumping stations, and industrial pumping stations. Simplicity of design and efficient debris handling make the raking machine the ideal solution for cost efficient cleaning of single or multiple bar screens.

The Bosker automatic raking screen has continually evolved since its introduction in 1960, and its success has been reinforced by Bosker extensive experience in mechanical water filtration.

Bosker customizes each automatic raking screen to site and application specific parameters. It is simple to retrofit into existing installation, usually with no need for expensive civil modifications.

Today, there are over 1000 successful installations worldwide. It is this unique combination of an efficient design and long-term, in-depth field experience that is your assurance of reliable and economical performance.

The Problem
Conventional trashrakes can require complex civil works and large amounts of space to operate, as well as having only limited abilities to remove oversized, awkward debris such as tree trunks, tires, weeds, etc. Conventional rakes also have difficulty removing fibrous material that becomes entwined in the screening bars. These rakes either ride over debris or push debris deeper into the bar screen, compounding the effects of headloss and excessive velocities through the bar screen. Additionally, once a conventional trashrake has removed debris, a second debris handling system is required, adding to costs, complexity and maintenance. Conventional rakes have difficulty raking multiple bar screens, requiring either a rake for each screen or complex, labor-intensive systems to traverse between screens. These rakes have to be manually operated.

The Solution
The Bosker automatic raking screen is a trashrake cubed, adding value by doing the work of three conventional machines – a trashrake, conveyor and debris loading system. There is no need for multiple rakes, conveyor belts or manual handling of debris, substantially reducing costs. Debris is loaded directly into a dump skip or trailer, eliminating the need for additional handling. Open, overhead construction means the screen deck is uncluttered. Our engineers can include bends in the over-head monorail if required, allowing access to multiple screens or remote dump sites. Operation is fast, simple and fully automatic, providing 24-hour coverage in case of nighttime screen blockages.

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Bosker Automatic Trashrake features

- The Bosker monorail system leaves access clear at deck level and optimizes available working area on the screen deck
- Structural supports can be easily positioned at most sites to accommodate the track
- All gearboxes are life-time filled
- Low noise operation for urban sites
- Capacity ranges from 250 to 3000kg safe working load (debris loading)
- Grippers available in widths of up to 5m
- Barscreen spacing from 12mm to 200mm+
- Intake depths of over 60m can be cleaned
- Vertical barscreens can be cleaned
- The gripper is generally open sided to allow automatic extraction of debris, such as long tree trunks, and can easily extract awkward debris such as logs, oil drums, pallets and plastic sheets, and ice sheets in colder regions
- Multiple dump areas are selectable
- The monorail track can be curved to achieve remote location dumping
- Travel speeds from 10 to 60m/min are possible on wide screens, reducing overall cleaning cycle times
- Fully automatic start from pushbutton, time clock, periodic timer, level differential signal and remote signal from telemetry is available. Manual control is available for initial machine set up after installation and for service, repair and overhaul operations only

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Alternative materials

Grippers can be produced in a variety of materials for different application. These vary from stainless steel, which is suited to seawater and sewage applications due to its non-corrosive properties, to hot-dipped galvanized steel for fresh water environments. A non-spark aluminum-bronze design is a further alternative for sewage plants where non-sparking materials are mandatory.

The supporting framework for the Bosker automatic raking screen is made from long-lasting hot-dipped tubular galvanized steel sections.
This structure is tailored to each installation to optimize available space whilst being aesthetically sympathetic when retrofitted to existing sites. The Automatic Trashrake's framework is mounted to existing floors and walls in order to reduce alterations to civil works.

The Bosker Overhead Trashrake operating fully automatically under heavy debris conditions

Sewage gripper

Bosker designed, manufactured and installed the above Bosker Overhead Trashrake with two machines on a common track each with a 3,000kg lifting capacity

The gantry and grab can be designed to suit any layout

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Managing debris removal

Bosker automatic trashrakes have been installed at a wide variety of water intakes where a key objective has been the provision of simple and effective coarse screening. Bosker automatic trashrakes often act as the very first screening stage. They are a vital means of removing a large volume of awkward debris (such as driftwood and tree trunks) from the water and protecting critical power generation equipment or downstream pumps.

For normal applications at slightly smaller plants, a traveling Bosker automatic trashrakes and trolley assembly can service a multiple screen installation. With either design, the overhead positioning of the Rake's trolley creates the advantage of a clean and entirely accessible screen deck.

Protected machinery
Motors for Bosker automatic raking screens are concealed and protected within the trolley assembly. A hoist motor (which lowers and lifts the rake's gripper) drives through a gearbox to the main hoist shaft. The main lift cables are wound on cable drums fitted to the shaft. The Bosker automatic trashrake's power pack is a self-contained unit where core components such as the motor, pump, solenoid valve, filters and pressure relief valve can all be easily accessed for maintenance.

The control cabling is routed through the supporting framework. Hydraulic drums, which contain the hoses to the grab's close and open rams, are driven by the main hoist motor with a spring tension system to ensure a constant and equal tension is always maintained. The trolley also contains the traveling motor and hydraulic pack.

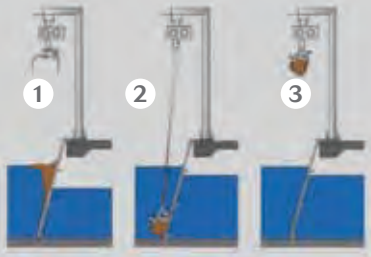
Drives are protected within the track assembly. The Bosker smart design makes operation trouble-free. If, for example, the gripper is unable to submerge due to a large buoyant object it will close and cease to descend, preventing possible cable entanglement. By locating the hoses behind the hoist cables chance of damage by floating debris is reduced.

Mounting the hydraulic cylinders directly on the gripper minimizes the number of submersible moving parts. No moving parts are permanently submerged.

How it works
The Bosker automatic trashrake traverses on a monorail track over the screen and dump areas. Travel speeds are between 10-30m/min. At installations where there is a long track length and a heavy debris loading, a dual travel speed of 30-60m/min would be specified to reduce the overall cleaning cycle time.

1. At the start signal the Bosker automatic raking screen travels to the designated screen area and stops over its first pickup point.
2. The gripper descends to the bottom of the screen, collecting debris in its jaws. Cylinders close the gripper and the hoist elevates the gripper and debris to the trolley.
3. The trolley and gripper return to the dump area where the gripper opens, releasing debris into the hopper, trailer or other dumpsite.

The Bosker automatic trashrake then moves back to the second pickup point at the screen, continuing the cycle until the selected screen area is clean.



1) Start Position
2) Gripping Position
3) Transport Position

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Bosker Automatic Raking Screens

Engineering Services

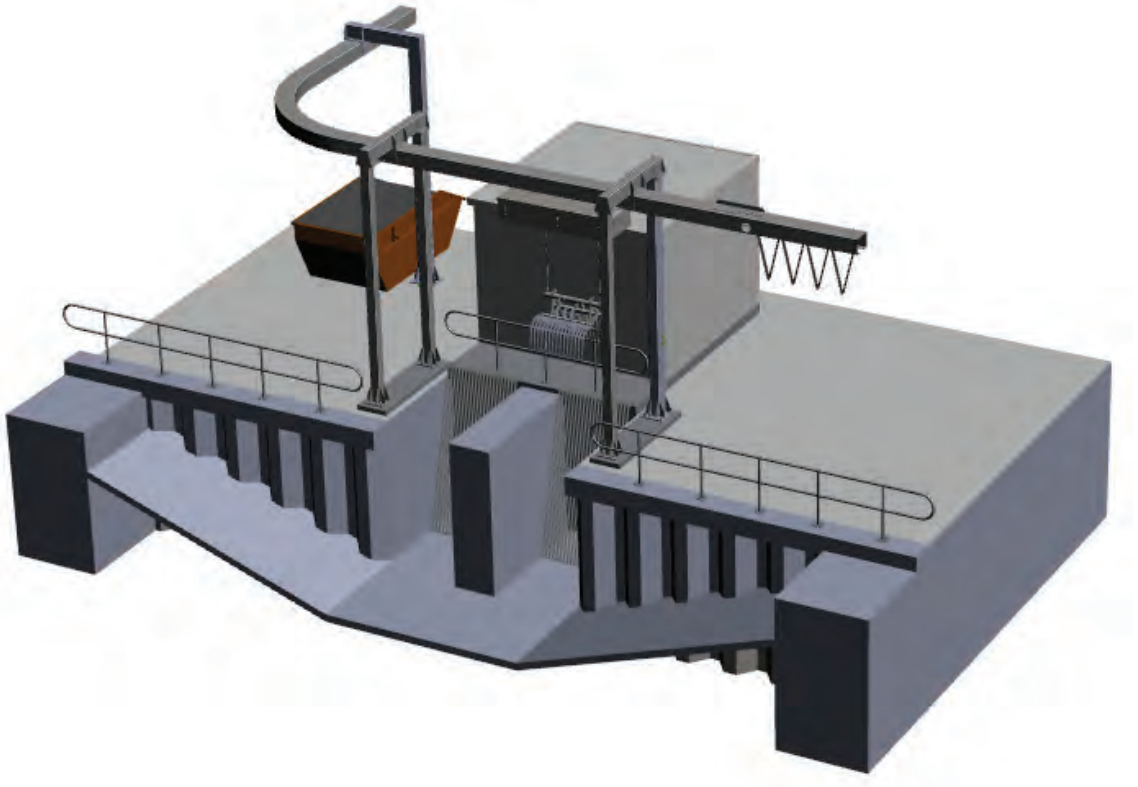
Install, commission, maintain
Bosker service engineers can install, commission and maintain all machines. A team of international engineers will visit sites around the world to advise on all aspects of our products.

Bosker is able to provide long-term agreements covering spares and maintenance, relieving you of costly overheads by providing trained personnel where and when you need them particularly during planned shut downs.

Spare parts
Bosker retain comprehensive records of all the machines they have built. The records can be accessed quickly on our computerized spare parts database. The spares supplied are genuine, guaranteed and backed by our detailed knowledge of all subsequent modifications or upgrades which may have occurred since the machines were supplied. Our spares managers are available for advice at any time. We can recommend suitable spare parts for both holding on site as strategic spares, and for your long term needs for planned maintenance shut downs. Spares can be supplied ex-works or delivered to site for installation.

Training
As a supplier of engineered capital equipment, we naturally offer our end users on-site or in-house training courses. We have skilled instructors available, and can train your team in all aspects of equipment use, including detailed instructions for replacing parts, adjustment and monitoring.

The training courses are for individuals on a one-to-one basis or for groups of up to eight, either on-site or in our worldwide offices. Contact our spares and service managers for details of the courses available.



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Technical Data

		Typical Technical Data (Adapted to Site Specifices)			
Model		Light Duty		Heavy Duty	
		Metric	Imperial	Metric	Imperial
Safe working load		250 kg	550 lbs	500kg	1100 lbs
Standard Maximum Depths (for greater depths, contact Bosker)		7.0m	40'	15.0m	80'
Minimum Bar Spacing (smaller spacings possible woth special "fine screening" grippers, (contact Bosker)		20mm	0.75"	30mm	1"
Maximum Bar Spacing		100mm		150mm	
Hoist Moter Size		2.2kw	3 HP	4.0kw	5.4 HP
Hoist Lifting Speed		20m/min	60'/min	20m	60'/min
Trolly Motor Size (straight/curved track)		0.37 /2x0.37Kw	.5HP/2 x .5 HP	0.37kw	.5HP/2 x .5 HP
Hydraulic Motor Size		1.5kw	2 HP	1.5kw	2 HP
Hydraulic Working Pressure (Au)		120 bar	1.300 PSI	120 bar	1.300 PSI
Weight of Trolley		300-400kg	800-1000 lbs	400-500kg	1000-1800 lbs
Weight of Gripper (minimum-maximum)		750kg	1650 lbs	1000kg	2200 lbs
Typical Dimensional data	A (curved track/straight track)	2515/2565mm	8'-3" / 8'-5"		8'-3" / 8'-5"
	B	2050mm	6'-9"	2050mm	6'-9"
	C	965mm	3'-2"	965mm	3'-2"
	D	890mm	35"	915mm	36"
	E	10° to 35°	10° to 35°	10° to 35°	10° to 35°
	F (min/max)	1220/1525mm	4' / 5'	1525/2440mm	5' / 8'
	G (max)	10m	33'	10m	33'
	H (min)	5m radius	16'5" radius	5m radius	16'5" radius

		Typical Technical Data (Adapted to Site Specifices)			
Model		Super Duty		Ultra Duty	
		Metric	Imperial	Metric	Imperial
Safe working load		1000kg	2200 lbs	3000kg	6600 lbs
Standard Maximum Depths (for greater depths, contact Bosker)		20.0m	80'	23.0m	80'
Minimum Bar Spacing (smaller spacings possible woth special "fine screening" grippers, (contact Bosker for details)		30mm	1.5"	40mm	1.5"
Maximum Bar Spacing		150mm		250mm	
Hoist Moter Size		5.5kw	7.5 HP	7.5kw	10 HP
Hoist Lifting Speed		15m	50'/min	10m	35'/min
Trolly Motor Size (straight/curved track)		0.55kw	.5HP/2 x .5 HP	2 x 0.75kw	2 x 1.0 HP
Hydraulic Motor Size		1.5kw	2 HP	1.5kw	2 HP
Hydraulic Working Pressure (Au)		120 bar	1.300 PSI	120 bar	1.700 PSI
Weight of Trolley		500-800kg	1100 – 2200 lbs	1000-1500kg	2200-3300 lbs
Weight of Gripper (minimum-maximum)		1200kg	2800 lbs	1500kg	3300 lbs 2515/2565mm
Typical Dimensional data	A (curved track/straight track)	2540/2590mm	8'-4" / 8'-6"	3380/3455mm	11'-1" / 11'-4"
	B	2050mm	6'-9"	2135mm	7'0"
	C	965mm	3'-2"	1040mm	3'-5"
	D	915mm	36"	990mm	39"
	E	10° to 35°	10° to 35°	10° to 35°	10° to 35°
	F (min/max)	1830/2745mm	6' / 9'	2440/4875mm	8' / 16'
	G (max)	10m	33'	10m	33'
	H (min)	5m radius	16'5" radius	5m radius	16'5" radius

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