BEAUDREY

SCREENS, DEBRIS FILTERS AND CONDENSER TUBE-CLEANING SYSTEMS

Trash Rakes

Travellina Band Screens

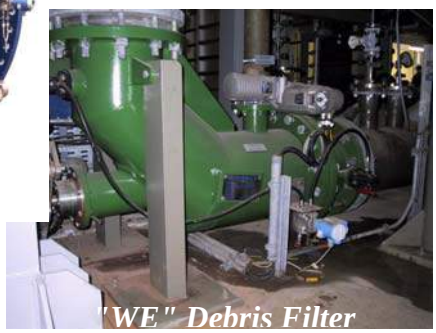
Drum Screens

Travellina Band Screens

Skid for tube-cleaning system

"W" Debris Filter

CTCS Strainer



"WE" Debris Filter

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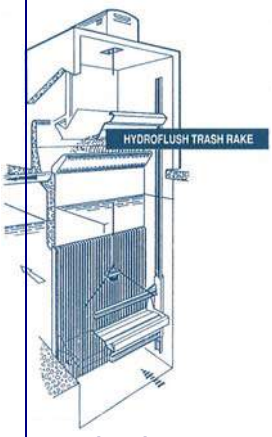
BEAUDREY – SCREENS AND FILTERS

OVER 90 YEARS OF WATER SCREENING MAKE ALL THE DIFFERENCE



Trash Rake

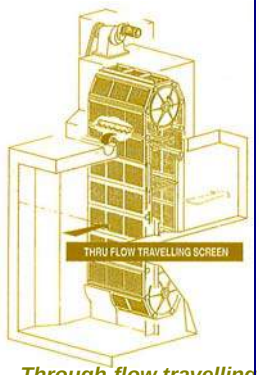
Water screening consists in separating debris or either natural or man-made origin, from the water itself. A successful screening plant must be carefully designed and built according to the quality of debris to be removed. The screening equipment must be of a high standard of efficiency and reliability.

Founded in 1912, BEAUDREY is an engineering and construction company the basic activity of which is the design, fabrication and installation of different types of water-screening equipment, debris filters and on-line condenser tube-cleaning systems. These machines have been fitted in different sorts of plants where water screening is essential : ***industrial plants, water supplies, agricultural and irrigation applications, thermal and nuclear power plants*** world-wide.

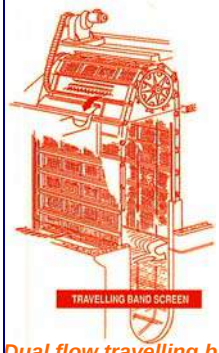
Installed in heavily-polluted rivers or canals or along seafronts, BEAUDREY screens can be used to ensure the environment is cleared of industrial and man-made waste.

Furthermore, special patented devices make sure that water-life (fish, shell-fish, etc.) is removed from the water and returned unharmed into its natural environment.

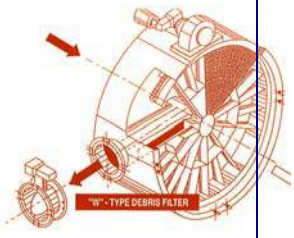
All BEAUDREY screening plants are custom-built and our 90 years of experience feed-back leads to the constant improvement of our machines. Designed to minimize operational costs and maintenance needs, BEAUDREY screens are an efficient and economical solution to all water-screening problems.



Through-flow travelling band screens

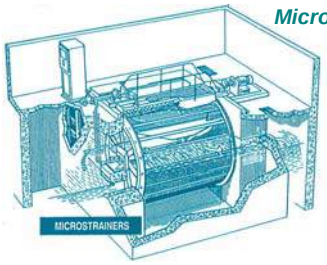


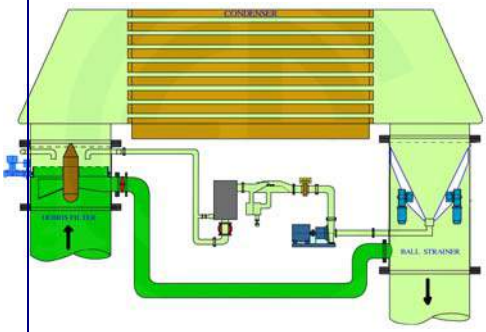
Dual flow travelling band screens



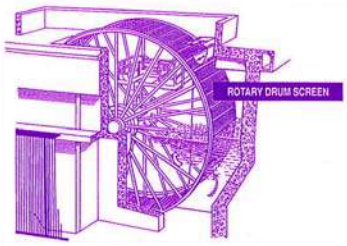
Debris filters

Microstrainers

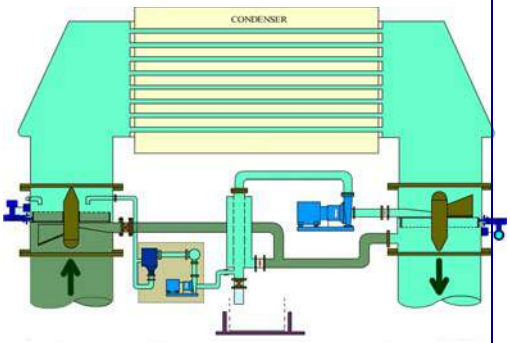




On-line condenser tube-cleaning system



Rotary drum screens



Zero ball-loss system

IF WATER SCREENING IS A PROBLEM FOR YOU, THEN BEAUDREY CAN HELP. SHOULD YOU HAVE ANY QUESTIONS ABOUT OUR EQUIPMENT, OUR HEAD-OFFICE IN PARIS IS AT YOUR DISPOSAL. WE CAN MEET YOU IF YOU WISH, OR SIMPLY DISCUSS YOUR NEEDS OVER THE PHONE.

PLEASE FEEL FREE TO CALL US.

WE LOOK FORWARDS TO MAKING YOUR ACQUAINTANCE.

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BEAUDREY SCREENS AND FILTERS

BEAUDREY STOPGATES

MAIN APPLICATIONS

Sluice gates are designed to isolate water pits to be partially or totally dried.

Three main types of sluice gates are available :

- Sluice gates designed to be handled by a lifting chain or beam, without load.
- Sluice gates to be submitted to a slight load (water flow shut down without inducing a difference in the upstream and downstream water levels). This type of sluice gate is generally handled by manual, electromechanical or hydraulic jacks.
- Sluice gates to be lifted under a heavy load. They are generally equipped with rollers and operated by electrical or hydraulic jacks.

BEAUDREY fabricates the three types of sluice gates in all sizes and for all water loads.

Construction

- Machine-welded
- Rubber seal
- Stainless steel accessories.

Variations and Equipment

Inflatable seals, automatic lifting beam, electrical or hydraulic lifting jacks, water level balancing valves, cathodic protection. All stainless steel construction.

BEAUDREY SCREENS AND FILTERS

BEAUDREY TRASH RAKES

"S" Type, Fixed Head Structure in either concrete or steel

"CV" Type, Scraper Rake

Mobile Trash Rake

"SH" type, hydraulically-actuated rake

Continuous chain raked bar screen

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BEAUDREY SCREENS AND FILTERS

"S" TYPE TRASH RAKE

DEBRIS REMOVAL BY WATER FLUSHING

MAIN APPLICATIONS
All intake plants or canals where medium or large size debris are to be removed (leaves, logs, containers, plastic sheets, algae, jellyfish, etc.....) t is installed across the walls of the canal, or on the intake wall.

WATER TO BE SCREENED
River and lake water-seawater-waste water.

FLOW RATE
Up to 50 000 m^3/h

SPACE BETWEEN BARS
From 100 to 20 mm

MAXIMUM ADMISSIBLE VARIATION OF WATER LEVELS No limit.

NORMAL HEAD-LOSS DURING OPERATION
From 2 to 15 cm H_2O during normal operation.

SIZE Up to 5.30 m in width.

OPERATIONAL MODE
Timer - Head-loss indication - continuous operation

CLEANING
Removal of debris by tilting rake. Flush water and debris are carried in the rake assembly and tilted out at the upper part of the machine (raking without water on request).

AVAILABLE LAYOUTS
Secured on the civil works. It is also available as a complete structure to be crane-installed. A concrete gantry can replace the structure above the service deck. Can be vertical or inclined.

MATERIALS
Painted steel with stainless steel accessories, or totally stainless steel structure.

AVANTAGES
Economical - Low loss of head - Reliable and efficient - High debris-handling capacity – Automatic - Little maintenance required.

SPECIAL EQUIPMENT
Control cabinet, loss of head indicator, cathodic protection by sacrificial anodes or imposed current. "Bio-flush" fish protection device. Hydraulic trash rake with jacks on the rake for heavy loads (raking/sand removal).

BEAUDREY SCREENS AND FILTERS

DESCRIPTION

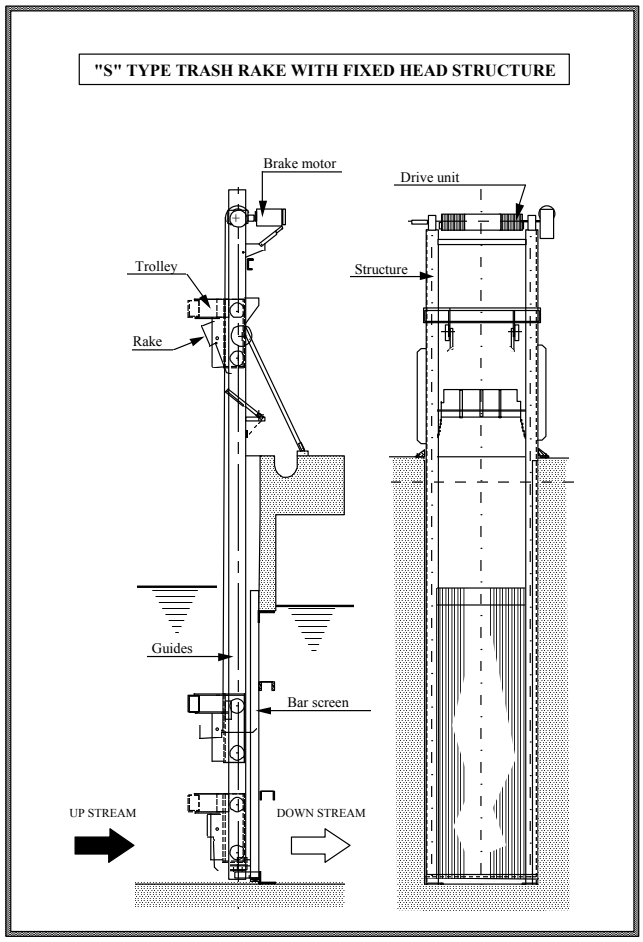
A trolley hanging on two cables travels up and down a two-channel, bolted track. On the trolley is a rake assembly, a trash collector and water-collecting bucket. The collector has two stable positions (vertical or horizontal) and engaged.

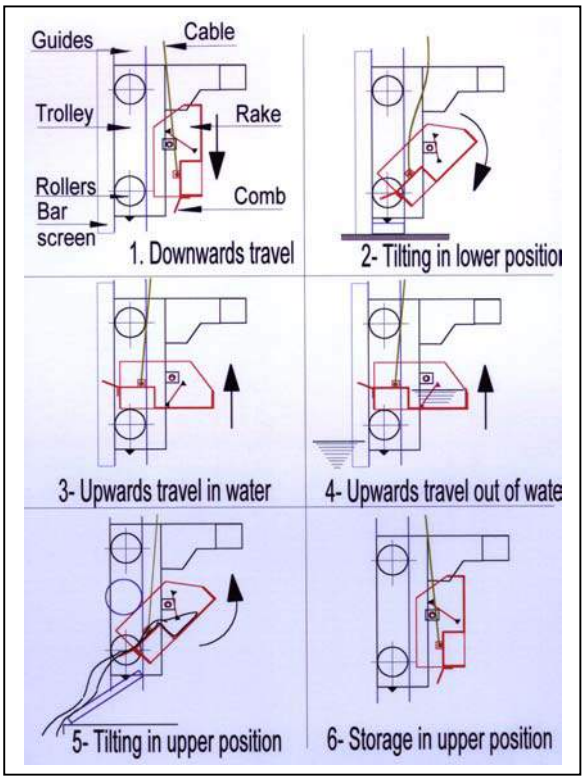
Buffers at the top and bottom of the rake structure tilt the trolley from one position to the other.

At the bottom, the rake assembly tilts horizontally It digs into the trash and mates with the bars of the screen however large the trash build-up. The trolley ascends, collecting the trash.

As it comes out of the water, the water in the rear bucket helps compensate for the increased apparent weight of the trash.

On reaching deck level, the track stops and tilts the rake assembly. Large trash fall off by gravity, the water flushing out of the rear bucket washes off adherent trash.





Operation of the rake / trash collector assembly

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BEAUDREY SCREENS AND FILTERS

"SH" TYPE, HYDRAULICALLY-ACTUATED TRASH RAKE

HYDRAULIC ACTUATION TO HANDLE HEAVY LOADS OF DEBRIS, SILT AND SLUDGE

WATER TO BE SCREENED
River or lake water - sea-water

SPACE BEWEEN BARS From 100 to 20 mm.

MAXIMUM ADMISSIBLE VARIATION IN WATER LEVELS
No limit.

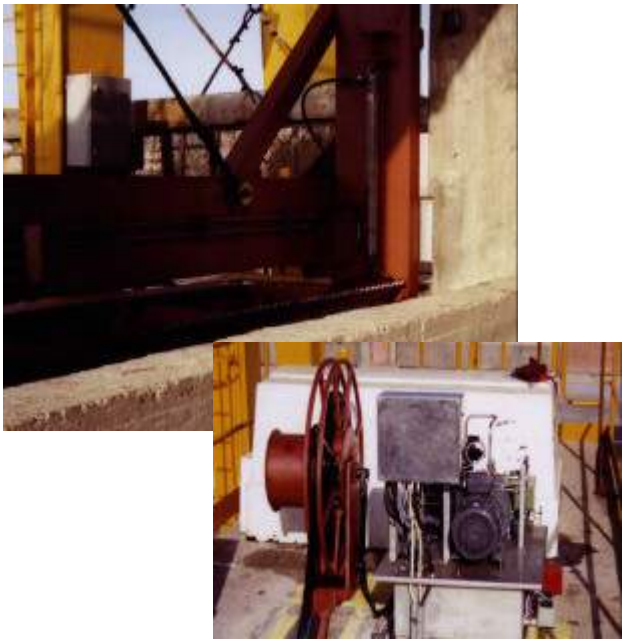
NORMAL LOSS OF HEAD DURING OPERATION
From 2 to 20 cm H_2O during normal operation.

SIZE OF RAKE Up to 6 m in width.

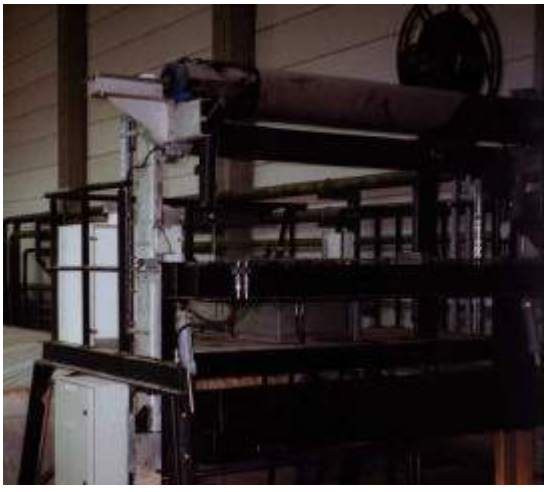
OPERATIONAL MODE
Semi-automatic under operator control, or totally automatic (head-loss indication or timer).

CLEANING
Cleaning is performed by a rake operated by a cable and jack. Debris are discharged by tilting the rake at the top part of the machine. The trolley/rake assembly runs along the bar screen.

LAYOUT
The bar screen must be installed vertically. The trolley moves along rails on the service deck.



Sines – Portugal
Hydraulic jacks on trash rake – Actuation unit



Seraing - Belgium

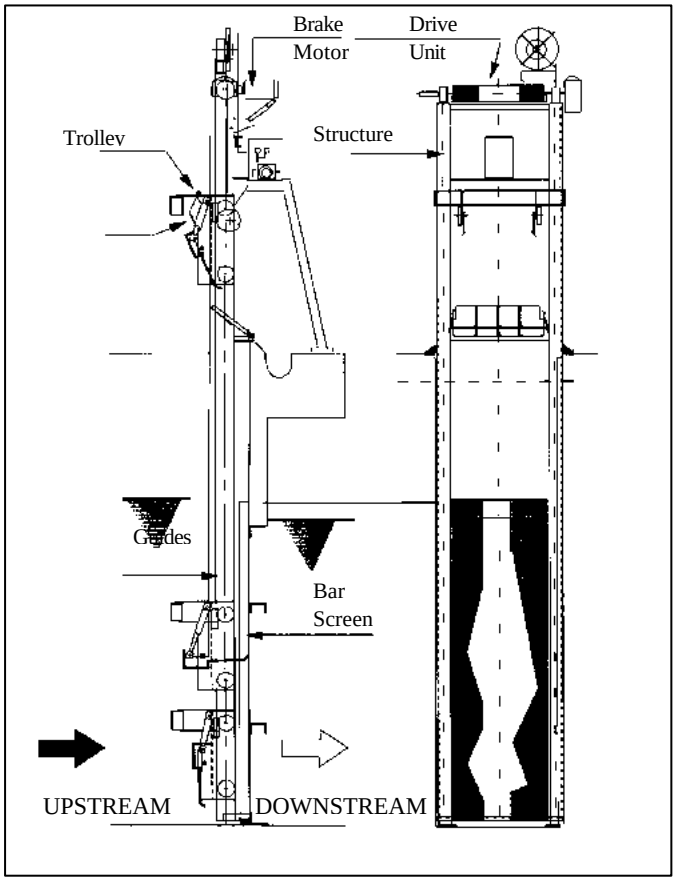
MATERIALS
Painted steel structure, accessories made of stainless steel.

AVANTAGES
Efficient – Economical - Important debris-handling capacity - Little maintenance Requirements - Low loss of head.

SPECIAL EQUIPMENT
Loss of head indicator. Incorporated debris basket.

BEAUDREY SCREENS AND FILTERS

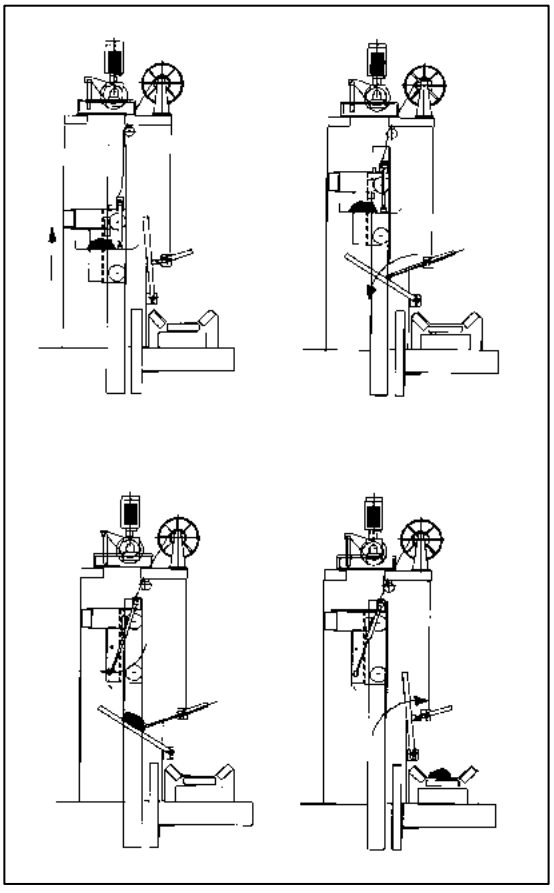
The "SH" hydraulically-actuated trash rake is the best solution where heavily-polluted waters are encountered, thereby requiring a very powerful raking capacity.



- The "SH" trash rake's operation is exceptionally safe as it relies on a simple principle : tilting a debris-collecting rake borne by a trolley travelling up and down bolted guides, hanging from a hoist.
- The cleaning of the bar screen is achieved by combing off the debris during upward travel, the rake assembly then being horizontal.
- When the trolley travels downwards, the rake assembly is tilted vertically. Tilting is obtained by hydraulic jacks which give a great digging power to remove sand and seaweed at the bottom of the rack.
- The rake cleaning is achieved on top by flushing with the large quantity of water carried in the scoop at the rear of the rake assembly.
- When the rake tilts, the water violently flushes the comb carrying all trash away into the collection trough.

Rake up-ward travel

Tilting of the trash flap



Tilting of the rake

Tilting of the trash flap

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BEAUDREY SCREENS AND FILTERS

"S" TYPE MOBILE TRASH RAKE

TROLLEY/RAKE ASSEMBLY TRAVELLING IN FIXED GUIDES

MAIN APPLICATIONS
All intake plants with several identical bar screens but not requiring continual raking at certain periods. If permanent raking of each bar screen is necessary, the "S" type trash rake with a fixed head structure is to be used (massive arrival of algae, jelly-fish, etc...).

WATER TO BE SCREENED
River and lake water - sea-water

SPACE BETWEEN BARS
From 100 to 20 mm

MAXIMUM ADMISSIBLE VARIATION OF WATER LEVELS
No limit.

NORMAL HEAD-LOSS DURING OPERATION
From 2 to 15 cm H_2O during normal operation.

SIZE
Up to 5.30 m in width.

OPERATIONAL MODE
Semi-automatic operation under operator control, or entirely automatic.

CLEANING
By tilting rake. The debris are tilted out of the rake at the upper part of the machine.

AVAILABLE LAYOUTS
Two types are available according to whether the installation includes a guard-rail or not. The debris are recovered either in a flume or in a basket carried by the trash rake. The trash rake moves along rails on the service deck.

MATERIALS
Steel structure. The rake guides and the rake itself can be made of stainless steel, if requested.

AVANTAGES
- Economical – Efficient – Reliable - Low loss of head - High debris-handling capacity - Little maintenance required.

SPECIAL EQUIPMENT
Control cabinet, loss of head indicator, cathodic protection by sacrificial anodes or imposed current. "Bio-flush" fish protection device. Hydraulic trash rake with jacks on the rake for heavy loads (raking/sand removal).

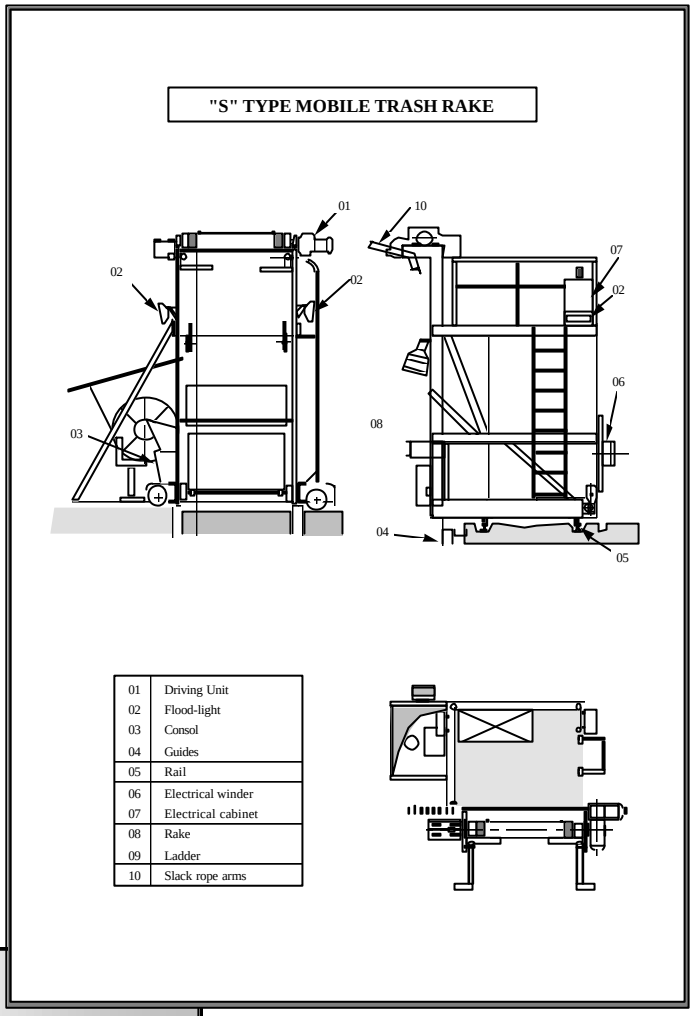
BEAUDREY SCREENS AND FILTERS

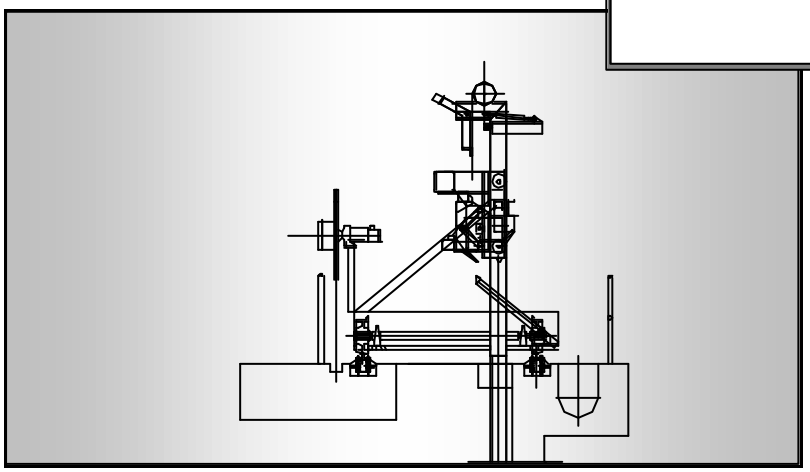
DESCRIPTION

- Operation is achieved by tilting a debris-collecting rake born by a trolley travelling up and down bolted guides, hanging from a hoist.
- The rake assembly is tilted vertically for downwards travel.
- As it travels upwards the rake assembly reaches a horizontal position and debris are combed off the bar screen.
- At the top of the rake, the debris are flushed away into the collection trough by the large quantity of water carried in the scoop at the rear of the rake assembly.
- Debris are collected in trash baskets borne by the mobile platform.

OPERATION

- The trash rake automatically operates the cleaning cycles, the trash baskets must be hand-emptied.
- Operation is initiated by an operator from the control panel.
- A step-by-step operating mode is also possible.





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BEAUDREY SCREENS AND FILTERS

"CV" TYPE, SCRAPER TRASH RAKE

DEBRIS REMOVAL WITHOUT WATER

MAIN APPLICATIONS
All intake plants or canals where medium or large size debris are to be removed (leaves, logs, containers, plastic sheets, algae, jellyfish, waste-water debris etc.....)
It is installed across the walls of the canal, or on the intake wall.

WATER TO BE SCREENED
River and lake water – seawater – waste water

FLOW RATE
Up to 30 000 m^3/h

SPACE BETWEEN BARS
From 100 to 20 mm

MAXIMUM ADMISSIBLE VARIATION OF WATER LEVELS
No limit.

NORMAL HEAD-LOSS DURING OPERATION
From 2 to 15 cm H_2O during normal operation.

SIZE
Up to 4.20 m in width.

OPERATIONAL MODE
- By timer, head-loss indication or continuous operation

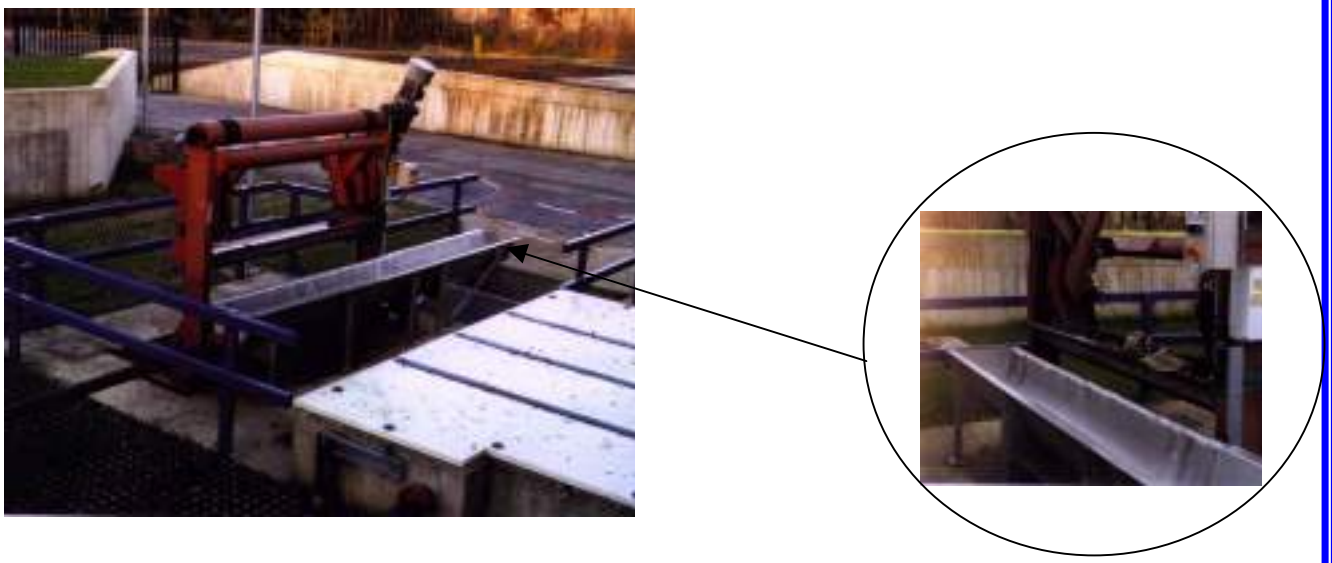
CLEANING
Removal of debris by scraper action. Debris are mechanically scraped and transferred to a trash basket or collection trough.

AVAILABLE LAYOUTS
Secured on the civil works. It is also available as a complete structure to be crane-installed. Equipment installed vertically.

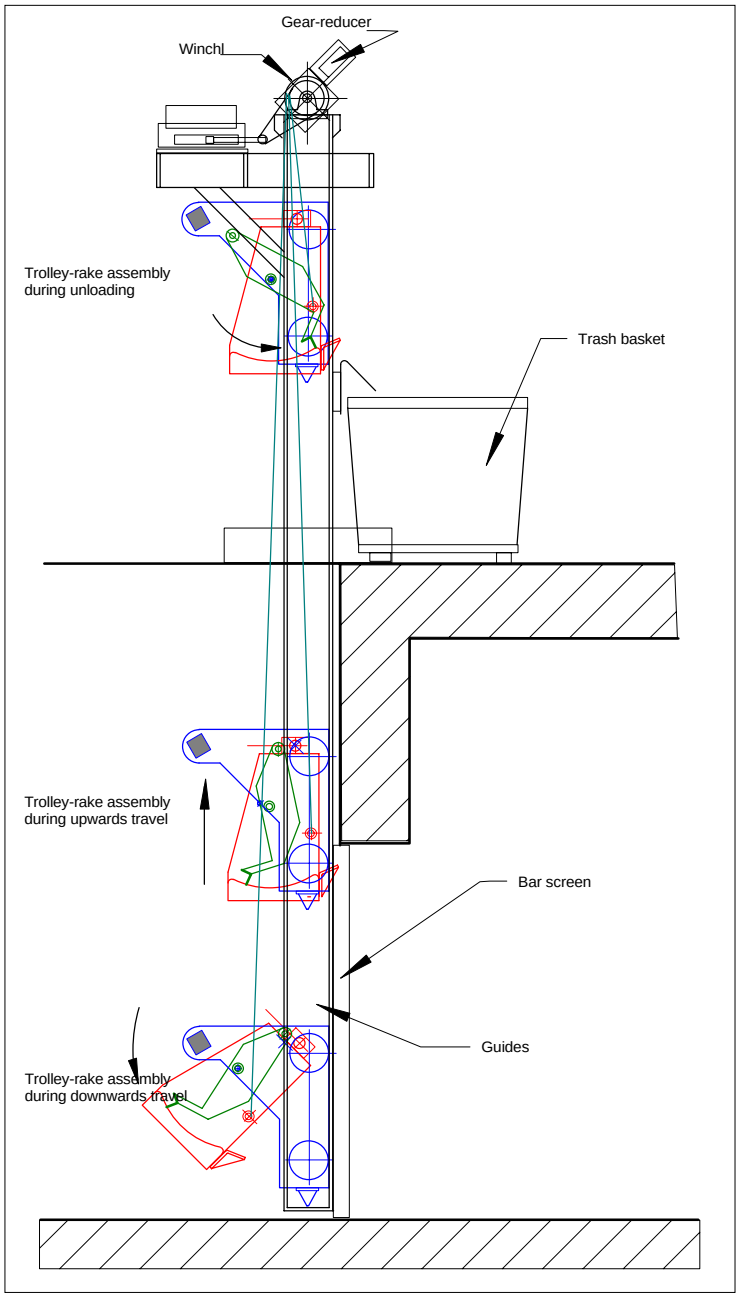
MATERIALS
Painted steel with stainless steel accessories, or totally stainless steel structure.

AVANTAGES
Economical - Low loss of head - Reliable and efficient - High debris-handling capacity - Automatic - Little maintenance required – Small height above deck.

SPECIAL EQUIPMENT
Control cabinet, loss of head indicator, cathodic protection by sacrificial anodes or imposed current.



BEAUDREY SCREENS AND FILTERS



DESCRIPTION

- This trash rake's operation is exceptionally safe as it relies on a simple principle : tilting a debris-collecting rake born by a trolley travelling up and down bolted guides, hanging from a hoist.

- The cleaning of the bar screen is achieved by scraping the rake assembly during its upwards travel in a horizontal position. During downwards travel, the rake assembly is disengaged. Tilting is obtained by unbalancing the rake assembly through a buffer effect of track stops. The rake tilts under its own weight as well as a buffer reaction.

- The rake is cleaned by a scraping action using an articulated arm on the trolley. Debris are recovered in a collection trough and removed either by flushing with water or mechanically towards a trash basket.

OPERATING PRINCIPLE OF A "CV" TYPE TRASH RAKE

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BEAUDREY SCREENS AND FILTERS

"A" TYPE, DUAL-FLOW TRAVELLING BAND SCREENS

MAIN APPLICATIONS
Cooling water intakes, pretreatment of drinking water, industrial cooling water intakes, irrigation, pretreatment of industrial or urban waste water, cooling tower outlets

WATER TO BE SCREENED River or lake water - sea-water - sewage water.

FLOW RATE Up to 70 000 m^3/h per screen.

SCREENING MEDIUM From 12 x 12 mm to 0.4 x 0.4 mm.

MAXIMUM ADMISSIBLE VARIATION IN WATER LEVELS No limit.

NORMAL HEAD-LOSS DURING OPERATION
From 3 (minimum) to 25 cm H_2O (maximum) during normal operation.

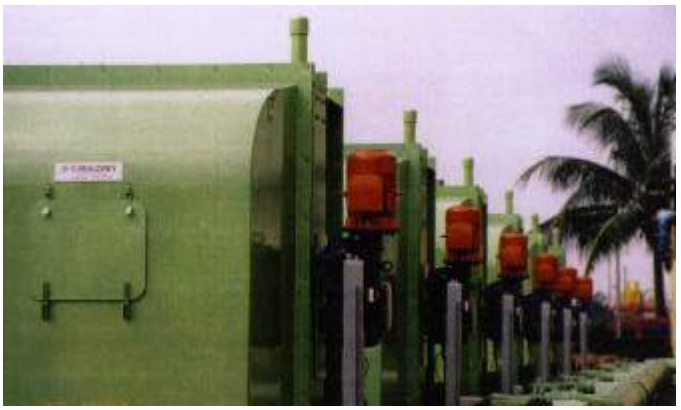
SIZE Standard width from 1 m to 4 m. Special designs up to 7 m in width, on request.

OPERATING MODES (Automatic or manual)
Timer - Head-loss indication - Continuous operation

BACK-WASH SPRAY WATER CLEANING
External spray piping on the upper part of the screen back-washes the band screen. The wash-water and debris are evacuated via a flume. Wash-water pressure : 3 bars.

FLOW PATTERN From outside to inside (reverse flow pattern on special request).

AVAILABLE LAYOUTS With full carrying structure or with rails and guides fixed to the civil works.



MATERIALS
Painted steel with stainless steel accessories, or completely stainless steel structure. Polyester covers.

UP-STREAM PROTECTION Bar screens.

AVANTAGES
Very efficient - Compact layout - Entirely automatic - Little maintenance involved - Can cope with large water-level variations - Low head-loss - Screening efficiency : 100 %.

SPECIAL EQUIPMENT
Cathodic protection (using sacrificial anodes or impressed current system). Head-loss indicators. Control cabinet. "NOCLING" anti-fibre screening panels (for water with a high level of fibrous content). Seismic qualification. Built-in by-pass valve. Passive or active fish-saving systems.

BEAUDREY SCREENS AND FILTERS

The outside towards inside flow pattern has many advantages :

- The unscreened water remains outside and the trash never interferes with the screen structure. No blockage is thus possible and no shocks can spoil the paint protection.

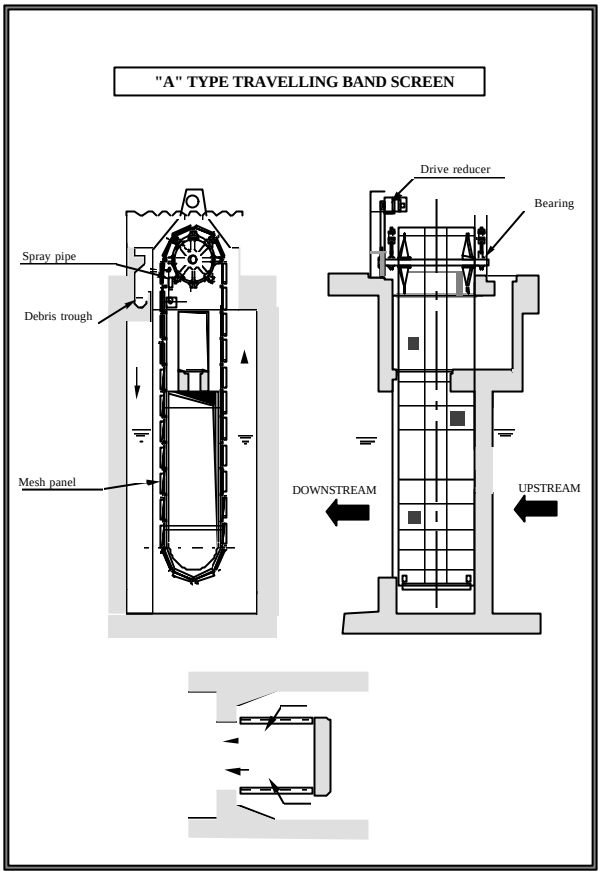
- The side rubber seal is on the outside held horizontally on the panel end-plate. It is folded outwards to rub on the sealing plates. This ensures sealing that is better than the mesh aperture. Folding inwards is not possible as rubber is not compressible and would corrogate. Seals overlap so that no gap opens when the panels turn around at the bottom.

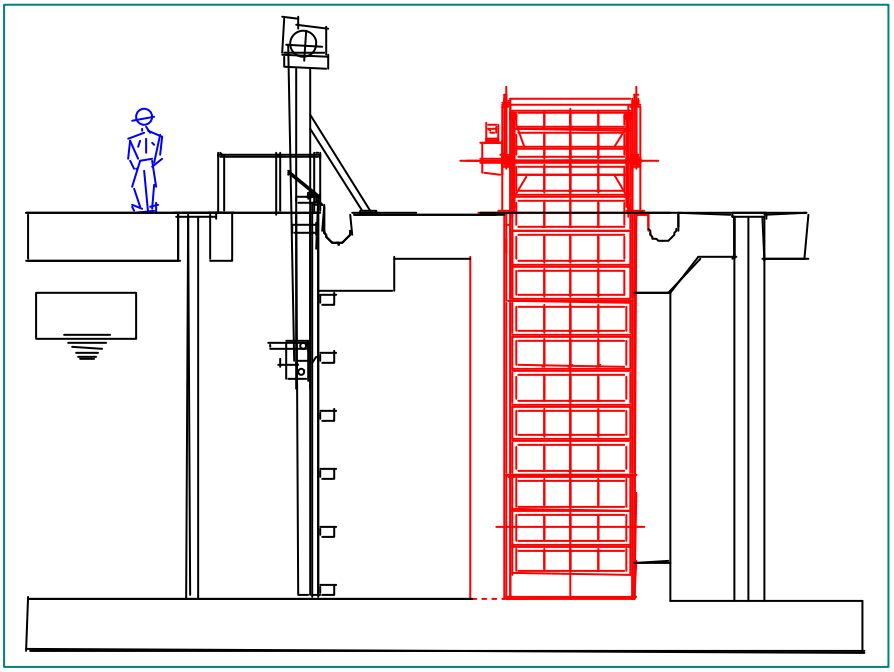
- The arrested trash is kept on the outside face and is back-washed into an external trough that is designed without having to take into account any interference from screen structure or mechanics.

  The trough is thus a single exit, easily accessible part that can be inspected while the machine is running.

- Any trash that is arrested is carried up without falling off by the trash lifting trays. The panel frames thus constitute large-capacity trash lifting baskets. No trash build-up can occur in the screen pit.

- The high-energy back-wash projects all the trash whatever their nature. The fact that gravity is not used is not relevant on such short distances as it would amount to less than five percent of the whole back-wash water jet energy. Over eighty years satisfactory operation backs this statement.





TYPICAL PLANT LAYOUT USING DUAL-FLOW TRAVELLING BAND SCREENS

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BEAUDREY SCREENS AND FILTERS

THRU-FLOW
TRAVELLING BAND SCREENS

MAIN APPLICATIONS Primary screening of cooling water, industrial intake plants, pre-treatment of urban or industrial waste water.

WATER TO BE SCREENED River or lake water - sea-water - recycled water - sewage water.

FLOW RATE Up to 60 000 m^3/h per screen.

SCREENING MEDIUM From 12 x 12 mm to 6 x 6 mm.

MAXIMUM ADMISSIBLE VARIATION IN WATER LEVELS No limit.

NORMAL HEAD-LOSS DURING OPERATION From 5 to 35 cm H_2O during normal operation.

SIZE Standard width from 1 m to 4 m. Special models up to 7 m in width.

OPERATIONAL MODE By timer, head-loss indication or continuous operation

BACK-WASH SPRAY WATER CLEANING Internal spray piping on the upper part of the screen back-washes the band screen. The wash-water and debris are evacuated via a flume. Wash-water pressure : 3.5 bars.

FLOW PATTERN The water penetrates the upstream side of the screen and then crosses through the downstream side of the screen.

AVAILABLE LAYOUTS Delivered with a completely-assembled main structure (crane installation is possible on request) or installed in rails and guides fixed to the civil works.

MATERIALS Painted steel with stainless steel accessories, or completely stainless steel structure. Polyester covers.

UP-STREAM PROTECTION Bar screens.

AVANTAGES - Very simple civil works involved - Entirely automatic - Very little maintenance required - Can cope with large water-level variations - Screening efficiency : 95 % approximately

SPECIAL EQUIPMENT Cathodic protection (using sacrificial anodes or impressed current system). Head-loss indicators. Control cabinet. "NOCLING" anti-fibre screening panels (for water with a high level of fibrous content). Seismic qualification.Front or rear side back-wash layout.

BEAUDREY SCREENS AND FILTERS

OPERATION

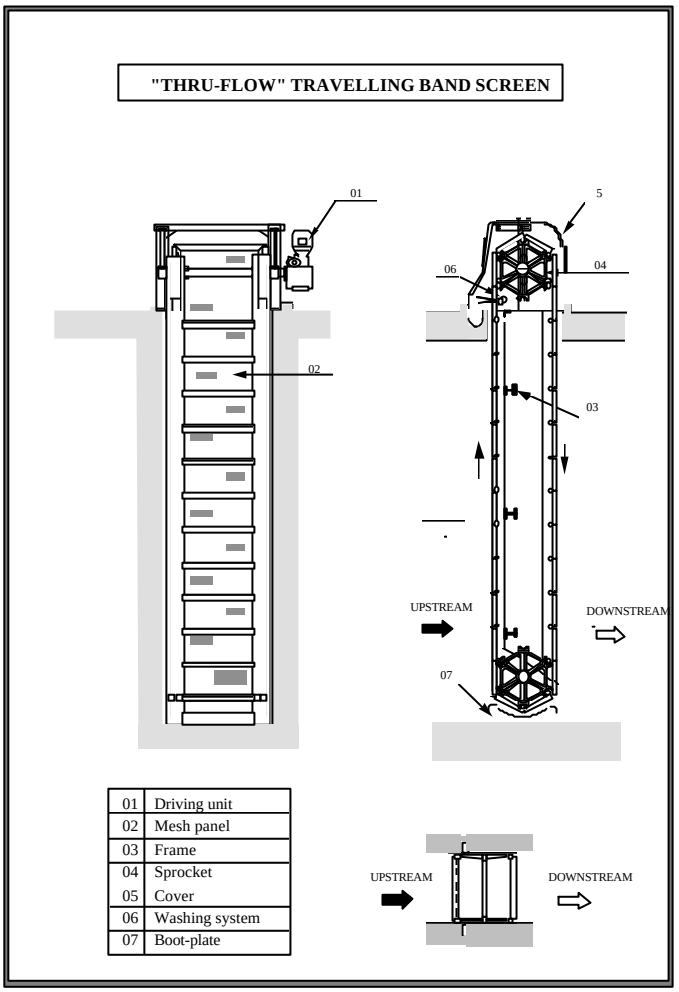
- The screen is an endless rotating belt sieve separating the chamber into two compartments.

- Water flows through the up-travelling upstream face of the screen through the mesh then through the down-travelling downstream face.

- A mobile sealing device fitted on the mobile part prevents any direct communication between unscreened and screened water.

- Trash arrested on mesh surface creates a loss of head. This is measured and monitors the operating cycles of the machine at preset differentials.

- A powerful back-washing (from inside towards outside) in the shape of a high-velocity water blade sends the trash into a trough. It is then carried away through flumes running along the deck.



GENERAL

- The arrested trash is kept on the outside face and is back-washed into an external trough that is designed without having to take into account any interference from screen structure or mechanics.

  The trough is thus a single exit, easily accessible part that can be inspected while the machine is running.

- Any trash that is arrested is carried up without falling off by the trash lifting trays. The panel frames thus constitute large-capacity trash lifting buckets. No trash build-up can occur in the screen pit.

- The high-energy back-wash projects all the trash whatever its nature. The fact that gravity is not used is not relevant on such short distances as it would amount to less than five percent of the whole back-wash water jet energy. Seventy years satisfactory operation backs this statement.

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BEAUDREY SCREENS AND FILTERS

"C" TYPE, DUAL-FLOW TRAVELLING BAND SCREENS

MAIN APPLICATIONS
Cooling water intakes, pretreatment of drinking water, industrial cooling water intakes, irrigation, pretreatment of industrial or urban waste water, cooling tower outlets

WATER TO BE SCREENED River or lake water - sea-water - sewage water.

FLOW RATE Up to 12 000 m^3/h per screen.

SCREENING MEDIUM From 12 x 12 mm to 0.4 x 0.4 mm.

MAXIMUM ADMISSIBLE VARIATION IN WATER LEVELS No limit.

NORMAL HEAD-LOSS DURING OPERATION
From 3 (minimum) to 25 cm H_2O (maximum) during normal operation.

SIZE Standard width from 0.8 m to 2.4 m.

OPERATING MODES (Automatic or manual) Timer - Head-loss indication - Continuous operation

BACK-WASH SPRAY WATER CLEANING
External spray piping on the upper part of the screen back-washes the band screen. The wash-water and debris are evacuated via a flume. Wash-water pressure : 3 bars.

FLOW PATTERN From outside to inside (reverse flow pattern on special request).

AVAILABLE LAYOUTS With full carrying structure or with rails and guides fixed to the civil works.

MATERIALS
Painted steel with stainless steel accessories, or completely stainless steel structure. Polyester covers.

UP-STREAM PROTECTION Bar screens.

AVANTAGES
Very efficient - Compact layout - Entirely automatic - Little maintenance involved - Can cope with large water-level variations - Low head-loss - Screening efficiency : 100 %.

SPECIAL EQUIPMENT
Cathodic protection (using sacrificial anodes or impressed current system). Head-loss indicators. Control cabinet. "NOCLING" anti-fibre screening panels (for water with a high level of fibrous content). Seismic qualification. Built-in by-pass valve. Passive or active fish-saving systems.

BEAUDREY SCREENS AND FILTERS

The outside towards inside flow pattern has many advantages :

- The unscreened water remains outside and the trash never interferes with the screen structure. No blockage is thus possible and no shocks can spoil the paint protection.

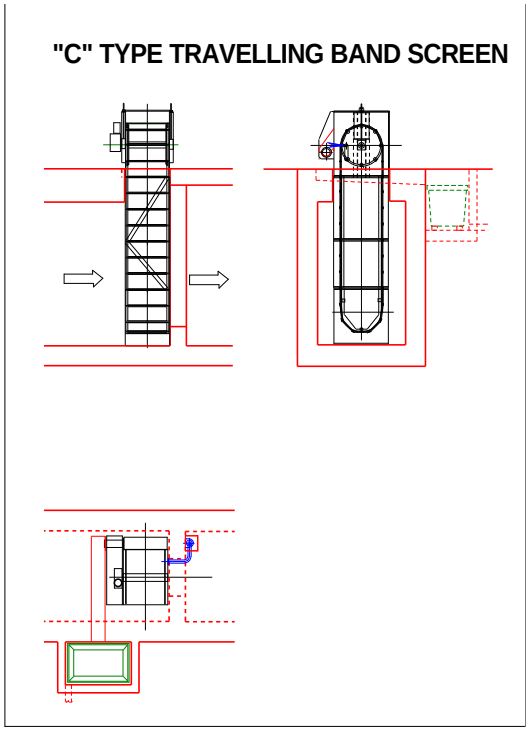
- The side rubber seal is on the outside held horizontally on the panel end-plate. It is folded outwards to rub on the sealing plates. This ensures sealing that is better than the mesh aperture. Folding inwards is not possible as rubber is not compressible and would corrogate. Seals overlap so that no gap opens when the panels turn around at the bottom.

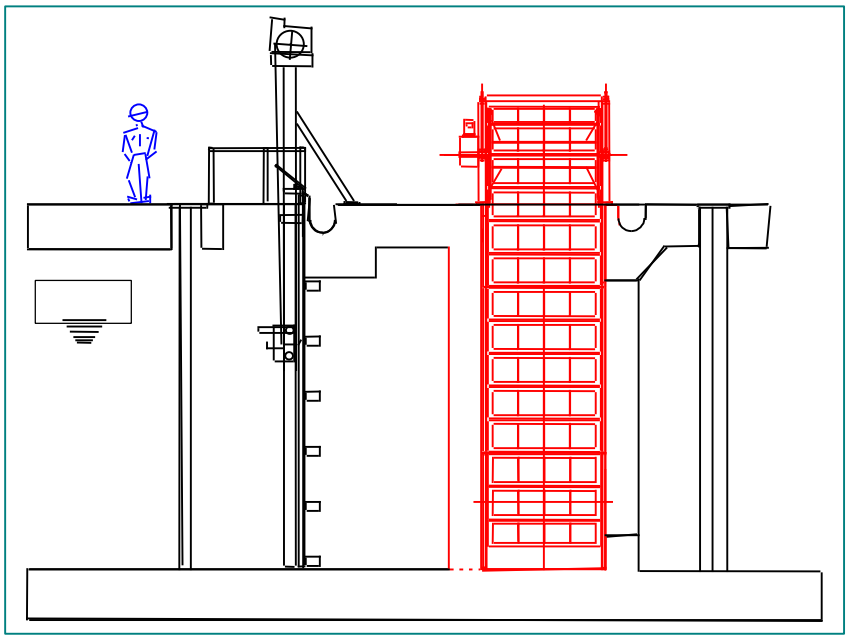
- The arrested trash is kept on the outside face and is back-washed into an external trough that is designed without having to take into account any interference from screen structure or mechanics.

  The trough is thus a single exit, easily accessible part that can be inspected while the machine is running.

- Any trash that is arrested is carried up without falling off by the trash lifting trays. The panel frames thus constitute large-capacity trash lifting baskets. No trash build-up can occur in the screen pit.

- The high-energy back-wash projects all the trash whatever their nature. The fact that gravity is not used is not relevant on such short distances as it would amount to less than five percent of the whole back-wash water jet energy. Over eighty years satisfactory operation backs this statement.





TYPICAL PLANT LAYOUT
USING "C" TYPE DUAL-FLOW
TRAVELLING BAND SCREENS

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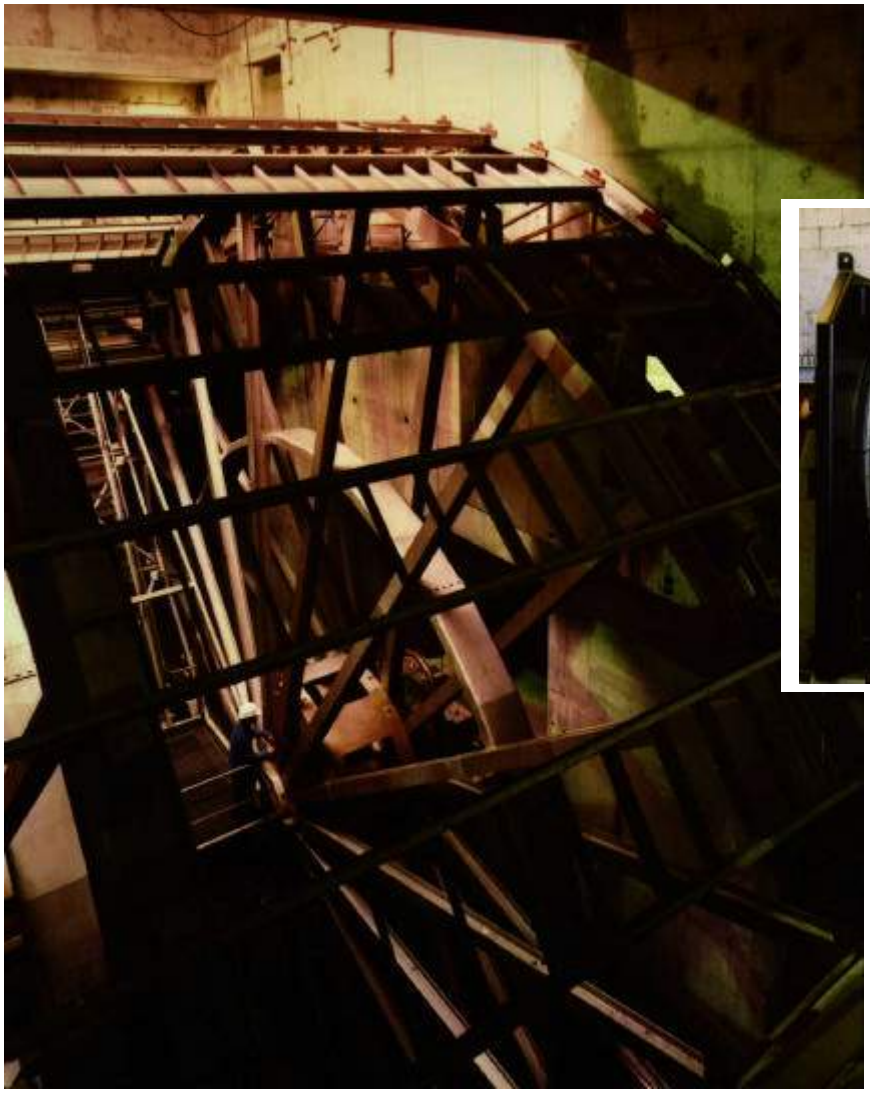
BEAUDREY SCREENS

DRUM SCREENS



23 m diameter drum screen

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BEAUDREY SCREENS

MAIN APPLICATIONS
Cooling water screening, industrial intake plants, irrigation, water supply, pre-treatment of urban or industrial sewage water.

WATER TO BE SCREENED
River or lake water - sea-water - sewage waters.

FLOW RATE
All flow rates up to 150 000 m^3/h per drum screen.

SCREENING MEDIUM
From 12 x 12 mm to 0.25 x 0.25 mm.

MAXIMUM ADMISSIBLE WATER-LEVEL VARIATIONS
Up to 14 m.

NORMAL HEAD-LOSS DURING OPERATION
From 3 (minimum) to 25 cm (maximum) H_2O during normal operation.

SIZE
Width from 1.2 m to 12 m standard. Diameter from 1.5 to 24 m.

OPERATIONAL MODE
- By timer - By loss of head indication - Continuous operation

BACK-WASH SPRAY WATER CLEANING
Internal spray-water piping at the upper part of the drum screen ensures the panels are back-washed. Wash-water and debris are evacuated via a flume. Wash-water pressure : 3.0 bars.

FLOW PATTERN
From outside to inside (for reverse flow direction : refer to "B" type drum screen)

LAYOUTS
One or two wheels according to the width.

MATERIALS
Painted steel with stainless steel accessories, or complete stainless steel construction.

UP-STREAM PROTECTION

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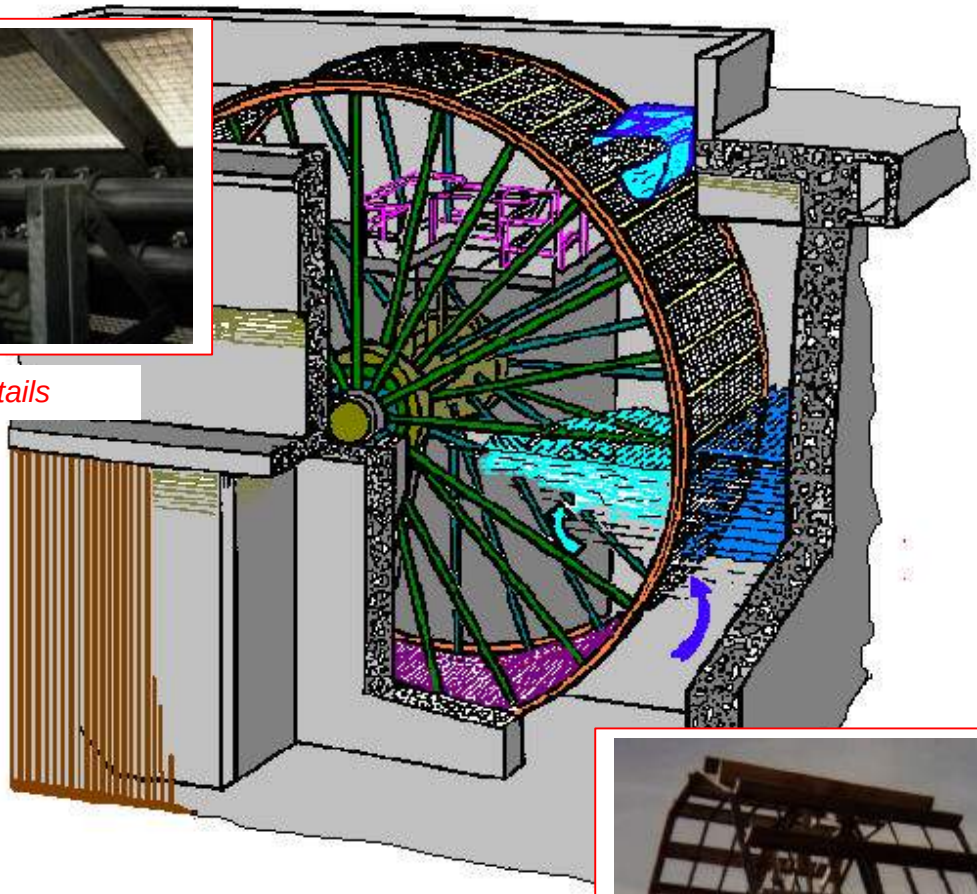
BEAUDREY SCREENS

Wash-water piping details



Drive system details

Shop assembly

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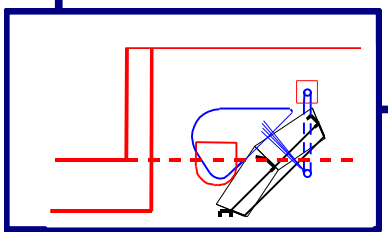
BEAUDREY SCREENS

Backwashing of a drum screen

Drum screen clogged with debris



Drum screen after back-washing

Debris removed into trash basket

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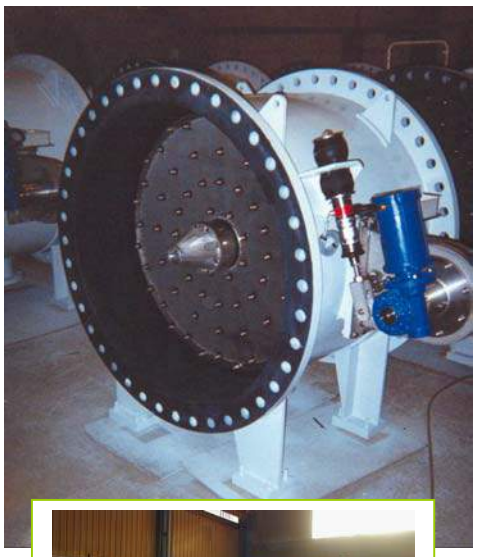
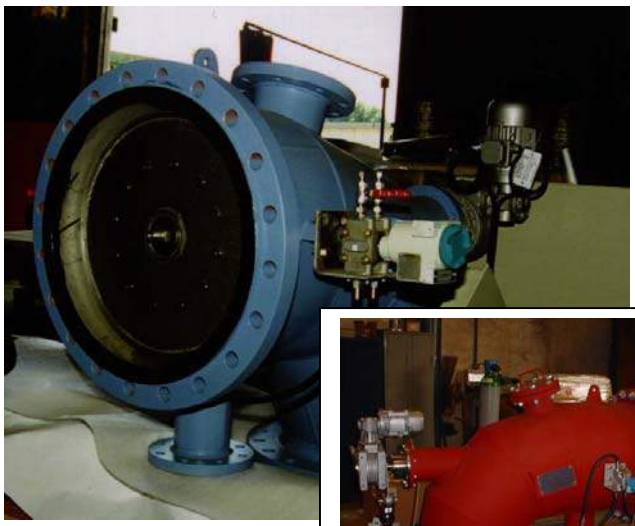
FILTRES BEAUDREY

BEAUDREY DEBRIS FILTERS



"W" TYPE DEBRIS FILTERS

"WS" TYPE



"WE" TYPE

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BEAUDREY SCREENS AND FILTERS

"W" TYPE, DEBRIS FILTER

MAIN APPLICATIONS
Protection of condensers and other such installations against debris which may have passed intake screening plants or which may have developed in the piping (mussels, oysters, algae, stones, plastic material, jelly-fish, etc...).

WATER TO BE SCREENED River or lake water - sea-water - brine - recirculated water.

FLOW RATE From 1 000 m^3/h to 70 000 m^3/h.

SCREENING MEDIUM 10x10 - 6x6 - 4x4 mm.

SERVICE PRESSURE Pressure up to 20 bars.

NORMAL HEAD-LOSS DURING OPERATION
From 0.20 to 0.55 m H_2O.

SIZE All diameters from Ø 500 to 3200 mm. Larger sizes require special designs.

OPERATIONAL MODE (Automatic or manual)
By timer or pressostat control. Continual operation is also possible.

BACK-WASH FILTER CLEANING Back-wash induced by suction scoop. Each compartment of the circular screening area is washed in turn. The wash-water is evacuated towards a gutter or through piping connected to the outfall of the condenser.

INSTALLATION CONNECTIONS By flange for installation on the pipe. The filter is delivered to site fully-assembled.

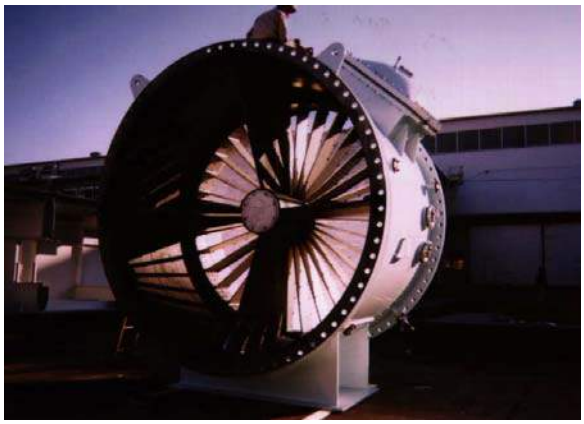
MATERIALS Filter shells are made of painted steel for fresh-water applications, and rubber-lined for use in salt-water. All internal components are made of stainless steel.

UPSTREAM PROTECTION Screening line in the pump house. The "W" type filter is a final-step filter.

AVANTAGES Economical - Compact design - Requires no maintenance - Very low head-loss - Screening efficiency : 100 %.

SPECIAL EQUIPMENT Electrical cabinet and pressostat. Built-in by-pass.

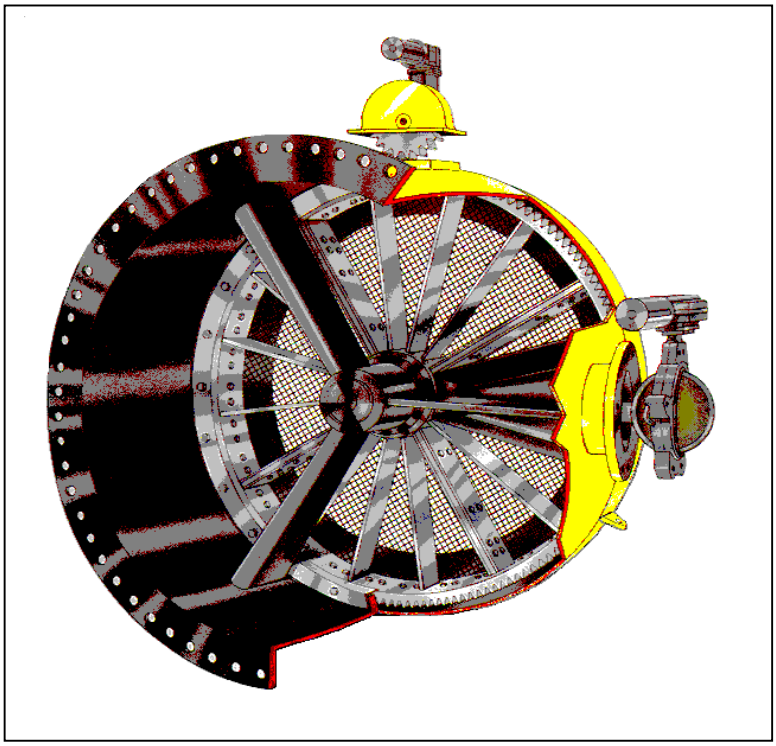
NOTE
BEAUDREY can also supply a complete package consisting of debris filter and tube-cleaning equipment.



Debris Filter – Nominal Diameter 3200 mm (Japan)

Debris Filter – Nominal Diameter 2000 mm (Denmark)

BEAUDREY SCREENS AND FILTERS

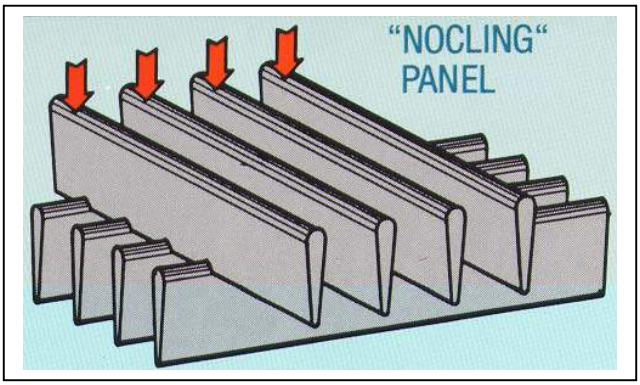


DESCRIPTION

- The filter is enclosed inside a spool piece. The water flows through the rotating screening wheel. The debris are collected in the cells of the wheel. When required, the wheel is rotated at a low speed and each cell passes in front of the back-wash scoop. The "NOCLING" TM panels are back-washed and the debris are evacuated towards the outlet of the condenser. The washing is initiated by opening an external valve.
- The cleaning cycle only lasts a few minutes and can be triggered either by a timer or by a differential-pressure switch.
- The rotating wheel is driven via a nylon gear and pinion by an external motor and reducer.
- A torque limiting device and a shock absorbing device protect the equipment from mechanical overload due to blocking by debris . The shock absorbing device also protect the equipment from vibration generated by water turbulence

Conditions required for a good back-washing efficiency :

a) The back-wash flow is high enough to remove the most adherent debris.
b) The panel is of the BEAUDREY patented "NOCLING"TM multicanal design which prevents debris including the fibrous material and jelly-fish from building up or adhering.



DEBRIS HANDLING CAPACITY

The BEAUDREY type debris filter can handle any type of debris such as :

- Clams, shells, mussels, crabs, oysters,
- Pebbles and stones
- Grass, seaweed, fibres of any length
- Plastic bags, cans, etc.
- Twigs and refuse
- Jellyfish and fish

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BEAUDREY SCREENS AND FILTERS

"STATODYN" STRAINER

MAIN APPLICATIONS
All applications requiring the elimination of small and medium-sized debris (industry, water distribution, fabrication, aspersion etc...).

WATER TO BE SCREENED
River or lake water - sea-water - recycled water.

FLOW RATE
Up to 8 000 m^3/h

SCREENING MEDIUM APERTURE
From 2 mm down to 0.4 mm.

MAXIMUM ADMISSIBLE WATER-LEVEL VARIATION
Pressure : from 0.5 up to 16 bars. Greater pressures are possible on request.

NORMAL HEAD-LOSS DURING OPERATION
0.5 to 0.8 m H_2O.

SIZE AND LAYOUT
All sizes from 80 mm diameter flanges. Inline or elbow layouts.

OPERATIONAL MODE
By manual or power actuation of flush valves.

FLUSHING
Washing performed by flushing and surface turbulence.

INSTALLATION
The filter is delivered fully assembled, ready to be installed.

MATERIALS
Steel or polyester shell. Stainless steel cartridges.

UP-STREAM PROTECTION
Elimination of debris with a cross-section larger than 2 x 2 cm.

AVANTAGES
- Economical
- Static, therefore no maintenance
- Screening efficiency : 100 %.
- No mechanical components involved
- Low head-loss

SPECIAL EQUIPMENT
Automatic operation device with pressostat and switchgear cabinet.

4 cartridge Statodyn Strainer

7 cartridge Statodyn Strainer

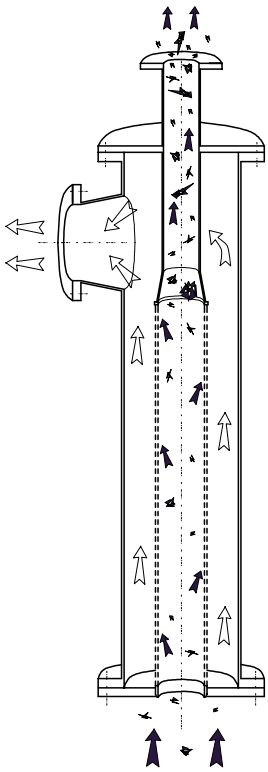
BEAUDREY SCREENS AND FILTERS

PURPOSE :

A BEAUDREY "STATODYN" pressure-line strainer is installed on a pipeline. It arrests all particles larger than the filtration gauge. It can handle large elements such as clams, shells, pebbles, small twigs as well as leaves, weed, plastics, etc.... It is, of course, self cleaning.

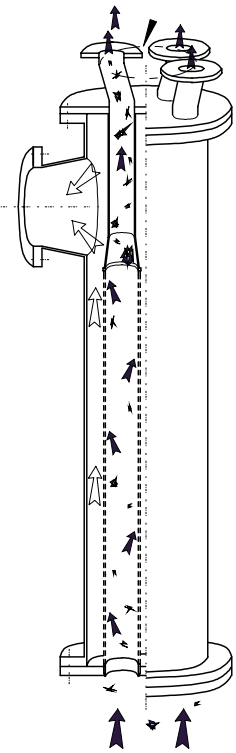
HOW IT WORKS :

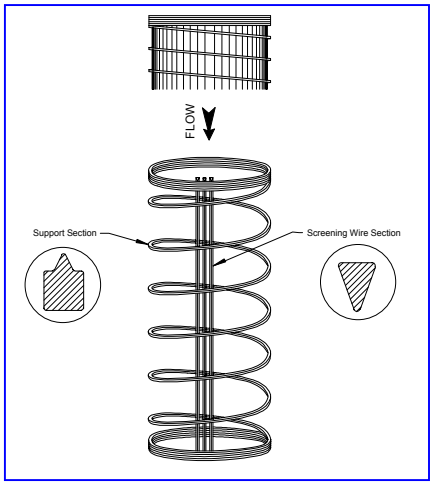
- The "Statodyn" strainer comprises an inlet flange, an outlet flange, a filter body, the special cartridges and the flush valves.
- Water enters the body, flows into the cartridges, then through the mesh, is collected and flows out into the pipeline.
- When the Delta P builds up owing to the cartridges getting clogged by the arrested debris, the strainer is flushed by opening, in turn and for a few seconds, the flush valve of each cartridge. The violent flow thus generated through the cartridge and valve carries away the deposited debris. The carefully-controlled turbulences created by the nature of the cartridge and the proportion between the various dimensions are the key to the success of this apparently simple process.
- The flush valves can either be hand-operated (the cheaper form) or power-actuated.
- The flushing cycle is actuated either at fixed intervals (timer or operator instruction) or when the Delta P builds up (pressostat operation).
- Naturally, the finer the filtration size chosen for a given quality of water, the shorter the time between two flushing cycles. In the same manner, the cleaner the water for a given filtration size, the less frequent the flushing cycles.



SINGLE CARTRIDGE STATODYN

MULTIPLE CARTRIDGE STATODYN





SCREENING CARTRIDGE

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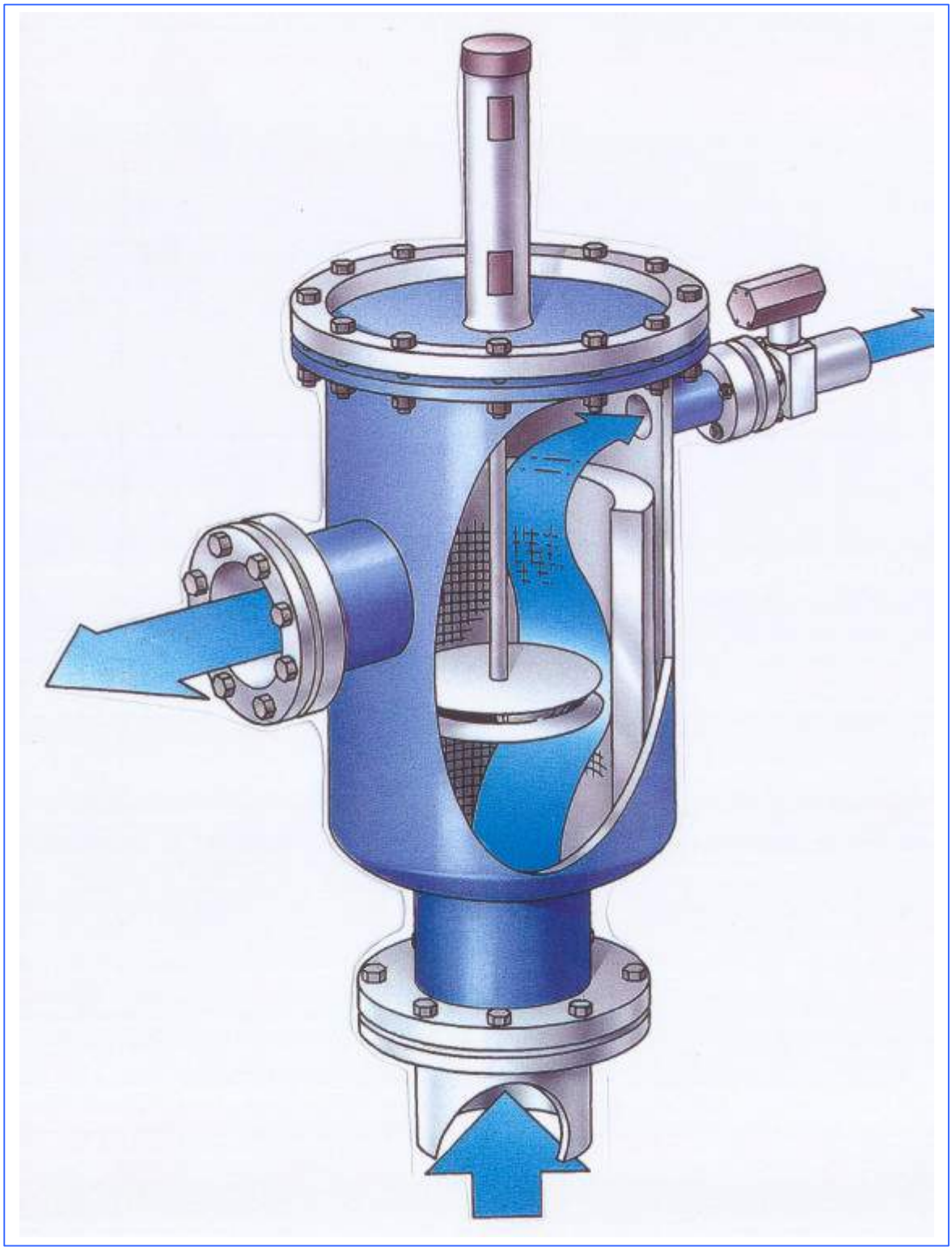
BERNOULLI FILTERS



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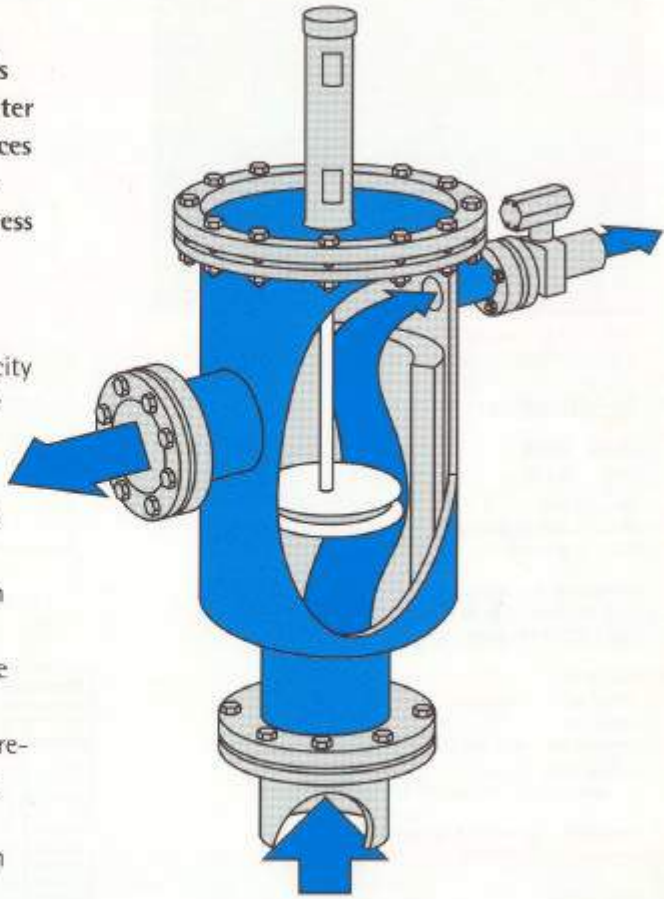
Bernoulli

An automatic filter for liquids

The Bernoulli Filter is a self-cleaning filter for continuous filtration of liquids in pressurized systems. The Bernoulli Filter removes debris from natural water sources such as sea water or river water. It can also be used to remove particles in process liquids.



Cleaning operation

A specially designed piston creates a velocity increase between the piston and the filter basket. The velocity increase results in a local pressure reduction which "vacuum cleans" the basket inside. Debris is flushed out to drain through a separate valve.

The Bernoulli Filter has a control system which automatically initiates a cleaning sequence before a possible clogging of the basket have reduced the flow rate. The cleaning sequence can also start after a pre-set time. The main flow is not interrupted during the cleaning sequence.

The operation of the Bernoulli Filter can also be centrally computer controlled.

Advantages

- Continuous operation - the Bernoulli Filter is designed for continuous operation without interruptions and does not require any regular maintenance.
- Low pressure drop even for high flow rates
- Low flushing pressure - 0,3 bar pressure gauge is sufficient.
- Easy installation - the Bernoulli Filter can be fitted directly to pipe lines. Any horizontal or vertical position is possible.
- Good corrosion resistance - the Bernoulli Filter has a stainless steel, PVC or glass fibre body, particularly suitable for corrosive liquids such as sea water.

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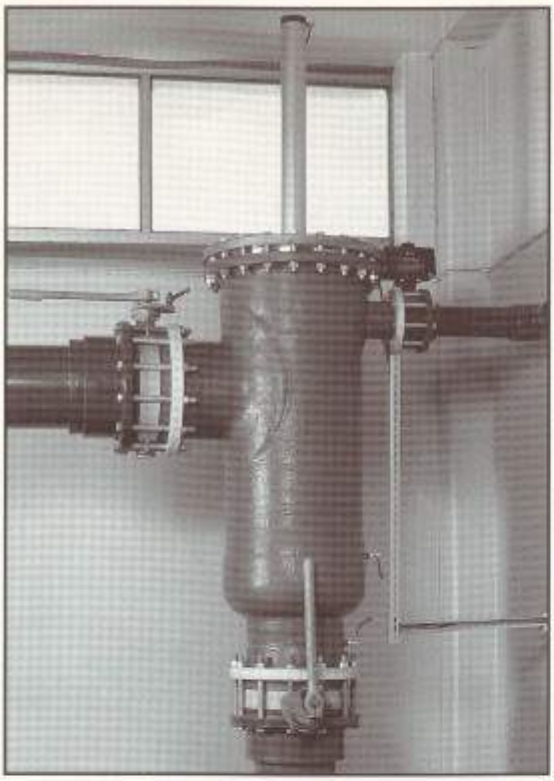


BSG 300 at Swedish Match AB in Malmö, Sweden. Brackish harbour water for air conditioning.

Specification

FILTER TYPE	FILTER BODY	DESIGN PRESSURE	MAX OPERATING TEMPERATURE
BSP	PVC	10 bar g	40°C
BSG	GRP (polyester)	10/6 bar g	60°C
BSS	AISI 316	10 bar g	80°C

FILTRATION: 0,15 – 2,0 mm
MAX PARTICLE SIZE: 40 mm
MIN SYSTEM PRESSURE: 0,3 bar g

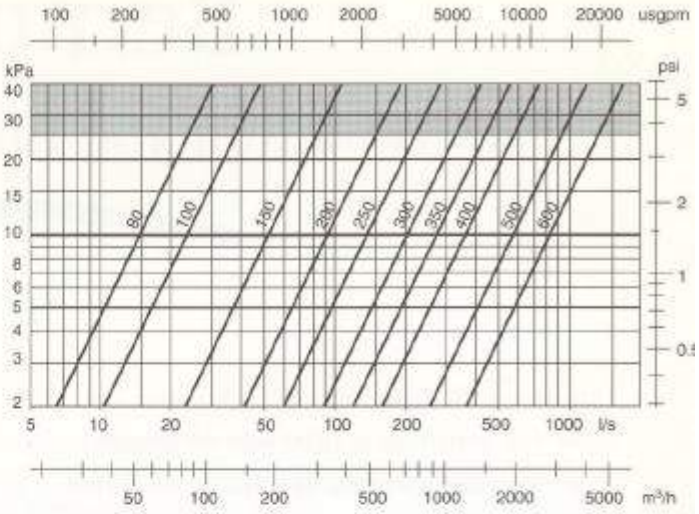
MATERIAL
BODY: As indicated above
BASKET: AISI 316, Titanium
DRIVING UNIT: AISI 316
PISTON SEAL: Polyuretan
FLUSHING VALVE: PVC or AISI 316

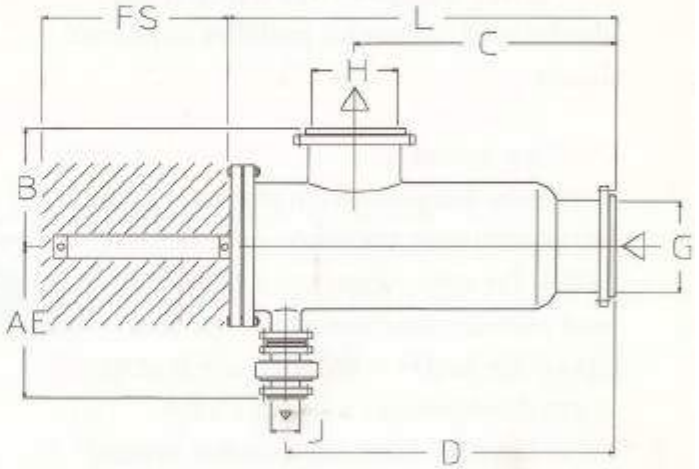
CONTROLS: Pneumatic, 6 bar air pressure
Voltage 230 V, 50/60 Hz

FUNCTIONS:
Electronic control
Differential pressure switch
Timer controlled override
Double supervision system

CONTACTS FOR COMPUTER SUPERVISION:
Filter in operation
Flushing
Alarm

Selection chart





Bernoulli Filter FLANGES ACCORDING TO DIN 2632, PN 10	DIMENSIONS IN mm								Weight	Flow	
TYPE	AE	B	C	D	L	FS	G / H	J	TOT kg	Max l / s	Flush l / s
	PVC - BODY										
BSP 80	350	340	390	500	610	360	DN 80	DN 40	17	23	2,5
BSP 100	420	280	440	565	690	360	DN100	DN40	24	36	4
	GLASS FIBRE BODY										
BSG 150	480	275	530	675	830	600	DN 150	DN 40	37	83	9
BSG 200	540	350	705	880	1080	700	DN 200	DN 50	50	145	17
BSG 250	401	400	825	1050	1250	950	DN 250	DN 100	95	235	28
BSG 300	431	475	1000	1260	1500	900	DN 300	DN 100	140	325	37
BSG 350	431	475	1100	1380	1850	1100	DN 350	DN 100	160	450	50
BSG 400	501	600	1220	1520	1800	1100	DN 400	DN 100	230	580	67
BSG 500	803	700	1600	2060	2350	1650	DN 500	DN 125	400	910	105
BSG 600	993	830	1750	2210	2500	1600	DN 600	DN 150	630	1300	150
	STAINLESS STEEL BODY										
BSS 100	265	175	325	440	595	550	DN 100	DN 40	50	36	4
BSS 150	340	250	460	605	760	600	DN 150	DN 40	90	83	9
BSS 200	375	300	600	775	950	700	DN 200	DN 50	140	145	17
BSS 250	401	400	825	1060	1250	950	DN 250	DN 100	210	235	28
BSS 300	431	360	850	1110	1355	900	DN 300	DN 100	250	325	37
BSS 400	511	450	1020	1320	1570	1100	DN 400	DN 100	500	580	67

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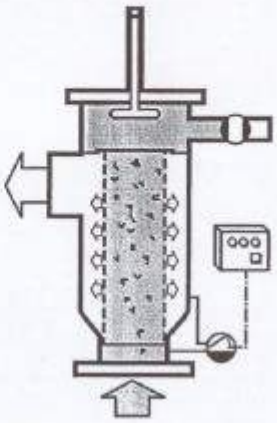
Bernoulli

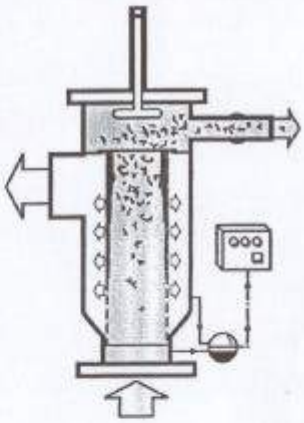
An automatic filter for liquids

Cleaning operation

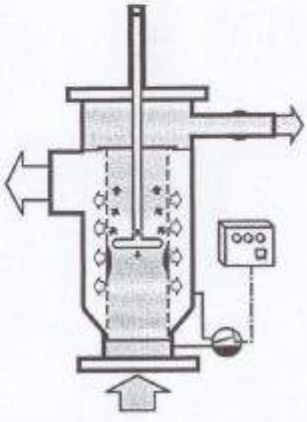
Normal operation
The flushing valve is closed and the piston mounted in the end cover remains outside the strainer basket.



Flushing phase one
Cleaning is initiated either through increase in differential pressure or after a preset time interval. The flushing valve opens and large matters are flushed out.



Flushing phase two
The piston moves twice into the basket. The increased flow velocity between basket and piston creates a pressure drop. This reverses the flow direction locally into the basket and removes particles adhering to the basket.



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BEAUDREY SCREENS, FILTERS & TUBE-CLEANING SYSTEMS

CONTINUOUS TUBE-CLEANING SYSTEMS (CTCS)

Ball strainer

Ball re-circulation skid

WHY ARE CONDENSER TUBE CLEANING SYSTEMS NEEDED ?

Upstream screens and strainers only remove solids. The cooling water contains other undesirable elements such as :

- Dissolved products that can precipitate and build into scale on the tube surface,
- Biological elements that settle and grow in the tubes,
- Fine mineral particles that settle on the low-velocity boundary layer and combine with the scale and/or biological growth.

The results are :

- Possible underlying corrosion of the tubes,
- A large reduction of the heat transfer by the tubes with the consequent loss of generated electricity (up to 2% and higher).

Fitting a BEAUDREY condenser tube cleaning system totally eliminates these.

BEAUDREY SCREENS, FILTERS & TUBE-CLEANING SYSTEMS

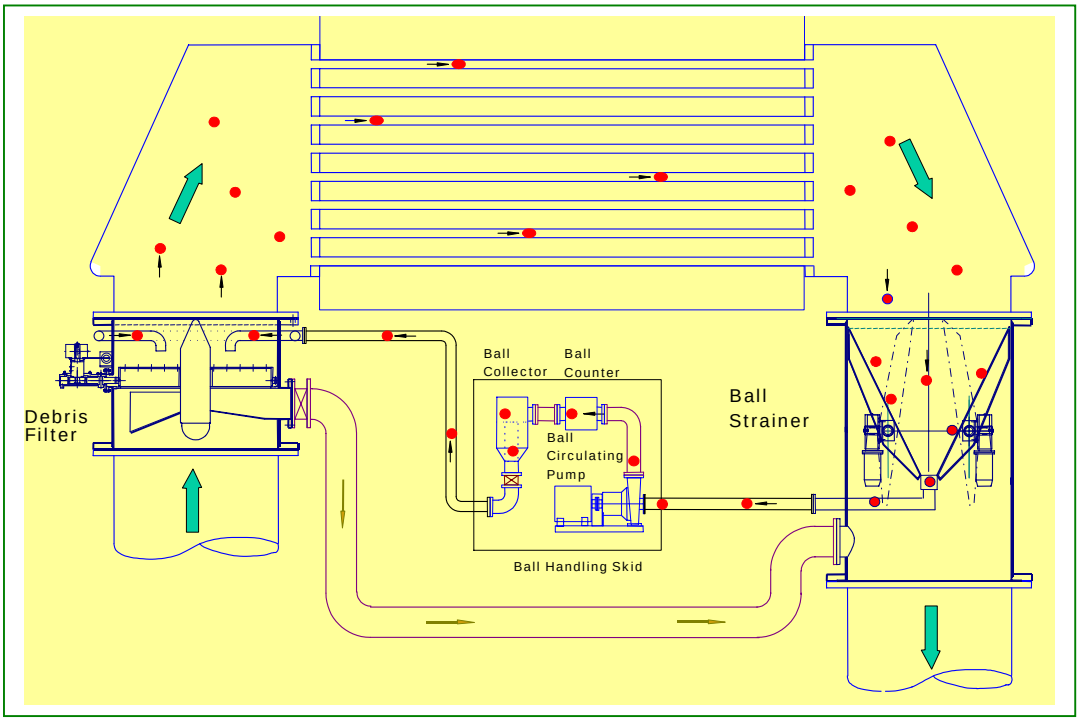
HOW DOES IT WORK ?

The original principle dates back to 1927 and its technology has been improved ever since. It culminates in the present BEAUDREY design.

Rubber sponge-balls with a diameter slightly larger than that of the tube are injected ahead of the water box inlet, travel through and sweep the tubes with the flow. They are collected in a strainer downstream of the water box outlet and immediately pumped back to the inlet side.

BEAUDREY tube-cleaning systems can be installed either during plant construction to prevent any expected form of tube fouling or retrofitted to plants in service to resolve existing tube-fouling problems.

Each system is custom designed to suit each case. This applies as much to the equipment as to the operation sequences or the type of sponge balls. For example, a plant where severe scaling is the main problem must operate continuously as experience shows that such deposits are best avoided if they are not left to build up. In other cases, a few hours per day or each week may be enough.



ADVANTAGES

- Increases the generated power without cost
- Eliminates periodical shut-downs for tube-cleaning and the resulting production losses
- Eliminates costly mechanical and/or chemical cleaning
- Reduces chlorination costs
- Extends condenser tube life
- Ensures even application of ferrous sulphate dosing

APPLICATIONS :

Power Plants :

New Plants : To maintain initial steam-side back-pressure in the condenser.

Revamping : To regenerate the original performance of the condensers.

Industry : Desalination plants, oil refineries, chemical and heating plants, condensers or exchangers.

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ZERO BALL LOSS

CONTINUOUS TUBE CLEANING SYSTEM

ENVIRONMENT FRIENDLY

- No balls can escape to the environment
- Compact : fits where no other system does
- Lower fuel consumption or more power generated at no extra cost
- Eliminates periodical shut-downs for tube-cleaning and the resulting production losses
- Eliminates costly mechanical and/or chemical cleaning
- Reduces chlorination costs
- Extends condenser tube life
- Ensures even application of ferrous sulphate dosing

DEDICATED TO TUBE CLEANING SINCE 1923

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E. BEAUDREY & Cie.

WHY IS THE BEAUDREY ZBL CONDENSER TUBE CLEANING THE BEST ON THE MARKET ?

- It is designed by the Company specialised in cooling water cleanliness since 1912 and in condenser tube cleaning since 1923,
- BEAUDREY has gathered within a totally-dedicated entity, all possible condenser tube cleaning system know-how, experience and creative capacity.
- It is built to the same exacting quality standards as all other BEAUDREY products,
- It uses a "W" filter ball-catcher,
- It is the most compact system available anywhere,
- Automatic operation and permanent monitoring,
- Totally safe and proven components.

INFORMATION NEEDED FOR DESIGN :

- Nominal and maximum flow per line,
- Condenser inlet and outlet pressure,
- Condenser outlet nozzle diameter and CW pipes general arrangement
- Number of outlet nozzles,
- Flange standard,
- Condenser tube number and inside diameter,
- Type of Water and CW System (Sea / River / Opened or Closed Circuit),
- Power supply

The ZBL design and many of its features are patented.

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ZERO BALL LOSS, COMPACT CONTINUOUS TUBE CLEANING SYSTEM

Available in all sizes from 900 mm (36") to 3600 mm (144") diameter.

WHY ARE CONDENSER TUBE CLEANING SYSTEMS NEEDED ?

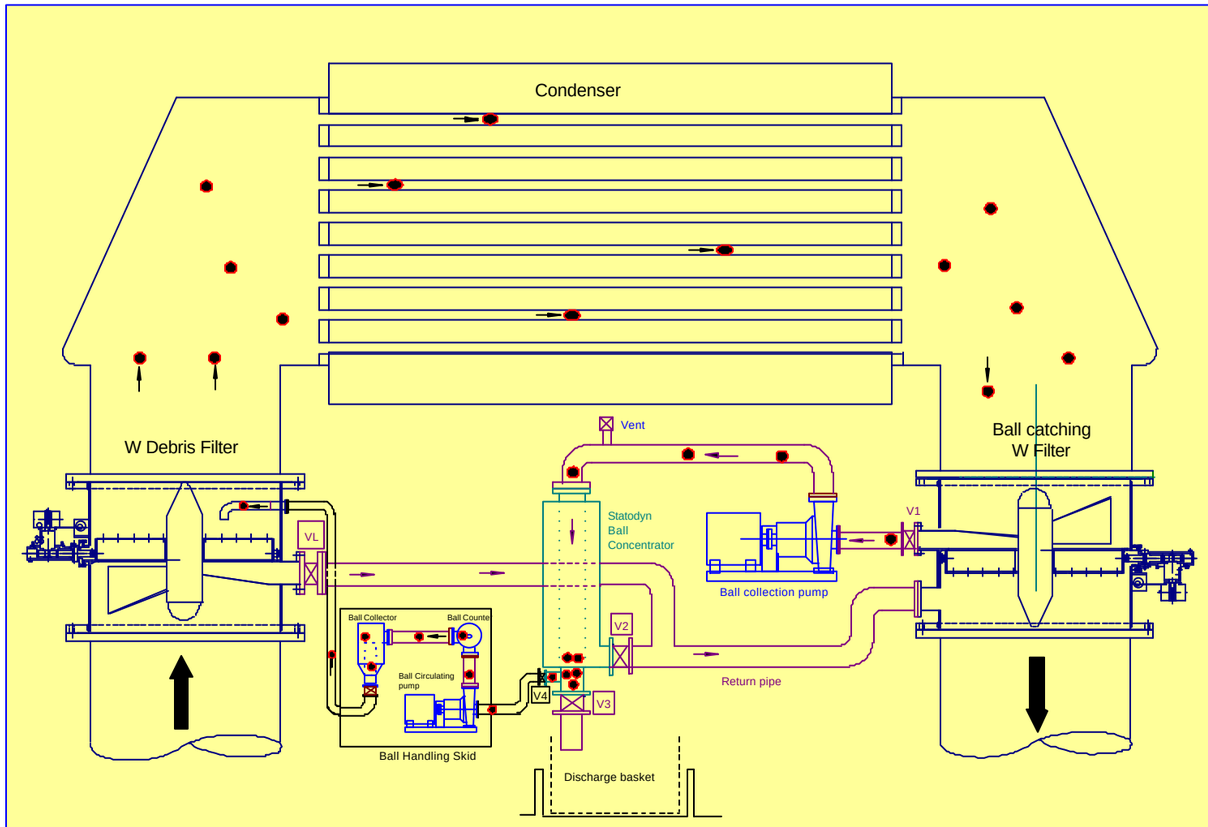
Upstream screens and strainers only remove solids. The cooling water contains other undesirable elements such as :

- **Dissolved products that can precipitate and build into scale on the tube surface,**
- **Biological elements that settle and grow in the tubes,**
- Fine mineral particles that settle on the low-velocity boundary layer and combine with the scale and/or biological growth.

The results are :

- **Possible underlying corrosion of the tubes**,
- A large reduction of the heat transfer by the tubes with the consequent loss of generated electricity (up to 3% and more).

Fitting a BEAUDREY ZBL condenser tube cleaning system totally eliminates these without creating ball-release problems.



HOW DOES IT WORK ?

The ZBL system, while using the time-proven, rubber sponge-ball tube-sweeping method, is a quantum leap in the field.

It uses a "W" type ball-catching filter instead of tilting grids.

The balls are arrested by the rotating filter, extracted by the scoop and ball pump and sent to a "Statodyn" self-cleaning static concentrator. The water without the balls returns to the CW outlet pipe and the balls go to the ball management skid to be finally injected back at the condenser inlet.

Neither the "W" filter nor the "Statodyn" concentrator offer any escape route for the balls at any time.

Each system is custom-designed to suit each case. Types of balls and operation sequences are selected for cost efficiency ranging from continuous operation for scale-prone plants down to a few hours a week in some cases.

The condenser inlet debris filter is mandatory.

APPLICATIONS

Power Plants

In new plants : to maintain initial steam-side back-pressure in the condenser

In revamping existing plants : to regenerate the original performance of the condensers

Industry

Desalination plants, oil refineries, chemical and heating plants

Condensers or exchangers

IT PAYS FOR ITSELF IN UNDER A YEAR

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BEAUDREY TUBE-CLEANING SYSTEMS

CLEANING BALLS

APPLICATION

Continuous cleaning of condenser or heat exchanger tubes, cooled by river or sea water, directly or through cooling towers.

TECHNICAL FEATURES

Base material: natural rubber

Structure: sponge rubber with open pores.

Apparent specific weight in water: 1.02 g/cm3

Dry specific density:
- medium : 0.2 g/cm3
- hard : 0.3 g/cm3

Heat resistance: 130°C maximum

Colour: Light Grey (Medium) and Dark Grey (Hard)

Diameter: from 21 to 33 mm (larger diameter possible). Increment = 1 mm.

Tolerances: +/- 1 mm for diameter

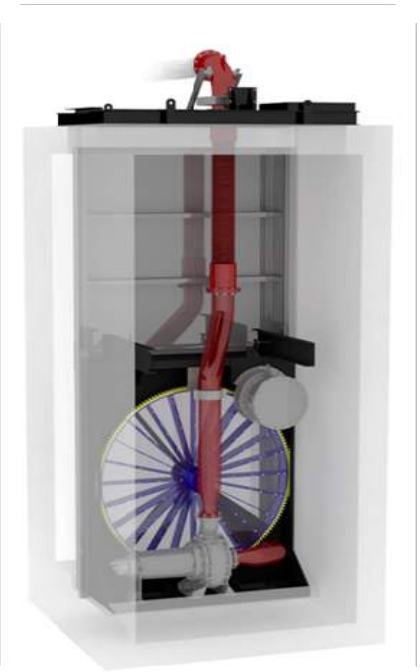
REFERENCE CODE

Hardness	*Diameter (mm)*
BM : Medium **BH** : Hard	**21** to **33**

Example: Balls 28 mm diameter medium density → **BM 28**
Balls 24 mm diameter hard density → **BH 24**

Water Intake Protection (WIP)

View from upstream



View from downstream

Benefits

- Simple installation
- Low maintenance
- Reliable
- Independently proven lowest fish mortality rate of intake systems
- Reliable
- Fully customizable

Description

Water intake systems using travelling band screens are not well suited for water life recovery and return. Often they can be difficult to retrofit with fish recovery and return technologies. The Beaudrey Water Intake Protection (WIP) screen has been developed to overcome these problems. It is a combination of the time-tested “Scoop-a-Fish©” system and the well-proven Beaudrey Debris Filter resulting in a unique, reliable and high performing screen.

Advantages

- Well suited for aquatic life protection: 2 year independent study confirmed that the WIP has no negative impact on aquatic life
- Help plants to achieve USA EPA 316(b) requirements
- No debris carry-over
- Designed to easily retrofit travelling band screens
- Can potentially provide significant reduction in civil costs on certain types of new builds
- Easy installation: no modification of concrete structure required
- Installed with “NoCling©” anti-fiber screening panels for water with high fibrous content
- Easy to operate and maintain; all equipment can be lifted out of the water in three hours or less for inspection

How it Works with Water Life

The screening disk has deep compartments and is fitted with the fish-friendly "NoCling©" panel. As the water flows through the screening disk, aquatic species are recovered and within two minutes they are being returned by a proven fish-friendly pump into the flume or pipework to be redirected back into the water source without harm and without ever having left the water.

Retrofit

The WIP's design allows for simple installation into the travelling band screen guides. After the existing band screen is dismantled, the modular WIP can slide into the pit within a day.

No modification of the concrete structure is required.

Size	• Pit width: 1 222 mm (4 ft) to 3 049 mm (10 ft) • Screening apertures available from 2 mm (2/25") to 10 mm (2/5")
Materials *	• Frame: rubber-lined carbon steel or stainless steel (304L, 316L, Duplex or Super Duplex) • Rotating wheel and screening disk: stainless steel (304L, 316L, Duplex or Super Duplex) • Nuts and bolts: Duplex stainless steel or Super Duplex stainless steel ** Other materials available upon request*
Flow Rate	3 000 m^3/h (13,200 GPM) to 36 000 m^3/h (158,000 GPM)

Beaudrey will build to the specific requirements of your site. Please contact us for a quote at: www.Beaudrey.com/contact