

EQUIPMENT SPECIFICATION FOR A FINE SCREEN.

General

The Supplier shall design and supply an automatic operating fine screen which is designed on the principal of a rotating endless filter belt build out of synthetic elements.

System performance

The fine-screen shall take out, convey and discharge all solids greater than the selected screen opening size of ??? mm. When the screen is in operation, the rotating filter belt shall at least every 5 seconds take out a portion of debris from the water by lifting it on a horizontal row of teeth (forming a rake) on the filter belt.

The fine screen shall be designed such that it effectively picks-up the screenings right from the bottom of the channel.

For maintenance, wear and tear and safety, it's not allowed to submerge any other moving parts except the drive-chains.

Hydraulic properties:

In order to guarantee a proper functioning of the screen, the flow speed between the elements shall preferably be 1 m/s but may never exceed the max. allowable 1.2 m/s. The manufacturer shall therefore provide calculation of the required water height before the screen to ensure that flow speed between the elements does not exceed this limit with the given flow capacity and channel width. When the required water height is higher than the estimated value as specified in this document, the manufacturer shall propose a suitable sized channel narrowing (venturi) behind the screen in order to create the required water height, taking into account the hydraulic head loss over the screen.

Filter-belt description

The filter-belt shall be built up from stainless steel shafts and synthetic (ABS) elements. In order to eliminate wear of the elements and the effect of sand or grit particles, it is not acceptable that the adjoining elements are moving/rubbing against each other during rotation. Therefore the design shall comply with the following properties:

The construction shall be such that all elements on one row are mounted tight against each other on two stainless steel shafts forming a rigid block; elements may not move against adjoining elements in the same row.

The filter belt shall be built up from a number of rigid filter blocks, mounted above each other between two stainless steel chains. Each filter block must be able to rotate with regard to the adjacent block above or beneath however there may be no physical contact at all between the blocks in order to eliminate possible wear.

On both sides of the screen there shall be a separate stainless steel chain from standard DIN size which is easy to replace. It is not acceptable when the filter belt is constructed from separate chain links mounted on the carrying shafts.

Rotating parts are not acceptable in the submerged area. Therefore the chains on both sides of the machine shall slide over HDPE rails without the use of rollers. The turning point on the bottom of the channel shall also be based on sliding principle instead of rotating rollers or wheels.

In the favour of easy maintenance and running without jamming it is not allowed to use a middle chain between the filter blocks.

Screenings discharge & filter-belt cleaning

The discharge of screenings and cleaning of the filter-belt shall be accomplished by a three stage filter-belt cleaning system:

1. a spray header on the outside of the filter-belt to spray the screenings away from the filter-belt;
2. a spray header on the inside of the filter-belt to spray out the screenings between the filter-elements and to clean the edge of the rotating brush;
3. a rotating spiral-brush to brush of the remaining screenings of the filter-belt;

Materials:

All submerged parts of the machine shall be corrosion resistant: frame, chains, shafts and fasteners shall be made of stainless steel 304. The filter elements and wear and tear parts shall be made from ABS or similar synthetic material.

Drive unit:

To optimize the rotation speed of the filter belt and the brush, the filter belt and the brush should have each a separate motorgearbox. This gives max. flexibility for operating of the screen and a steady speed for the brush to get max. cleaning performance.

A connection by chain or v-belt between filter belt and brush is not allowed.

The motorgearbox should have the following characteristics:

1. Vertical IP55 enclosure
2. Motor speed - 1500 rpm.
3. Suitable for full voltage starting at 3ph-50Hz-400V power supply.

The Motorgearbox is totally enclosed oil-lubricated, air-cooled and flange-mounted. The gears and bearings are splash lubricated to suit the size and mounting orientation of the unit.

The first oil fill has to be included.

Maintenance

For maintenance purposes it must be possible to quickly remove or replace a block with filter elements without the use of special tools and without interrupting the endless construction of the chains. This must be possible within 30 minutes, regardless the width of the machine, after which the machine can be put in service again.

It must be possible to temporary operate the screen with one or more missing filter blocks.

Filter blocks or carrying shafts should be removed from the front-side of the machine in order to minimise the required space on both sides of the screen; systems that require lateral removal of the shafts are not acceptable.
Replacement of wear and tear parts on the inside of the screen, also at the bottom, like guide rails etc, should be easily replaceable without pivoting or removing the screen out of the channel.

Protection

All Stainless steel parts have to be pickled.

- Proprietary items, motor/gearboxes/lubricators etc are supplied in manufacturers finish.

Manufacturer:

Spaans Babcock
the Netherlands
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e-mail: sales@spaansbabcock.nl

or equal approved supplier

DESIGN CRITERIA AND TECHNICAL DATA

Design criteria / tender specifications:

| | | | |
|--|---------|-------|-------------------------|
| Number of fine screens | : | ..... |  |
| Water medium | : | ..... |  |
| Channel width | : | ..... | m |
| Channel depth | : | ..... | m |
| Max. water depth in Channel | : | ..... | m |
| Min. water depth in channel | : | ..... | m |
| Discharge height | : | ..... | m |
| Flow capacity | max. | : | m ³ /h |
| | average | : | m ³ /h |
| | min. | : | m ³ /h |
| Max flow velocity between the elements | : | 1,2 | m/s |
| Sloth width | : | ..... | mm |
| Max. space each side of fine screen | : | 0,7 | m |
| Angel of inclination | : | ..... | ° |

Technical data / Manufacturers specifications (to be filled out)

| | | | |
|--|---|-------|----|
| Manufacturer | : | ..... |  |
| Type | : | ..... |  |
| Width of fine screen | : | ..... | mm |
| Water height in front of screen | : | ..... | mm |
| Discharge height above channel | : | ..... | mm |
| Total length of screen | : | ..... | mm |
| Total height of screen | : | ..... | mm |
| Minimal space necessary each side of the screen (left / right) | : | ..... | m |
| Weight | : | ..... | kg |

Max. size of handled screenings

| | | | |
|----------------------|---|-------|-------------------|
| - Assumed circular | : | ..... | mm |
| - Assumed square | : | ..... | mm |
| Filter belt velocity | : | ..... | m/min |
| max. Capacity | : | ..... | m ³ /h |

Motorgearbox for filter belt: (SEW or eq.)

| | | | |
|-----------------------|---|-------|-------|
| Manufacturer | : | ..... |  |
| Type | : | ..... |  |
| Power | : | ..... | kW |
| ratio | : | 1: | |
| output rotation speed | : | ..... | 1/min |
| input rotation speed: | : | ..... | 1/min |

| | | | |
|---------------------------|---|---------|------|
| service factor (min. 1.5) | : | ..... | (-) |
| efficiency of Motor | : | ..... | % |
| voltage | : | ..... | V/Hz |
| protection | : | IP..... | |
| Ex-protection | : | ..... |  |
| Oil amount | : | ..... | l |
| weight | : | ..... | kg |

Motorgearbox for Brush: (SEW or eq.)

| | | | |
|---------------------------|---|---------|-------|
| Manufacturer | : | ..... |  |
| Type: | : | ..... |  |
| Power | : | ..... | kW |
| ratio | : | 1: | |
| output rotation speed | : | ..... | 1/min |
| input rotation speed | : | ..... | 1/min |
| service factor (min. 1.5) | : | ..... | (-) |
| efficiency of Motor | : | ..... | % |
| voltage / Hz | : | ..... | V/Hz |
| protection | : | IP..... | |
| Ex-protection | : | ..... |  |
| Oil amount | : | ..... | l |
| weight | : | ..... | kg |

Materials:

| | | |
|---------------------------|---|--------------------------|
| Machine frame | : | Stainless steel 304 |
| Covering plates | : | Stainless steel 304 |
| Chain | : | Stainless steel 316 |
| Rollers (in chain) | : | Stainless steel hardened |
| Drive sprocket | : | Stainless steel 304 |
| Shafts | : | Stainless steel 304 |
| Filter elements | : | ABS |
| All wear and tear parts | : | HDPE - plastic |
| Small parts and fasteners | : | Stainless steel 304 |

Total Price: EURO