



# Flat-Fine Screen

**clean  
water  
engineering**

**GRIMMEL**  
WASSESTECHNIK



# Flat-Fine Screen.

## FLEXIBLE AND CERTAIN SEPARATION OF SOLIDS

Our Flat-Fine Screen is variable like the material that reaches a sewage treatment plant. Coarse and fine particles will be separated as required by the subsequent process. Our patented flat fine screen FFR has replaceable bar grids with gaps from 1,0 – 6,0 mm to separate the screenings from the wastewater flow.

A special feature of the screen is the tapered bar screen profile, installed at a very flat angle of 30° in relation to the ground level of the channel. This ensures higher hydraulic throughput as in a screening system with a sharp increased screen field angle. The installed bar screen gives 100 % screen coverage of the channel width (no losses on the channel walls resulting from deflection systems, chain drives, structural frames, etc.). These two features give the flat fine screen an extra-large screening surface. A special fixture, mounted on the channel bottom, allows an easy replacement of the bar grid. The grid replacement is useable, to change the gap width of the screen. All moving parts of the flat fine screen are above the water line. In case of movement, the scraper arm touches down under the water line, to remove the solids and screenings from the bar grid into the integrated screw compactor.

The bar grid is cleaned by a scraper arm with a replaceable scraper bar (material: PE) – nearly the only part that is subject to wear and tear. Depending on the screen frame size, the scraper arm is driven either by a gear motor or by a hydraulic drive unit with suitable hydraulic cylinder. The cleaning process starts directly on the channel bottom in front of the bar grid. The design of the screen allows installation without a recess in the channel, avoiding sand and grit deposits. While the scraper arm moves upwards, all collected screenings on the bar grid will be picked up and removed by the scraper. When the scraper arm reaches its upper hold point, the screenings are being flushed into the subsequent screenings wash press via rinsing nozzles or alternatively by an optional mechanical scraper element. The scraper arm remains at its hold position above the water line until the next cleaning cycle starts.



Flat-Fine Screen FFR 130 with electric drive

“We have taken the operator’s wishes for less maintenance and high operational reliability and implemented them in the design principles. Decades of positive practical experience prove us right. A trend-setting idea has taken a successful path.”

**Olaf Grimmel** – CEO



# The FFR in use.



## And this is how it works:

The two bigger hydraulically powered screen types (FFR 2.5 and 3.0) also allow an optional pre-wash of the screenings at an earlier stage during upwards movement in the scraping process. This reduces the proportion of loose sludge and minerals in the screenings and lowers the consumption wear on parts in the subsequent screenings wash press. The models for low channel depths (FFR 80 until FFR 130) do not require this pre-wash system. The flat fine screen system has already proven its suitability for everyday use in hundreds of applications and indeed particularly for sewage with a high proportion of mineral constituents. Its simple, reliable and low-maintenance stainless steel design, together with a high level of hydraulic throughput are the main reasons why our customers decided for the flat fine screen system.

Under usual conditions the Flat-Fine Screen is equipped with an integrated Screenings Wash Press. The screenings that have been removed are

flushed directly and without any mechanical touching into the wash press via the discharge edge of the bar grid. In the screenings wash press any faecal content that stick on the screenings will be treated in the wash water bath inside the press trough due to the movement of the press screw. The released faecal particles will be washed out with the added wash water (service water) and fed back into the sewage flow together with the resulting press water.

The press water and any surplus wash water flows back into the channel via the discharge edge in front of the screen. Any material that is larger than the gap width remains on the grid and is conveyed into the wash press in the next clearance run. Once the screenings are removed, they are washed off and conveyed inside the subsequent friction and transport pipes, whereupon they are compacted and finally discharged into a container.



# Many advantages for your plant.

“I'm excited! No ball bearings, deflection rollers or chains in the waste water that have to be lubricated and replaced again and again.”

Besides the intended use in concrete channels the smaller types of the FFR screens – especially FFR 80 – can be installed in a stainless steel box too.

The use of these FFRs ranges from inlet screens, installed within free-standing steel channels, to integrated inlet tanks in compact grit trap systems with different throughput volumes. However, as the gap width can be adjusted to suit different requirements, implementation is also perfectly feasible for applications such as septic acceptance stations, return sludge screens and relief facilities for the replacement of primary clarifiers.

It is even conceivable to use the FFR 80 to operate a screen without a wash compactor – something which is otherwise uncommon in the FFR series. As usual, it is also possible to add customised options to the steel tank, such as an integrated emergency bypass pipe, operating platforms, measuring equipment, on-site controls and also inspection holes in the tank.



Outdoor installation in stainless steel tank



FFR hydraulic with combined wash press



FFR electric with each own wash press



## Customer testimonials

“At long last: a screen that can cope with our stones and sand.”

“Except for a daily visual check, we haven't done anything on the screen for years. No faults at all, even after a decade.”

“I'd rather have a bit more fallen back screenings with the return flow from the press onto the grid than the permanent mess with clogged-up drainage holes and slots in the old washer compactor.”

“The principle is almost too simple.”

# All important details.

## GENERAL FEATURES

Screening system with verifiable lowest malfunction and maintenance periods

No sand deposits in front of screen caused by scraper starting at bottom level

High hydraulic throughput and low hydraulic loss due to 30 degree installation of the bar screen and use of total channel width

No jamming/blockage of screen caused by solids

No moving bearings, chains, wheels etc. below water level

Simple to retrofit into existing channels (no recess required in the channel bed)

Easily detachable openings and hygienic containment

Completely made out of stainless steel (to suit your requirements)

Good visibility of the entire process

Low machine height, easily accessibly

Extremely low operating costs

Very brief assembly time and therefore only short downtime for the sewage plant

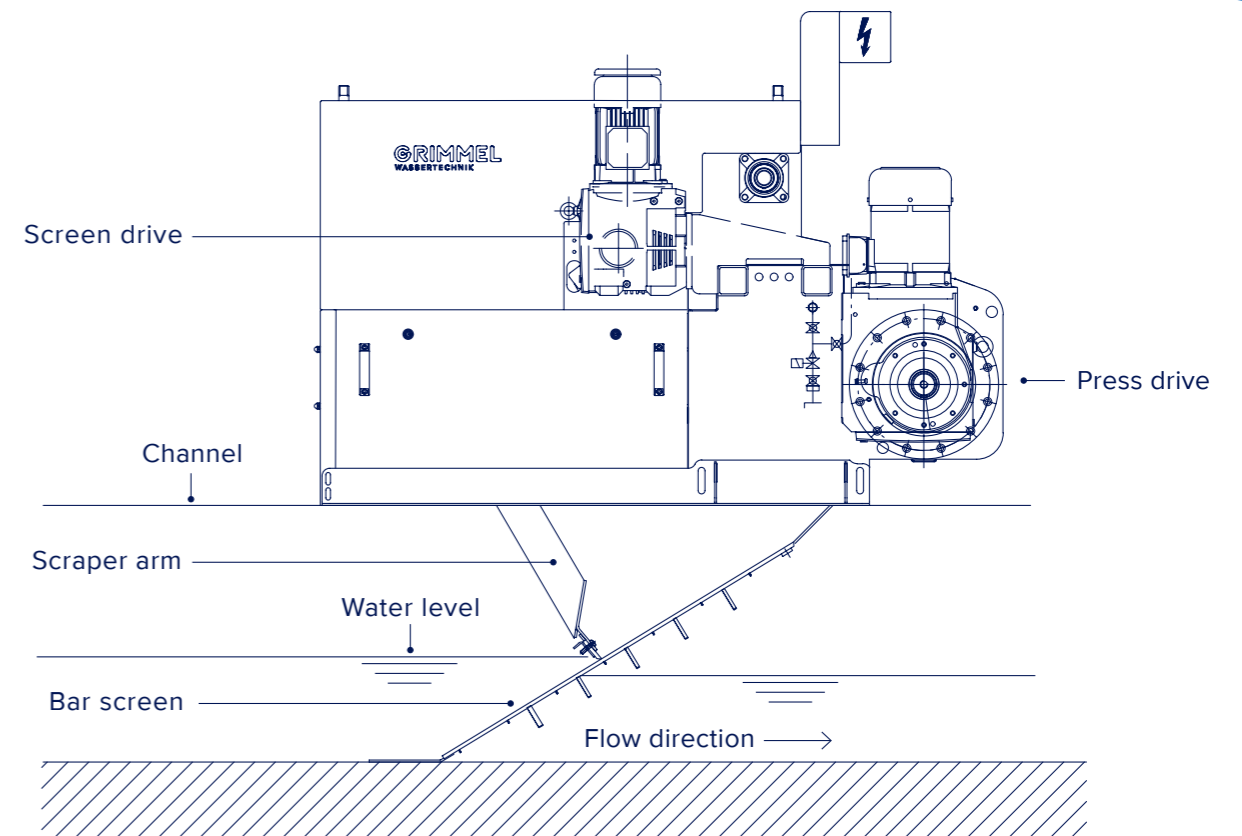
Machine requires no on-site readjustment

Gap widths can easily be changed at a later stage, by replacing the bar grid (a job which takes approximately 15 minutes), without the need to involve special assembly staff

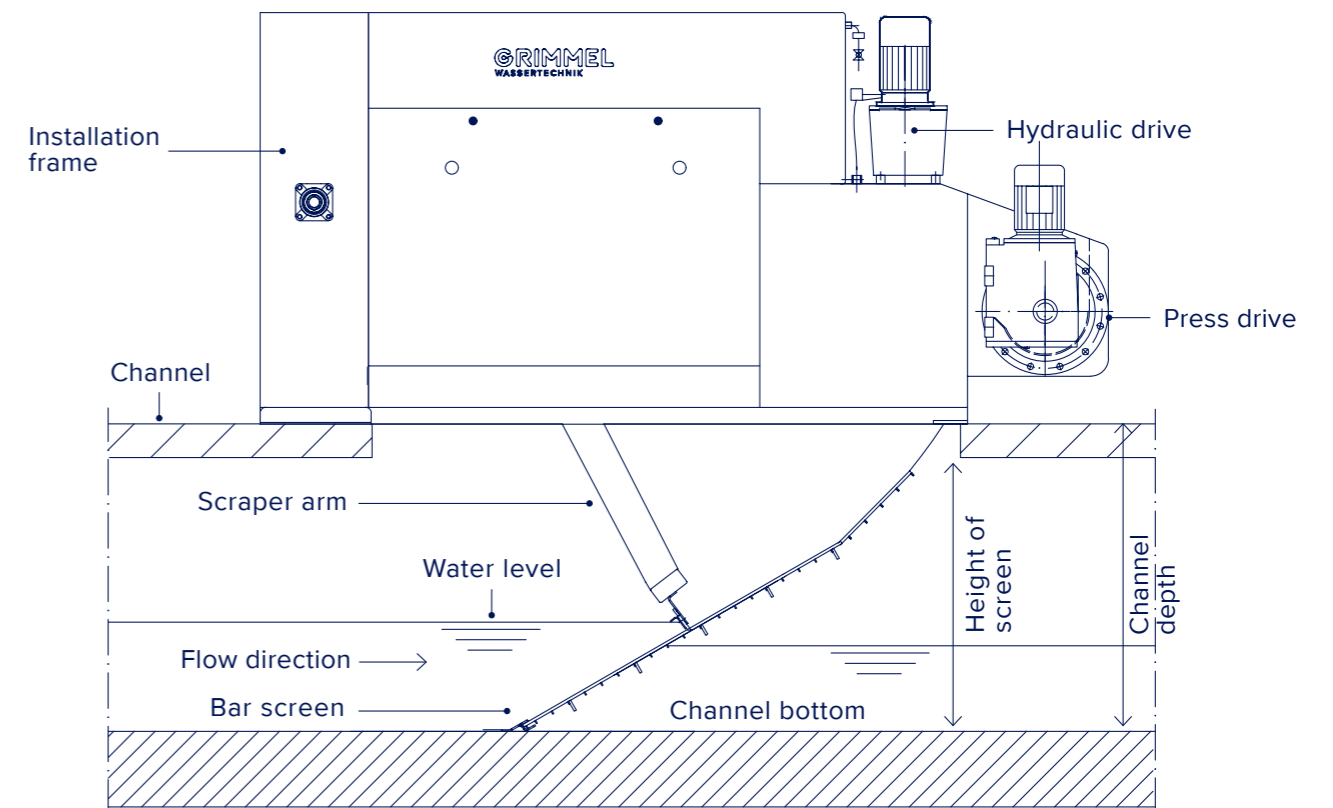
Scraper bar is the only consumption item (any wear and tear of the bar will automatically be compensated)

Optional: electric lighting inside the screen with inspection window, bagging device mounted at the end of the screenings discharge pipe, replaceable end piece of the compactor's press screw

Very little wear and tear as the machine contains in general few moving parts (maintenance costs, spare parts)



Flat-Fine Screen with electric drive



Flat-Fine Screen with hydraulic drive



# System components and function.

MADE IN GERMANY

## 1 / Base frame

The base frame is a sturdy welded stainless steel structure which houses the drive unit of the screenings wash press and the covers, which can easily be taken off, one segment after another. When the covers are open, it is possible to work on the entire construction, as it is easily accessible. The base frame is mounted on the upper edge of the channel and bolted together with the bar screen frame that is installed in the channel, so that both frames create a single unit. Upon request, types FFR 80, FFR 100 and FFR 130 can also be delivered with interior lighting. This unique option is a great benefit in poor lighting conditions, as it provides a perfect view of all movable parts and also of the channel and the bar screen.

## 2 / Bar screen

The bar grid with a slope in the direction of the flow, is designed in a flow-efficient construction and rests on a mounting frame, attached directly to the channel sole. Both components are being fixed together in a way that they can be detached again during operation of the machine. This design permits the simple, fast and cost-effective replacement of the installed bar screen. The special shape and strength of the bars in the screen grid make it resistant against mineral materials (stones, grit, etc.) and other solid screenings. The bar grid is sealed on both sides of the channel by means of robust stainless steel profiles.

## 3 / Discharge of screenings

Screenings removed from the bar grid are being flushed by spray nozzles (which are integrated in the scraper arm) into the screenings wash press as integrated part of the flat fine screen system. Upon request, the discharge of the screenings from the scraper arm into the screw trough is also possible by a mechanical scraper arm which will be foreseen inside the screen structure. In such a case no service water supply is required for the screen, only for the integrated screenings wash press

## 4 / Arm-mounted scraper

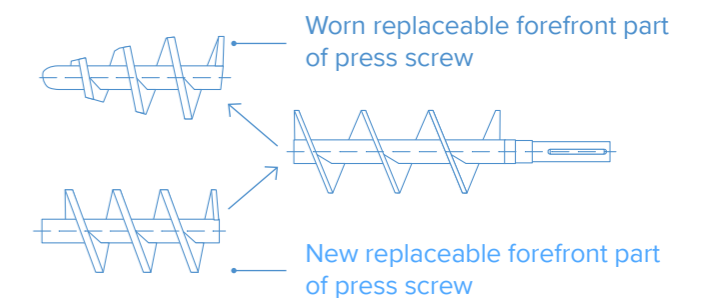
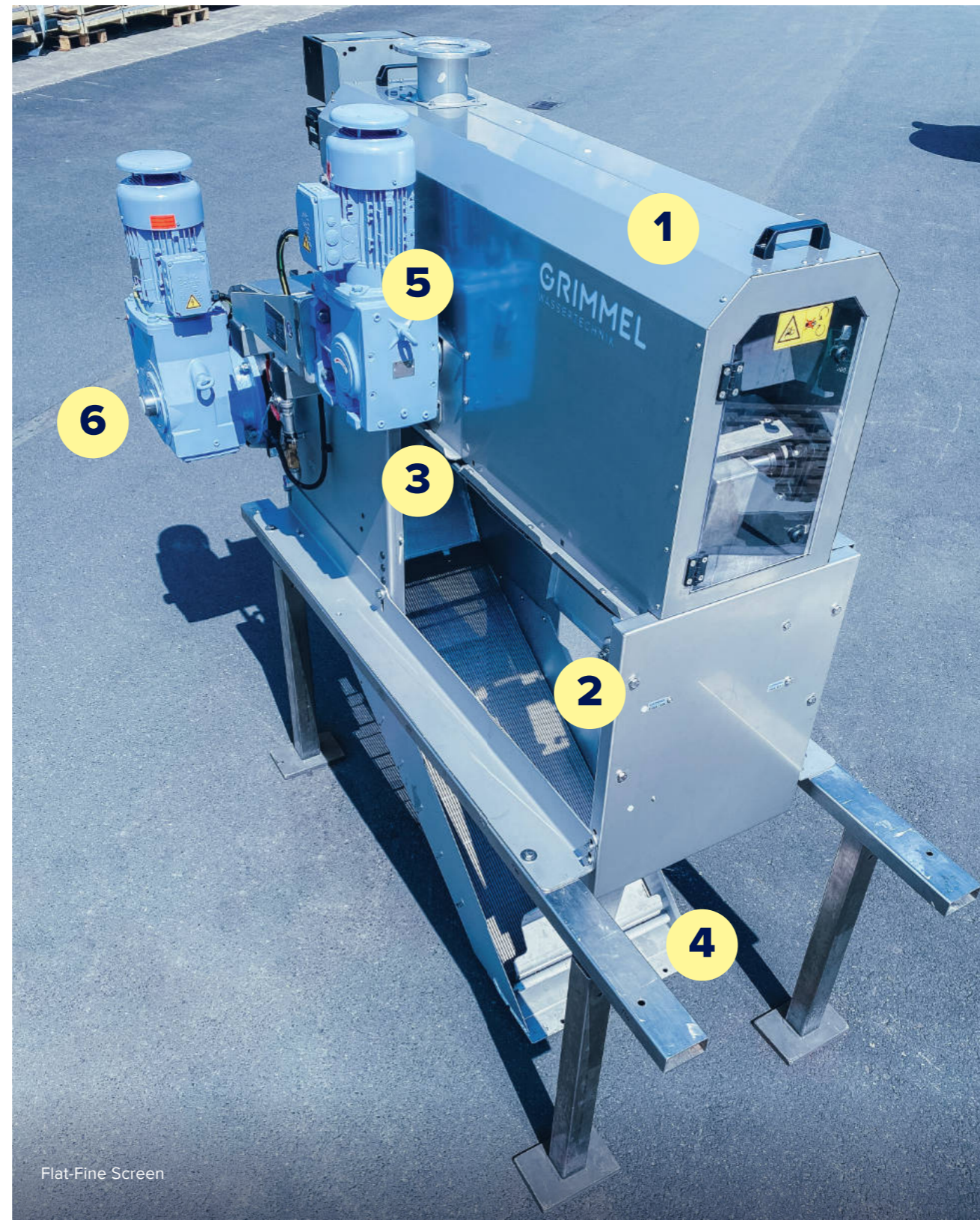
The scraper arm carries a self-adjusting, non-serrated scraper bar which ensures the clearance of the bar grid in a straight line, without causing jams or blockages. When it carries out its scraping job, the scraper starts directly in the area of the channel sole and sweeps the screenings over the bar grid upwards, out of the wastewater flow and into the subsequent screenings treatment section. When moving back, the scraper arm is being lifted up from the bar grid by a mechanical deflection device and then it drops down to the channel sole.

## 5 / Drive unit

Up to a channel depth of 1300 mm, the scraper arm is driven by a electric geared motor, in deeper channels, up to 2500 mm, the system will be driven by a hydraulic unit and hydraulic cylinders. The basic functional concept of the design ensures that even fairly large solids (such as stones, squared timber, etc.) do not cause any blockages on the screen.

## 6 / Screenings wash press

As a rule, the screen described above is completed by the treatment of the screenings in the wash press (RGWP), which is connected on the base frame of the flat fine screen and forms a constructional unit with the screen. A special development allows that the RGWP works without drainage holes or slots in the trough of the wash press. This eliminates the need for conventional components such as brushes attached on the press screw or the press water box which is foreseen underneath the press trough in classical wash press systems. Further equipment that might be added is the patented replaceable forefront of the press screw for the convenient and cost-effective replacement of that part. It is also possible to add an intensive whirl washer unit after the screenings wash press which allows a much higher removal of faecal matters from the screenings.



Replaceable forefront part



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