

Flat screens
FS series screens





High performance horizontal screens used in a wide range of applications

For over a century, Metso has been designing and supplying high quality machines to growth industries throughout the world. Besides its technological performance in materials crushing and handling, Metso has an excellent reputation as a leading manufacturer of vibrating equipment for quarrying and the mining industry.

Screens and vibrating feeders: a long pedigree

Metso has supplied thousands of screens, feeders and scalpers for a great variety of applications throughout the world.

From the simplest mobile unit to the most sophisticated installations (several crushing stages), Metso has the experience, equipment

and know-how to meet customers' needs. With the acquisition of Svedala in 2001, Metso expanded its network and improved its ability to offer the best screening solutions to meet growing demand in the global market. Today, Metso has unmatched expertise in terms of vibrating equipment.

Performance and modularity

Besides offering the best performance, Metso, and the "Vibrating Product" team in particular, have developed a range of vibrating equipment, offering modularity, making machines easier to use, reducing maintenance and providing flexible solutions with options that are interchangeable between machines. In conclusion, the world of screens and vibrating feeders is undergoing a revolution.



FS202/FS203

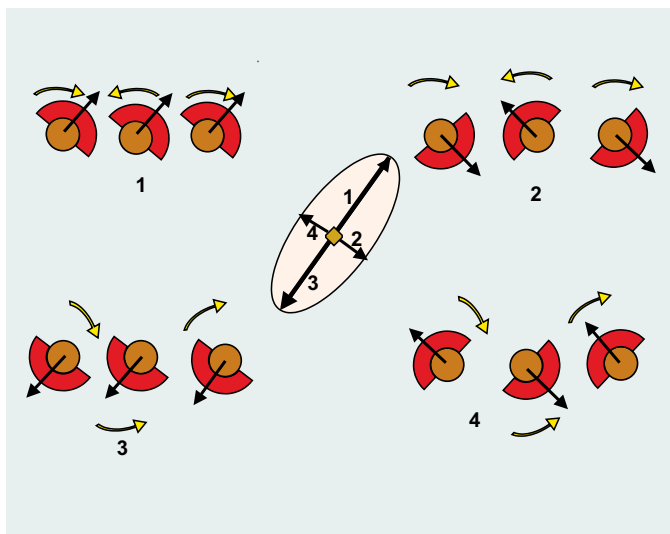
FS282/FS283

FS302/FS303

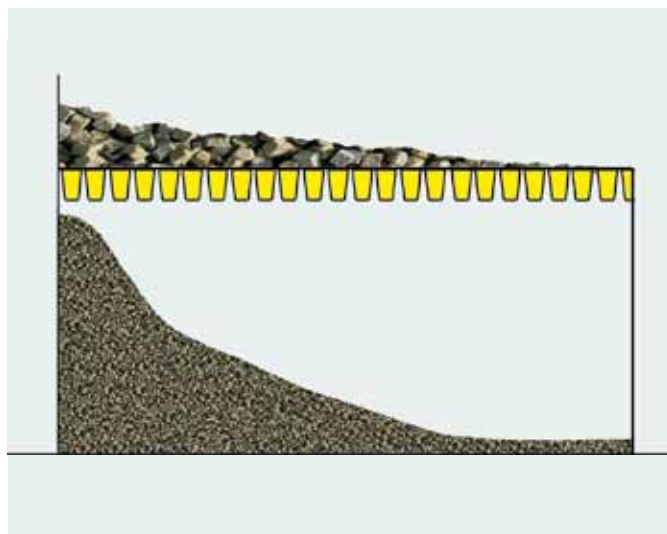
FS352/FS353

FS402/FS403





Elliptical motion.



Faster stratification.

High "G-forces" horizontal screen

"High-power" elliptical vibration

The screens elliptical motion is combined with high acceleration, thereby bringing more power into play than in traditional screens.

This "high power" feature delivers better performance in terms of both throughput and screening efficiency.

Typical screening problems:

- Very sticky or clay materials (waste rock screening, for instance): FS screens are superior thanks to their "High Power" concept.
- Materials with bad cubicity: FS screens are superior thanks to their elliptical motion.

- Wide mesh opening: FS screens are superior thanks to their bigger vibration stroke.

The ability to make mechanical adjustments allows you to adjust all screening parameters in order to adapt them to all types of application

Elliptical shape

In the standard version, FS screens have a 1:3 elliptical ratio. This 1: 3 ratio is very "aggressive", causing:

- Vibration of the layer of materials in two directions.
- Faster stratification of the layer so that fines pass through the screening mesh quickly and efficiently.

Performance: up to 25% better

Thanks to their characteristics, FS screens offer an up to 25% better performance than standard horizontal screens featuring linear vibration.



FS screens installed in cascade.





Reinforced plates.



Huck bolt.



Transmission.

Designed for the toughest applications

Body

The body of a FS screen is extremely strong, supporting the stresses required by the "high power" mechanism. This rigidity is provided by frames made from beam sections with stiffeners positioned in critical areas.

The side plates are huck bolted without any welding.

Cardan drive

The standard drive arrangement for the FS screens is a cardan drive.

Benefits of a cardan drive:

- The pulley connection does not vibrate, giving the belts a long lifespan (this is not the case with a traditional, pivoting motor support).
- Components are standard and therefore easy to procure: bearings, belts, pulleys, cardans etc.
- Safety requirements are met thanks to the guards.
- Operation is quieter (compared to a traditional pivoting motor support).
- Maintenance is reduced.

Rubber suspension

The standard mounting arrangement for the FS screens is with reinforced rubber springs.

Rubber springs on FS screens offer the following benefits compared to traditional coiled springs:

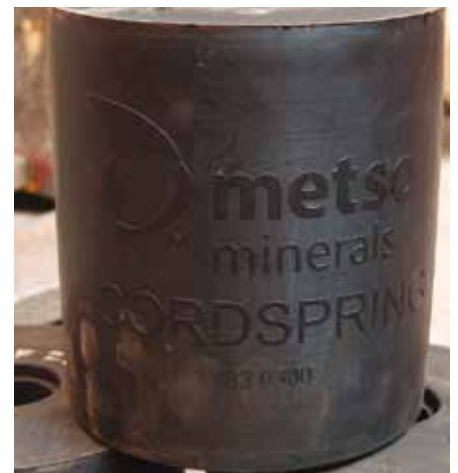
- Much lower operation noise.
- Increased safety for operators (no risk to fingers).
- Smoother shut down of the unit. Restricting in-phase amplitude avoids any damage with the chute work...)



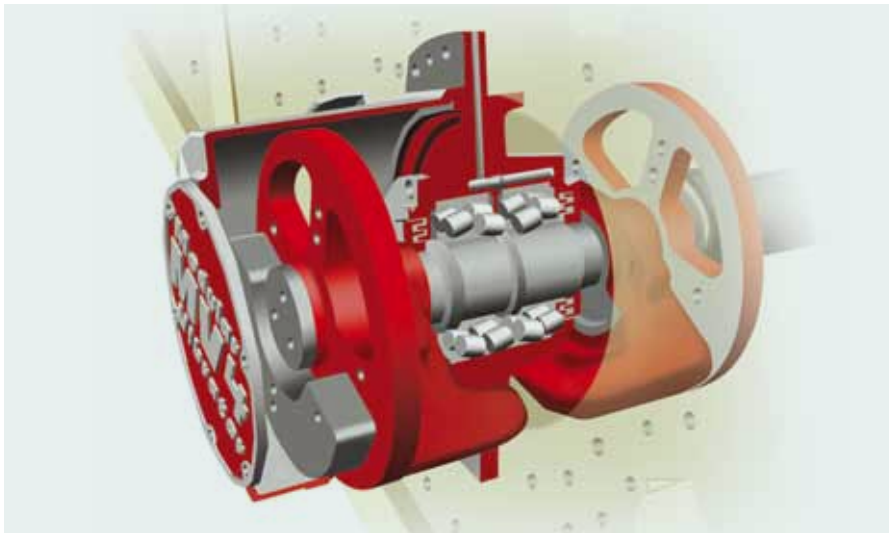
Cardan drive.



Cordspring rubber suspension.



Cordspring rubber suspension.



Simple design



Guards.

General arrangement

Simple deign

The triple shaft line mechanism comprises six modular MV vibrators connected in pairs by cardan shafts and synchronized by gears. This results in an elliptical motion at a 45° angle (in the standard screen) in the direction of the flow over the screen.

Nordberg Modular Vibrators MV series

Modular MV vibrators have a simple design (guaranteeing reliability) and are used on all Nordberg screens, feeders and scalpers.

Lubrication

Lubricating of vibrator bearings with grease offers the following benefits:

- No risk of the grease being polluted (there is always a risk of this with oil lubricated bearings, either when the oil is periodically changed or when breathers are damaged).

- No risk of leaks (there is always a risk of this with oil lubrication because rotating shaft sealing are difficult due to vibration and acceleration).

MV vibrators should be lubricated every 50 to 200 hours, depending on whether you use mineral or synthetic grease.

An automatic lubrication unit is available as an option for customers who want to prolong maintenance cycles to every 2,000 to 4,000 hours (frequency for refilling up the grease tank).

The gears are contained in an aluminium gear housing (completely separate from the MV vibrators) with its own oil bath. Since there is no need to seal the rotating shaft, there is no risk of leakage.

In certain cases, oil change frequency can be extended to every 4,000 hours.



Automatic grease unit.



Grease points (12).



Vibrators synchronized by gears.



Unbalanced weights.



Internal guards.

Modular machine design

Setting the vibration

Depending on the application, the vibration amplitude can be adjusted by adding or removing unbalanced weights bolted to the counterweights.

Setting the vibration angle

If necessary, the synchronised gears can be set in various positions, changing the vibration angle.

For the standard screen, the vibration angle is set at 45°, corresponding to the normal feed speed of materials (possible to adjust between 30° and 60°).

Internal protection of mechanism

The mechanical parts located inside the screen are fully protected by rubber lined steel guard. Inspection doors have been fitted to provide rapid access to counterweights when changing settings.

Nordberg modular vibrator exchange service

In the case of bearing problems, no extra work is required than replacing the relevant

MV vibrator via standard replacement of the modular vibrator.

Since this is a simple operation, the vibrator can be replaced in 3 to 6 hours. In comparison, a mechanism with oil lubricated gears necessitates replacing all the bearings because the oil is common to all the bearings, therefore “spreading the problem”. This type of work always takes much longer and is more costly.

Metso stocks modular MV vibrators to guarantee immediate availability and minimal downtime.

Nordberg MV modular vibrators are reconditioned to the highest standards and are guaranteed by Metso.

Before, during and after the purchase of your new machine, you can count on Metso experts to provide the best service and support in the world – all over the world. Whether you’re installing an entire customised system, a complete circuit, or simply replacing or updating a single piece of equipment, you can count on us to provide the right equipment for your needs.



MV vibrator installation.



Transport packing.



FS screen with washing system.

Wet screening

The washing system has been designed for complete reliability and is characterised by:

- Replaceable nozzles.
- Inclinable perforated tubes that can adjust the angle of the jets (counter flow or not).
- An adjustable valve per spray pipe.
- Sealing boots along the sideplates.
- Perforated rubber tubes in the standard version.

- Perforated tubes easily detachable from the screen (replacement).
- Fully galvanised unit is standard.
- A large number of perforated tubes to ensure efficient washing when material is very dirty.

Dust encapsulation

A flexible rubber skirting system can be installed, attaching the FS screen to non-vibrating structure to reduce dust. When replacing screen panels, this rubber skirting can be easily unclipped to allow access to the screen.

Special screening equipment

The standard FS screens are equipped with crosstension screen panels.

However, depending on the application, FS screens can be fitted with different types of panels by installing modular screening panels.

Other options

- Rubber liners: cross beams, sideplates...
- Hydraulic drive motor.
- Fully galvanised screen.
- Special colour paint.



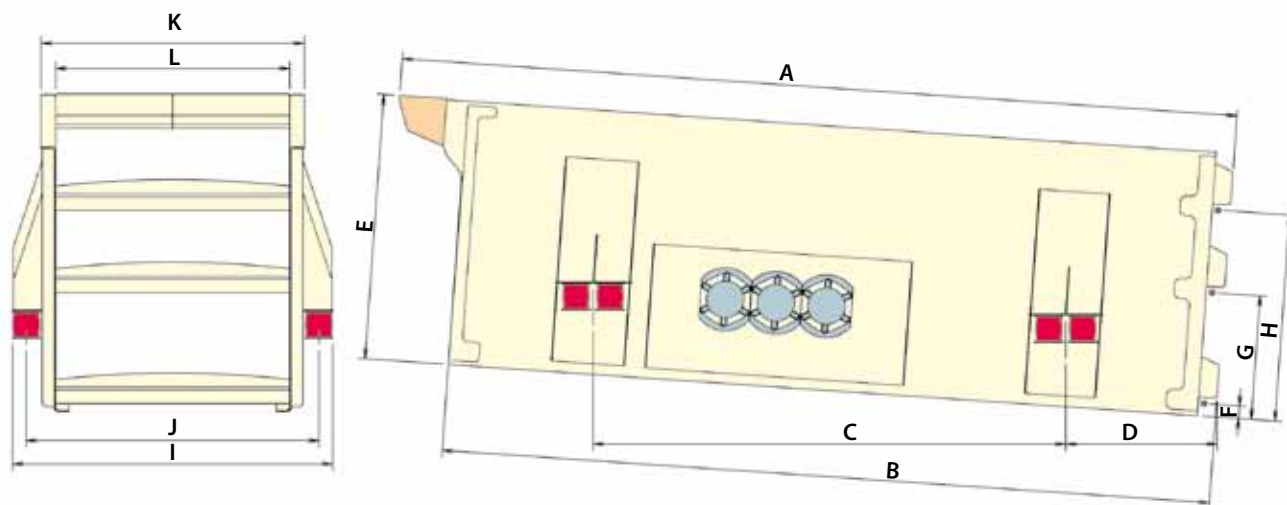
FS fitted with Trelex LS300 modular panels.



Dust encapsulation.

Range	Dimensions (mm)	Number of decks	Area (m ²)	MV Vibrators	Motor (kW)	Approximate weight (*) (kg)
FS202	1631 x 4900	2	8	4 x MV2	30	6 500
FS203	1631 x 4900	3	8	6 x MV2	30	8 500
FS282	1631 x 6100	2	10	6 x MV2	30	8 300
FS283	1631 x 6100	3	10	6 x MV2	37	9 500
FS302	1936 x 6100	2	11.8	6 x MV2	37	9 000
FS303	1936 x 6100	3	11.8	6 x MV2	37	11 500
FS352	2242 x 6100	2	13.7	6 x MV2	37	12 800
FS353	2242 x 6100	3	13.7	6 x MV3	55	14 500
FS402	2547 x 6100	2	15.5	6 x MV3	55	15 000
FS403	2547 x 6100	3	15.5	6 x MV3	55	17 000

* Estimated weight with drive assembly (motor + transmission) and synthetic equipment.



Range	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm
FS202	5649	5099	3395	826	1583	50	-	1030	2348	2124	1872	1632
FS203	5649	5099	3395	826	2272	50	1030	1719	2348	2124	1872	1632
FS282	6894	6344	4389	1089	1566	17	-	1001	2348	2124	1872	1632
FS283	6894	6344	4389	1089	2245	17	1001	1689	2348	2124	1872	1632
FS302	6920	6360	3905	1253	1533	107	-	1047	2650	2422	2176	1936
FS303	6920	6360	3905	1253	2233	107	1047	1747	2650	2422	2176	1936
FS352	6990	6380	3955	1222	1770	30	-	1128	2956	2728	2482	2242
FS353	6990	6380	3955	1222	2470	30	1128	1828	2956	2728	2482	2242
FS402	7054	6409	4096	1176	1901	143	-	1392	3401	3157	2787	2547
FS403	7054	6409	4096	1176	2570	143	1352	2061	3401	3157	2787	2547

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