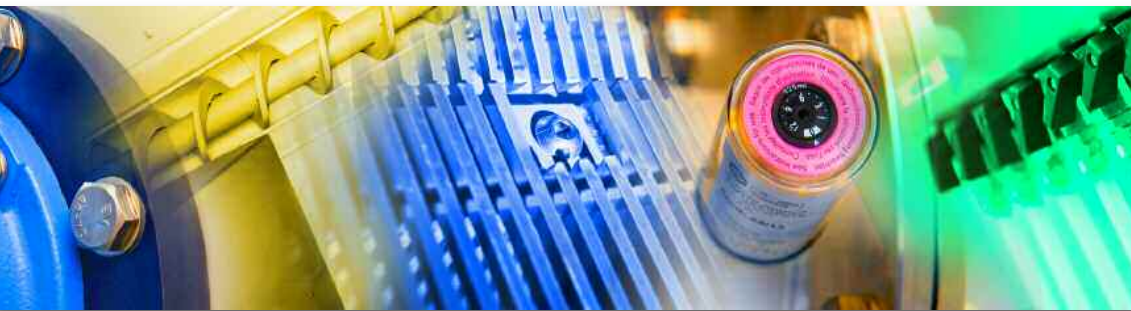


CYLINDRICAL GRIT SEPARATOR/ COMPACT UNIT WS

Our All-Rounder





THE PROCESS

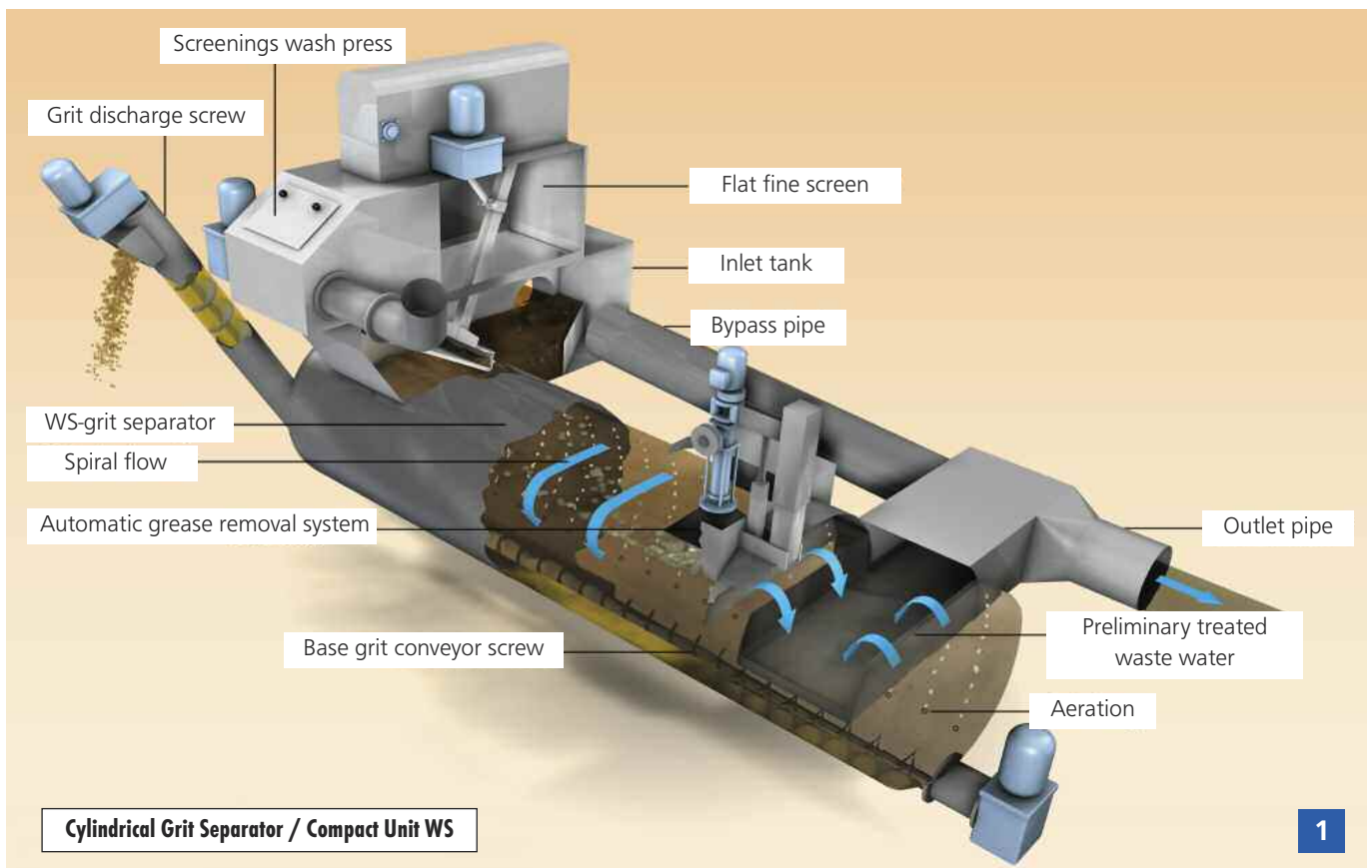
The Cylindrical Grit Separator / Compact Unit WS developed by WERKSTOFF+FUNKTION Grimmel Wassertechnik offers mechanical pre-cleaning, screenings treatment, grit and grease removal in one single system.

At the beginning of the cleaning process in the Cylindrical Grit Separator / Compact Unit WS, the waste water flows either by gravity (Pic. 3) or being pumped (Pic. 2) to the inflow tank where the screening system is installed. Here, the coarse substances are deposited on the screen grid and removed from the waste water flow before they are routed to the integrated Screenings Wash Press. This unit washes and dewateres the screenings and presses the compacted material through a discharge pipe e.g. towards a disposal container. Because of the special design of the screen drainage system, the pre-cleaned waste water is routed

to the following Cylindrical Grit Separator (Pic. 1). A tangential flow component is already generated during the inflow into the grit separator, crosswise to the actual horizontal flow direction through the Grit Separator. The formation of the spiral flow is the basis for a successful grit separation. To maintain the spiral flow formation over the whole length of the Grit Separator, coarse air bubbles are injected into the tank along the entire Grit Separation System. The effective design of the tank shape and the optimized supporting flow deflection of the waste water ensure to accomplish the desired spiral flow pattern.

The solid particles contained in the waste water stream are entrained by this spiral flow, reaching, as a result of the acting forces, the outer section of the rotating flow. On the one hand, the horizontal flow is smaller in this outer section and, on the other hand, the possibilities of contact with the tank wall are more frequent and longer.

Both factors have the effect that the solid particles are routed to the tank wall and transported through the spiral flow to the bottom of the Cylindrical Grit Separator. Here, a conveyor screw is arranged in a trough-shaped section along the entire length of the Cylindrical Grit Separator. Due to small flow velocities over the trough, a sedimentation of the particles occurs in this low-flow area of the base conveyor screw. The deposited constituents are conveyed



through the operation of the base conveyor screw towards the diagonally arranged grit discharge screw. Here, the deposited grit is taken over from the base conveyor screw and transported through a dewatering zone to a container provided for this purpose or a downstream grit washing system.

The function of the described grit separation process has been scientifically confirmed and has proven successful in hundreds of operational applications.

Due to their low density, grease and floating particles are buoyed up to the water surface and accumulate as a result of the prevailing surface flow conditions at the outflow side in front of the baffle. Here, these floating particles can be removed automatically with the aid of an easily implemented grease removal system through a grease pump and, on request, be integrated into the screenings.

The resulting mechanically clean waste water leaves the Cylindrical Grit Separator through the outflow channel and can be routed through the outflow pipe to the downstream biological waste water treatment process.

The Cylindrical Grit Separator / Compact Unit WS can additionally be equipped with an integrated, automatically responding emergency bypass so that costly constructional measures are omitted. This is combined with space savings of up to 50% as opposed to conventional compact units, the same grit collection efficiency, a clearly better operational accessibility as well as lower maintenance costs.



The maintenance costs are verifiably extremely low due to the Flat Fine Screen with an integrated Screenings Wash Press as well as the efficient grease and floating substance technology.

The Cylindrical Grit Separator / Compact Unit WS differs from the other designs by the low inflow heights and the low required air injection depth into the Grit Separator.

In total, this leads to a low energy consumption.

SYSTEM COMPONENTS AND FUNCTION

Flat Fine Screen with Inflow Tank

The inflow tank in the Cylindrical Grit Separator / Compact Unit WS usually accommodates the Flat Fine Screen with an integrated screenings press (Pic. 4). Here, the coarser constituents are removed from the waste water inflow, compacted in the downstream wash press and routed to disposal.

As early as at this point, the idea of odor encapsulation is implemented, which is likewise applied in the downstream compact unit technology. Large maintenance and inspection openings enable a simple access to all assemblies. In addition, an automatically responding emergency overflow with integrated emergency bypass line can be implemented optionally in the inflow tank (Pic. 5). In the case of an emergency or if maintenance activities are performed

on the compact unit, the waste water can be routed through the bypass.

The special benefits of the Flat Fine Screen are well-known in practice and highly valued. The screen grid that may be designed with a variable gap width has very large hydraulic capacities due to its flat slope in the waste water stream.

In addition, the modification of the screen grid gap width, which may be easily performed depending on the operating situations, represents a further highlight of the proven technology. The scraper arm used for clearing the screen grid is being moved by a motor drive attached outside the housing.



4



5

Grit Separation Tank

The Cylindrical Grit Separator is arranged downstream of the screen system. Due to the tangential inflow of the pre-cleaned waste water to the horizontal Cylindrical Grit Separation Tank arranged underneath, the typical spiral flow is formed to accomplish grit removal. This flow type is optimized through the injection of coarse air bubbles along the grit separator (Pic. 7) and is the basis for excellent Grit Separation efficiencies. The ventilation systems are implemented with-out any internal installations, which would be susceptible to blockages, and can be adjusted individually in view of the air throughput. The grit separated in the sand trap from the waste water is deposited in the base screw (Pic. 7) and is routed to the diagonally arranged grit discharge screw (Pic. 6 + 8).

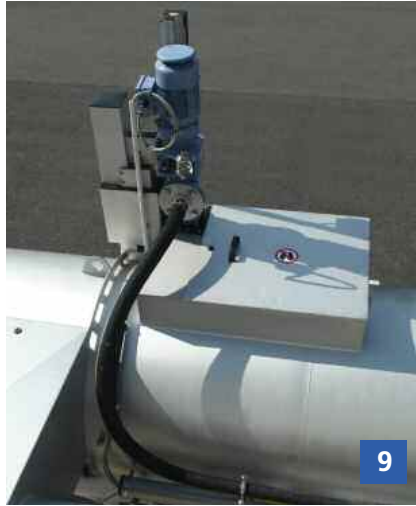


The grit discharge screw is variable in its position and length and conveys the separated grit to the downstream grit disposal system. The drying level of the highly varying grit compositions can be optimized through individual operating time settings.



Grease Removal

In contrast to usual grease removal facilities in grit separators, the Cylindrical Grit Separator employs a simpler and easier-to-maintain installation. The spiral flow prevailing in the Grit Separator leads to clear flow conditions also on the water surface of the Grit Separator. The two overlapping flow directions (axial and spiral flow) result in an independent accumulation and increasing concentration of grease and floating particles on the water surface at the



side of the discharge area in front of the baffle. Here, a locally limited automatic removal of these separated floating particles occurs with the aid of a vertically mounted eccentric screw pump that is movable in height (Pic. 9).

Emergency Bypass

In the inflow tank upstream of the screen and in the outflow tank of the Compact Unit, gates may be inserted in connection with a bypass line. By activating the gates, a shutdown of the entire Cylindrical Grit Separator, e.g. for inspection activities, is possible (Pic. 10 + 11).

In this case, the inflowing waste water passes a spillway positioned in the inflow tank and bypasses the entire Cylindrical Grit Separator through the bypass line towards the outflow.

This may likewise occur automatically in the case of an emergency, e.g. a power failure, without activating the gates and does not require any operational activity.



OPERATIONAL CHARACTERISTICS

- Simple and quick installation through compact design of the entire system
- Highly efficient and scientifically proven grit separation in the typical requirements range
- The small overall height with a low inflow height and a low air injection depth in the Cylindrical Grit Separator clearly reduce the required energy demand
- Optional cables, ex works, with/without local operating point
- Space savings up to 50% and reduction of construction costs as opposed to conventional compact systems as well as clearly better operational accessibility
- In the case of pit arrangement with gravity inflow, no vehicle-accessible installation pit cover is required, as the disposal containers may be placed at the side of the pit
- Verifiably lowest maintenance and operating effort
- Whole system is hygiene-encapsulated and, despite this, easy accessibility to all units is given
- Very easy modification of the screen gap width possible according to required operating situation
- No moving parts in the submersed section of the fine screen system
- Very easy operator-friendly implementation of grease and floating particle separation
- Optional: Integrated emergency bypass line, i.e. no additional structural measures required

Day-to-day experience

... the simple grease removal is amazing ...

... we have built a platform on our own to even better reach everything ...

... in comparison to the previous design in concrete, this is a great operational benefit. Everything together in one place – superb ...

... we simply placed a pre-assembled garage over the pit and have now a heated space that accommodates everything ...

... we would not have thought that the outdoor installation can be implemented that easily ...

... it still removes the grit perfectly after all those years. We have no deposits in the basin or digestion tank ...

... you hardly smell anything ...

... the entire unit with screen is convincing regarding operating reliability...

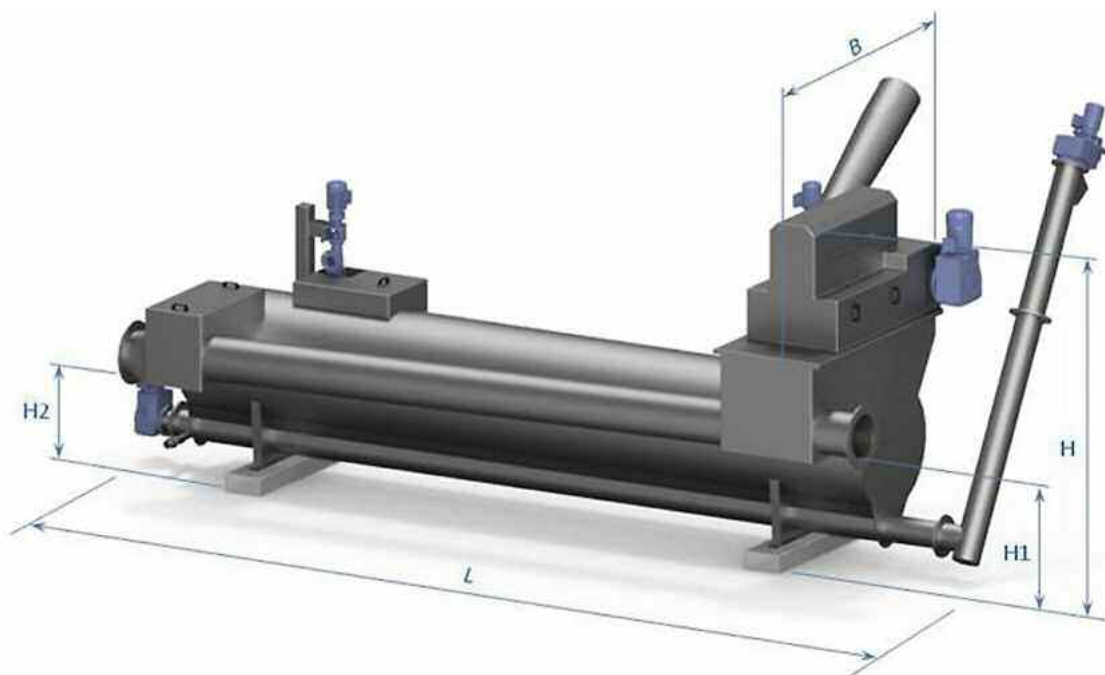
... the installation is ready for operation in one day, including electrical engineering. Simply amazing ...

... sometimes you have to ask yourself: Where is this compact system actually installed? There is so little to be done on it ...

DIMENSIONS

size/type	flow capacity (l/s) (m ³ /h)		length of unit (mm)	width of unit (mm)	height of unit (mm)	invert inlet (mm)	invert flow (mm)	connection DN
	l/s	m ³ /h						
			L	B	H	H1	H2	
WS 20	20	72	3400	2180	2900	1150	1020	250
WS 40	40	144	4400	2230	2900	1150	990	300
WS 60	60	216	6150	2280	2900	1150	950	350
WS 80	80	288	7400	2280	2900	1150	950	350
WS 100	100	360	7900	2330	3050	1290	1050	400
WS 120	120	432	8900	2330	3050	1290	1050	400
WS 140	140	504	9450	2450	3200	1450	1150	500
WS 160	160	576	10150	2450	3200	1450	1150	500
WS 180	180	648	11050	2900	3650	1650	1350	500
WS 200	200	720	12050	3000	3650	1650	1350	600
WS 220	220	792	13050	3000	3650	1650	1350	600
WS 240	240	864	13150	3200	3850	1770	1450	600
WS 260	260	936	13750	3200	3850	1770	1450	600

Special sizes on demand



WERKSTOFF + FUNKTION
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Ideen die klären

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