

<p>RBS 300 with twin outlet for two HDH 770 straw mills.</p>	
Machine function	Shredding straw from big bales, round bales etc, into a fragmentation of approx 80 mm in average and metering the material for a hammer mill, by first feeding the material into a stone trap at the end of a auger:
Machine number	1033-001, Type: RBS 300
Machine paint	Standard ISO 12944-5 category C2. Machines, guards etc. comes in a color type RAL 3001 red suitable for indoor, non corrosive environment - water and oil resistant -15 to + 60 degrees C, surface purified with alkaline degreaser, painted with a machine primer and here after coating paint.
Custom tariff number	84369900
Standard	DS/EN 60204-1:2006 Safety of Machinery - Electrical Equipment of Machines, DS/EN ISO 13850 of January 29 th 2007 emergency stop, DS/EN ISO 13849-1 safety-related parts of control systems, DS/EN 60204-1: 2006, cable installation method E
Power consumption kW	2x 30 kW main motor 1,5 kW tub 2,2 kW auger
Starter and wiring	Shredder rotor: Y/D 7x 6 mm ² Tub: frequency 4x 1,5 mm ² Auger: DOL 4x 1,5 mm ²
Motor rpm	Shredder rotor: 3000 min ⁻¹ Tub: 1400 min ⁻¹ Auger: 1400 min ⁻¹
Gear motor type	Tub: C412P, B3, I:31,4 Auger: VF 86, P100 B14, I:15
RPM on output	Tub: 45 min ⁻¹ Auger: 93 min ⁻¹

Auger volume 75%	135 m ³ /h, at 30 Kg/m ³ = 4050 Kg/h
Level sensor	Ultrasound, Sick UM 30-214111
Measures	Height: 2200 + 700, Width: 3000x3000
Weight	2200 Kg.
Operation description	<p>The straw bale stamps are falling into the rotating tub where flexible arms are pushing/rotating the straw around and over the two shredder rotor's in the bottom of the machine. The material level inside the rotating tub is controlled with a level sensor working as a ultrasound sensor. The conveyer table feeding the shredder is stopped when the "high level" (approx. 6-800 mm) is reached, and started again xx sec. after the high level is diapered again.</p> <p>A round rigid plate cover above the rotating tub is keeping the straw inside the machine and prevents spillage of straw out of the machine. There is a rubber sealing between the rigid and rotating tub.</p> <p>The speed of the rotating tub is setting the capacity flow on the line, higher speed = more material throughput.</p> <p>At the bottom in the shredder is placed shredder housing, where two rotating shredder rotor's with each 82 knives are shredding at 3000 rpm, tip speed is 47 m/s. The knife rotor is protected by a grid that holds back material, the knives are shredding between these grid bars. In front and after the grid, is placed a bypass stone trap, this is a 80 mm wide opening along the full length of the rotor that allows stones and other obstacles that are sliding on the bottom of the machine, to by-pass the shredder rotor.</p> <p>Both rotors are individually controlled/watched by a amp watch, and a set point protects them against overload. If the amp usage on either of the motors is above set point level (adjustable) for more than 0,2 sec. then will the; 1. rotating tub be stopped and, 2. the straw feed table is stopped, until the motors have been under their set point again for more then 3-5 sec. (adjustable). The rotating tub will start again with a ramp of 3 sec.</p> <p>Under the two shredder rotor is placed a conveying auger that transports the shredded straw to the stone trap.</p>

Control of the machine	<p>Starting the plant: All machines that are mounted after the Shredder, Mill, filter, ventilator augers etc. must start before the shredder.</p> <ol style="list-style-type: none"> 1. Start the conveying auger under the two rotors (2,2 kW, DOL) 2. Start the two main rotor2 (2x 30 kW, Y/D) 3. Start the Tub motor (2,2 kW, Frequency inverter) <p>Stopping the plant: Like above but opposite number, first 3, wait 10 sec., then 2 and 1</p> <p>Control of overload: Both main motors (2x 30 kW) must have amp. Metering, when overloaded = stop 3</p> <p>Control of capacity: The speed of the tub (2,2 kW) controls the capacity, more speed (more Hz) = more capacity</p> <p>Control of filling in the tub: The ultra sound level sensor must be linked to the feeding table that feeds the material into the tub. This sensor is adjusted for straw depth level on sight, approx 500-800 mm and when at top level, then the feed table must stop, when re fill is required, then the level sensor gives new signal, this is a I/O signal.</p>																																				
RISK ASSESSMENT	Machine: This machine cannot work as a “Stand Alone”, and can therefore not be delivered with a CE marking.																																				
RISK ASSESSMENT – ATEX	<table border="1" data-bbox="603 1249 1433 1749"> <thead> <tr> <th data-bbox="603 1249 970 1330">  </th> <th colspan="2" data-bbox="978 1249 1433 1330">GESTIS-STAU-EX</th> </tr> <tr> <th data-bbox="603 1337 970 1368">Material</th> <th data-bbox="978 1337 1198 1368">Stroh (2213)</th> <th data-bbox="1206 1337 1433 1368">Miscanthus</th> </tr> </thead> <tbody> <tr> <td data-bbox="603 1375 970 1406">Feuchte</td> <td data-bbox="978 1375 1198 1406">-</td> <td data-bbox="1206 1375 1433 1406">10,2 %</td> </tr> <tr> <td data-bbox="603 1413 970 1444">Korngösse < 500 µm</td> <td data-bbox="978 1413 1198 1444">96%</td> <td data-bbox="1206 1413 1433 1444">56%</td> </tr> <tr> <td data-bbox="603 1451 970 1482">Korngösse < 125 µm</td> <td data-bbox="978 1451 1198 1482">26%</td> <td data-bbox="1206 1451 1433 1482">35%</td> </tr> <tr> <td data-bbox="603 1489 970 1520">Median-Wert µm</td> <td data-bbox="978 1489 1198 1520">200 µm</td> <td data-bbox="1206 1489 1433 1520">280 µm</td> </tr> <tr> <td data-bbox="603 1527 970 1559">UNtere Ex-Grenze</td> <td data-bbox="978 1527 1198 1559">125 g/m³</td> <td data-bbox="1206 1527 1433 1559">60 g/m³</td> </tr> <tr> <td data-bbox="603 1565 970 1597">Max Ex Überdruck</td> <td data-bbox="978 1565 1198 1597">8,0 bar</td> <td data-bbox="1206 1565 1433 1597">7,7 bar</td> </tr> <tr> <td data-bbox="603 1603 970 1635">K_{ST}-Wert [bar m/s]</td> <td data-bbox="978 1603 1198 1635">47</td> <td data-bbox="1206 1603 1433 1635">115</td> </tr> <tr> <td data-bbox="603 1641 970 1673">Ex-Fähigkeit</td> <td data-bbox="978 1641 1198 1673">St1</td> <td data-bbox="1206 1641 1433 1673">St1</td> </tr> <tr> <td data-bbox="603 1680 970 1711">Zündtemp.</td> <td data-bbox="978 1680 1198 1711">470 C</td> <td data-bbox="1206 1680 1433 1711">-</td> </tr> <tr> <td data-bbox="603 1718 970 1749">Glimmtemperatur</td> <td data-bbox="978 1718 1198 1749">310 C</td> <td data-bbox="1206 1718 1433 1749">-</td> </tr> </tbody> </table> <p data-bbox="603 1789 772 1821">Wheat straw:</p> <p data-bbox="603 1827 1437 1930">Risk for dust explosion depends on the conditions that have to be fulfilled with regard to fragmentation. From above table sheet is important figures as follows:</p> <ul data-bbox="651 1937 1334 2007" style="list-style-type: none"> - Fragmentation must contain 96 % below 0,5 mm. - The medium length must be 0,2 mm. <p data-bbox="603 2045 1430 2114">Any ware on RBS 260 is average length above 50 mm. And this machine cannot course explosive burning situations.</p>		GESTIS-STAU-EX		Material	Stroh (2213)	Miscanthus	Feuchte	-	10,2 %	Korngösse < 500 µm	96%	56%	Korngösse < 125 µm	26%	35%	Median-Wert µm	200 µm	280 µm	UNtere Ex-Grenze	125 g/m ³	60 g/m ³	Max Ex Überdruck	8,0 bar	7,7 bar	K _{ST} -Wert [bar m/s]	47	115	Ex-Fähigkeit	St1	St1	Zündtemp.	470 C	-	Glimmtemperatur	310 C	-
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Analyzed risk following EN-ISO 13849-1:	S	F	P	PLr
<p>1. Mounting: The machine is provided lifting positions that ensures balance when lifting and strong enough to hold machine load. Follow instruction from the manual, when mounting the machine. Work place assessment should be made, before start with mounting.</p>	S2	F1	P1	c
<p>2. Operating:</p> <p>a. In automatic: The machine has to be mounted with a filling device, that provides cover for accidental entering into the machine like Cormall BT 170 straw bale table or similar, and with a closed connected outtake on the auger outtake of the machine, such as cormall stone trap with HDH 770 straw mill, auger or similar device.</p>	S2	F1	P1	c
<p>b. In manual with front loader: The machine must be on same floor level as the loader is driving at, to prevent accidental entering of the machine.</p>	S2	F1	P1	c
<p>3. Servicing:</p> <p>a. All lubrication positions are from a safe position.</p>	S1	F1	P1	a
<p>b. In case of a blocking under the knife rotor, is provided access between the rotor and the conveying auger, through a service door, this door has to be removed by tools and is bolted with safety mothers. Before opening the machine must be turned off on the main switch and locked.</p>	S2	F1	P1	c
<p>4. Renovation:</p> <p>a. Change of knives inside the machine can happen 2-3 times a year. To change knives one has to go into the machine. Or use the same door as described under 3b. Access into the machine is provided through filling opening in the top of the machine Before entering the machine must be turned off on the main switch and locked. The filling device must also be turned off also. Work place assessment should be made.</p>	S2	F1	P1	c
<p>b. Change of pulley belt or chain on rotating tub: The machine must be turned off on the main switch and locked before starting. All safety covers and guards that are removed must be mounted back onto the machine after replacement, tightening of the pulley or alignment of the wheels. Work place assessment should be made.</p>	S1	F1	P1	a
<p>5. Scrapping/recycling: same comment as under 1. Mounting</p>	S2	F1	P1	c

