

Picture



Machine function

The string and twine remover works with all bales from 600 mm and up to 1200 mm height. the machine is working independent if straw bales come high og low after each other and needs no adjustment between different straw bale types.

A counter sensor and a bale start sensor detect the bales and measures the length of the individual bale for the calculation of sequence start. This is made for every individual bale thus ensuring that removal of strings are always made in the middle of the bale.

The Sequence:

Simultaneously when the knife is crossing the bale underneath and cut the strings, is the hook bar lowered into position above the bale to take of the strings from the top of the bale. A bale sensor detects the bale height and ensures correct working height for the hook, every time.

After the knife has cut the string the first time and it goes across to cut the 2nd time, is also activates the hook that collects the strings on the top of the bale directly above the knife and takes the strings to the side of the bale conveyer.

When the hook has crossed over and pulled all strings to the side and in under the winder fork, then the winder fork is lowered down and winds all strings around the fork. After the winder is done with this, goes the fork up again and the strings/twines fall off at the side of the conveyer at 300 mm distance from the conveyer.




The straw bale on the line is now ready to go into the bale breaker and the conveyer is again activated, at the same time as the fork goes up and hook bar is raised from the bale. The total sequence time is less than 1 minute from stop conveyer to start conveyer again.

Machine number

1085-100 and 1085-101(twin into container)
3085-010 (Control cabinet)
1034-142 BC-140, 3,16meter crane loader conveyer
1034-143 2x BC-140, 2,5meter, in and outlet conveyers

Custom tariff number

84369900

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, aggregate that is used inside the machine is only with gray primer paint – paint is water and oil resistant -15 to + 60 degrees C, surface purified with alkaline degreaser, painted with a machine primer and here after coating paint.																																						
Standard	DS/EN 60204-1:2006 Safety of Machinery - Electrical Equipment of Machines, DS/EN ISO 13850 of January 29th 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	Installed power : 6,25 kW Power consumption/bale : 95 Watt																																						
Measures with min. conveyers	Length: 5,5 - Width: 3,4 - Height: 3,7 [Meter]																																						
Weight total incl. conveyer	2150 Kg																																						
Bale handling measures	Bale height	600-1300 mm																																					
	Bale width	800-1300 mm																																					
	Bale length	1500-2600 mm placed by crane 1900-2600 mm placed manually																																					
	Round bale	NO																																					
Machine capacities	12 – 16 ton/hour or 30 bales per hour Approx.																																						
RISK ASSESSMENT Machine	The machine can be only be used as standalone machine																																						
RISK ASSESSMENT – ATEX	<table><tr><td></td><td colspan="2">GESTIS-STAU-EX</td></tr><tr><td>Material</td><td>Stroh (2213)</td><td>Miscanthus</td></tr><tr><td>Feuchte</td><td>-</td><td>10,2 %</td></tr><tr><td>Korngrösse < 500 µm</td><td>96%</td><td>56%</td></tr><tr><td>Korngrösse < 125 µm</td><td>26%</td><td>35%</td></tr><tr><td>Median-Wert µm</td><td>200 µm</td><td>280 µm</td></tr><tr><td>UNtere Ex-Grenze</td><td>125 g/m³</td><td>60 g/m³</td></tr><tr><td>Max Ex Überdruck</td><td>8,0 bar</td><td>7,7 bar</td></tr><tr><td>KST-Wert [bar m/s]</td><td>47</td><td>115</td></tr><tr><td>Ex-Fähigkeit</td><td>St1</td><td>St1</td></tr><tr><td>Zündtemp.</td><td>470 C</td><td>-</td></tr><tr><td>Glimmtemperatur</td><td>310 C</td><td>-</td></tr></table>				GESTIS-STAU-EX		Material	Stroh (2213)	Miscanthus	Feuchte	-	10,2 %	Korngrösse < 500 µm	96%	56%	Korngrösse < 125 µm	26%	35%	Median-Wert µm	200 µm	280 µm	UNtere Ex-Grenze	125 g/m³	60 g/m³	Max Ex Überdruck	8,0 bar	7,7 bar	KST-Wert [bar m/s]	47	115	Ex-Fähigkeit	St1	St1	Zündtemp.	470 C	-	Glimmtemperatur	310 C	-
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Wheat straw: We have evaluated the risk for dust explosion based on the conditions that have to be full filled for this to happen and have used the official figures from the German institute BGIA: - There is no dust explosion possible under any circumstance																																							
EN/ISO 13849-1	Safety levels: PLr: c, (machine with automatic start with restricted access)																																						

Analyzed risk following EN-ISO 13849-1:	S	F	P	PLr
1. Mounting: The machine is provided lifting positions that ensures balance when lifting and strong enough to hold machine load. Work place assessment should be made, before start mounting.	S2	F1	P1	c
2. Operating: The machine has to be mounted with some kind of receiving device for the strawbale that has been taken of the string, typically a bale breaker machine, here must be made separate risk analyze if this is not a machine from Cormall. Risk Analyzed and approved machines from Cormall are SBB 1400, SBB 1800 and MTX_H with SBB 2000. WARNING! Crane area where the crane is placing the straw bale must be fenced, and with a access door that gives signal to the control and stops the crane when a person is entering the placement area	S2	F1	P1	c
3. Servicing: All lubrication positions are from safe position.	S1	F1	P1	a
4. Renovation: change of knives: The access door to change knife is made with a door switch that stops the line/machine. Inside the service area is placed a manual switchboard for service. It only activates motors if a person is holding the switch in its activation position.	S2	F1	P1	c
5. Scrapping/recycling: same comment as under 1. Mounting	S2	F1	P1	c

Signal Handshakes for crane and receiver machine

Definition of I/O:

I = On, start, run, enable.

0 = Off, stop, disable.

Cormall: OUT	Status	Description	Type	Voltage
Ready signal	I	Emergency stop ok	Digital	0V
	0	Emergency stop active or error	Digital	0V
Running	I	Cormall is running in automatic	Digital	0V
	0	Cormall is in manually mode or pressed stop	Digital	0V

Cormall: INTO	Signal	Description	Type	Voltage
Enable	I	Enable Cormall	Digital	0V
	0	stops Cormall instantly	Digital	0V
Start	I	Start Cormall	Digital	0V
	0	Stops Cormall in its sequence	Digital	0V

Values below are theoretical and without straw bale distance (space between bales), and crane waiting time:

Capacity	Kg/h	
Conveyer speed	3600	mm/min.
Sequence time	55	sec.
Waiting on crane	15	sec.
Bale distance for refill	500	mm
Lost, crane + sequence	4200	mm.

Bale length	Bales/hour	Bale weight [kg]				
		350	400	450	500	550
1500	34,8	12.194	13.935	15.677	17.419	19.161
1600	34,3	12.000	13.714	15.429	17.143	18.857
1700	33,8	11.813	13.500	15.188	16.875	18.563
1800	33,2	11.631	13.292	14.954	16.615	18.277
1900	32,7	11.455	13.091	14.727	16.364	18.000
2000	32,2	11.284	12.896	14.507	16.119	17.731
2100	31,8	11.118	12.706	14.294	15.882	17.471
2200	31,3	10.957	12.522	14.087	15.652	17.217
2300	30,9	10.800	12.343	13.886	15.429	16.971
2400	30,4	10.648	12.169	13.690	15.211	16.732
2500	30,0	10.500	12.000	13.500	15.000	16.500
2600	29,6	10.356	11.836	13.315	14.795	16.274
2700	29,2	10.216	11.676	13.135	14.595	16.054
2800	28,8	10.080	11.520	12.960	14.400	15.840
2900	28,4	9.947	11.368	12.789	14.211	15.632

Machine measures

