1.0 Description of System

A) Dewired Waste Paper Section

Dewired bales are received by the A-Line Bale Breaker M93010 and B-Line Bale Breaker M93025. The Bale Breakers break the bales and feed the loose paper onto the Dewired Waste Paper Transfer Conveyor M93035.

The loose paper is dropped in the storage area. The loose paper is moved into separate piles for magazines and paper by mobile equipment.

B) Pulper Drum Feed System

Loose magazine paper (OMG) is fed onto the OMG Infloor Conveyor M93036 by mobile equipment. The OMG Leveller M93037 ensures a constant filling level at the discharge section of the conveyor which transfers the OMG onto the Waste Paper Infloor Conveyor M93038.

Loose Paper (ONP) is loaded onto the Waste Paper Infloor Conveyor M93038 by mobile equipment.

The combined quantity of OMG and ONP is transferred to the Pivoting Conveyor M93040. The Pivoting Conveyor is feeding the A-Line Drum Pulper Feed Conveyor M93041 and B-Line Drum Conveyor M93045 simultaneously.

The A-Line Drum Pulper Feed Conveyor M93041 and B-Line Drum Pulper Feed Conveyor M93045 feed the mixture of OMG and ONP directly into the pulper A and pulper B respectively.

The A-Line Leveller M93042 and B-Line Leveller M93046 ensure a constant layer of mixed OMG and ONP on their respective conveyor.

1.1. PERFORMANCE DATA

Delivery:	Rail	loose	0%	bales	100%
	Trucks	loose	20% max.	bales	100% max.
Handling equipment:	Clamp truck			waste paper bales	
	Front end loader			loose waste paper	
	24h/ d			7d/ w	
Waste paper received:	baled waste paper			100%	
	Magazines, OMG			approx. 15%	
	Newsprint, ONP			approx. 85%	
Moisture:	approx.		5-15%		
	average		10%		

Bulk weight of loose paper ONP	approx. 135kg/ m³	8lbs./ ft.³
Bulk weight of loose paper OMG	approx. 180kg/ m³	11lbs./ ft.³

Plant Capacities:

Bale receiving and storage feed:	2800 adst/ d	2540 admt/ d
Drum feed capacity:	2400 adst/ d	2177 admt/ d

Single Equipment Capacity:

Bale breaker:	each unit	1400 adst/ d	1270 admt/ d
Dewired loose paper transfer conveyor:		2800 adst/ d	2540 admt/ d
OMG receiving conveyor:		500 adst/ d	454 admt/ d
Storage capacity approx.		4,2 adst/ d	3,8 admt/ d
ONP receiving conveyor:		2400 adst/ d	2177 admt/ d
Storage capacity approx.		23 adst/ d	21 admt/ d
Drum feed system:	each line	1200 adst/ d	1089 admt/ d

1.2. LIST OF SYSTEM MACHINERY

CU item no.:	Description of machinery	Type	Manuf. no.:
	A) WASTE PAPER HANDLING		
M93025	Bale Breaker	4xS-550 x 1750	FA0328-004
M93035	Conveyor, Dewired Waste Paper Transfer	PB-2000 x 80100	FA0328-005
M93090	Conveyor, Dewired Waste Paper Transfer Chain Lube System		
	Walkway to Storage Feed Conv.		FA0328-006
M93010	Bale Breaker	4xS-550 x 1750	FA0328-007
	B) DRUM PULPER FEEDING		
M93036	Conveyor, OMG Infloor	PB-1500 x 21850	FA0328-010
M93092	Conveyor, OMG Infloor Chain Lube System		
M93037	Levelling Wheel	Ø 2000 x 1385	FA0328-011
M93038	Conveyor, Waste Paper Infloor	PB-2000 x 69600	FA0328-012
M93094	Conveyor, Waste Paper Infloor Chain Lube System		
M93040	Pivoting Conveyor	GGF-1800 x 4000	FA0328-013
	Walkway for Pivoting Conveyor		FA0328-013.1
M93041	Conveyor, A-Line Drum Pulper Feed	KGF-1200 x 24050	FA0328-014
M93096	Conveyor, A-Line Drum Pulper Feed Chain Lube System		
M93042	Levelling Wheel	Ø 3000 x 1080	FA0328-015
	Radiometric Weighing Scale - see separate documentation!		FA0328-016

1.2. LIST OF SYSTEM MACHINERY

CU item no.:	Description of machinery	Type	Manuf. no.:
M93045	Conveyor, B-Line Drum Pulper Feed	KGF-1200 x 39250	FA0328-017
M93098	Conveyor, B-Line Drum Pulper Feed Chain Lube System		
M93046	Levelling Wheel	Ø 3000 x 1080	FA0328-018
	Radiometric Weighing Scale - see separate documentation!		FA0328-019
	Walkway for Drum Feed Conv.		FA0328-020
	Walkway for ONP-Receiving Conv.		FA0328-021
	Deflector for OMG/ ONP-Receiving Conv.		FA0328-022

1.3. MACHINE DESCRIPTION

CU item no.:	Description of machinery	Type	Manuf. no.:
	A) WASTE PAPER HANDLING		
M93025	Bale Breaker	4xS-550 x 1750	FA0328-004
M93035	Conveyor, Dewired Waste Paper Transfer	PB-2000 x 80100	FA0328-005
M93090	Conveyor, Dewired Waste Paper Transfer Chain Lube System		
	Walkway to Storage Feed Conv.		FA0328-006
M93010	Bale Breaker	4xS-550 x 1750	FA0328-007
	B) DRUM PULPER FEEDING		
M93036	Conveyor, OMG Infloor	PB-1500 x 21850	FA0328-010
M93092	Conveyor, OMG Infloor Chain Lube System		
M93037	Levelling Wheel	Ø 2000 x 1385	FA0328-011
M93038	Conveyor, Waste Paper Infloor	PB-2000 x 69600	FA0328-012
M93094	Conveyor, Waste Paper Infloor Chain Lube System		
M93040	Pivoting Conveyor	GGF-1800 x 4000	FA0328-013
	Walkway for Pivoting Conveyor		FA0328-013.1
M93041	Conveyor, A-Line Drum Pulper Feed	KGF-1200 x 24050	FA0328-014
M93096	Conveyor, A-Line Drum Pulper Feed Chain Lube System		
M93042	Levelling Wheel	Ø 3000 x 1080	FA0328-015
	Radiometric Weighing Scale - see separate documentation!		FA0328-016

1.3. MACHINE DESCRIPTION

CU item no.:	Description of machinery	Type	Manuf. no.:
M93045	Conveyor, B-Line Drum Pulper Feed	KGF-1200 x 39250	FA0328-017
M93098	Conveyor, B-Line Drum Pulper Feed Chain Lube System		
M93046	Levelling Wheel	Ø 3000 x 1080	FA0328-018
	Radiometric Weighing Scale - see separate documentation!		FA0328-019
	Walkway for Drum Feed Conv.		FA0328-020
	Walkway for ONP-Receiving Conv.		FA0328-021
	Deflector for OMG/ ONP-Receiving Conv.		FA0328-022

1.3.1 MACHINE DESCRIPTION FMW - BALE BREAKER

-) M93025 - Bale Breaker - FA0328-004
-) M93010 - Bale Breaker - FA0328-007

General:

The bale breaker is used for opening the waste paper bales.
The bales are fed to the bale breaker by an apron conveyor and once the machine has performed its task, it transfers the loosened material to the chain belt conveyor located downstream.

The bale breaker must never be fed frozen bales of waste paper, because this reduces the throughput rate of the machine and in extreme cases causes damage to the machine.

Feeding the bale breaker with extremely damp (sodden) bales of waste paper likewise reduces its throughput rate.

1.3.2 MACHINE DESCRIPTION
FMW - A P R O N C O N V E Y O R

-) M93035 - Conveyor, Dewired Waste Paper Transfer - FA0328-005
-) M93036 - Conveyor, OMG Infloor - FA0328-010
-) M93038 - Conveyor, ONP Infloor - FA0328-012

General:

To simplify transportation, the apron conveyors are only partially assembled (up to a given length) and the drives mounted and tested.

Conveyors which exceed this given length are delivered in sections which are marked in accordance with the sequence in which they are to be reassembled. Machine components are, as far as possible, assembled before they leave the factory.

The conveyor is delivered as a complete machine but without any electrical equipment.

1.3.3 MACHINE DESCRIPTION FMW - LEVELLING WHEEL

-) M93037 - Levelling Wheel - FA0328-011
-) M93042 - Levelling Wheel - FA0328-015
-) M93046 - Levelling Wheel - FA0328-018

General:

The levelling wheel is used for evening out loose waste paper being transported. Loose waste paper is fed to the levelling wheel by means of a chain belt conveyor. This conveyor transfers the evened-out material to the waste paper breaker wheel located next in the processing sequence.

The levelling wheel must not be fed waste paper bales or parts of waste paper bales, because they would become wedged-in beneath the wheel and consequently lead to a paper jam.
A further consequence of this would be a reduction in the throughput rate of the entire system.

1.3.4 MACHINE DESCRIPTION
FMW - B E L T C O N V E Y O R

-) M93040 - Pivoting Conveyor - FA0328-013

General:

To simplify transportation, the belt conveyors are only partially assembled (up to a given length) and the drives mounted and tested.

Conveyors which exceed this given length are delivered in sections which are marked in accordance with the sequence in which they are to be reassembled. Machine components are, as far as possible, assembled before they leave the factory.

The conveyor is delivered as a complete machine but without any electrical equipment.

1.3.5 MACHINE DESCRIPTION
FMW - C H A I N B E L T C O N V E Y O R

-) M93041 - Conveyor, A-Line Drum Pulper Feed - FA0328-014
-) M93045 - Conveyor, B-Line Drum Pulper Feed - FA0328-017

General:

To simplify transportation, the chain belt conveyors are only partially assembled (up to a given length) and the drives mounted and tested.

Conveyors which exceed this given length are delivered in sections which are marked in accordance with the sequence in which they are to be reassembled. Machine components are, as far as possible, assembled before they leave the factory.

The conveyor is delivered as a complete machine but without any electrical equipment.

1.3.6 MACHINE DESCRIPTION
FMW - C O N V E Y O R C H A I N L U B E S Y S T E M

-) M93090 - Conveyor, Dewired Waste Paper Transfer Chain Lube System
-) M93092 - Conveyor, OMG Infloor Chain Lube System
-) M93094 - Conveyor, Waste Paper Infloor Chain Lube System
-) M93096 - Conveyor, A-Line Drum Pulper Feed Chain Lube System
-) M93098 - Conveyor, B-Line Drum Pulper Feed Chain Lube System

detailed descrption see File 2: Sub-Supplier REBS

1.3.7 Functional Description

A) Dewired Waste Paper Section

1) A-LINE BALE BREAKER M93010
B-LINE BALE BREAKER M93025

The following description is for A-Line Bale Breaker M93010. However the same operation procedure is valid for B-Line Bale Breaker M93025.

a) Normal operation

Dewired bales are fed into the inlet chute of A-Line Bale Breaker M93025 (M93035).

The Bale Breaker is equipped with four spiral shafts which are driven independent by separate electric motors/ frequency converters. The spiral shafts 1 and 3 turn in opposite direction of 2 and 4, such that a dewired bale is forced/ broken up between spiral shafts 1&2 and 3&4 respectively.

The motor speed is kept constant at 1800 rpm, the shaft speed is 24 rpm.

If during normal operation the max. set torque is exceeded as measured via the frequency converters, then the drives will be stopped and thereafter the rotation will be done in the opposite direction for approx. 3 seconds. Then the drive will be stopped and the rotation will be done again in the original operation direction.

This control is done independently for each spiral shaft.

During the start, until 1800 rpm is reached, an increased start up torque is permitted for 1 second.

2 level controller LIC 801 and LIC 802 are used to maintain the material level in the feed chute between a minimum (low) level and a maximum (high) level. The maximum is set such that only one bale at a time can be fed to the bale breaker to ensure best efficiency i.e. as soon as one bale is fed to the bale breaker the high level is exceeded and the upstream conveyor from the dewiring machine is stopped. When the minimum level is reached the upstream conveyor is started again.

b) Alarm Conditions

If directional change of a spindle shaft is initiated more than 30 times in sequence with less than 5 seconds between rotation change, then the operation of the complete Bale Breaker is stopped as well as the conveyor upstream.

An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

If the material level in the inlet chute is below the Low-Low Level of either the level controller LIC 801 or LIC 802 then an indication will be given on the operator panel and the Bale Breaker will be stopped until sufficient material is fed above the set low-low level.
The low-low filling level must be set approx. 300-400mm above the top edge of the screw to ensure that the fall of bales will be dampened and thus to avoid damage to the screw shafts, bearings and seals.

NOTE: In automatic mode operation of A-Line Bale Breaker M93010 and B-Line Bale Breaker M93025 can be done only when the Dewired Waste Paper Transfer Conveyor M93035 is running i.e. if Dewired Waste Paper Transfer Conveyor M93035 is stopped both bale breakers will be stopped as well.

c) Manual Operation Mode

In addition to the fully automatic operation mode, the Bale Breaker can be operated in manual mode by changing the selector switch from "automatic" to "manual".

In the manual mode, the rotation of each spiral shaft can be changed individually by turning the respective local switches to "forward" or "reverse".

The PLC however will still monitor the max. permissible torque as set for the automatic mode. In case, the set torque value is exceeded, the PLC will initiate an audible and visible alarm. However the operator is still able to keep the screw turning.

Operating Instruction: No frozen bales shall be fed through the bale breaker as this may cause damage to the equipment.
The efficiency of the bale breaker is impaired when wet bales are fed or strip bales. After each strip bale five normal paper bales shall be used.

2) DEWIRED WASTE PAPER TRANSFER CONVEYOR M93035

a) Normal operation

Loose paper is fed from the A-Line Bale Breaker M93010 and B-Line Bale Breaker M93025 onto the conveyor.

The conveyor transports the loose paper at a constant speed to the offloading area.

The level controller LSAH 811is installed after the outlet of the A-Line Bale Breaker M93010. If the High level of the level controller is exceeded the A-Line Bale Breaker will be stopped and an alarm will be indicated on the operator panel of the control room. When the High level is deenergized for more than 2 seconds then the A-Line Bale Breaker will be started again.

The level controller LSAH 815is installed after the outlet of the B-Line Bale Breaker M93025. If the High level of the level controller is exceeded the B-Line Bale Breaker will be stopped and an alarm will be indicated on the operator panel of the control room. When the High level is deenergized for more than 2 seconds then the B-Line Bale Breaker will be started again.

b) Alarm Conditions

If during the operation either of the limit switches ZSA 821 or ZSA 825 in the torque supports of the drive motors is energised due to overload, the conveyor as well as the bale breakers will be stopped. An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

At the start of the conveyor an overload is permitted for 1 second to account for the increased starting torque.

If either of the emergency pull cord switches ZSA 831 or ZSA 835 is energised, the conveyor as well as the bale breakers will be stopped.

An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

If the rotation as measured by the zero speed switch SSA 841 is below ..... rpm, the conveyor as well as the bale breakers will be stopped.

An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

c) Automatic Lubrication System

The automatic lubrication system Exxxxx has its own independent control system.

If the automatic lubrication system is faulty, an alarm will be indicated on the operator panel in the control room. However, the conveyor will continue to operate.

d) Manual Operation

In addition to automatic operation, the conveyor can be operated in the manual mode by changing the local selector switch from "automatic" to "manual".

In manual mode, the conveyor can be started and stopped whereby the PLC will still control the safety equipment as follows;

- alarm condition as under b1: the PLC will sound an audible and visible alarm and the conveyor will continue operation.
- alarm condition as under b2 and b3: the PLC will sound an audible and visible alarm and the conveyor will be stopped.

B) Pulper Drum Feed System

1) OVERALL SYSTEM FUNCTION

Either Pulper A or B may be in operation or both may operate simultaneously.

The feed rate for loose paper may vary for each pulper. Therefore, the operation of the Pulper Drum Feed System has to satisfy the various operating conditions of the Pulpers.

Pulper A feed is controlled via the radiometric weighing scale WIC 531 installed after A-Line Leveller M93042.

Pulper B feed is controlled via the radiometric weighing scale WIC 731 installed after B-Line Leveller M93046.

The scales adjust the speed of the respective feed conveyor according to the density of the loose paper layer measured.

The varying speed of the pulper feed conveyors is also changing the speed of the OMG Infloor Conveyor M93036 indirectly and Waste Paper Infloor Conveyor M93038 directly.

The speed of the Waste Paper Infloor Conveyor M93038 will be controlled to 100% of the total feed required by both pulper feed conveyors M 93041 and M 93045.

The speed of the OMG Infloor Conveyor M93036 will be controlled to ensure a percentage (5% to 25%) of the feed from the Waste Paper Infloor Conveyor M93038. The required percentage of the OMG will be set by the operator in the control room.

The Pivoting Conveyor M93040 is always operating at a fixed speed which is designed according to the speed required for maximum capacity of the Pulper Feed System.

The level controller LC 521 installed before the A-Line Leveller M93042 and the level controller LC 721 installed before the B-Line Leveller M93046 control the distribution of the mixed loose paper from the Pivoting Conveyor M93040 i.e. the position of the Pivoting Conveyor.

In addition to the full automatic mode i.e. start/stop initiated by the signal "loose paper required" from the main plant control and the manual mode for each equipment there is a remote mode which allows the starting and stopping of the pulper feed system from a switch close to the pivoting conveyor.

In the remote mode the full automatic control as described above is maintained and only starting/stopping of the pulper feed system is done from the local position.

2) OMG - INFLOOR CONVEYOR M93036

a) Normal operation

The OMG-Infloor Conveyor is filled level with the ground floor by mobile equipment.

The speed of the OMG Infloor Conveyor M93036 will be controlled to ensure a percentage (5% to 25%) of the feed from the Waste Paper Infloor Conveyor M93038. The required percentage of the OMG will be set by the operator in the control room.

b) Alarm Conditions

1. If during the operation the limit switch ZSA 121 in the torque support of the drive motor is energised due to overload, the conveyor will be stopped. An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   At the start of the conveyor an overload is permitted for 1 second to account for the increased starting torque.

2. If either of the emergency pull cord switch ZSA 131 or ZSA 135 is energized, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

3. If during the operation of the conveyor the rotation as measured by the zero speed switch SSA 141 is below ..... rpm, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

NOTE: If not stated otherwise in automatic mode the Stop of the OMG Infloor Conveyor M 93036 does not stop the Wastepaper Infloor Conveyor M 93038. In this operating condition 100% of loose paper required is loaded onto the Wastepaper Infloor Conveyor M 93038 and full plant capacity is maintained.

For starting first the Wastepaper Infloor Conveyor M 93038 has to be in operation before the OMG Infloor Conveyor M 93036 can be started.

c) Automatic Lubrication System

The automatic lubrication system Exxxxx has its own independent control system.

If the automatic lubrication system is faulty, an alarm will be indicated on the operator panel in the control room. However, the conveyor will continue to operate.

d) Manual Operation

In addition to automatic operation, the conveyor can be operated in the manual mode by changing the local selector switch from "automatic" to "manual".

In manual mode, the conveyor can be started and stopped whereby the PLC will still control the safety equipment as follows;

- alarm condition as under b1: the PLC will sound an audible and visible alarm and the conveyor will continue operation.
- alarm condition as under b2 and b3: the PLC will sound an audible and visible alarm and the conveyor will be stopped.

In manual mode however the start and stop of the conveyor is independent from the operating condition of the other equipment.

The conveyor speed is controlled by the PLC when the Wastepaper Infloor Conveyor M 93038 is operating. Otherwise the drive will be operated at the nominal speed in manual mode.

Operating Instruction: The operator of the mobile equipment has to ensure that the conveyor is filled level with the ground floor along the length of the conveyor. The more accurate the operator maintains the specified level the less production interruption and higher accuracy is achieved.

3) LEVELLER OMG INFLOOR CONVEYOR M93037

a) Normal operation

The leveller ensures a constant layer of loose paper on the OMG Infloor Conveyor M 93036.

Loose paper higher than the gap between the leveller and the conveyor is pushed back against the forward motion of the conveyor. Therefore, the level of the loose paper just before the leveller may increase.

Rotation of the leveller is at a constant speed.

b) Alarm Conditions

1. If the level of the loose paper in front the leveller exceeds the High-High Level as set by the level controller LCA 211 an audible and visible alarm is initiated as well as an alarm is indicated on the operator panel in the control room.

   This indicates that the operator has overfilled the conveyor and filling level of the conveyor shall be reduced drastically until the loose paper level is at least 5 seconds below the High-Level of level controller LCA 211 and alarm is cancelled.

2. If the level of the loose paper in front the leveller falls below the Min- Level as set by the level controller LCA 211 an audible and visible alarm is initiated as well as an alarm is indicated on the operator panel in the control room. The OMG Infloor Conveyor M 93036 and leveller continue to operate.

3. If during normal operation the limit switch ZSA 231 in the torque support of the drive motor is energised due to overload, the leveller will be stopped.

An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

At the start of the leveller an overload is permitted for 1 second to account for the increased starting torque.

4. If the limit switch ZSA 221 for the lift off safety is energised the leveller will be stopped.

An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

Note: If not stated otherwise in automatic mode the OMG Infloor Conveyor M 93036 is stopped simultaneously with the leveller. However the leveller may continue operation even so the OMG Infloor Conveyor M 93036 is stopped.

For starting first the leveller M 93037 has to be in operation before the OMG Infloor Conveyor M 93036 can be started.

c) Manual Operation

In addition to automatic operation, the leveller can be operated in the manual mode by changing the local selector switch from "automatic" to "manual".

In manual mode, the leveller can be started and stopped whereby the PLC will still monitor the safety equipment as described under b1 to b3.

- alarm condition as under b1,b2 and b3: the PLC will sound an audible and visible alarm and the leveller will continue operation.
- alarm condition as under b4: the PLC will sound an audible and visible alarm and the leveller will be stopped.

In manual mode however the start and stop of the leveller is independent from the operating condition of the other equipment.

Operating Instruction: Waste paper bales or larger parts of bales must not be fed to the levelling wheel since those would be wedged under the levelling wheel and may damage the conveyor.

4) WASTEPAPER INFLOOR CONVEYOR M93038

a) Normal operation

Between 5% to 25% of the total loose paper requirement as set by the operator is fed from the OMG Infloor Conveyor M93036 onto the Wastepaper Infloor Conveyor M93038.

Additional loose paper is filled level with the ground floor onto the conveyor by mobile equipment resulting in a bottom layer of loose magazine and a top layer of loose newspaper.

The conveyor speed is controlled by the PLC at 100% of the total capacity required by both pulper feed conveyor i.e. adjusted to the varying speeds due to the control via the radiometric scales.

If the High-High level in the outlet chute of the conveyor is exceeded as set by the level controller LCA 315 the ONP Infloor Conveyor M 93038 will be stopped. However the Pivoting Conveyor M 93040 will continue to operate. The ONP Infloor Conveyor M 93038 will be started again if the filling level is below the High level.

b) Alarm Conditions

1. If the High-High level in the outlet chute of the conveyor is exceeded for a continuous period of longer than 2 minutes an alarm on the operator panel in the control room will be indicated.

2. If during the operation the limit switch ZSA 321 in the torque support of the drive motor is energized due to overload, the conveyor will be stopped. An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   At the start of the conveyor an overload is permitted for 1 second to account for the increased starting torque.

3. If either of the emergency pull cord switch ZSA 331 or ZSA 335 is energized, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

4. If during the operation of the conveyor the rotation as measured by the zero speed switch SSA 341 is below ..... rpm, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   NOTE: For starting first the Pivoting Conveyor M 93040 has to be in operation before the ONP Infloor Conveyor M 93038 can be started.

c) Automatic Lubrication System

The automatic lubrication system Exxxxx has its own independent control system.

If the automatic lubrication system is faulty, an alarm will be indicated on the operator panel in the control room. However, the conveyor will continue to operate.

d) Manual Operation

In addition to automatic operation, the conveyor can be operated in the manual mode by changing the local selector switch from "automatic" to "manual".

In manual mode, the conveyor can be started and stopped whereby the PLC will still control the safety equipment as follows;

- alarm condition as under b1and b2: the PLC will sound an audible and visible alarm and the conveyor will continue operation.
- alarm condition as under b3 and b4: the PLC will sound an audible and visible alarm and the conveyor will be stopped.

In manual mode however the start and stop of the conveyor is independent from the operating condition of the other equipment.

The conveyor speed is controlled by the PLC when the Pivoting Conveyor M 93038 is operating. Otherwise the drive will be operated at the nominal speed in manual mode.

Operating Instruction: The operator of the mobile equipment has to ensure that the conveyor is filled level with the ground floor along the length of the conveyor. The more accurate the operator maintains the specified level the less production interruption and higher accuracy is achieved.

5) PIVOTING CONVEYOR M93040

a) Normal operation

The pivoting conveyor M93040 receives the loose paper mixture from the Wastepaper Infloor Conveyor M93038.

The pivoting conveyor operates at a constant speed which considers that Pulper A and Pulper B are operating simultaneously at maximum capacity.

If both pulpers are operating at the same capacity the position of the pivoting conveyor will be in the middle between the A-Line Drum Pulper Feed Conveyor M93041 and B-Line Drum Pulper Feed Conveyor M93045 ensuring that both pulper feed conveyor receive nearly equivalent quantities of loose paper.

The level controller LC 521 installed before A-Line Leveler M93042 and the level controller LC 721 installed before B-Line Leveler M93046 are controlling the position of the pivoting conveyor such that equal levels are maintained at both pulper feed conveyors within a 10% tolerance.

If one pulper stops operation the pivoting conveyor will move in such position to ensure that all loose paper is feed to the pulper remaining in operation. If both pulper stop operation the pivoting conveyor will stop.

The position of the pivoting conveyor is monitored by the rotation generator ZIC 911.

b) Alarm Conditions

1. If the emergency pull cord switch ZSA 931 is energized, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

2. If the position of the pivoting conveyor as set by the control system and measured by the rotation generator is not reached within 10 seconds an alarm will be initiated.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

NOTE: If not stated otherwise in automatic mode the ONP Infloor Conveyor M 93038 is stopped simultaneously with the pivoting conveyor.

For starting first one of the pulper feed conveyor has to be in operation before the pivoting conveyor can be started.

d) Manual Operation

In addition to automatic operation, the pivoting conveyor can be operated in the manual mode by changing the local selector switch from "remote" to "manual".

In manual mode, the conveyor belt can be started and stopped as well the pivoting conveyor can be turned in either direction whereby the PLC will still control the safety equipment as follows.

- alarm condition as under b2: the PLC will sound an audible and visible alarm and the conveyor will continue operation.
- alarm condition as under b1: the PLC will sound an audible and visible alarm and the conveyor will be stopped.

In manual mode however the start, stop and swivelling of the pivoting conveyor is independent from the operating condition of the other equipment.

6) A-LINE DRUM PULPER FEED CONVEYOR M93041

a) Normal operation

The A-Line Drum Pulper Feed Conveyor M93041 is fed by the pivoting conveyor M93040. The speed of the conveyor is controlled by the radiometric scale WIC 531 installed after A-Line Leveller M93042.

The radiometric scale measures the density of the loose paper layer by means of radiometric radiation. The proprietary scale control system determines the necessary conveyor speed from the required pulper feed capacity, the density of the loose paper layer measured and the fixed height of the loose paper layer as established by the leveller.

The required conveyor speed setting is transferred to the PLC system which controls the speed of the conveyor via the frequency converter.

In case that pulper A is stopped the pulper feed conveyor will be stopped as well.

b) Alarm Conditions

1. If during operation the limit switch ZSA 521 in the torque support of the drive motor is energized due to overload, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   At the start of the conveyor an overload is permitted for 1 second to account for the increased starting torque.

2. If the emergency pull cord switch ZSA 535 is energised, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

3. If the rotation as measured by the zero speed switch ZSA 541 is below ..... rpm, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   In automatic mode the pulper feed conveyor is started and stopped by the signal "loose paper required" from the main plant control.

c) Automatic Lubrication System

The automatic lubrication system E..... has its own independent control system.

If the automatic lubrication system is faulty, an alarm will be indicated on the operator panel in the control room. However, the conveyor will continue to operate.

d) Manual Operation

In addition to automatic operation, the conveyor can be operated in the manual mode by changing the local selector switch from "remote" to "manual".

In manual mode, the conveyor can be started and stopped whereby the PLC will still monitor the safety equipment as described under b1 to b4.

- alarm condition as under b1: the PLC will sound an audible and visible alarm and the conveyor will continue operation.
- alarm condition as under b2 and b3: the PLC will sound an audible and visible alarm and the conveyor will be stopped.

In manual mode however the start and stop of the conveyor is independent from the operating condition of the other equipment.

The conveyor speed is controlled by the PLC when the signal "loose paper required" from the main plant control is present. Otherwise the drive will be operated at the nominal speed in manual mode.

7) A-LINE LEVELLER M93042

a) Normal operation

The A-Line Leveller M93042 evens out the loose paper layer to a nearly constant height of 600 mm on the A-Line Pulper Feed Conveyor M93041 i.e. the layer height is kept constant independent of the conveyor speed.

Loose paper higher than the gap between the leveller and the conveyor is pushed back against the forward motion of the conveyor. Therefore, the level of the loose paper just before the leveller may increase.

The level control LCA 611 installed before the leveller is controlling the operation of the pivoting conveyor. If the High-High Level is exceeded the pivoting conveyor will be stopped to avoid transporting of loose paper over the leveller. The pivoting conveyor will be started again if the loose paper level is least 5 seconds below the High-Level of the level controller LCA 611.

Rotation of the leveller is at a constant speed.

b) Alarm Conditions

1. If the level of the loose paper in front the leveller falls below the Min- Level as set by the level controller LCA 611 an audible and visible alarm is initiated as well as an alarm is indicated on the operator panel in the control room. The pulper feed conveyor and leveller continue to operate.

2. If during normal operation the limit switch ZSA 631 in the torque support of the drive motor is energized due to overload, the leveller as well as the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   At the start of the conveyor an overload is permitted for 1 second to account for the increased starting torque.

3. If the limit switch ZSA 621 for the lift off safety is energized the leveller will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

Note: If not stated otherwise in automatic mode the pulper feed conveyor is stopped simultaneously with the leveller. However the leveller may continue operation even so the pulper feed conveyor is stopped.

For starting first the leveller M 93042 has to be in operation before the pulper feed conveyor M 93041 can be started.

The pulper feed conveyor A and pulper feed conveyor B have to be started in sequence if both are stopped.

c) Manual Operation

In addition to automatic operation, the leveller can be operated in the manual mode by changing the local selector switch from "automatic" to "manual".

In manual mode, the leveller can be started and stopped whereby the PLC will still monitor the safety equipment as described under b1 to b3.

- alarm condition as under b1 and b2: the PLC will sound an audible and visible alarm and the leveller will continue operation.
- alarm condition as under b3: the PLC will sound an audible and visible alarm and the leveller will be stopped.

In manual mode however the start and stop of the leveller is independent from the operating condition of the other equipment.

Operating Instruction: Waste paper bales or larger parts of bales must not be fed to the levelling wheel since those would be wedged under the levelling wheel and may damage the conveyor.

8) B-LINE DRUM PULPER FEED CONVEYOR M93045

a) Normal operation

The B-Line Drum Pulper Feed Conveyor M93045 is fed by the pivoting conveyor M93040. The speed of the conveyor is controlled by the radiometric scale WIC 731 installed after B-Line Leveller M93046.

The radiometric scale measures the density of the loose paper layer by means of radiometric radiation. The proprietary scale control system determines the necessary conveyor speed from the required pulper feed capacity, the density of the loose paper layer measured and the fixed height of the loose paper layer as established by the leveller.

The required conveyor speed setting is transferred to the PLC system which controls the speed of the conveyor via the frequency converter.

In case that pulper B is stopped the pulper feed conveyor will be stopped as well.

b) Alarm Conditions

1. If during operation the limit switch ZSA 721 in the torque support of the drive motor is energized due to overload, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   At the start of the conveyor an overload is permitted for 1 second to account for the increased starting torque.

2. If the emergency pull cord switch ZSA 735 is energised, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

3. If the rotation as measured by the zero speed switch ZSA 741 is below ..... rpm, the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   In automatic mode the pulper feed conveyor is started and stopped by the signal "loose paper required" from the main plant control.

c) Automatic Lubrication System

The automatic lubrication system E..... has its own independent control system.

If the automatic lubrication system is faulty, an alarm will be indicated on the operator panel in the control room. However, the conveyor will continue to operate.

d) Manual Operation

In addition to automatic operation, the conveyor can be operated in the manual mode by changing the local selector switch from "remote" to "manual".

In manual mode, the conveyor can be started and stopped whereby the PLC will still monitor the safety equipment as described under b1 to b4.

- alarm condition as under b1: the PLC will sound an audible and visible alarm and the conveyor will continue operation.
- alarm condition as under b2 and b3: the PLC will sound an audible and visible alarm and the conveyor will be stopped.

In manual mode however the start and stop of the conveyor is independent from the operating condition of the other equipment.

The conveyor speed is controlled by the PLC when the signal "loose paper required" from the main plant control is present. Otherwise the drive will be operated at the nominal speed in manual mode.

9) B-LINE LEVELLER M93046

a) Normal operation

The B-Line Leveller M93046 evens out the loose paper layer to a nearly constant height of 600 mm on the B-Line Pulper Feed Conveyor M93045 i.e. the layer height is kept constant independent of the conveyor speed.

Loose paper higher than the gap between the leveller and the conveyor is pushed back against the forward motion of the conveyor. Therefore, the level of the loose paper just before the leveller may increase.

The level control LCA 811 installed before the leveller is controlling the operation of the pivoting conveyor. If the High-High Level is exceeded the pivoting conveyor will be stopped to avoid transporting of loose paper over the leveller. The pivoting conveyor will be started again if the loose paper level is least 5 seconds below the High-Level of the level controller LCA 811.

Rotation of the leveller is at a constant speed.

b) Alarm Conditions

1. If the level of the loose paper in front the leveller falls below the Min- Level as set by the level controller LCA 811 an audible and visible alarm is initiated as well as an alarm is indicated on the operator panel in the control room. The pulper feed conveyor and leveller continue to operate.

2. If during normal operation the limit switch ZSA 831 in the torque support of the drive motor is energized due to overload, the leveller as well as the conveyor will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

   At the start of the conveyor an overload is permitted for 1 second to account for the increased starting torque.

3. If the limit switch ZSA 821 for the lift off safety is energized the leveller will be stopped.

   An audible and visible alarm will be initiated and an alarm will be shown on the control room operator panel.

Note: If not stated otherwise in automatic mode the pulper feed conveyor is stopped simultaneously with the leveller. However the leveller may continue operation even so the pulper feed conveyor is stopped.

For starting first the leveller M 93046 has to be in operation before the pulper feed conveyor M 93045 can be started.

The pulper feed conveyor A and pulper feed conveyor B have to be started in sequence if both are stopped.

c) Manual Operation

In addition to automatic operation, the leveller can be operated in the manual mode by changing the local selector switch from "automatic" to "manual".

In manual mode, the leveller can be started and stopped whereby the PLC will still monitor the safety equipment as described under b1 to b3.

- alarm condition as under b1 and b2: the PLC will sound an audible and visible alarm and the leveller will continue operation.
- alarm condition as under b3: the PLC will sound an audible and visible alarm and the leveller will be stopped.

In manual mode however the start and stop of the leveller is independent from the operating condition of the other equipment.

Operating Instruction: Waste paper bales or larger parts of bales must not be fed to the levelling wheel since those would be wedged under the levelling wheel and may damage the conveyor.

3. General Plant Control

If not stated otherwise the following general plant control requirements have to be fulfilled

a. The control system is monitoring the drives, safety equipment and emergency push buttons of each equipment. Start up of an equipment will be done only if no fault is present from drives, safety equipment and emergency push buttons.

b. Control signals from the field devices are accepted as correct only if the are present for at least 2 seconds.

c. Signals from the safety devices are accepted as correct immediately without delay.

d. The speed of frequency controlled drives can be increased up to a maximum of 75 Hz only. If faster speed is required by the plant control then an alarm is initiated at the operator panel in the control room.

e. Visual and audible alarm will have 2 different indication;

- for alarm condition where action is required from the mobile equipment operator
- for alarm conditions where action is required from plant operation or maintenance personnel