

Client: EFT – Rudnik I Termoelektrana Stanari D.O.O.

Project: Coal Crushing and Conveying Equipment –
Stanari Mine BiH

Commissioning Program and Dossiers

Crusher station & belt conveying system



Pic.1 Side view Crusher station

Date: 19.02.2015
Rev. 0



Magdeburger Förderanlagen und Baumaschinen GmbH
Sudenburger Wuhne 47
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1. Commissioning Program

1.1 General

This Commissioning program is intended to describe step by step the commissioning activities and tests. It covers the period of time from mechanical completion right up to the Start-Up Procedures.

Commissioning includes coordination of all individual activities (incl. those of the sub-suppliers) in order to provide production requirements and performance as contractually agreed to.

All commissioning measures are allocated to the commissioning stages explained subsequently. The commissioning stages (**fig. 1**) contain the essential steps of preparation and execution of the commissioning activities of all by FAM supplied equipments.

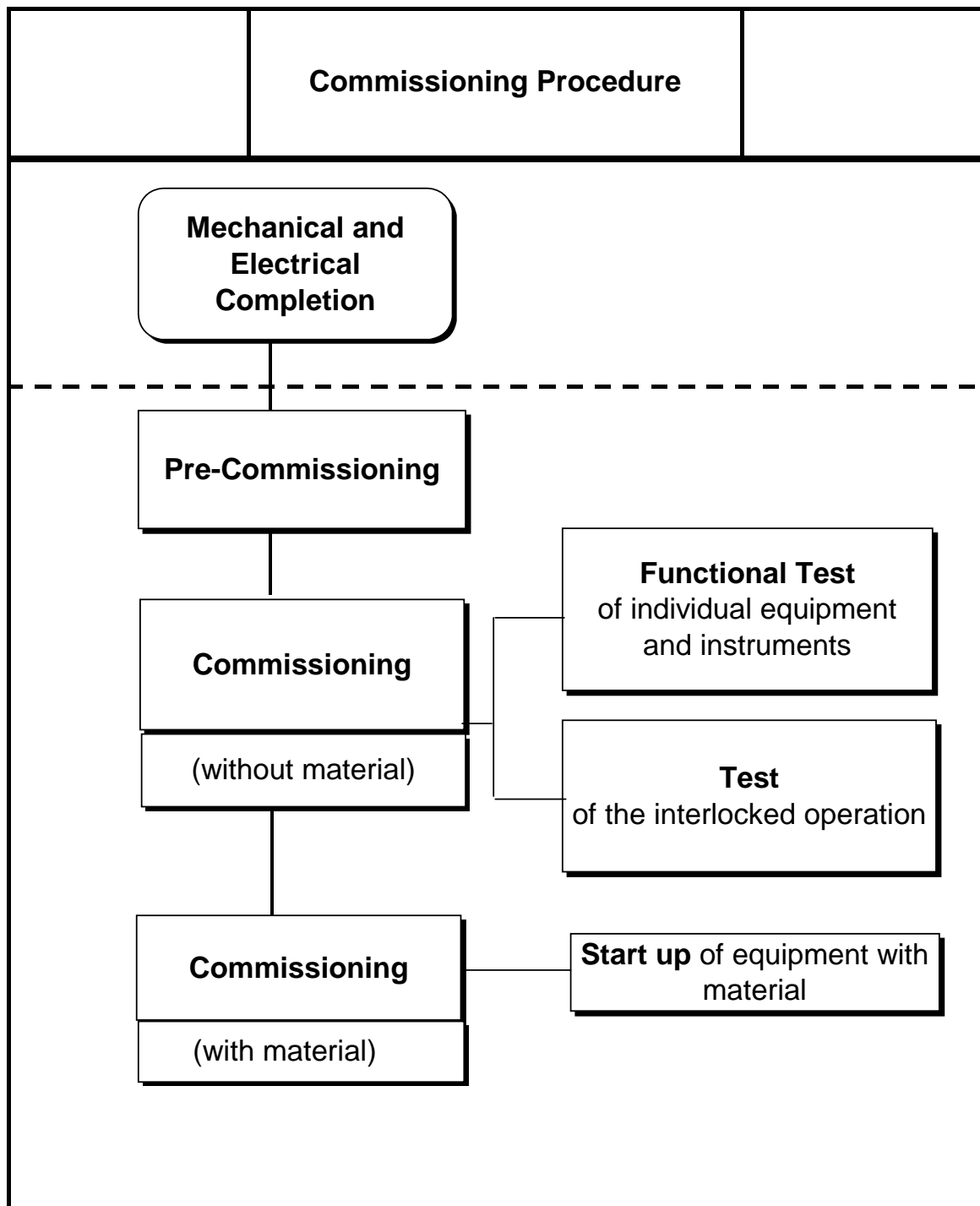
In general the commissioning procedures are sub-divided into the following steps.

- Pre-commissioning
- Commissioning (Functional and Interlocked Operation Test) without material
- Commissioning with material

These steps include all settings, adjustments and functional tests to that allow operability of the plant to operate without and with material (as specified in contract documents).

The system consist:

- Crusher Station for twin Truck feeding
- Belt conveyor system consists of a continuous belt conveyor line U-1 to U-5 (with Magnetic separator, Metal detector and belt scale).

**Fig. 1: Commissioning steps**

1.2 Pre-commissioning

The Pre-commissioning activities begin, as a rule, only after mechanical, electrical and control completion of the equipment. The Pre-Commissioning tests comprise all activities for testing the system controls.

Before switching on (switch gear) for the first time, the contractor must submit the end of erection work.

The Pre-commissioning tests require component suppliers to be present for the electrical and control equipment review and checkout.

1.3 Commissioning without material

The purpose of the commissioning procedure is to make adjustments and assure that the equipment are ready for Commissioning with material. The Commissioning procedures contain the following two activities:

- Functional Tests
- Interlocked Operation Test

1.3.1 Functional Tests

Functional Tests are physical run tests of individual components **without feed material**.

During the Functional Tests for example the following items are addressed:

- Check all bearings for temperature and assure proper and sufficient lubrication,
- Circulation control devices are checked for operation and sensitivity,
- All limit switches are set and safety devices checked,
- Mechanical settings such as tensioning and aligning the conveyors are rechecked,
- Rotational direction of motors, power draw
- and temperature are checked.

Specification, Sensor List and List of Power Consumption (Motor List) will form the basis for the Functional Tests.

The switching state remaining after the functional test “disconnected” or “ready for operation” is determined in agreement with the client. Specific Lock-out-Procedures shall be arranged before starting the tests.

Carrying out of the Functional Tests and readiness for Interlocked Operation Tests must be recorded.

1.3.2 Interlocked Operation Test

These tests are conducted **without operating the facility with feed material**.

These tests demonstrate the functionality of the equipment, including Start-Stop-sequences, interlocking and control and safety functions. For the equipment, this covers the entire system tests required prior the introduction of product.

During the Testing, for example the following checks are carried out and operating possibilities are checked:

- Functioning of the individual devices/control systems in interlocked operation,
- Starting up and shutting down procedures including interlocks and permissives,
- “Emergency-Stop” and starting up after “Emergency-Stop”,
- Switching on and off interlockings of all operating possibilities,
- Functioning of the safety devices during starting up and shutting down as well as in the case of malfunction changeovers,
- Intended and actual parameters in interlocked operation.

The specification and the contractual agreements are the basis for carry out the Interlocked Operation Test.

On conclusion of a successful Interlocked Operation Test, the equipment are ready for start-up operation with material.

1.4 Commissioning with material

Start-up of the facility occurs after commissioning and all interlocks and permissives have been checked. The feed material is introduced into the system for processing.

The key function of the start up testing with feed is to assure that the settings without and with feed are within normal parameters. All interlocking possibilities and specified functions are run through and tested again under normal operating conditions and recorded. The tests shall be started with low load and after reaching suitable operating conditions shall proceed to design load.

During the Commissioning with material, the following checks are carried out.

- Check the material handling,
- Set upper and lower limits and trigger values of the level indicators,
- Set the signalling devices,
- Start up
- Start-up after “Emergency-Stop”,
- Check settings of safety devices (hydraulic safety valves, shutdown switches, etc.)

During the Start-Up-procedures of the components and function groups of the equipment are operated in connection **with the operating material**.

During this period all systems are checked und adjusted under various modes of operation and loading configurations.

2. Prerequisites to provide by the buyer

01	Operating staff
	- Operator in centre operator
	- Machine operator
	- Other labour force
02	Provision of fluids (with marking of transfer points)
	- Fluids in agreed /
	and required quality/composition/volume
	- Sufficient filling level of storehouses/silos
	Volume per hour/day/month
	- Electric energy
03	Provision of gauges (if required)
	- Trains, waggons
04	Safeguarding the availability of suppliers of orderer of equivalent rank
	- Software engineers
	- Electronic specialists for attendance of superior instrumentation and control equipment
	- Readiness for calling
05	Safeguarding the readiness-for-service of equipment upstream and downstream of plant
06	Sufficient storage capacity of silos, open-air storage grounds etc.
07	Availability of controls (if included in orderer's scope of performances)
	- Local control
	- Remote and automatic control
	- Interlock conditions and signalling appliances
08	Safety equipment ready for service



3. Check Lists

3.1 Test Certificate Crusher

Commissioning Procedure Impact crusher System



Förderanlagen Magdeburg

Impact crusher

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Project:	EFT Stanari	Test date:	
Project No.:	109794	Supervisor:	
Doc.-No.:		Present Persons:	

Item	Test Method / Operation Procedure		Remarks	Result
1. Purpose	To check and confirm whether the impact crusher can operate continuously without problem.			<input type="checkbox"/>
2. Test Item	<ul style="list-style-type: none"> No-load-operation (Cold run) Continuous operation (Heat run) 			<input type="checkbox"/>
3. Scope	This procedure shall be applied to the following crusher: impact crusher			<input type="checkbox"/>
4. Commissioning Organization	Commissioning organization is shown in Table 1			<input type="checkbox"/>
5. Instruments & Tools	List of required Instruments and Tools is shown in Table 2			<input type="checkbox"/>
6. Schedule	Commissioning organization schedule must be cleared up in front of commissioning			<input type="checkbox"/>
7. Pre-inspection and preparation before commissioning operation	1.	Confirm all safety devices working properly		<input type="checkbox"/>
	2.	Concerned crusher are erected completely		<input type="checkbox"/>
	3.	Electrical cabling works and checks are completed		<input type="checkbox"/>
	4.	Hydraulic connecting works and checks are completed		<input type="checkbox"/>
	5.	Confirm all transport locks are taken out		<input type="checkbox"/>

Commissioning Procedure

Impact crusher System



Förderanlagen Magdeburg

Impact crusher

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	6.	Confirm the rotor lock is dismounted (on opposite side of drive)		<input type="checkbox"/>
	7.	Confirm the alignment of the impact crusher is exact horizontal		<input type="checkbox"/>
	8.	Check casing is closed		<input type="checkbox"/>
	9.	Confirm if the lubrication oil and grease is filled in at required level		<input type="checkbox"/>
	10.	Machine cleaning and removal of foreign matter		<input type="checkbox"/>
	11.	Check the V-belt drive for correct tensioning and correct alignment of the belt pulleys		<input type="checkbox"/>
	12.	Confirm the feeding device is mounted to feed over the whole width of the impact crusher		<input type="checkbox"/>
	13.	Instrument cabling works and checks are completed		<input type="checkbox"/>
	14.	Confirm if the electric motor thermal set value is appropriate		<input type="checkbox"/>
	15.	Check if the control test is completed		<input type="checkbox"/>
	16.	Confirm if electric power supply for control & instrument is on		<input type="checkbox"/>
	17.	Confirm the motor for the correct sense of rotation		<input type="checkbox"/>
	18.	Check the bolts and nuts for tight seat		<input type="checkbox"/>
	19.	Confirm preparation of measuring equipment, instruments and tools required for commissioning operation (see Table 2)		<input type="checkbox"/>

Commissioning Procedure

Impact crusher System



Förderanlagen Magdeburg

Impact crusher

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8. Safety countermeasure	1.	Setting of marks for commissioning operation and restricted areas		<input type="checkbox"/>
	2.	Communication with all personnel at operation area		<input type="checkbox"/>
	3.	Setting of safety tape around commissioning area		<input type="checkbox"/>
	4.	Radio/telephone communication between FGD control room and local operators		<input type="checkbox"/>
	5.	Putting safety protectors		<input type="checkbox"/>
	6.	Provision of fire extinguishers		<input type="checkbox"/>
9. Continuous operation	9.1 Preparation			
	1.	Establishment of operating system		<input type="checkbox"/>
	9.2 No-load-operation			
	1.	Switch on main power supply		
	a)	Switch on mill		<input type="checkbox"/>
	2.	Confirmation items		
	a)	Check the rotation direction (rotation direction shall be same as arrow mark shown on the mill housing)		<input type="checkbox"/>
	b)	Check the abnormal sound/noise		<input type="checkbox"/>
	c)	Check the speed sensor		<input type="checkbox"/>
	d)	Check the bearing temperature		<input type="checkbox"/>
	e)	Noise measuring in No-load operation		<input type="checkbox"/>
	9.3 Continuous operation			
	1.	If no abnormally is observed during the No-load-Operation mentioned in 9.2 above, approximately 2 hours continuous operation will be carried out.		

Commissioning Procedure

Impact crusher System



Förderanlagen Magdeburg

Impact crusher

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	2.	Switch on the conveyors and equipment behind the mill.		<input type="checkbox"/>
	3.	Start-up the apron feeder with 50% capacity.		<input type="checkbox"/>
	4.	Checks and measurements		
	a)	Speed sensor: function test		<input type="checkbox"/>
	b)	Housing opening sensors: function test		<input type="checkbox"/>
	c)	Vibration sensor: function test		<input type="checkbox"/>
	d)	Temp: Bearing temperature measurement		<input type="checkbox"/>
	e)	Current: start up current, stable operation current etc. shall be recorded according to test record sheet.		<input type="checkbox"/>

	Approved	Checked	Prepared
Signature			

Commissioning Procedure Impact crusher System



Förderanlagen Magdeburg

Impact crusher

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Required Personnel	Client	Remarks
Supervisors		
2x Operator <div><div></div><div>1x in FGD control room</div><div>1x local</div></div>		
Local Foreman		
Recorder		Record of noise and temperature
Switchgear Observer Electrician		Measuring of start up current, stable operation current
Communication Method (temporary)		
<div><div><div>FGD Operator</div><div>FGD Control Room</div></div><div>Temporary telephone or transceiver</div><div><div>FGD Operator</div><div>Local</div></div><div><div>Supervisor</div><div>Local</div></div><div><div>Foreman</div><div>Local</div></div><div><div>Electrician</div><div>Switchgear</div></div></div>		

Table 1: Commissioning Operation Organization

Commissioning Procedure Impact crusher System



Förderanlagen Magdeburg

Impact crusher

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No.	Name	Prepared by Client	Remarks
1.	Thermometer (contactless)	<input type="checkbox"/>	
2.	Noise meter	<input type="checkbox"/>	
3.	Multimeter (Clamp meter)	<input type="checkbox"/>	
4.	Stop watch	<input type="checkbox"/>	
5.	Transceiver or temporary telephone	<input type="checkbox"/>	
6.	General Tools	<input type="checkbox"/>	
7.	Waste Cloth	<input type="checkbox"/>	
8.	Hand lamp	<input type="checkbox"/>	
9.	Grease Gun	<input type="checkbox"/>	
10.	Safety Tape	<input type="checkbox"/>	
11.	Marks	<input type="checkbox"/>	
12.	Test Record Sheets	<input type="checkbox"/>	
13.	Factory Test Record	<input type="checkbox"/>	
14.	Construction Drawings, Dimensional Drawings	<input type="checkbox"/>	

Table 2: List of Required Instruments and Tools

<div> <div>Commissioning assembly inspection</div> <div>Impact crusher</div> </div>				 Förderanlagen Magdeburg	
Impact crusher				Page 7 of 8	
Motor		Impact Crusher			
Type:		Type:			
Voltage:		Capacity:			
Serial Number:		Serial Number:			
Test belt tension					
	Setting via belt elongation (new belt)			Remarks	
		nominal value	actual value		
	equilibrated	1000 mm			
	tense	1008,78 mm			
	Setting via belt elongation (used belt)				
		nominal value	actual value		
	equilibrated	1000 mm			
	tense	1005,60 mm			
Hydraulic system					
	Test housing opening			Remarks	
		open	close		
Visual control					
	proofness hydraulik system			Remarks	
	equipment labeling				
	security equipment				
Erection work					
	<ul style="list-style-type: none"> The assembly work is carried out by qualified and experienced personnel in compliance with the relevant accident prevention regulations. The installation was carried out properly and professionally under the rules of the art. 				
Approved		Checked		Prepared	

Commissioning Operation Record

Impact crusher

Impact crusher

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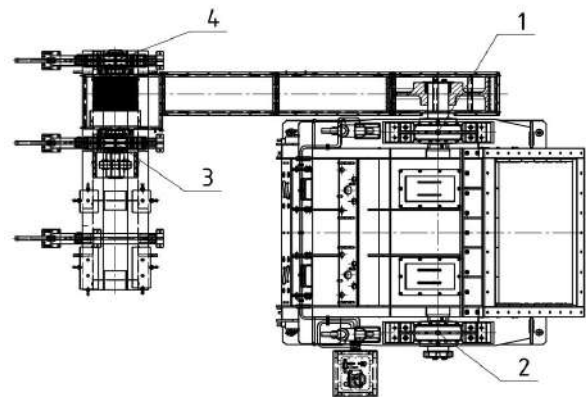
Motor		Impact Crusher		Medium	
Type:		Type:			
Voltage:		Capacity:			
Serial Number:		Serial Number:			

Test Record Temperature

	Test Time	Current (A)	Voltage (V)	Rev. (rpm)	Measured Temperature					Ambient
					1	2	3	4		
No-load operation	start 0'									
	10'									
	20'									
	30'									
	40'									
	50'									
	1°00'									
	30'									
	2°00'									

Start up current:	A
Start up time:	sec
Shut down time:	sec

Measuring Points



Approved	Checked	Prepared



3. Check Lists

3.2 Test Certificate Apron Feeder

client: EFT Stanari	Checklist Functional Tests Apron Feeder			
<div style="display: flex; justify-content: space-between;"> <div> Plant: _____ Project: _____ Order No.: _____ </div> <div> Apron Feeder AF 2000x15 Semi Mobile Crushing Station 109794 </div> </div>				
Pos.	component	date	signature	remark
1	safety facilities			
2	drive unit			
3	drive, bearings			
4	chain, apron			
5	additional facilities			

remark:


Final assembly control:


An inspection was carried out by the a.m. participants to check the readiness for commissioning the assembled plant (only system delivery FAM).

commissioning without material
commissioning with material

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	name	place of examination	date	signature
examiner				

EFT Stanari		Checklist Functional Tests																													
<div style="display: flex; justify-content: space-between;"> <div style="width: 25%;"> Plant: Project: Order No.: </div> <div style="width: 75%; border-bottom: 1px solid black;"> Apron Feeder AF 2000x15 Semi Mobile Crushing Station 109794 </div> </div>																															
Pos.	component	quantity	function test		remark																										
			mechanical	electrical																											
1	safety facilities																														
	emergency pull cord																														
	signal horn																														
	signal light																														
	mounting of all safety devices																														
	acc. drawings:																														
	09247440 - Apron Feeder AF2200x15																														
	09244637 - Switching element																														
	09262021 - Emergency switch device																														
remark: Final assembly control: An inspection was carried out by the a.m. participants to check the readiness for commissioning the assembled plant (only system delivery FAM). <div style="display: flex; justify-content: space-between;"> <div> commissioning without material commissioning with material </div> <div> <input type="checkbox"/> <input type="checkbox"/> </div> </div>																															
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EFT Stanari		Checklist Functional Tests			
<div style="display: flex; justify-content: space-between;"> <div style="width: 25%;"> Plant: Project: Order No.: </div> <div style="width: 75%;"> <div style="border-bottom: 1px solid black; margin-bottom: 2px;">Apron Feeder AF 2000x15</div> <div style="border-bottom: 1px solid black; margin-bottom: 2px;">Semi Mobile Crushing Station</div> <div style="border-bottom: 1px solid black; margin-bottom: 2px;">109794</div> </div> </div>					
Pos.	component	quantity	function test		remark
			mechanical	electrical	
2	drive unit				
	checking the quit run of the drive unit				
	checking the sense of rotation of the motors				
	oil filling gear unit				
	acc. drawings:				
	09261840 - Drive unit				

remark:

Final assembly control:

An inspection was carried out by the a.m. participants to check the readiness for commissioning the assembled plant (only system delivery FAM).


commissioning without material
commissioning with material

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	name	place of examination	date	signature
examiner				

EFT Stanari		Checklist Functional Tests																												
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Pos.	component	quantity	function test		remark																									
			mechanical	electrical																										
3	drive, bearings																													
	checking the temperature of bearings during running																													
	alignment drive unit																													
	checking for unusual running noise																													
	checking the connections and lines for																													
	damage and tightness																													
	acc. drawings:																													
	09261840 - Drive unit																													
	09136441 - Driven tumbler																													
	09136447 - Take-up unit																													
remark: Final assembly control: An inspection was carried out by the a.m. participants to check the readiness for commissioning the assembled plant (only system delivery FAM). <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 60%;"> commissioning without material commissioning with material </div> <div style="width: 40%;"> <input type="checkbox"/> <input type="checkbox"/> </div> </div>																														
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Pos.	component	quantity	function test		remark																									
			mechanical	electrical																										
4	chain, apron																													
	checking for alignment of chain																													
	checking the movement of chains over the driving- and take-up sprocket																													
	checking and correcting, if necessary, the chain tension																													
	checking the aprons for fastening																													
	acc. drawings:																													
	09255162 - Set of aprons																													
remark: Final assembly control: An inspection was carried out by the a.m. participants to check the readiness for commissioning the assembled plant (only system delivery FAM). <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 60%;"> commissioning without material commissioning with material </div> <div style="width: 40%;"> <input type="checkbox"/> <input type="checkbox"/> </div> </div>																														
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EFT Stanari		Checklist Functional Tests Apron Feeder				
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Pos.	component	quantity	function test		remark	
			mechanical	electrical		
5	additional facilities					
	checking the gap between aprons and impact rails					
	acc. drawings:					
	09255163 - Set of impact rails					
remark: Final assembly control: An inspection was carried out by the a.m. participants to check the readiness for commissioning the assembled plant (only system delivery FAM). <div style="display: flex; justify-content: space-between;"> <div> commissioning without material commissioning with material </div> <div> <input type="checkbox"/> <input type="checkbox"/> </div> </div>						
	name	place of examination		date	signature	
examiner						

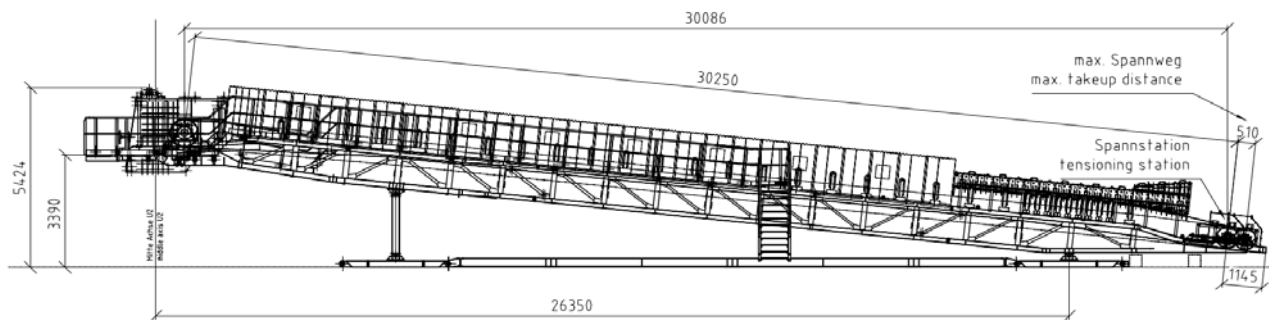


3. Check Lists

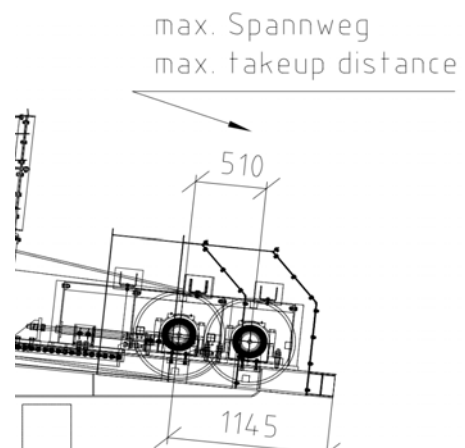
3.3 Test Certificate Conveyor

Check and Control List (Prüf- und Kontrollvorschrift) U1					Rev.0	17.02.2015
0	Geometric Data					
0.1	Conveyor length	m	30			initial installation
0.2	Conveyor height	m	4			initial installation (incl. constructional height)
1	Take up pulley position					
			target	tolerance	realized	comments
1.1	start position take up carriage - for belt vulcanisation	mm	0	+/- 50		(see sketch)
2	Speeds					
			target	tolerance	realized	comments
2.1	conveyor belt speed	m/s	1,21	+/- 0,2		correlates n Motor= 1000 /min
3	Belt tension					
			target	tolerance	realized	comments
3.1	by screw					
3.1.1	pretension distance	mm	90	+/- 1		
3.1.2	corresponding take up force (at pulley)	kN	80	+/- 1		
4	Setting VFD's (torque and ramp time from 0 to 1000 min⁻¹)					
			target	tolerance	realized	comments
4.1	Torque limited					
4.1.1	Belt drive (VFD) (operation)	Nm	475	+/- 5%		
4.1.2	Belt drive (VFD) (starting)	Nm	700	+/- 5%		
4.2	Ramp time (Time from 0 to nominal motor speed)					
4.2.1	Belt drive (VFD) - starting	sec	5	+/- 10%		
4.2.2	Belt drive (VFD) - braking	sec	5	+/- 10%		
5	Brake torques					
			target	tolerance	realized	comments
5.1	Belt conveyor drive	Nm	75	+/- 10%		

sketch 1



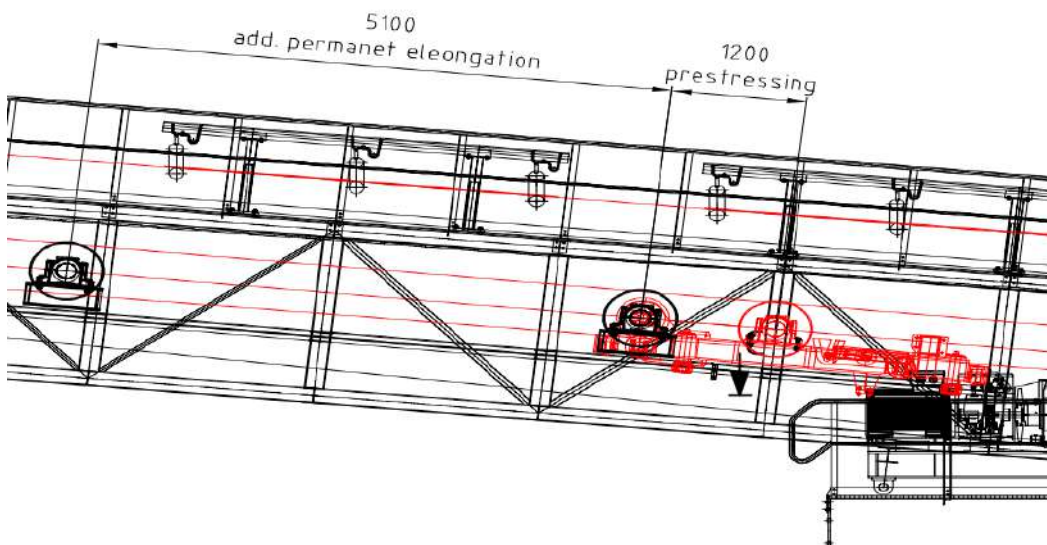
Einzeinheit SSST U1



Check and Control List (Prüf- und Kontrollvorschrift) U2					Rev.0	17.02.2015
0	Geometric Data					
0.1	Conveyor length	m	501			initial installation
0.2	Conveyor height	m	31,23			initial installation (incl. constructional height)
1	Take up pulley position		target	tolerance	realized	comments
1.1	start position take up carriage - for belt vulcanisation	mm	0	+/- 50		rubber block take up car in end position (see sketch)
1.2	distance pulley as a result of prestressing	mm	1200	+/- 50		consider additional permanent elongation 5100mm
2	Speeds		target	tolerance	realized	comments
2.1	conveyor belt speed	m/s	2,64	+/- 0,2		correlates n Motor = 1000 /min
3	Belt tension		target	tolerance	realized	comments
3.1	by winch					
3.2	Resultant Force at tension pulley out of operation +/- 1%	kN	82	+/- 1		rope force at measuring device = 20,5 kN
3.2.1	Force measured by meas. device no load operation +/- 1%	kN	19,5	+/- 1		check value for no load operation
3.2.2	max. Force in meas.device during const. operation +1 %	kN	22	+/- 1		
3.2.3	min. Force in meas.device during const. operation -1 %	kN	14	+/- 1		
4	Setting VFD's (torque and ramp time from 0 to 1000 min⁻¹)		target	tolerance	realized	comments
4.1	Torque limited					
4.1.1	Belt drive (VFD) (operation)	Nm	750	+/- 5%		each drive
4.1.1	Belt drive (VFD) (starting)	Nm	1050	+/- 5%		each drive
4.2	Ramp time (Time from 0 to nominal motor speed)					
4.2.1	Belt drive (VFD) - starting	sec	20	+/- 10%		
4.2.2	Belt drive (VFD) - braking	sec	15	+/- 10%		
5	Brake torques		target	tolerance	realized	comments
5.1	Belt conveyor drive	Nm	90	+/- 10%		each drive

sketch 1

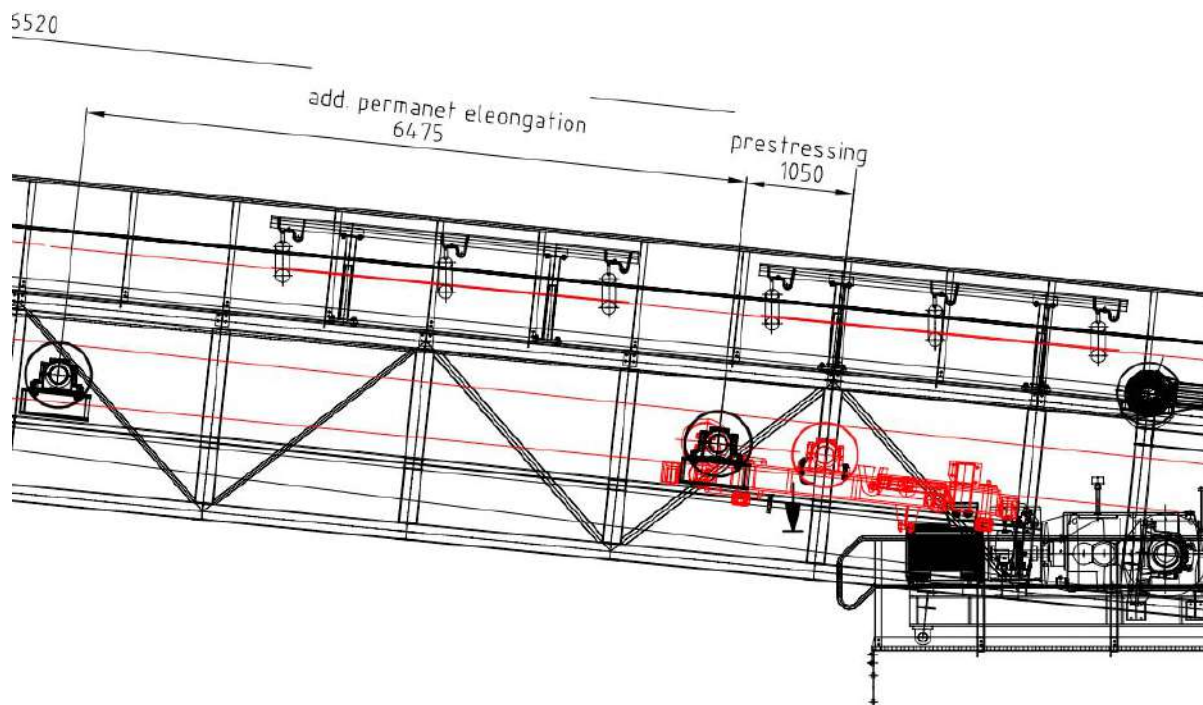
sketch 1 GF U2



Check and Control List (Prüf- und Kontrollvorschrift) U3					Rev.0	17.02.2015
0	Geometric Data					
0.1	Conveyor length	m	642,33			initial installation
0.2	Conveyor height	m	-0,05			initial installation (incl. constructional height)
1	Take up pulley position		target	tolerance	realized	comments
1.1	start position take up carriage - for belt vulcanisation	mm	0	+/- 50		rubber block take up car in end position (see sketch)
1.2	distance pulley as a result of prestressing	mm	1050	+/- 50		consider additional permanent elongation 6475mm
2	Speeds		target	tolerance	realized	comments
2.1	conveyor belt speed	m/s	2,65	+/- 0,2		correlates n Motor= 1000 /min
3	Belt tension		target	tolerance	realized	comments
3.1	by winch					
3.2	Resultant Force at tension pulley out of operation +/- 1%	kN	53	+/- 1		rope force at measuring device = 13,25 KN
3.2.1	Force measured by meas. device no load operation +/- 1%	kN	13,5	+/- 1		check value for no load operation
3.2.2	max. Force in meas.device during const. operation +1 %	kN	15	+/- 1		
3.2.3	min. Force in meas.device during const. operation -1 %	kN	12,5	+/- 1		
4	Setting VFD's (torque and ramp time from 0 to 1000 min⁻¹)		target	tolerance	realized	comments
4.1	Torque limited					
4.1.1	Belt drive (VFD) (operation)	Nm	400	+/- 5%		each drive
4.1.1	Belt drive (VFD) (starting)	Nm	600	+/- 5%		each drive
4.2	Ramp time (Time from 0 to nominal motor speed)					
4.2.1	Belt drive (VFD) - starting	sec	20	+/- 10%		
4.2.2	Belt drive (VFD) - braking	sec	15	+/- 10%		
5	Brake torques		target	tolerance	realized	comments
5.1	Belt conveyor drive	Nm	90	+/- 10%		each drive

sketch 1

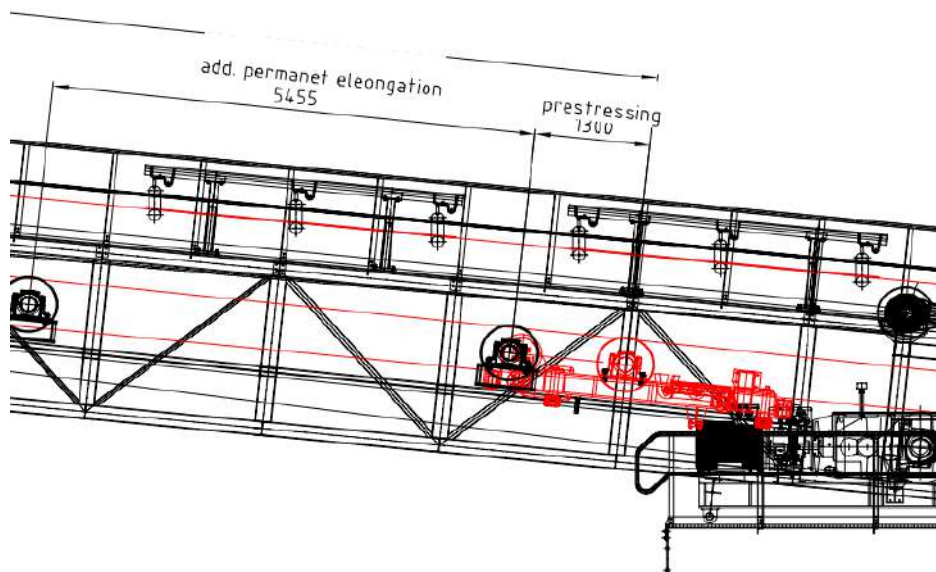
sketch 1 GF U3



Check and Control List (Prüf- und Kontrollvorschrift) U4					Rev.0	17.02.2015
0	Geometric Data					
0.1	Conveyor length	m	539,95			initial installation
0.2	Conveyor height	m	4,7			initial installation (incl. constructional height)
1	Take up pulley position		target	tolerance	realized	comments
1.1	start position take up pulley - for belt vulcanisation	mm	0	+/- 50		rubber block take up car in end position (see sketch)
1.2	distance pulley as a result of prestressing	mm	1300	+/- 50		consider additional permanent elongation 5455mm
2	Speeds		target	tolerance	realized	comments
2.1	conveyor belt speed	m/s	2,65	+/- 0,2		correlates n Motor= 1000 /min
3	Belt tension		target	tolerance	realized	comments
3.1	by winch					
3.2	Resultant Force at tension pulley out of operation +/- 1%	kN	75	+/- 1		rope force at measuring device = 18,75 KN
3.2.1	Force measured by meas. device no load operation +/- 1%	kN	22,9	+/- 1		check value for no load operation
3.2.2	max. Force in meas.device during const. operation +1 %	kN	25,75	+/- 1		
3.2.3	min. Force in meas.device during const. operation -1 %	kN	20,4	+/- 1		
4	Setting VFD's (torque and ramp time from 0 to 1000 min⁻¹)		target	tolerance	realized	comments
4.1	Torque limited					
4.1.1	Belt drive (VFD) (operation)	Nm	420	+/- 5%		each drive
4.1.1	Belt drive (VFD) (starting)	Nm	650	+/- 5%		each drive
4.2	Ramp time (Time from 0 to nominal motor speed)					
4.2.1	Belt drive (VFD) - starting	sec	20	+/- 10%		
4.2.2	Belt drive (VFD) - braking	sec	15	+/- 10%		
5	Brake torques		target	tolerance	realized	comments
5.1	Belt conveyor drive	Nm	90	+/- 10%		each brake

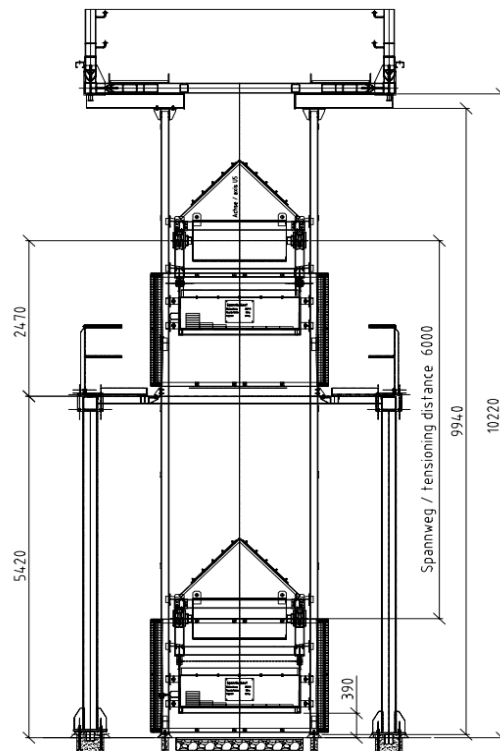
sketch 1

sketch 1 GF U4



Check and Control List (Prüf- und Kontrollvorschrift) U5				Rev.0	17.02.2015
0	Geometric Data				
0.1	Conveyor length	m	284,03		initial installation
0.2	Conveyor height	m	5,61		initial installation (incl. constructional height)
1	Take up pulley position		target	tolerance	realized
1.1	start position ballast box - for vulcanisation	mm		+/- 100	(see sketch)
2	Speeds		target	tolerance	realized
2.1	conveyor belt speed	m/s	2,65	+/- 0,2	correlates n Motor= 1000 /min
3	Belt tension -		target	tolerance	realized
3.1	by gravity				
3.1.1	nominal value at take-up pulley	kN	38,1	+/- 1	
3.1.2	max. Filling of ballast box 100%	kg	2025	+/- 10	
4	Setting VFD's (torque and ramp time from 0 to 1000 min⁻¹)		target	tolerance	realized
4.1	Torque limited				
4.1.1	Belt drive (VFD) (operation)	Nm	650	+/- 5%	
4.1.1	Belt drive (VFD) (starting)	Nm	1000	+/- 5%	
4.2	Ramp time (Time from 0 to nominal motor speed)				
4.2.1	Belt drive (VFD) - starting	sec	20	+/- 10%	
4.2.2	Belt drive (VFD) - braking	sec	15	+/- 10%	
5	Brake torques		target	tolerance	realized
5.1	Belt conveyor drive	Nm	280	+/- 10%	

sketch 1





3. Check Lists

3.4 Consumer List

Item	Equipmt'	Motor	Qty	Service	Power			Start. Torque	Model	Duty	FLA	PF	EFF	Manu- fact.	Temp. rise	Insul. class	Prot. degree	Cool.	Noise	Voltage	Freq.	Speed	Starter	Frame	Local Control Box	checked Date	signature
	Tag No.				Tag	rated	required																				
Performance reserve Transformer		0%																									
LV-Load			C	Continuous (Acc. IEC S1)	S			Standby				IC410	IC410	-	Non-ventilated	IC416	-	Fan cooled		6kV	400V				8		
			I	Intermittent (Acc. IEC S3,S4)	blue= estimated values			Formula				IC411	IC411	-	Self-ventilated					690V	DC-Busbar				4		

PROJECT: EFT Stanari
FAM PROJECT NO. : 10979416A.AEZ.810390.810
DOCUMENT NO.:
STATUS : For Approval

CONSUMER LIST

DOCUMENT NO. : 109794-1700-Consumer list
REVISION NO. : 0
MACHINE NO. : Crusher +Belt Conveyor U-1...U-5
Date: 21.01.15



Item	Equipmt' Tag No.	Motor Tag	Qty	Service	Power required		common	Start. Torque [%]	Model	Duty	FLA [A]	PF	EFF	Manu- fact.	Temp. rise [K]	Insul. class	Prot. degree	Cool.	Noise [dB]	Voltage [V]	Freq. [Hz]	Speed [rpm]	Starter	Frame	Local Control Box	checked Date	signature		
					rated kW	kW																						kW	
EC2																													
1			1		2630kVA		2630kVA				266,4	0,86	0,95							6000	50								
2	EC2	EC2 . 00 - T01	1	Transformer 6000/690V	630kVA		630kVA				63,8	0,86	0,95							6000	50								
3	EC2	.	1	Reserve			0				0,0	0,86	0,95							6000	50								
4	EC2	EC2 . 00 - W02	1	Feeding EC1	1600kVA		1600kVA				162,1	0,86	0,95							6000	50								
5	EC2	EC2 . 00 - W03	1	Feeding EC3	400kVA		400kVA				40,5	0,86	0,95							6000	50								
6	EC2	.											0,95																
7	EC2	.			452kW		452kW	502kVA			554,9	0,90	0,95							690	50								
8	U2	U2 . 81 - M01	1	Take-up station U-2	4,00	3,30	4				4,3	0,82	0,95							690	50				VOS-23				
9	U3	U3 . 81 - M01	1	Take-up station U-3	4,00	3,30	4				4,3	0,82	0,95							690	50				VOS-23				
10	EC2	EC2 . 00 - T02	1	Transformer 690/400V	63		63				64,5	0,86	0,95							690	50								
11	U2	U2 . 11 - Y01	1	Belt conveyor U-2 Brake 1	0,2		0,2				0,2	0,86	0,95							690	50								
12	U2	U2 . 11 - Y02	1	Belt conveyor U-2 Brake 2	0,2		0,2				0,2	0,86	0,95							690	50								
13	U3	U3 . 11 - Y01	1	Belt conveyor U-3 Brake 1	0,2		0,2				0,2	0,86	0,95							690	50								
14	U3	U3 . 11 - Y02	1	Belt conveyor U-3 Brake 2	0,2		0,2				0,2	0,86	0,95							690	50								
15	U3	U3 . 11 - Y03	1	Belt conveyor U-3 Brake 3	0,2		0,2				0,2	0,86	0,95							690	50								
16	U2	U2 . 11 - M01	1	Belt conveyor U-2 drive motor 1	90	200	200				204,8	0,86	0,95							690	50		VFD		VOS-22				
17	U2	U2 . 11 - M02	1	Belt conveyor U-2 drive motor 2	90							0,86	0,95									690	50		VFD				
18	U2	U2 . 11 - M03	1	Belt conveyor U-2 drive motor 3	90							0,86	0,95									690	50		VFD				
19	U3	U3 . 11 - M01	1	Belt conveyor U-3 drive motor 1	90	180	180				184,3	0,86	0,95							690	50		VFD		VOS-22				
20	U3	U3 . 11 - M02	1	Belt conveyor U-3 drive motor 2	90							0,86	0,95									690	50		VFD				
21	U3	U3 . 11 - M03	1	Belt conveyor U-3 drive motor 3	90							0,86	0,95									690	50		VFD				
22			1								0,0	0,86	0,95							690	50								
23			1								0,0	0,86	0,95							690	50								
24	EC2	.	1								0,0	0,86	0,95							690	50								
25	EC2	.			27		27	31kVA			111,3	0,86	0,95							400	50								
26	EC2	EC2 . 04 - E01...ff	1	Indoor Lighting	2		2				3,5	0,86	0,95							400	50								
27	EC2	EC2 . 04 - E40... ff.	1	Outdoor Lighting U2	1,9		2				3,4	0,86	0,95							400	50								
28	EC3	EC3 . 04 - E40... ff.	1	Outdoor Lighting U3	1,1		1				1,9	0,86	0,95							400	50								
29	EC2	EC2 . 04 - E10... ff.	1	Internal consumers switchgear	3		3				5,3	0,86	0,95							400	50								

PROJECT: EFT Stanari
FAM PROJECT NO. : 10979416A.AEZ.810390.810
DOCUMENT NO.:
STATUS : For Approval

CONSUMER LIST

DOCUMENT NO. : 109794-1700-Consumer list
REVISION NO. : 0
MACHINE NO. : Crusher +Belt Conveyor U-1...U-5
Date: 21.01.15



Item	Equipmt' Tag No.	Motor Tag	Qty	Service	rated	Power required	common	Start. Torque	Model	Duty	FLA [A]	PF	EFF	Manu- fact.	Temp. rise [K]	Insul. class	Prot. degree	Cool.	Noise [dB]	Voltage [V]	Freq. [Hz]	Speed [rpm]	Starter	Frame	Local Control Box	checked Date	signature
					kW	kW	kW	[%]																			
30	EC2	EC2 . 04 - G01	1	Battery charger	2,8		3				5,5	0,86	0,85							400	50						
31	EC2	EC2 . 04 - E01	1	Air Conditioner 1	5,5		6				18,9	0,86	0,85							230	50						
32	EC2	EC2 . 04 - E02	1	Air Conditioner 2	5,5		6				18,9	0,86	0,85							230	50						
33		.	1	Reserve	1,98		2				3,9	0,86	0,85							400	50						
34	U2	U2 . 04 - E1... ff.	3	Belit conv. U2 heating gear box	0,5		1,5				2,4	1,86	0,85							230	50						
35	U3	U3 . 04 - E1... ff.	3	Belit conv. U3 heating gear box	0,5		1,5				1,5	2,86	0,85							230	50						
36		.					0,0				0,0	3,86	0,85							230	50						
EC3																											
1			1		400kVA		400kVA				40,5	0,86	0,95							6000	50						
2	EC3	EC3 . 00 - T01	1	Transformer 6000/690V	250kVA		400kVA				40,5	0,86	0,95							6000	50						
3	EC3	EC3 .	1	Reserve			0					0,86	0,95							6000	50						
4		.										0,86	0,95							6000	50						
5		.			206		206	240kVA			352,3	0,86	0,95							690	50						
6	U4	U4 . 81 - M01	1	Take-up station U-4	4,00	3,30	4,0				4,3	0,82	0,95							690	50				VOS-23		
7												0,86	0,95							690	50						
8	EC3	EC3 . 00 - T02	1	Transformer 690/400V	63		63				64,5	0,86	0,95							690	50						
9	U4	U4 . 11 - Y01	1	Belt conveyor U-4 brake 1	0,2		0,2				0,2	0,86	0,95							690	50						
10	U4	U4 . 11 - Y02	1	Belt conveyor U-4 brake 2	0,2		0,2				0,2	0,86	0,95							690	50						
11	U5	U5 . 11 - Y01	1	Belt conveyor U-5 brake 1	0,2		0,2				0,2	0,86	0,95							690	50						
12	U5	U5 11 - E03	1	Metal Separator	8,75		9				9,0	0,86	0,95							690	50						
13	U4	U4 . 11 - M01	1	Belt conveyor U-4 drive motor 1	90	130	130				133,1	0,86	0,95							690	50		VFD		VOS-22		
14	U4	U4 . 11 - M02	1	Belt conveyor U-4 drive motor 2	90							0,86	0,95							690	50		VFD				
15																											
16																											
17																											
18		.			24		24	28kVA			111,3	0,86	0,95							400	50						
19	EC3	EC3 . 04 - E01...ff	1	Indoor Lighting	2		2				3,5	0,86	0,95							400	50						
20	U4	U4 . 04 - E40... ff.	1	Outdoor Lighting U4	1,9		2				3,4	0,86	0,95							400	50						

Item	Equipmt' Tag No.	Motor Tag	Qty	Service	rated	Power required	common	Start. Torque	Model	Duty	FLA	PF	EFF	Manu- fact.	Temp. rise	Insul. class	Prot. degree	Cool.	Noise	Voltage	Freq.	Speed	Starter	Frame	Local Control Box	checked Date	signature
					kW	kW	kW	[%]			[A]				[K]				[dB]	[V]	[Hz]	[rpm]					
21	U5	U5 04 - E40... ff.	1	Outdoor Lighting U5	2,1		2				3,7	0,86	0,95							400	50						
22	EC3	EC3 . 04 - E10... ff.	1	Internal consumers switchgear	3		3				5,3	0,86	0,95							400	50						
23	EC3	EC3 . 04 - G01	1	Battery charger	2,8		3				4,9	0,86	0,95							400	50						
24	EC3	EC3 . 04 - E01	1	Air Conditioner 1	5,5		6				16,9	0,86	0,95							230	50						
25	EC3	EC3 . 04 - E02	1	Air Conditioner 2	5,5		6				16,9	0,86	0,95							230	50						
26	EC3	.	0	Reserve	2,28		0				0,0	0,86	0,95							400	50						
27	U4	U4 . 04 - E1... ff.	2	BelIt conv. U4-heating gear box	0,5		1,0				3,1	0,86	0,95							230	50						
28	U5	U5 . 04 - E1... ff.	1	BelIt conv. U5-heating gear box	0,5		0,5				1,5	0,86	0,95							230	50						
29		.	0				0				0,0	0,86	0,95							400	50						
TPP-Station																											
1	U5	U5 . 11 - M01	1	Belt conveyor U-5 drive motor	110	70	70				123,7	0,86	0,95							400	50		VFD		VOS-22		



3. Check Lists

3.5 Sensor List

PROJECT: EFT Stanari						DOCUMENT NO.: 109794-1600-Sensor List						<div>FAM</div> <div>Magdeburger Förderanlagen und Baumaschinen GmbH</div>			
FAM PROJECT NO. : 109794						REVISION NO.: preliminary									
DOCUMENT NO.: 109794-1600-Sensor						MACHINE NO.: BC									
STATUS : preliminary						Date: 02.05.14									
Item	Tag No.	Sensor Tag				Signal Points							Remark	Checked date	Signature
						Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor			
Emergency stop U-1															
1	=U1	=U1	.02	+L415	-S01	1	Pull rope switch 1	PRS00191.054033.001	KIEPE	NC	24V DC	-			
2	=U1	=U1	.02	+L415	-S02	1	Pull rope switch 2	PRS00191.054033.002	KIEPE	NC	24V DC	-			
3	=U1	=U1	.02	+L499	-S03	1	Emergency stop push button 1	3SB3801-0DF-Z	SIEMENS	NC	24V DC	-			
4															
Emergency stop U-2															
5	=U2	=U2	.02	+L415	-S01	1	Pull rope switch 1	PRS00191.054033.001	KIEPE	NC	24V DC	-			
6	=U2	=U2	.02	+L415	-S02	1	Pull rope switch 2	PRS00191.054033.002	KIEPE	NC	24V DC	-			
7	=U2	=U2	.02	+L425	-S03	1	Pull rope switch 3	PRS00191.054033.003	KIEPE	NC	24V DC	-			
8	=U2	=U2	.02	+L425	-S04	1	Pull rope switch 4	PRS00191.054033.004	KIEPE	NC	24V DC	-			
9	=U2	=U2	.02	+L435	-S05	1	Pull rope switch 5	PRS00191.054033.005	KIEPE	NC	24V DC	-			
10	=U2	=U2	.02	+L435	-S06	1	Pull rope switch 6	PRS00191.054033.006	KIEPE	NC	24V DC	-			
11	=U2	=U2	.02	+L445	-S07	1	Pull rope switch 7	PRS00191.054033.007	KIEPE	NC	24V DC	-			
12	=U2	=U2	.02	+L445	-S08	1	Pull rope switch 8	PRS00191.054033.008	KIEPE	NC	24V DC	-			
13	=U2	=U2	.02	+L455	-S09	1	Pull rope switch 9	PRS00191.054033.009	KIEPE	NC	24V DC	-			
14	=U2	=U2	.02	+L455	-S10	1	Pull rope switch 10	PRS00191.054033.010	KIEPE	NC	24V DC	-			
15	=U2	=U2	.02	+L465	-S11	1	Pull rope switch 11	PRS00191.054033.011	KIEPE	NC	24V DC	-			
16	=U2	=U2	.02	+L465	-S12	1	Pull rope switch 12	PRS00191.054033.012	KIEPE	NC	24V DC	-			
17	=U2	=U2	.02	+L475	-S13	1	Pull rope switch 13	PRS00191.054033.013	KIEPE	NC	24V DC	-			
18	=U2	=U2	.02	+L475	-S14	1	Pull rope switch 14	PRS00191.054033.014	KIEPE	NC	24V DC	-			
19	=U3	=U3	.03	+L476	-S15	1	Pull rope switch 15	PRS00191.054033.015	KIEPE	NC	24V DC				
19	=U2	=U2	.02	+L499	-S16	1	Pull rope switch 16	PRS00191.054033.016	KIEPE	NC	24V DC	-			
20															
Emergency stop U-3															
21	=U3	=U3	.02	+L415	-S01	1	Pull rope switch 1	PRS00191.054033.001	KIEPE	NC	24V DC	-	in future		
22	=U3	=U3	.02	+L415	-S02	1	Pull rope switch 2	PRS00191.054033.002	KIEPE	NC	24V DC	-	in future		
22	=U3	=U3	.02	+L425	-S03	1	Pull rope switch 3	PRS00191.054033.003	KIEPE	NC	24V DC	-	in future		
23	=U3	=U3	.02	+L425	-S04	1	Pull rope switch 4	PRS00191.054033.004	KIEPE	NC	24V DC	-	in future		

Item	Tag No.	Sensor Tag				Signal Points						Remark	Checked date	Signature
						Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor		
23	=U3	=U3	.02	+L435	-S05	1	Pull rope switch 5	PRS00191.054033.005	KIEPE	NC	24V DC	-	in future	
24	=U3	=U3	.02	+L435	-S06	1	Pull rope switch 6	PRS00191.054033.006	KIEPE	NC	24V DC	-	in future	
24	=U3	=U3	.02	+L445	-S07	1	Pull rope switch 7	PRS00191.054033.007	KIEPE	NC	24V DC	-	in future	
25	=U3	=U3	.02	+L445	-S08	1	Pull rope switch 8	PRS00191.054033.008	KIEPE	NC	24V DC	-	in future	
26	=U3	=U3	.02	+L455	-S09	1	Pull rope switch 9	PRS00191.054033.009	KIEPE	NC	24V DC	-	in future	
27	=U3	=U3	.02	+L455	-S10	1	Pull rope switch 10	PRS00191.054033.010	KIEPE	NC	24V DC	-	in future	
28	=U3	=U3	.02	+L465	-S11	1	Pull rope switch 11	PRS00191.054033.011	KIEPE	NC	24V DC	-	in future	
29	=U3	=U3	.02	+L465	-S12	1	Pull rope switch 12	PRS00191.054033.012	KIEPE	NC	24V DC	-	in future	
30	=U3	=U3	.02	+L475	-S13	1	Pull rope switch 13	PRS00191.054033.013	KIEPE	NC	24V DC	-	in future	
31	=U3	=U3	.02	+L475	-S14	1	Pull rope switch 14	PRS00191.054033.014	KIEPE	NC	24V DC	-	in future	
32	=U3	=U3	.02	+L485	-S15	1	Pull rope switch 15	PRS00191.054033.015	KIEPE	NC	24V DC			
33	=U3	=U3	.02	+L485	-S16	1	Pull rope switch 16	PRS00191.054033.016	KIEPE	NC	24V DC			
34	=U3	=U3	.02	+L495	-S17	1	Pull rope switch 17	PRS00191.054033.017	KIEPE	NC	24V DC			
35	=U3	=U3	.02	+L495	-S18	1	Pull rope switch 18	PRS00191.054033.018	KIEPE	NC	24V DC			
36	=U3	=U3	.02	+L495	-S19	1	Pull rope switch 19	PRS00191.054033.019	KIEPE	NC	24V DC			
37	=U3	=U3	.02	+L495	-S20	1	Pull rope switch 20	PRS00191.054033.020	KIEPE	NC	24V DC			
38	=U3	=U3	.02	+L498	-S21	1	Pull rope switch 21	PRS00191.054033.021	KIEPE	NC	24V DC			
39	=U3	=U3	.02	+L498	-S22	1	Pull rope switch 22	PRS00191.054033.022	KIEPE	NC	24V DC			
40	=U3	=U3	.02	+L231	-S05	1	Emergency stop push button 1	VOS-22-NT	Dittelbach&Kerzler	NC	24V DC			
41														
Emergency stop U-4														
42	=U4	=U4	.02	+L415	-S01	1	Pull rope switch 1	PRS00191.054033.001	KIEPE	NC	24V DC	-		
43	=U4	=U4	.02	+L415	-S02	1	Pull rope switch 2	PRS00191.054033.002	KIEPE	NC	24V DC	-		
44	=U4	=U4	.02	+L425	-S03	1	Pull rope switch 3	PRS00191.054033.003	KIEPE	NC	24V DC	-		
45	=U4	=U4	.02	+L425	-S04	1	Pull rope switch 4	PRS00191.054033.004	KIEPE	NC	24V DC	-		

Item	Tag No.	Sensor Tag		Signal Points							Remark	Checked date	Signature
				Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor			
46	=U4	=U4	.02 +L435 -S05	1	Pull rope switch 5	PRS00191.054033.005	KIEPE	NC	24V DC	-			
47	=U4	=U4	.02 +L435 -S06	1	Pull rope switch 6	PRS00191.054033.006	KIEPE	NC	24V DC	-			
48	=U4	=U4	.02 +L445 -S07	1	Pull rope switch 7	PRS00191.054033.007	KIEPE	NC	24V DC	-			
49	=U4	=U4	.02 +L445 -S08	1	Pull rope switch 8	PRS00191.054033.008	KIEPE	NC	24V DC	-			
50	=U4	=U4	.02 +L445 -S09	1	Pull rope switch 9	PRS00191.054033.009	KIEPE	NC	24V DC	-			
51	=U4	=U4	.02 +L455 -S10	1	Pull rope switch 10	PRS00191.054033.010	KIEPE	NC	24V DC	-			
52	=U4	=U4	.02 +L455 -S11	1	Pull rope switch 11	PRS00191.054033.011	KIEPE	NC	24V DC	-			
53	=U4	=U4	.02 +L465 -S12	1	Pull rope switch 12	PRS00191.054033.012	KIEPE	NC	24V DC	-			
54	=U4	=U4	.02 +L465 -S13	1	Pull rope switch 13	PRS00191.054033.013	KIEPE	NC	24V DC	-			
55	=U4	=U4	.02 +L465 -S14	1	Pull rope switch 14	PRS00191.054033.014	KIEPE	NC	24V DC	-			
56	=U4	=U4	.02 +L475 -S15	1	Pull rope switch 15	PRS00191.054033.015	KIEPE	NC	24V DC	-			
57	=U4	=U4	.02 +L475 -S16	1	Pull rope switch 16	PRS00191.054033.016	KIEPE	NC	24V DC	-			
58	=U4	=U4	.02 +L231 -S05	1	Emergency stop push button 1	VOS-22-NT	Dittelbach&Kerzler	NC	24V DC	-			
59	=U5	=U5	.03 +L232 -S06	1	Emergency stop push button 2	VOS-22-NT	Dittelbach&Kerzler	NC					

Emergency stop U-5

60	=U5	=U5	.02 +L415 -S01	1	Pull rope switch 1	PRS00191.054033.001	KIEPE	NC	24V DC	-			
61	=U5	=U5	.02 +L415 -S02	1	Pull rope switch 2	PRS00191.054033.002	KIEPE	NC	24V DC	-			
62	=U5	=U5	.02 +L425 -S03	1	Pull rope switch 3	PRS00191.054033.003	KIEPE	NC	24V DC	-			
63	=U5	=U5	.02 +L425 -S04	1	Pull rope switch 4	PRS00191.054033.004	KIEPE	NC	24V DC	-			
64	=U5	=U5	.02 +L435 -S05	1	Pull rope switch 5	PRS00191.054033.005	KIEPE	NC	24V DC	-			
65	=U5	=U5	.02 +L435 -S06	1	Pull rope switch 6	PRS00191.054033.006	KIEPE	NC	24V DC	-			
66	=U5	=U5	.02 +L499 -S07	1	Emergency stop push button 1	3SB3801-0DF-Z	SIEMENS	NC	24V DC	-			
67													

Start up warning U-1

68	=U1	=U1	.03 +L415 -H01	1	Flash lamp 1	PMF2030	Pfannenber	-	-	230VAC			
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Item	Tag No.	Sensor Tag				Signal Points						Remark	Checked date	Signature
						Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor		
69	=U1	=U1	.03	+L415	-H02	1	Horn 1	570 052 68	WERMA	-	-	230VAC		
70														

Start up warning U-2														
71	=U2	=U2	.03	+L415	-H01	1	Flash lamp 1	PMF2030	Pfannenber	-	-	230VAC		
72	=U2	=U2	.03	+L415	-H02	1	Horn 1	570 052 68	WERMA	-	-	230VAC		
73	=U2	=U2	.03	+L425	-H03	1	Flash lamp 2	PMF2030	Pfannenber	-	-	230VAC		
74	=U2	=U2	.03	+L425	-H04	1	Horn 2	570 052 68	WERMA	-	-	230VAC		
75	=U2	=U2	.03	+L435	-H05	1	Flash lamp 3	PMF2030	Pfannenber	-	-	230VAC		
76	=U2	=U2	.03	+L435	-H06	1	Horn 3	570 052 68	WERMA	-	-	230VAC		
77	=U2	=U2	.03	+L445	-H07	1	Flash lamp 4	PMF2030	Pfannenber	-	-	230VAC		
78	=U2	=U2	.03	+L445	-H08	1	Horn 4	570 052 68	WERMA	-	-	230VAC		
79	=U2	=U2	.03	+L455	-H10	1	Flash lamp 5	PMF2030	Pfannenber	-	-	230VAC		
80	=U2	=U2	.03	+L455	-H09	1	Horn 5	570 052 68	WERMA	-	-	230VAC		
81	=U2	=U2	.03	+L465	-H11	1	Flash lamp 6	PMF2030	Pfannenber	-	-	230VAC		
82	=U2	=U2	.03	+L465	-H12	1	Horn 6	570 052 68	WERMA	-	-	230VAC		
83	=U2	=U2	.03	+L475	-H13	1	Flash lamp 7	PMF2030	Pfannenber	-	-	230VAC		
84	=U2	=U2	.03	+L475	-H14	1	Horn 7	570 052 68	WERMA	-	-	230VAC		
85	=U2	=U2	.03	+L485	-H15	1	Flash lamp 8	PMF2030	Pfannenber	-	-	230VAC		
86	=U2	=U2	.03	+L485	-H16	1	Horn 8	570 052 68	WERMA	-	-	230VAC		
87	=U2	=U2	.81	+L498										

Start up warning U-3														
1	=U3	=U3	.03	+L405	-H01	1	Flash lamp 1	PMF2030	Pfannenber	-	-	230VAC	in future	
2	=U3	=U3	.03	+L405	-H02	1	Horn 1	570 052 68	WERMA	-	-	230VAC	in future	
3	=U3	=U3	.03	+L415	-H03	1	Flash lamp 2	PMF2030	Pfannenber	-	-	230VAC	in future	
4	=U3	=U3	.03	+L415	-H04	1	Horn 2	570 052 68	WERMA	-	-	230VAC	in future	

Item	Tag No.	Sensor Tag				Signal Points						Remark	Checked date	Signature
						Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor		
5	=U3	=U3	.03	+L425	-H05	1	Flash lamp 3	PMF2030	Pfannenber	-	-	230VAC	in future	
6	=U3	=U3	.03	+L425	-H06	1	Horn 3	570 052 68	WERMA	-	-	230VAC	in future	
7	=U3	=U3	.03	+L435	-H07	1	Flash lamp 4	PMF2030	Pfannenber	-	-	230VAC	in future	
8	=U3	=U3	.03	+L435	-H08	1	Horn 4	570 052 68	WERMA	-	-	230VAC	in future	
9	=U3	=U3	.03	+L445	-H09	1	Flash lamp 5	PMF2030	Pfannenber	-	-	230VAC	in future	
10	=U3	=U3	.03	+L445	-H10	1	Horn 5	570 052 68	WERMA	-	-	230VAC	in future	
11	=U3	=U3	.03	+L455	-H11	1	Flash lamp 6	PMF2030	Pfannenber	-	-	230VAC	in future	
12	=U3	=U3	.03	+L455	-H12	1	Horn 6	570 052 68	WERMA	-	-	230VAC	in future	
13	=U3	=U3	.03	+L465	-H13	1	Flash lamp 7	PMF2030	Pfannenber	-	-	230VAC	in future	
14	=U3	=U3	.03	+L465	-H14	1	Horn 7	570 052 68	WERMA	-	-	230VAC	in future	
15	=U3	=U3	.03	+L475	-H15	1	Flash lamp 8	PMF2030	Pfannenber	-	-	230VAC		
16	=U3	=U3	.03	+L475	-H16	1	Horn 8	570 052 68	WERMA	-	-	230VAC		
17	=U3	=U3	.03	+L485	-H17	1	Flash lamp 9	PMF2030	Pfannenber	-	-	230VAC		
18	=U3	=U3	.03	+L485	-H18	1	Horn 9	570 052 68	WERMA	-	-	230VAC		
19	=U3	=U3	.03	+L495	-H19	1	Flash lamp 9	PMF2030	Pfannenber	-	-	230VAC		
20	=U3	=U3	.03	+L495	-H20	1	Horn 9	570 052 68	WERMA	-	-	230VAC		
21	=U3	=U3	.03	+L498	-H21	1	Flash lamp 10	PMF2030	Pfannenber	-	-	230VAC		
22	=U3	=U3	.03	+L498	-H22	1	Horn 10	570 052 68	WERMA	-	-	230VAC		
23														

Start up warning U-4

24	=U4	=U4	.03	+L415	-H01	1	Flash lamp 1	PMF2030	Pfannenber	-	-	230VAC		
25	=U4	=U4	.03	+L415	-H02	1	Horn 1	570 052 68	WERMA	-	-	230VAC		
26	=U4	=U4	.03	+L425	-H03	1	Flash lamp 2	PMF2030	Pfannenber	-	-	230VAC		
27	=U4	=U4	.03	+L425	-H04	1	Horn 2	570 052 68	WERMA	-	-	230VAC		
28	=U4	=U4	.03	+L435	-H05	1	Flash lamp 3	PMF2030	Pfannenber	-	-	230VAC		
29	=U4	=U4	.03	+L435	-H06	1	Horn 3	570 052 68	WERMA	-	-	230VAC		
30	=U4	=U4	.03	+L445	-H07	1	Flash lamp 4	PMF2030	Pfannenber	-	-	230VAC		

Item	Tag No.	Sensor Tag				Signal Points						Remark	Checked date	Signature
						Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor		
31	=U4	=U4	.03	+L445	-H08		1	Horn 4	570 052 68	WERMA	-	-	230VAC	
32	=U4	=U4	.03	+L455	-H09		1	Flash lamp 5	PMF2030	Pfannenber	-	-	230VAC	
33	=U4	=U4	.03	+L455	-H10		1	Horn 5	570 052 68	WERMA	-	-	230VAC	
34	=U4	=U4	.03	+L465	-H11		1	Flash lamp 6	PMF2030	Pfannenber	-	-	230VAC	
35	=U4	=U4	.03	+L465	-H12		1	Horn 6	570 052 68	WERMA	-	-	230VAC	
36	=U4	=U4	.03	+L475	-H13		1	Flash lamp 7	PMF2030	Pfannenber	-	-	230VAC	
37	=U4	=U4	.03	+L475	-H14		1	Horn 7	570 052 68	WERMA	-	-	230VAC	
38	=U4	=U4	.03	+L485	-H15		1	Flash lamp 8	PMF2030	Pfannenber	-	-	230VAC	
39	=U4	=U4	.03	+L485	-H16		1	Horn 8	570 052 68	WERMA	-	-	230VAC	
40														

Start up warning U-5

41	=U5	=U5	.03	+L405	-H01		1	Flash lamp 1	PMF2030	Pfannenber	-	-	230VAC	
42	=U5	=U5	.03	+L405	-H02		1	Horn 1	570 052 68	WERMA	-	-	230VAC	
43	=U5	=U5	.03	+L415	-H03		1	Flash lamp 2	PMF2030	Pfannenber	-	-	230VAC	
44	=U5	=U5	.03	+L415	-H04		1	Horn 2	570 052 68	WERMA	-	-	230VAC	
45	=U5	=U5	.03	+L424	-H05		1	Flash lamp 3	PMF2030	Pfannenber	-	-	230VAC	
46	=U5	=U5	.03	+L424	-H06		1	Horn 3	570 052 68	WERMA	-	-	230VAC	
47														


Conveyor drive U-1

48	=U1	=U1	.11	+L400	-B01		1	Speed sensor	XSA-V12373	TELEMECANIQUE	NC	24V DC	inductive +Timer	
49	=U1	=U1	.11	+L400	-B02		1	Belt breakage	BLS001	KIEPE	NC	24V DC	Magnetic switch	
50	=U1	=U1	.11	+L405	-B03		1	Material height	UC3000-U9+IUE2+R2	Pepperl + Fuchs	4-20mA	24V DC	ultrasonic sensor	300-3000mm
135a	=U1	=U1	.12	+L406	-B06		1	Brake open	XS7-C40PC449	TELEMECANIQUE	NO	24V DC	Proximity switch	add. 18.11.2013
51	=U1	=U1	.11	+L405	-S04		1	Misalignment switch 1	MRS001	KIEPE	NC	24V DC	mechanical switch	
52	=U1	=U1	.11	+L405	-S05		1	Misalignment switch 2	MRS001	KIEPE	NC	24V DC	mechanical switch	
53	=U1	=U1	.11	+L425	-S06		1	Misalignment switch 3	MRS001	KIEPE	NC	24V DC	mechanical switch	

Item	Tag No.	Sensor Tag					Signal Points							Remark	Checked date	Signature
							Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor			
54	=U1	=U1	.11	+L425	-S07		1	Misalignment switch 4	MRS001	KIEPE	NC	24V DC	mechanical switch			
55	=U1	=U1	.11	+L499	-B04		1	Overfilling chute	MFTS 20-59-NM-75	Ramsey	NC	24V DC	pendulum sensor			
56	=U1	=U1	.11	+L231	-A01		1	Local control station conveyor drive	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button			
57	=U1	=U1	.11	+L499	-R01		1	Motor 1 PT100 resistor	internal motor	Motor Subsuplier	analogue	PT100	temperature sensor			
58	=U1	=U1	.11	+L499	-R02		1	Thruster Brake PTC-resistor	internal motor	Motor Subsuplier	analogue	PTC	temperature sensor			
59																

Conveyor drive U-2

61	=U2	=U2	.11	+L400	-B02		1	Belt breakage	BLS001	KIEPE	NC	24V DC	Magnetic switch			
62	=U2	=U2	.11	+L405	-B03		1	Material detection	MWM-1/5-G	Dittelbach & Kerzler	NO/NC	24V DC	micro switch			
63	=U2	=U2	.11	+L405	-S01		1	Misalignment switch 1	MRS001	KIEPE	NC	24V DC	mechanical switch			
64	=U2	=U2	.11	+L405	-S02		1	Misalignment switch 2	MRS001	KIEPE	NC	24V DC	mechanical switch			
65	=U2	=U2	.11	+L415	-S03		1	Misalignment switch 3	MRS001	KIEPE	NC	24V DC	mechanical switch			
66	=U2	=U2	.11	+L415	-S04		1	Misalignment switch 4	MRS001	KIEPE	NC	24V DC	mechanical switch			
67	=U2	=U2	.11	+L435	-S05		1	Misalignment switch 5	MRS001	KIEPE	NC	24V DC	mechanical switch			
68	=U2	=U2	.11	+L435	-S06		1	Misalignment switch 6	MRS001	KIEPE	NC	24V DC	mechanical switch			
69	=U2	=U2	.11	+L455	-S07		1	Misalignment switch 7	MRS001	KIEPE	NC	24V DC	mechanical switch			
70	=U2	=U2	.11	+L455	-S08		1	Misalignment switch 8	MRS001	KIEPE	NC	24V DC	mechanical switch			
71	=U2	=U2	.11	+L475	-S09		1	Misalignment switch 9	MRS001	KIEPE	NC	24V DC	mechanical switch			
72	=U2	=U2	.11	+L475	-S10		1	Misalignment switch 10	MRS001	KIEPE	NC	24V DC	mechanical switch			
73	=U2	=U2	.11	+L475	-S11		1	Misalignment switch 11	MRS001	KIEPE	NC	24V DC	mechanical switch			
74	=U2	=U2	.11	+L475	-S12		1	Misalignment switch 12	MRS001	KIEPE	NC	24V DC	mechanical switch			
75	=U2	=U2	.81	+L498	-B04		1	Belt tension high 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
76	=U2	=U2	.81	+L498	-B05		1	Belt tension low 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
77	=U2	=U2	.11	+L499	-B06		1	Overfilling chute	MFTS 20-59-NM-75	Ramsey	NC	24V DC	pendulum sensor			
78	=U2	=U2	.11	+L231	-A01		1	Local control station conveyor drive	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button			
79	=U3	=U3	.81	+L232	-A02		2	Local control station take-up station	VOS-23-NT	Dittelbach&Kerzler		24V DC	several push button			

PROJECT: EFT Stanari		DOCUMENT NO.: 109794-1600-Sensor List		 Magdeburger Förderanlagen und Baumaschinen GmbH
FAM PROJECT NO. :	109794	REVISION NO.: preliminary		
DOCUMENT NO.:	109794-1600-Sensor	MACHINE NO.: BC		
STATUS :	preliminary	Date: 02.05.14		

Item	Tag No.	Sensor Tag				Signal Points							Remark	Checked date	Signature	
						Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor				
79	=U2	=U2	.11	+L499	-R01		1	Motor 1 PT100 resistor	internal motor		analogue	PT100	temperature sensor			
80	=U2	=U2	.11	+L499	-R02		1	Motor 2 PT100 resistor	internal motor		analogue	PT100	temperature sensor			
81	=U2	=U2	.11	+L499	-R03		1	Motor 3 PT100 resistor	internal motor		analogue	PT100	temperature sensor			
82	=U2	=U2	.11	+L499	-R04		1	Thruster Brake PTC-resistor	internal motor		analogue	PTC	temperature sensor			
83	=U2	=U2	.11	+L499	-B07		1	Brake open	XS7-C40PC449	TELEMECANIQUE	NO	24V DC	Proximity switch			add. 18.11.2013
84	=U2	=U2	.11	+L499	-B01			Load sensing bolt	KSW/70kN/D6-22/4...20mA	Piab	analogue	4-20mA				

Conveyor drive U-3

84	=U3	=U3	.11	+L405	-S09	1	Misalignment switch 9	MRS001	KIEPE	NC	24V DC	mechanical switch	in future		
85	=U3	=U3	.11	+L405	-S10	1	Misalignment switch 10	MRS001	KIEPE	NC	24V DC	mechanical switch	in future		
86	=U3	=U3	.11	+L405	-S11	1	Misalignment switch 11	MRS001	KIEPE	NC	24V DC	mechanical switch	in future		
87	=U3	=U3	.11	+L405	-S12	1	Misalignment switch 12	MRS001	KIEPE	NC	24V DC	mechanical switch	in future		
88	=U3	=U3	.11	+L455	-B01	1	Speed sensor	XSA-V12373	TELEMECANIQUE	NO	24V DC	inductive +Timer	in future to re-locate to +L400		
89	=U3	=U3	.11	+L455	-B02	1	Belt breakage	BLS001	KIEPE	NO	24V DC	Magnetic switch	in future to re-locate to +L400		
89a	=U3	=U3	.11	+L455	-B03	1	Material detection	MWM-1/5-G	Dittelbach & Kerzler	NO/NC	24V DC	micro switch	in future to re-locate to +L400		
90	=U3	=U3	.11	+L455	-S01	1	Misalignment switch 1	MRS001	KIEPE	NC	24V DC	mechanical switch			
91	=U3	=U3	.11	+L455	-S02	1	Misalignment switch 2	MRS001	KIEPE	NC	24V DC	mechanical switch			
92	=U3	=U3	.11	+L475	-S03	1	Misalignment switch 3	MRS001	KIEPE	NC	24V DC	mechanical switch			
93	=U3	=U3	.11	+L475	-S04	1	Misalignment switch 4	MRS001	KIEPE	NC	24V DC	mechanical switch			
94	=U3	=U3	.11	+L495	-S05	1	Misalignment switch 5	MRS001	KIEPE	NC	24V DC	mechanical switch			
95	=U3	=U3	.11	+L495	-S06	1	Misalignment switch 6	MRS001	KIEPE	NC	24V DC	mechanical switch			
96	=U3	=U3	.11	+L495	-B03	1	Belt tension high 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
97	=U3	=U3	.11	+L495	-B04	1	Belt tension low 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
98	=U3	=U3	.11	+L499	-B05	1	Overfilling chute	MFTS 20-59-NM-75	Ramsey	NC	24V DC	pendulum sensor			
99	=U3	=U3	.11	+L499	-S07	1	Misalignment switch 7	MRS001	KIEPE	NC	24V DC	mechanical switch			
100	=U3	=U3	.11	+L499	-S08	1	Misalignment switch 8	MRS001	KIEPE	NC	24V DC	mechanical switch			

Item	Tag No.	Sensor Tag					Signal Points							Remark	Checked date	Signature
							Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor			
101	=U3	=U3	.11	+L231	-A01		1	Local control station conveyor drive	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button			
102	=U3	=U3	.81	+L232	-A02		1	Local control station take-up station	VOS-23-NT	Dittelbach&Kerzler		24V DC	several push button			
103	=U3	=U3	.11	+L499	-R01		1	Motor 1 PT100 resistor	internal motor	Motor Subsupplier	analogue	PT100	temperature sensor	in future		
104	=U3	=U3	.11	+L499	-R02		1	Motor 2 PT100 resistor	internal motor	Motor Subsupplier	analogue	PT100	temperature sensor	in future		
105	=U3	=U3	.11	+L499	-R03		1	Motor 3 PT100 resistor	internal motor	Motor Subsupplier	analogue	PT100	temperature sensor	in future		
106	=U3	=U3	.11	+L499	-R04			Thruster Brake PTC-resistor	internal motor	Motor Subsupplier	analogue	PTC	temperature sensor			
107							1	Brake open	XS7-C40PC449	TELEMECANIQUE	NO	24V DC	Proximity switch	add. 18.11.2013		

Conveyor drive U-4

108	=U4	=U4	.11	+L400	-B01		1	Speed sensor	XSA-V12373	TELEMECANIQUE	NO	24V DC	inductive +Timer			
109	=U4	=U4	.12	+L400	-B02		2	Belt breakage	BLS001	KIEPE	NO	24V DC	Magnetic switch			
110	=U4	=U4	.11	+L400	-B03		1	Material detection	MWM-1/5-G	Dittelbach & Kerzler	NO/NC	24V DC	micro switch			
111	=U4	=U4	.11	+L405	-S01		1	Misalignment switch 1	MRS001	KIEPE	NC	24V DC	mechanical switch			
112	=U4	=U4	.11	+L405	-S02		1	Misalignment switch 2	MRS001	KIEPE	NC	24V DC	mechanical switch			
113	=U4	=U4	.11	+L415	-S03		1	Misalignment switch 3	MRS001	KIEPE	NC	24V DC	mechanical switch			
114	=U4	=U4	.11	+L415	-S04		1	Misalignment switch 4	MRS001	KIEPE	NC	24V DC	mechanical switch			
115	=U4	=U4	.11	+L435	-S05		1	Misalignment switch 5	MRS001	KIEPE	NC	24V DC	mechanical switch			
116	=U4	=U4	.11	+L435	-S06		1	Misalignment switch 6	MRS001	KIEPE	NC	24V DC	mechanical switch			
117	=U4	=U4	.11	+L445	-S07		1	Misalignment switch 7	MRS001	KIEPE	NC	24V DC	mechanical switch			
118	=U4	=U4	.11	+L445	-S08		1	Misalignment switch 8	MRS001	KIEPE	NC	24V DC	mechanical switch			
119	=U4	=U4	.11	+L475	-S09		1	Misalignment switch 9	MRS001	KIEPE	NC	24V DC	mechanical switch			
120	=U4	=U4	.11	+L475	-S10		1	Misalignment switch 10	MRS001	KIEPE	NC	24V DC	mechanical switch			
121	=U4	=U4	.11	+L475	-S11		1	Misalignment switch 11	MRS001	KIEPE	NC	24V DC	mechanical switch			
122	=U4	=U4	.11	+L475	-S12		1	Misalignment switch 12	MRS001	KIEPE	NC	24V DC	mechanical switch			
121	=U4	=U4	.11	+L475	-B03		1	Belt tension high 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
122	=U4	=U4	.11	+L475	-B04		1	Belt tension low 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
123	=U4	=U4	.11	+L499	-B05		1	Overfilling chute	MFTS 20-59-NM-75	Ramsey	NC	24V DC	pendulum sensor			
124	=U4	=U4	.11	+L231	-A01		1	Local control station conveyor drive	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button			

Item	Tag No.	Sensor Tag					Signal Points							Remark	Checked date	Signature
							Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor			
125	=U4	=U4	.81	+L232	-A02		1	Local control station take-up station	VOS-23-NT	Dittelbach&Kerzler		24V DC	several push button			
126	=U4	=U4	.11	+L499	-R01		1	Motor 1 PT100 resistor	internal motor	Motor Subsuplier	analogue	PT100	temperature sensor			
127	=U4	=U4	.11	+L499	-R02		1	Motor 2 PT100 resistor	internal motor	Motor Subsuplier	analogue	PT100	temperature sensor			
128	=U4	=U4	.11	+L499	B6		1	Brake open	XS7-C40PC449	TELEMECANIQUE	NO	24V DC	Proximity switch	add. 18.11.2013		

Conveyor drive U-5

129	=U5	=U5	.11	+L400	-B01		1	Speed sensor	XSA-V12373	TELEMECANIQUE	NO	24V DC	inductive +Timer			
130	=U5	=U5	.11	+L400	-B02		2	Belt breakage	BLS001	KIEPE	NO	24V DC	Magnetic switch			
131	=U5	=U5	.11	+L400	-B03		1	Material detection	MWM-1/5-G	Dittelbach & Kerzler	NO/NC	24V DC	micro switch			
132	=U5	=U5	.11	+L405	-S01		1	Misalignment switch 1	MRS001	KIEPE	NC	24V DC	mechanical switch			
133	=U5	=U5	.11	+L405	-S02		1	Misalignment switch 2	MRS001	KIEPE	NC	24V DC	mechanical switch			
134	=U5	=U5	.11	+L415	-B04		1	Belt tension high 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
135	=U5	=U5	.11	+L415	-B05		1	Belt tension low 1	XS7-C40PC449	TELEMECANIQUE	NC	24V DC	inductive sensor			
136	=U5	=U5	.11	+L405	-S01		1	Misalignment switch 1	MRS001	KIEPE	NC	24V DC	mechanical switch			
137	=U5	=U5	.11	+L405	-S02		1	Misalignment switch 2	MRS001	KIEPE	NC	24V DC	mechanical switch			
138	=U5	=U5	.11	+L415	-S03		1	Misalignment switch 3	MRS001	KIEPE	NC	24V DC	mechanical switch			
139	=U5	=U5	.11	+L415	-S04		1	Misalignment switch 4	MRS001	KIEPE	NC	24V DC	mechanical switch			
140	=U5	=U5	.12	+L425	-S05		1	Misalignment switch 5								
141	=U5	=U5	.13	+L425	-S06		1	Misalignment switch 6								
142	=U5	=U5	.11	+L231	-A01		1	Local control station conveyor drive	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button			
143	=U5	=U5	.11	+L499	-R01		1	Motor 1 resistor	internal motor	r Subs	analogue	PT100	temperature sensor			
144	=U5	=U5	.11	+L499	-B06		1	Overfilling chute	MFTS 20-59-NM-75	Ramsey	NC	24V DC	pendulum sensor			
145	=U5	=U5	.12	+L500	-R03		1	Brake open	XS7-C40PC449	TELEMECANIQUE	NO	24V DC	Proximity switch	add. 18.11.2013		

Emergency stop Crusher

146	=U5	=U5	.02	+L400	-S01		1	Emergency stop push button 1	3SB3801-0DF-Z	SIEMENS	NO	24V DC	-			
147	=U5	=U5	.02	+L400	-S02		1	Emergency stop push button 2	3SB3801-0DF-Z	SIEMENS	NO	24V DC	-			
148	=U5	=U5	.02	+L400	-S03		1	Emergency stop push button 3	3SB3801-0DF-Z	SIEMENS	NO	24V DC	-			

PROJECT: EFT Stanari					DOCUMENT NO.: 109794-1600-Sensor List					<div>FAM</div> <div>Magdeburger Förderanlagen und Baumaschinen GmbH</div>				
FAM PROJECT NO. : 109794					REVISION NO.: preliminary									
DOCUMENT NO.: 109794-1600-Sensor					MACHINE NO.: BC									
STATUS : preliminary					Date: 02.05.14									
Item	Tag No.	Sensor Tag			Signal Points							Remark	Checked date	Signature
					Qty	Description	Type	Manufacturer	Contact	Signal	Kind of sensor/actor			
149	=U5	=U5	.02	+L400 -S04	1	Emergency stop push button 4	3SB3801-0DF-Z	SIEMENS	NO	24V DC	-			
Start up warning Crusher														
#####	=CR1	=CR1	.03	+L599 -H01		1	Flash lamp 1	PMF2030	Pfannenberg	-	-	230VAC		
#####	=CR1	=CR1	.03	+L599 -H02		1	Horn 1	570 052 68	WERMA	-	-	230VAC		
Crusher Station														
#####	=CR1	=CR1	.11	+L400 -B01		1	Speed sensor 1	XS1-N18PA349D	TELEMECANIQUE	NO	24V DC	proximity switch		
#####	=CR1	=CR1	.11	+L400 -B02		1	Speed sensor 2	XS1-N18PA349D	TELEMECANIQUE	NO	24V DC	proximity switch		
#####	=CR1	=CR1	.11	+L400 -B03		1	Vibration sensor	?		NC	24V DC			
#####	=CR1	=CR1	.11	+L400 -R01		1	Motor 1 resistor 1	internal motor	Motor Subsuplier	analogue	PT100	temperature sensor	Crusher motor	
#####	=CR1	=CR1	.11	+L400 -R02		1	Motor 1 resistor 2	internal motor	Motor Subsuplier	analogue	PT100	temperature sensor	Crusher motor	
#####	=CR1	=CR1	.11	+L400 -R03		1	Motor 1 resistor 3	internal motor	Motor Subsuplier	analogue	PT100	temperature sensor	Crusher motor	
#####	=CR1	=CR1	.11	+L400 -R04		1	Bearing resistor 1	internal	Subsuplier	analogue	PT100	temperature sensor	Bearing Crusher	
#####	=CR1	=CR1	.11	+L400 -R05		1	Bearing resistor 2	internal	Subsuplier	analogue	PT100	temperature sensor	Bearing Crusher	
#####	=CR1	=CR1	.11	+L400 -R06		1	Motor 2 resistor	internal motor	Motor Subsuplier	analogue	PTC	temperature sensor	Crusher Hydraulic	
#####	=CR1	=CR1	.11	+L400 -R07		1	Motor 3 resistor	internal motor	Motor Subsuplier	analogue	PTC	temperature sensor	Aapron feeder	
#####	=CR1	=CR1	.81	+L400 -R08		1	Motor 4 resistor	internal motor	Motor Subsuplier	analogue	PTC	temperature sensor	Spillage conveyor	
#####	=CR1	=CR1	.11	+L400 -S01		1	Limit switch closed left	XS7-C40PC449	TELEMECANIQUE	NO	24V DC	mechanical switch	Chrusher housing monitoring	
#####	=CR1	=CR1	.11	+L400 -S02		1	Limit switch closed right	XS7-C40PC449	TELEMECANIQUE	NO	24V DC	mechanical switch	Chrusher housing monitoring	
#####	=CR1	=CR1	.11	+L231 -A01		1	Local control station	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button	Crusher	
#####	=CR1	=CR1	.11	+L232 -A01		1	Local control station	VOS-23-NT	Dittelbach&Kerzler		24V DC	several push button	Crusher Hydraulic	
#####	=CR1	=CR1	.11	+L233 -A01		1	Local control station	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button	Aapron feeder	
#####	=CR1	=CR1	.11	+L234 -A01		1	Local control station	VOS-22-NT	Dittelbach&Kerzler		24V DC	several push button	Spillage conveyor	
#####	=CR1	=CR1	.11	+L400 -B22		1	Material detection Apron F.below	FTI55-BAC2RVJ21A1A	ENDRESS+HAUSER	NO	24V DC	capacitive stick probe	Aapron feeder	
#####	=CR1	=CR1	.11	+L400 -B23		1	Material detection Apron F.above	FTI55-BAC2RVJ21A1A	ENDRESS+HAUSER	NO	24V DC	capacitive stick probe	Aapron feeder	